

COMMITTEE ON RESEARCH (COR)**Wednesday, September 17, 2014****3:00 – 4:30 pm****KL 324****[UCMCROPS/COR1415/Resources](#)****I. Chair's Report – *David Noelle***

- A. Update from Division Council meeting September 3.
- B. Expected CHASE ORU proposal
- C. IRB faculty survey. The Director of Research Compliance is willing to work with COR to construct a survey.

II. Consent Calendar

Approval of September 3 meeting minutes.

Pg. 1-3**III. SNRI 5 Year Review Planning****Pg. 4-72**

Background: SNRI is due to undergo a five-year review.

The unit's archived documents are appended to this packet. Pursuant to COR's policies on the establishment and review of research units, the five-year review must be initiated by the Administration with consultation from the Academic Senate. COR's policies are appended.

Discussion: COR to plan five-year review with VCR.

IV. Campus Review Items

- A. Senate-Administration IT Advisory Council draft charge.

Pg. 73-74

Action requested: COR to review the draft charge and provide any comments by October 3.

- B. SSHA Request for Suspension of Appraisal form.

Pg. 75-85

Action requested: COR to review SSHA's request and provide any comments by October 3.

- C. Economics PhD Proposal

Action requested: COR reviewer (identified prior to this meeting) to provide

comments on the proposal. COR to conduct a vote on approval or disapproval of the proposal by October 3. Due to the proposal's length, it is not appended to this packet. *The proposal can be viewed at UCMCROPS/COR1415/Resources/Review Items – Campus.*

V. Senate Research Grants

Pg. 86-92

- A. Deliberate concerning further requests for an expansion of this program.
- B. Begin discussion of program goals.

VI. Other Business

Committee on Research (COR)
Minutes of Meeting
September 3, 2014

Pursuant to call, the Committee on Research met at 3:00 pm on September 3, 2014 in Room 362 of the Kolligian Library, Chair David Noelle presiding.

I. Chair's Report

Chair Noelle welcomed new and continuing members to COR.

Chair Noelle directed the committee members' attention to the AY 13-14 COR annual report, specifically, the section on planning for AY 14-15. Vice Chancellor for Research (VCR) Traina pointed out that the office of Research Compliance is scheduled to undergo periodic review in AY 15-16 and suggested that COR participate in the review. COR members briefly discussed the Institutional Review Board (IRB) and whether faculty are experiencing any issues.

ACTION: Research and Development Services (RDS) staff will be asked to conduct a faculty survey on satisfaction with the IRB.

II. COR Goals for AY 14-15

Committee members agreed to focus on the following goals this academic year and assigned committee members to take the lead:

--Review of research units. Since the Senate has approved the policies drafted by last year's COR on the establishment and review of research units, COR will implement those policies this year. SNRI is scheduled for a five-year review and COR will work with the VCR to launch this endeavor and evaluate SNRI's research contribution to the campus. SNRI would need to be notified at least one year in advance so it can gather the necessary data.

ACTION: COR will identify the timeline, metrics, and necessary documentation needed to begin the five-year review.

--Faculty research grants. Last year's COR submitted two memos to Division Council stating the need for increased funding of the faculty grants program

as funding as not increased commensurate with the growth in faculty numbers. Many meritorious proposals could not be funded due to low levels of funding. In the absence of further funding, COR will re-evaluate the criteria used for the grant proposals. COR may involve Schools in the initial review of the proposals.

--Indirect cost return. COR members met with VP Feitelberg, AVC Jones, and Controller Riley in August to continue the AY 13-14 conversation about faculty funding. COR will continue to impart to the administration the importance of faculty bridge funding as well as consistency and transparency in an indirect cost return policy. COR will also work with the administration on communicating to faculty all updates concerning indirect cost return.

--Lab safety. In light of many faculty members moving from SEI to SEII, more issues surrounding labs have arisen and will persist for the next few years. VCR Traina co-chairs a campus research safety committee with faculty representation, and COR will continue to monitor and advise on lab safety issues.

--Grants management system and federal research guidelines. COR will assist the VCR, RDS, and the Sponsored Projects Office (SPO) by providing input on the new system before it is implemented in 2015. VCR Traina has already identified beta testers but COR will be asked to provide guidance on the training materials and other components of the new system. COR will also work with the VCR on reviewing the new federal research guidelines that are scheduled to become effective December 2014.

--Space. COR will work with other Senate committees, mainly CAPRA, on advising about space issues as they affect the campus research mission. Various space committees have been convened on campus over time, but there is a pressing need for more faculty representation.

--Limited submission grant proposals. These are currently handled at the School-level and COR will make recommendations on the review process and the need for transparency.

ACTION: At the next COR meeting, timelines will be assigned to each goal.

There being no further business, the meeting adjourned at 4:30 pm.

Attest: David Noelle, COR Chair

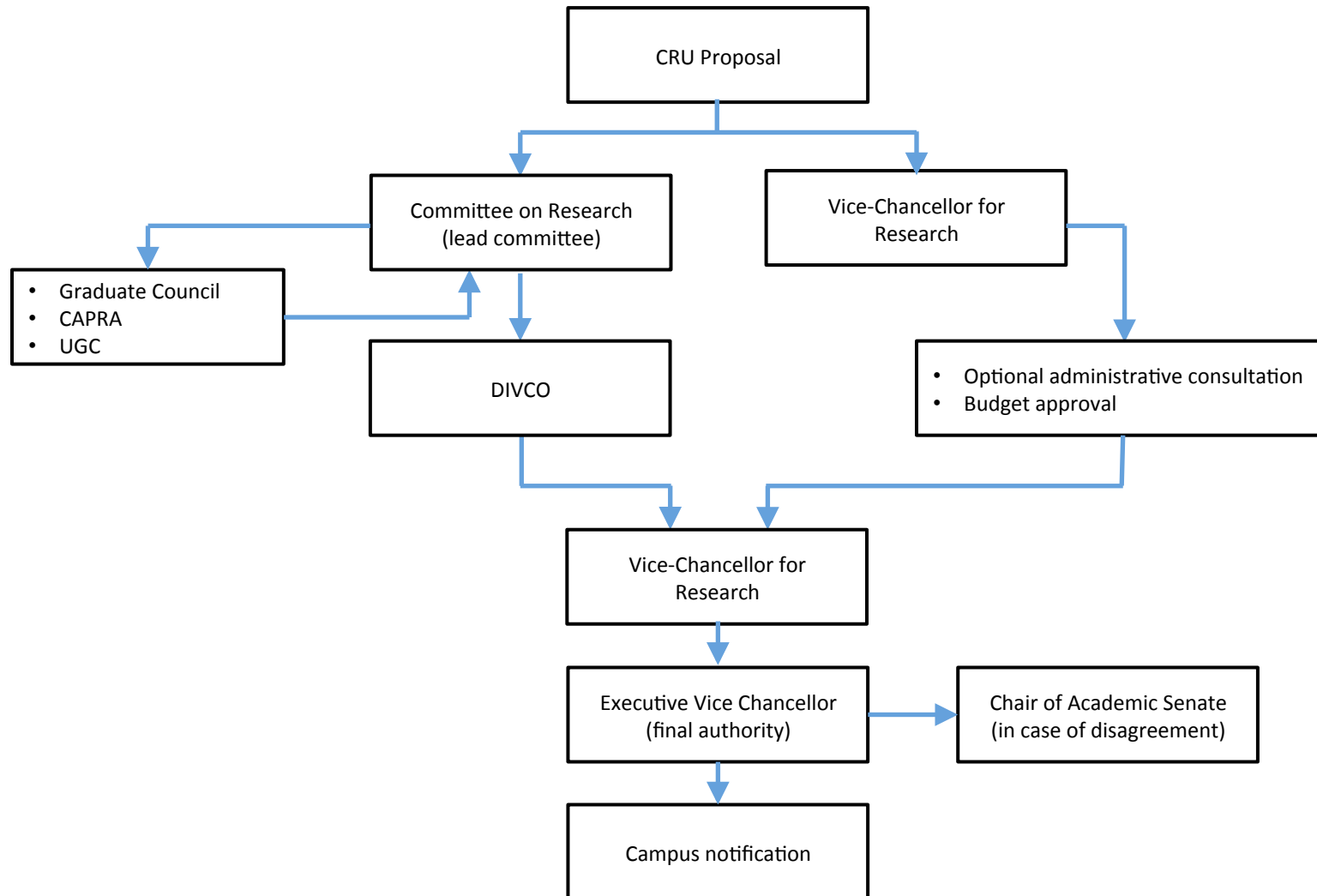
Minutes prepared by: Simrin Takhar, Senate Analyst

DRAFT

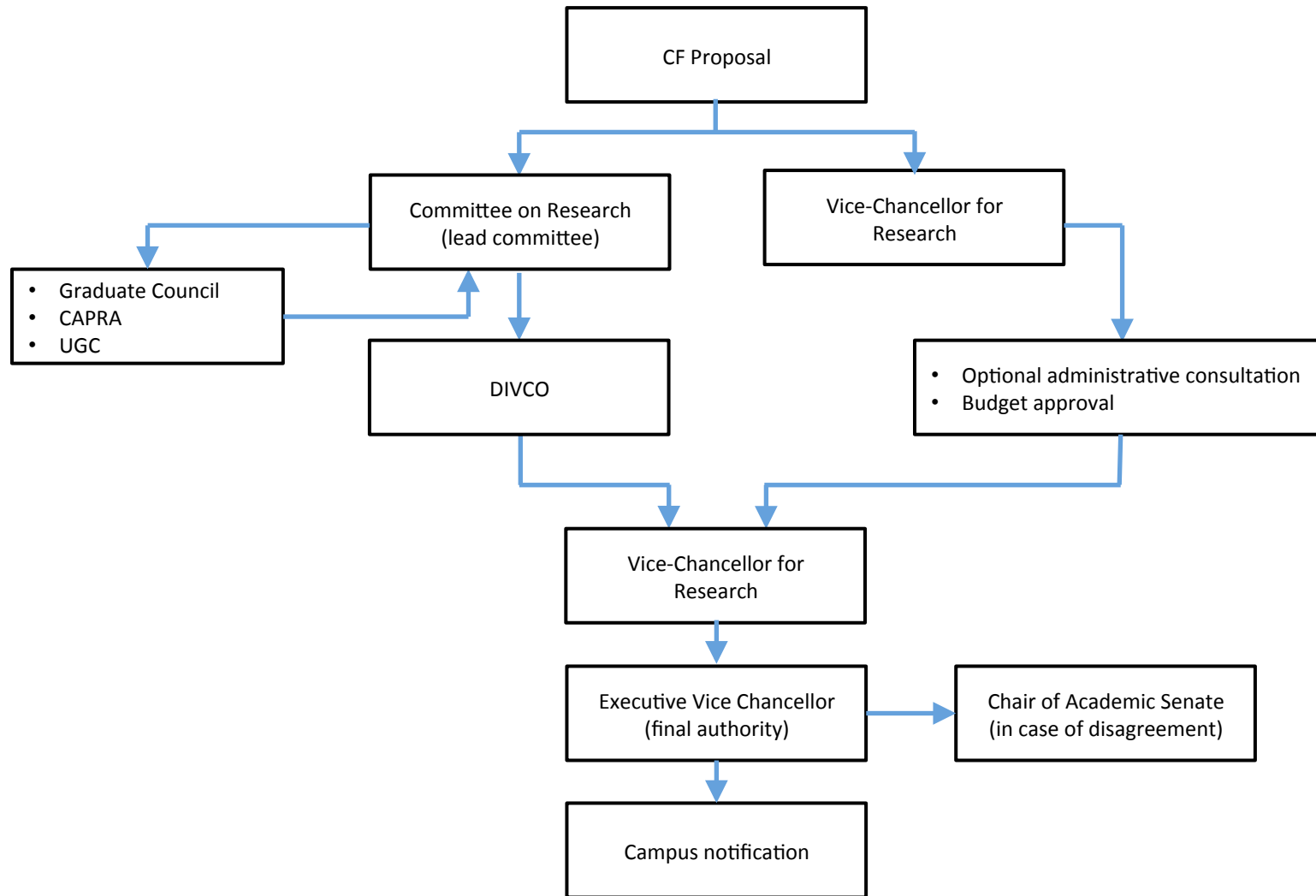
	CRU	Core Facility (CF)	ORU	MRU
Designations	Institute, Laboratory, Center, Station	Institute, Laboratory, Center, Station	Institute, Laboratory, Center, Station	Institute, Laboratory, Center, Station
Lines of Responsibility	CRU responsible to Vice Chancellor for Research (VCR) for administration, budget, space, personnel, and scholarship	CF responsible to VCR for administration, budget, space, personnel, and scholarship	ORU responsible to Chancellor or Chancellor's Designee (CD) for administration, budget, space, personnel, and scholarship	MRU responsible to the President and report through Chancellor or CD at host campus
Administration	Headed by Director who is a faculty member. Aided by Advisory Committee appointed by VCR.	Headed by Director who is a faculty member. Aided by Advisory Committee appointed by VCR.	Headed by Director who is a tenured faculty member. Aided by Advisory Committee Appointed by Chancellor or CD.	Headed by Director who is a tenured faculty member, aided by Associate Director on each campus at which unit is active. Aided by Advisory Committee appointed by President or President designee.
Budgetary Support	Potential funding by Office of Research based on merit review	Funding from recharge and contracts. Potential funding by Office of Research based on merit review	"[P]rovision is made in the campus budget for the unit's core administration support, Director's stipend, ..."	Administrative support from campus or from Office of the President
Proposal for Establishment	Faculty members submit a proposal stating unit's goals and objectives; describing added values and capabilities; explaining how mission extends beyond interests or needs of a single group, department, or school; and making clear how the unit will foster new intellectual collaborations, stimulate new funding, etc. [NB: CRU Policies include Review Criteria] Executive Vice-Chancellor has final authority for approval.	Faculty members submit a proposal stating CF's goals and objectives; describing added values and capabilities; explaining how mission extends beyond interests or needs of a single group, department, or school; and making clear how the unit will foster new intellectual collaborations, stimulate new funding, etc.	Faculty members submit a proposal stating unit's goals and objectives; describing added values and capabilities; explaining why goals cannot be achieved by existing campus structure; and making clear how the unit will foster new intellectual collaborations, stimulate new funding, etc.	Proposal originates at host campus and is submitted to the VCR, who seeks advice from all appropriate divisional Academic Senate Committees and administrative committees. After campus review, proposal is submitted to Vice Provost for Research by Chancellor or CD of host campus. The Vice Provost for Research reviews proposal and refers it to the Chancellor for comment. The Vice Provost for Research also refers the proposal to the Chair of Academic Council for comment by University Committee on Research Policy (UCORP), University Committee on Planning and Budget (UCPB), and CCGA. Vice Provost for Research retains final authority for recommending establishment of MRU to Provost and President. After Presidential approval, Provost informs Chancellors and Chair of Academic Council of the action.
Director	Appointed by VCR after a nomination procedure on which VCR and CoR agree. For new Director for an existing unit, nominates are solicited from Advisory Committee.	Appointed by VCR after a nomination procedure on which VCR and CoR agree. For new Director for an existing unit, nominates are solicited from Advisory Committee.	Appointed by Chancellor or CD after a nomination procedure on which the Chancellor and the Academic Senate agree. For new Director for an existing unit, nominates are solicited from Advisory Committee.	Appointed by the Provost after consultation with appropriate Chancellors and with advice of Search Committee appointed by Vice Provost for Research.

	CRU	Core Facility (CF)	ORU	MRU
Five-year Review	VCR initiates 5-year reviews. VCR in consultation with CoR should assure 5-year reviews are conducted at proper intervals. VCR appoints review committee from a slate nominated by CoR. Review committee's report should be provided to the Director for comment. Justification for continuation must be documented by review committee. The report is reviewed by appropriate Academic Senate committees. VCR decides on continuation and any changes in CRU, upon consideration of the ad hoc and Senate committee's recommendations. Disestablishment of CRU requires Provost's approval. To maintain portfolio campus CRUs, VCR transmits annual report to Chancellor, Executive Vice Chancellor, and the Academic Senate the establishments and disestablishments and a summary of 5-year reviews of CRUs.	VCR initiates 5-year reviews. VCR in consultation with CoR should assure 5-year reviews are conducted at proper intervals. VCR appoints review committee from a slate nominated by CoR. Review committee's report should be provided to the Director for comment. Justification for continuation must be documented by review committee. The report is reviewed by appropriate Academic Senate committees. VCR decides on continuation and any changes in CF, upon consideration of the ad hoc and Senate committee's recommendations. Disestablishment of CF requires Provost's approval. To maintain portfolio campus CFs, VCR transmits annual report to Chancellor, Executive Vice Chancellor, and the Academic Senate the establishments and disestablishments and a summary of 5-year reviews of CFs.	Chancellor initiates 5-year reviews. VCR in consultation with appropriate Senate Committee should assure 5-year reviews are conducted at proper intervals. The Chancellor or CD appoints review committee from a slate nominated by divisional Academic Senate. Review committee's report should be provided to the Director for comment. Justification for continuation must be documented by review committee. The report is reviewed by appropriate Academic Senate committees. The Chancellor or CD decides on continuation and any changes in ORU, upon consideration of the ad hoc and Senate committee's recommendations. Disestablishment of ORU requires Chancellor's approval. To maintain portfolio campus ORUs, the Chancellor or CD transmits annual report to the Vice Provost for Research listing ORU establishments and disestablishments and a summary of 5-year reviews of ORUs.	The Vice Provost for Research should assure that 5 year reviews are conducted at proper intervals. VCR appoints ad hoc review committee from a slate nominated by Chair of the Academic Council and the Chancellor or CD. Review committee's report should be provided to the Director for information. Justification for continuation must be documented by review committee. The 5-Year Review report is submitted to the Vice Provost for Research, who distributes it to the Vice Chancellors for campus comment and the Chair of the Academic Council for comment by UCORP, UCPB, and CCGA. Based on 5-Year Review Report and comments, the Vice Provost for Research approves continuation of unit, implements changes, or recommends disestablishment of unit to President.
Procedure for Disestablishment	Following a 5-year review, Executive Vice Chancellor approves request for disestablishment and informs the Chancellor, VCR, and Academic Senate of action.	Following a 5-year review, Executive Vice Chancellor approves request for disestablishment and informs the Chancellor, VCR, and Academic Senate of action.	Following a 5-year review, the Chancellor approves request for disestablishment and the Chancellor or CD informs the Vice Provost for Research of action.	Following a 5-year review, the Chancellor or CD submits request for disestablishment to Vice Provost of Research after appropriate campus administrative and Senate consultation and consultation with Advisory Committee. The request is referred by Vice Provost for Research to the Chancellors for comment. The Provost recommends disestablishment to the President. After Presidential approval, Provost informs Chancellors and Chair of the Academic Council of action.
Phase-Out Period	At most one full year after the end of the academic year	At most one full year after the end of the academic year	At most one full year after the end of the academic year	At most one full year after the end of the academic year
Procedure for Name Change	Director prepares a proposal to VCR describing rationale. After review by CoR, CAPRA, and appropriate campus administrators, Provost approves and informs Chancellor, VCR, and Academic Senate of action.	Director prepares a proposal to VCR describing rationale. After review by CoR, CAPRA, and appropriate campus administrators, Provost approves and informs Chancellor, VCR, and Academic Senate of action.	Director prepares a proposal describing rationale. After review by Senate and appropriate campus administrators, the Chancellor or CD approves and informs Vice Provost for Research of action.	Director prepares a proposal describing rationale. MRU Advisory Committee endorses requested name change. After review by appropriate host campus administrators and Senate committees of other participating campus, Director submits proposal package to Vice Provost for Research. After consultation with UCORP and favorable review at host campus and participating campuses, the host Chancellor approves name change and submits full documentation to Vice Provost for Research, who notifies other campus and the Chair of the Academic Council of change in name.
Annual Report	Unit should submit a report to VCR and CoR containing specific information.	Unit should submit a report to VCR and CoR containing specific information.	Unit should submit a report to VCR and CoR containing specific information.	Unit should submit a report to VCR and CoR containing specific information.

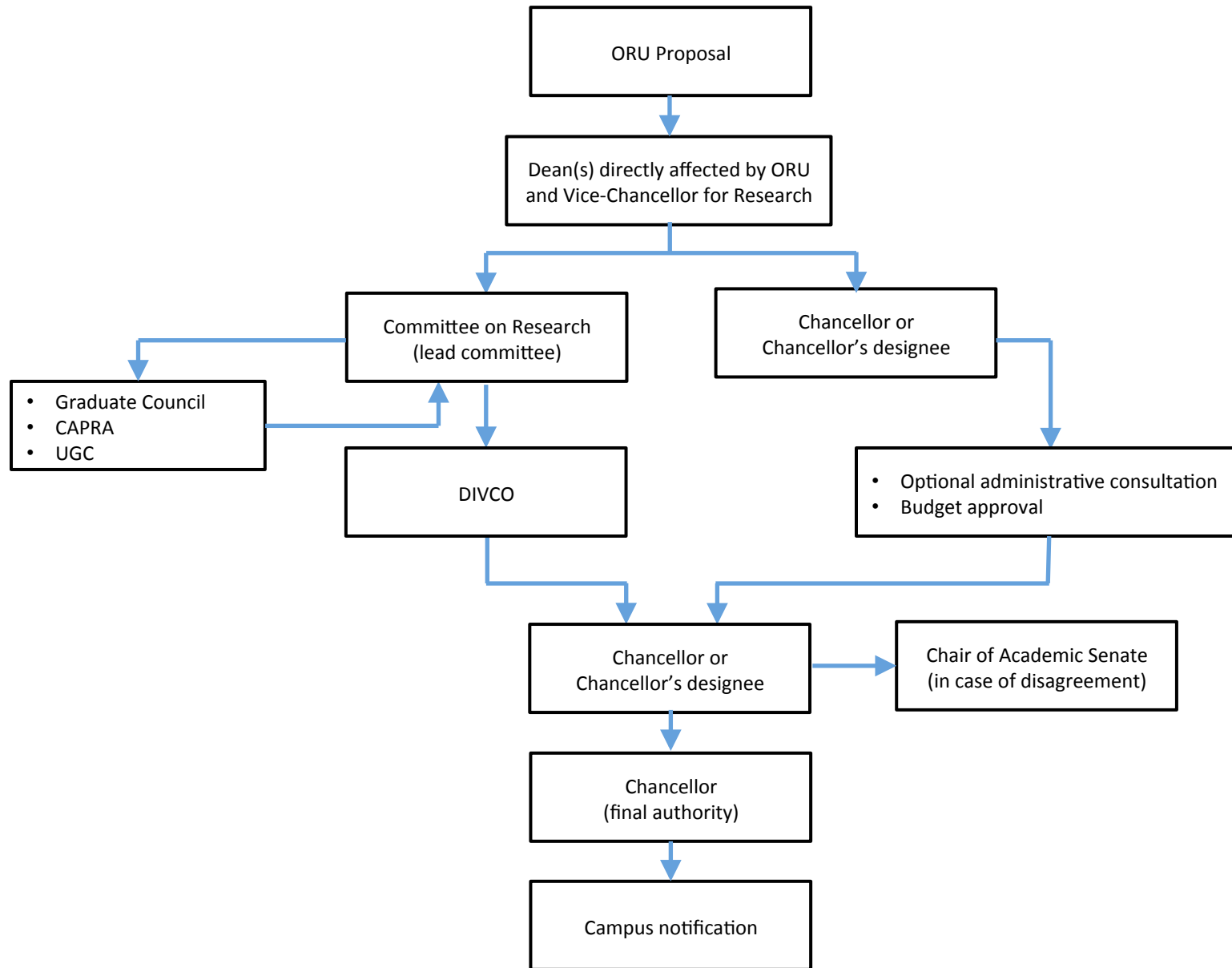
Approval Process for Establishment of a Centralized Research Unit (CRU)



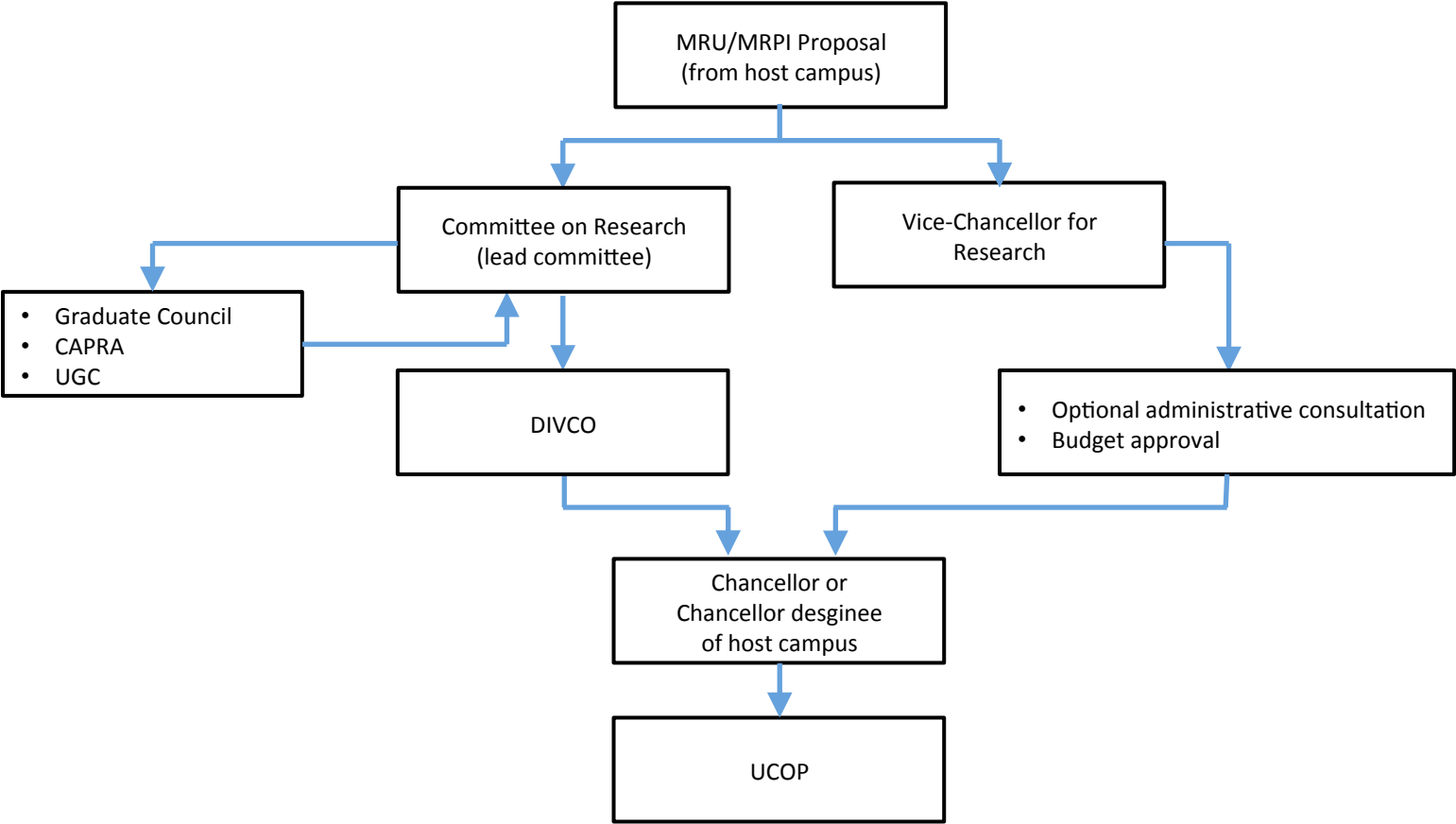
Approval Process for Establishment of a Core Facility (CF)



Approval Process for Establishment of a Organized Research Unit (ORU)



Approval Process for Establishment of an Multicampus Research Unit (MRU)/MRPI



Five-Year Review Criteria for Centralized Research Units

Five-year reviews by the Senate may be additional to reviews conducted by the Office of Research and other cognizant units. The objective of Senate review is to ensure that the units continue to reflect the criteria set by the Senate. The five-year review should be considered standard, but the Office of Research is empowered to request additional documentation at any stage. This review document should be no more than 5 pages.

Centralized Research Units (CRU) reviews will be evaluated according to the following:

1. CRU's original purpose
2. Present functions
3. Accomplishments (e.g., publications, grants, new collaborations, number of users, and educational/outreach activities associated with the unit)
4. Impacts
5. Future plans
6. Continuing development

CRU reviews will assess the following:

1. Adequacy of space and other resources made available to the unit
2. Success in meeting previously established objectives, planned changes in program objectives, and planned steps to achieve new objectives
3. Effectiveness and leadership of the Director and the participation of the Advisory Committee
4. Budget, including funds and expenditures

Five-Year Review Criteria for Core Facilities

Five-year reviews by the Senate may be additional to reviews conducted by the Office of Research and other cognizant units. The objective of Senate review is to ensure that the units continue to reflect the criteria set by the Senate. The five-year review should be considered standard, but the Office of Research is empowered to request additional documentation at any stage. This review document should be 5-10 pages.

Core Facility (CF) reviews must address the following:

1. CF's original purpose
2. Present functions
3. Accomplishments (e.g., publications, grants, new collaborations, number of users, and educational/outreach activities associated with the unit)
4. Impacts
5. Future plans
6. Continuing development

CF reviews will assess the following:

1. Adequacy of space and other resources made available to the unit
2. Success in meeting previously established objectives, planned changes in program objectives, and planned steps to achieve new objectives
3. Effectiveness and leadership of the Director and the participation of the Advisory Committee
4. Budget (including funds and expenditures, and adequateness and appropriateness to support the CF's mission)
5. Compliance with safety and operational regulations

Five-Year Review Criteria for Organized Research Units

Five-year reviews by the Senate may be additional to reviews conducted by the Office of Research and other cognizant units. The objective of Senate review is to ensure that the units continue to reflect the criteria set by the Senate. The five-year review should be considered standard, but the Office of Research is empowered to request additional documentation at any stage. This review document should be 5-10 pages.

Organized Research Units (ORU) reviews must address the following:

1. ORU's original purpose
2. Present functions
3. Accomplishments (e.g., publications, grants, new collaborations, number of users, and educational/outreach activities associated with the unit)
4. Impacts
5. Future plans
6. Continuing development

ORU reviews will assess the following:

1. Adequacy of space and other resources made available to the unit
2. Success in meeting previously established objectives, planned changes in program objectives, and planned steps to achieve new objectives
3. Effectiveness and leadership of the Director and the participation of the Advisory Committee
4. Budget, including funds and expenditures

Five-Year Review Criteria for Multicampus Research Units

Five-year reviews by the Senate may be additional to reviews conducted by the Office of Research and other cognizant units. The objective of Senate review is to ensure that the units continue to reflect the criteria set by the Senate. The five-year review should be considered standard, but the Office of Research is empowered to request additional documentation at any stage. This review document should be 5-10 pages.

Multicampus Research Units (MRU) reviews must address the following:

1. MRU's original purpose
2. Present functions
3. Accomplishments (e.g., publications, grants, new collaborations, number of users, and educational/outreach activities associated with the unit)
4. Impacts
5. Future plans
6. Continuing development

MRU reviews will assess the following:

1. Adequacy of space and other resources made available to the unit
2. Success in meeting previously established objectives, planned changes in program objectives, and planned steps to achieve new objectives
3. Effectiveness and leadership of the Director and the participation of the Advisory Committee
4. Budget, including funds and expenditures

Review Criteria for Establishment of Centralized Research Units

Centralized Research Units (CRU) proposals must address how the proposed unit will:

1. Foster new intellectual collaborations
2. Stimulate new sources of funding
3. Further innovative and original research
4. Support existing funded research
5. Supply research techniques or services to faculty groups
6. Contribute to the instruction mission of the university
7. Perform service and outreach to the public
8. Support a broad array of researchers, graduate group, schools, and the campus
9. Have sufficient faculty and technical expertise to ensure the successful operation of the unit
10. Have a management and financial plan that will ensure sustainability of the unit
11. Have a plan for how immediate and future space needs will be met
12. Procure extramural funds for its establishment and operation

Review Criteria for Establishment of Core Facilities

Core Facility (CF) proposals must address how the proposed facility will:

1. Foster new intellectual collaborations
2. Stimulate new sources of funding
3. Further innovative and original research
4. Support existing funded research
5. Supply research techniques or services to faculty groups
6. Contribute to the instruction mission of the university
7. Perform service and outreach to the public
8. Support a broad array of researchers, graduate group, schools, and the campus
9. Have sufficient faculty and technical expertise to ensure the successful operation of the facility
10. Procure extramural funds for its establishment and operation
11. Have a management and financial plan that will ensure sustainability of the facility
12. Have a plan for how immediate and future space and instrumentation needs will be met
13. Comply with existing safety and operational regulations

Review Criteria for Establishment of Organized Research Units

Organized Research Units (ORU) proposals must address how the proposed unit will:

1. Foster new intellectual collaborations
2. Stimulate new sources of funding
3. Further innovative and original research
4. Support existing funded research
5. Supply research techniques or services to faculty groups
6. Contribute to the instruction mission of the university
7. Perform service and outreach to the public
8. Support a broad array of researchers, graduate group, schools, and the campus
9. Have sufficient faculty and technical expertise to ensure the successful operation of the unit
10. Have a management and financial plan that will ensure sustainability of the unit
11. Have a plan for how immediate and future space needs will be met
12. Procure extramural funds for its establishment and operation

Review Criteria for Establishment of Multicampus Research Units

Multicampus Research Units (MRU) proposals must address how the proposed unit will:

1. Foster new intellectual collaborations
2. Stimulate new sources of funding
3. Further innovative and original research
4. Support existing funded research
5. Supply research techniques or services to faculty groups
6. Contribute to the instruction mission of the UC system
7. Perform service and outreach to the public
8. Support a broad array of researchers, graduate group, schools, the campus, and the university system
9. Have sufficient faculty and technical expertise to ensure the successful operation of the unit
10. Have a management and financial plan that will ensure sustainability of the unit
11. Have a plan for how immediate and future space needs will be met
12. Procure extramural funds for its establishment and operation

DRAFT ORU Proposal Review Policy at UC Merced

The minimum timeline for completion of the review process is one to two years from inception, and includes a year for Senate reviews at the campus level.

- (1) The review will involve the appropriate Deans, Directors and others who will be asked to comment on issues of quality and significance, organization design and support, budget and space.
- (2) The Vice Chancellor for Research will submit the completed ORU proposal package with a synopsis of the Deans' comments to the ad hoc Committee of the Graduate and Research Council (GRC) for review and recommendations.
- (3) The ad hoc Committee, following its own procedures for review, may request additional information from the proposers and will require that external letters be solicited by the Office of Research.
- (4) External reviewers will be drawn from the ORU's list of proposed names and by contacting other appropriate reviewers. All reviews will be treated as confidential, subject to the policies of the University of California.
- (5) After completion of the review, the ad hoc Committee will seek recommendations from GRC.
- (6) The advice of the Graduate and Research Council (GRC) concerning the establishment of an ORU based on the favorable review of a proposal will be provided to the Vice Chancellor for Research.
- (7) The proposal will next be conveyed to the Merced Division Chair of the Academic Senate. At the Chair's discretion, the proposal will be forwarded for commentary and recommendations to the appropriate campus Senate councils/committees, which typically will be Academic Planning and Resource Allocation (CAPRA) and the Undergraduate Council (UGC).
- (8) After completion of the campus review, the proposal is forwarded to the Vice Chancellor for Research for final approval and designation as an ORU.
- (9) If the Chancellor approves the ORU's establishment, the Chancellor or Vice Chancellor then notifies the Office of the President.

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Date: December 11, 2006

From: Maria Pallavicini, Dean of Natural Sciences
Jeff Wright, Dean of Engineering

To: Executive Vice Chancellor, Keith Alley

Re: The request for the Sierra Nevada Research Institute to be formally designated as an Organized Research Unit at UC Merced

With this memo, we support the establishment of the Sierra Nevada Research Institute as a formal Organized Research Unit (ORU) at UC Merced.

Handwritten signature of Maria Pallavicini in black ink.

Maria Pallavicini
Dean of Natural Sciences

Handwritten signature of Jeff Wright in black ink.

Jeff Wright
Dean of Engineering

Handwritten signature of Hans Bjornsson in black ink.

Hans Bjornsson
Interim Dean of Social Sciences, Humanities and Arts

**ESTABLISHMENT OF THE SIERRA NEVADA
RESEARCH INSTITUTE AS A FORMAL
ORGANIZED RESEARCH UNIT AT UC MERCED**

THE SIERRA NEVADA RESEARCH INSTITUTE

1. INTRODUCTION

The University of California opened its tenth campus, UC Merced, to undergraduates in Fall 2005. UC Merced enrolled ~900 undergraduate and graduate students on opening day, growing to 25,000 students at build-out. In 1998 lead planners for UCM convened a meeting of Directors from several UC Multi-campus Research Units to discuss possible UCM research initiatives. Discussions focused on research themes especially well suited to the campus location at the nexus of the Great Valley and Sierra Nevada regions. From initial discussions there emerged the concept of the Sierra Nevada Research Institute (SNRI), a new multidisciplinary research unit focused on environmental and social issues of greatest importance to the stakeholders of these regions. In 2002, the Founding Director of SNRI was hired and since that time has assisted the School Deans in recruiting and hiring the first UCM faculty, in particular, those who are members of the institute. These individuals have a strong focus in environmental science and engineering. With this document, the Founding Director and the current SNRI faculty are formally proposing the designation of SNRI as an Organized Research Unit (ORU) at UC Merced.

2. MISSION

The mission of the Sierra Nevada Research is to discover and disseminate new knowledge that contributes to sustaining natural resources and promoting social well being in the San Joaquin Valley and Sierra Nevada regions of California, and related regions worldwide, through integrated research in natural science, social science, and engineering.

This mission will be accomplished through:

- *Collaborative, multidisciplinary research conducted by faculty, students, staff in the School of Natural Science, the School of Engineering, and the School of Social Science, Humanities and Arts at UCM;*
- *Strong interactions with related research units within the UC system and close collaborative relations with scientists and managers at national laboratories (particularly LLNL) and local, state, and federal agencies;*
- *Creation of research facilities on the UCM campus and within the San Joaquin Valley and Sierra Nevada regions of California,*
- *Extensive sharing of SNRI data and information with public and private stakeholders,*
- *Sharing research results with local and regional stakeholders through public forums and workshops.*

3. VALUE OF A SIERRA NEVADA RESEARCH INSTITUTE

The Sierra Nevada is known for its spectacular landscapes and its many recreational and biological resources. The San Joaquin Valley is recognized around the world for its leadership in agricultural production. Together, these regions of California are legendary for their vast natural resources, physical and biological diversity and cultural heritage.

However, rapid population growth, competition for natural resources, air, water and soil pollution, and competing land uses pose serious threats to the sustainability of these regions.

Over the next twenty years the populations of the San Joaquin Valley and Sierra Nevada Regions are projected to increase by 2.5 million and 1 million residents, respectively; a rate nearly 20% higher than the projected statewide average. Population growth in the San Joaquin Valley could convert 20% of current cropland to urban use by the year 2040. If current development patterns continue, low density housing in the Sierran foothills would consume half of all private land in the region by 2040, fragmenting habitats and creating enormous safety concerns due to wildfire. Public lands are also under increasing pressure. For example, Yosemite National Park now accommodates between three and four million visitors every year, including nearly one-quarter million overnight stays.

Since 1990 there have been repeated calls for a Sierra Nevada Research Center that could help address regional ecological and social issues by conducting and coordinating regionally-focused, issue-oriented research while disseminating data, information and analytical tools to local stakeholders.¹ Moreover, population growth, land use change, and environmental sustainability are issues not just for California, but also for most areas of the globe. Thus, although regionally focused, the Sierra Nevada Research Institute will pursue general principles and theory. This will be promoted through comparative studies in other areas, notably Mediterranean-climate regions facing many of the same issues (e.g., the Cape Region of South Africa, the Mediterranean Basin, Chile), and through cooperative research and exchange programs established and fostered through formal institutional agreements.

A Sierra Nevada Research Institute will continue to be a boon to the new campus by supporting faculty recruitment efforts of individual academic departments while signaling UCM's commitment to innovative, multidisciplinary research and teaching programs that are rooted in the region. Importantly, a SNRI could also foster lasting, synergistic relationships between the campus and County, State and Federal agencies, as well as the private sector.²

¹ For example, in 1994 the Sierra Nevada Planning Team recommended creation of a research center that would be: independent, responsive to identified information needs, a repository for existing information, engaged in research that supports decision making, continue to develop new funding sources, and located in the region (Sierra Nevada Planning Team, 1994, "Critical questions for the Sierra Nevada: recommended research priorities and administration," Centers for Water and Wildland Resource Report 34).

² The interdisciplinary concept of SNRI follows a recent trend in UC to design institutions that promote engagement between the natural and social sciences (e.g., Berkeley's reorganization of several departments into Environmental Science, Policy, and Management, and Santa Barbara's opening of the Donald Bren School of Environmental Science and Management).

4. RESEARCH FOCI

The SNRI will conduct basic and applied research as it relates to key regional natural resources and environmental processes and issues. The intellectual enterprise will be tightly coupled with place, built on an infrastructure of data and models. Much of the research will be focused on the central and southern Sierra Nevada and the San Joaquin valley. Of particular interest will be issues that emphasize the connectivity between these two geographic regions. Many environmental problems relevant to the Sierran Nevada and the San Joaquin Valley span from molecular to landscape scales. Thus, scaling will be an important component of SNRI efforts.

The SNRI Director and initial faculty will be responsible for defining the Institute's research agenda. This will result from a comprehensive consideration of regional research needs and opportunities, faculty interest and availability of funding. The following are intended to serve as examples of research foci that could support environmental policy development and resource management:

KEY REGIONAL BIOLOGICAL PHYSICAL AND ECOSYSTEM PROCESSES;

- Physical, chemical and biological bases of California ecosystems
- Ecosystem consequences of regional climate change
- Water resources and biodiversity
- Biodiversity and ecosystem function
- Invasive species and ecosystem dynamics
- Habitat fragmentation, ecosystem processes, and wildlife population dynamics
- Air resources, air quality and ecosystem stability
- Fire, fuels and watershed function
- Geohazards and land use

KEY SOCIAL PROCESSES;

- Population growth and land use change
- Cultural diversification and changing use of public lands
- Water management and use
- Corporate environmental management

ENVIRONMENTAL INFORMATION SYSTEMS;

- Field computing
- Integrated remote sensing of social and ecological processes
- Data assimilation for regional atmospheric, hydrologic and ecosystem models
- Decision support systems for watershed and regional planning

RESEARCH SYNTHESIS AND POLICY ANALYSIS;

- Monitoring and adaptive management of Sierran ecosystems
- Sustainable development of the Great Valley and Sierran foothills
- Wildfire policy and management in rural and suburban environments
- Watershed management, water quality and quantity, and integrity of aquatic ecosystems

The current research activities of faculty and students affiliated with SNRI are oriented around issues of water quality and hydrology. Initial research projects include:

Contaminant fate and transport in Sierran Foothill and San Joaquin Valley surface and groundwater.

Relationship between mountain block recharge and surface water in Sierran rivers

Microbial diversity in elevation transects in the Sierra's

C cycle research in orchard production systems

Studies of atmospheric nanoparticles

Establishment of an environmental sensor network in the San Joaquin River watershed

Establishment of a hydrologic observatory in the Sierra Nevada.

This research portfolio will expand as additional faculty are hired.

5. SNRI ORGANIZATION

The personnel of the SNRI include a Director, affiliated faculty, support staff, postdoctoral researchers, and student researchers. Visiting scholars are also expected to play an important role. SNRI is designed to support the overall development of UC Merced. This requires close coordination with other UCM campus development efforts, and has included recruiting some established leaders for the SNRI faculty. These individuals are helping to build programs in their respective disciplines, thereby ensuring that the Institute is integrated into the larger intellectual enterprise of the campus.

The SNRI is organized around an ecosystems model. This model combines the earth sciences (hydrosphere, cryosphere, lithosphere, atmosphere), with biological sciences (biosphere, ecology molecular biology and genomics), engineering (environmental engineering and computer science) and social science (economics and public policy, etc.) in integrated studies of complex problems at the systems level. Through these balanced research efforts, the SNRI will serve as a source of objective scientific information as California faces the growing challenge of sustaining the integrity and quality of its human and natural resources into the future.

The Institute functions as an Organized Research Unit (ORU), in which the Director (a tenured faculty member) holds a fulltime appointment, and whose ladder-rank faculty researchers hold full appointments in their respective Schools.

Internal Advisory Committee: A faculty Advisory Committee shall provide counsel to the Director on all matters pertaining to the unit, including budgetary matters and personnel. The Advisory Committee shall consist of 3 to 5 faculty members, appointed by the Executive Vice Chancellor.

Director's Advisory Committee – External: An External Advisory Committee comprised of individuals from the public and private sectors will provide the Director with advice on research issues of relevance to the region.

Staff: SNRI will depend critically on adequate staffing to cover administrative, laboratory and operations support: Current SNRI staff consist of:

Position	FTE	Incumbent
Director	1.0	S. Traina
Administrative Assistant to the Director:	1.0	S. Steaples
EAL Laboratory Director	0.5	L. Zhao
Yosemite Station Director	0.75	E. Berlow

Positions that are needed within the next five years include

Sequoia/Kings Canyon Station Manager	1.0
MSO	0.5
Education and Outreach Coordinator	0.5

6. LOCATION AND FACILITIES

The institute will be headquartered in the first Science and Engineering (S&E1) building, at the UC Merced campus and will have associated laboratory and field research sites in the Great Valley and Sierra Nevada region. Faculty and students in the Schools of Natural Science and Engineering will housed within S&E1, while those in the School of Social Science, Humanities and Arts will be housed in the first classroom building.

The SNRI will operate the Environmental Analytical Laboratory (EAL), to be located in S&E1. This is a campus-wide multi-user facility dedicated to environmental, chemical analyses. Major instrumentation in this laboratory includes an inductively-coupled plasma (ICP) mass spectrometer, an optical emission ICP, a graphite furnace atomic absorption spectrometer, a microwave digestion system, a gas chromatograph-mass spectrometer – mass-spectrometer, a dissolved C analyzer and two ion chromatographs. User fees (rates to be determined) will offset some of the operating and maintenance costs of these instruments. A funding mechanism for the laboratory manager is currently under development. It is envisioned that this position will be funded in part by recharge dollars with the remainder of support coming from UC Merced central funds.

SNRI affiliated faculty are working on NSF proposals to add analytical equipment to the EAL. Over the next 5 years, they envision acquisition of an X-ray diffractometer, a LC-MS and a capillary electrophoresis-MS. These and other instruments will be added to the EAL as grant dollars and/or gift money become available.

In May 2004, Yosemite National Park and SNRI dedicated the first SRNI field station located in Wawona. This 1400 ft² facility will provide logistical support for academic field research and outreach activities in YNP. This facility will be supplemented with a residence for the Station Manager (an SNRI employee) and a bunkhouse in fiscal year 2005-2006. In 2004, UCM also renewed its MOU with Sequoia-Kings Canyon and Yosemite National Parks, which commits all parties to establish an SNRI field station in Sequoia-Kings Canyon National Park. The field stations will be available for use by faculty, staff and students of the University of California, as well as the larger academic community. We currently estimate the annual operating costs for

each field station, the associated residence for each station manager and the bunkhouse at each location at \$39,000 (per location). User fees will offset some to the operating costs of these facilities. The user fees will be set at a level commensurate with other UC field stations (e.g. UC Natural Reserve sites, White Mountain Research Center), subject to approval of the UC Merced Recharge Committee.

The SNRI will have extensive needs in the area of research computing and computational infrastructure. Many of the current and planned research activities will generate large, complex data sets.

7. EDUCATIONAL PROGRAMS

The SNRI will not offer graduate or undergraduate courses. At present, two undergraduate degrees are currently associated with SNRI faculty, Earth Systems Science (in the School of Natural Science) and Environmental Engineering (in the School of Engineering). The Environmental Systems graduate group is dominantly comprised of SNRI faculty. Much of the research and course work in these majors will draw heavily from the research portfolio of SNRI. Additionally, it is anticipated that both undergraduate and graduate courses will make use of the Wawona field station.

SNRI will partner with the National Park Service, state agencies and private groups to further outreach education in the areas of environmental science and policy. These efforts will serve to increase the visibility of UC Merced faculty and students concomitant with increasing enrollment in Earth Systems Science, Environmental Engineering and Environmental Systems.

Faculty in SNRI have already participated in a hydrology course for grades 6-12 science faculty from the San Joaquin Valley, the Bay Area and Southern California and a hydrology and aquatic chemistry course for high school students from the Merced High School District.

8. FOUNDING SNRI MEMBERS

The following UC Merced faculty and research affiliates have agreed to participate as SNRI members:

Name	School
<i>Faculty</i>	
Roger Bales	Engineering
Martha Conklin	Engineering
Phil Duffy	Natural Science
Jessica Green	Natural Science
Qinghua Guo	Engineering
Tom Harmon	Engineering
Shawn Kantor	SSHA
Valerie Leppert	Engineering
Peggy O'Day	Natural Science
Sam Traina (Director)	Nat. Science & Engineering
Christopher Viney	Engineering
Jeff Wright	Engineering
 <i>Affiliated Researchers</i>	
German Gavilan	Assist. Dean Engineering
Sarah May	Postdoctoral Investigator
Virginia Ramon	Postdoctoral Investigator
Robert Rice	Research Scientist
Shankar Sarkar-Sharma	Research Scientist
Domenik Wolff-Boenisch	Postdoctoral Investigator
Yiguo Zhang	Postdoctoral Investigator

Collaborative Activities:

There has already been a considerable amount of synergistic activity amongst the members of SNRI. Professors O'Day, Leppert and Traina submitted a successful research proposal to NSF to fund the purchase of an Environmental Scanning Electron Microscope. Professors Harmon, Bales and Traina have obtained a planning grant from NSF to develop an integrated sensor network to study water quality and hydrology in the San Joaquin watershed and Professors Bales, Conklin, Harmon and Traina are preparing a large, multi-investigator proposal to NSF for the establishment of a Hydrologic Observatory in the Sierra Nevada. Additionally, Professors Wright, Bales, Conklin, Harmon, O'Day and Traina are discussing a large research project with a local irrigation drainage district on the Westside of the San Joaquin Valley. Professor Kantor, along with colleagues in Natural Science and Engineering, are exploring diverse research projects on the political economy of water use in California. Current research proposals include a history of water use in the Sierra Nevada region and Central Valley, economic analyses of the costs and benefits of large-scale reclamation and irrigation projects in the region, and analyses of

the legal and economic issues surrounding the transfer of water rights among stakeholders. Professors Leppert and Traina are also exploring opportunities to conduct air quality research with investigators in Yosemite National Park. Clearly this group of individuals has developed a collaborative, interdisciplinary research program. It is anticipated that the scope, magnitude and breadth of this research will expand as faculty in the areas of ecology and atmospheric science join UCM and SNRI.

9. RELATED UNITS IN UC

Environmental research and education programs are located each of the other eight general campuses of the University of California. These include specific undergraduate and graduate degree programs, research centers and institutes, ORUs and one MRU. Eight programs that have the greatest overlap with the SNRI are discussed below. These descriptions were obtained from websites in the Office of the President and from websites for each of the programs.

- *Institute of the Environment (IoE) - UCLA*: This non-MRU, non-ORU is an autonomous unit that works campus-wide at UCLA to facilitate environment-related teaching, research and community outreach. It's stated objectives are: 1) to develop multidisciplinary academic programs that address the full breadth of environmental issues facing today's society; 2) to stimulate innovative and integrative interdisciplinary research on local, regional, and global environmental processes; and 3) to use collaborative problem-solving to strengthen UCLA's effectiveness in serving the community. The IoE currently has five research subgroups, *The Coastal Center*, the *Tropical Research Center*, the *Urban Center for People and the Environment*, the *Southern California Particle Center and Supersite*, the *Center for Air Pollution and Exposure*. The four latter subgroups focus on issues of specific regional significance to Southern California.
- *Institute for Innovation in Environmental Research (STEPS) - UCSC*: This non-MRU, non-ORU is a campus-wide effort to link Science, Technology, Engineering, Policy and Society. It is focused on anthropogenic induced climate change, genetic restructuring of ecosystems caused by the global transport of species and changing global environments, and the transformation of earth's major water systems through alteration of rivers and lakes, increased use of oceanic resources, and diffusion of environmental toxins.
- *National Institute for Global Environmental Change - UCD*: This federally funded, non-MRU, non-ORU is one of six U.S. DoE-funded regional centers that are committed to interdisciplinary academic research that increases the understanding of global environmental and climate change.
- *The Center for Ecological Health Research - UCD*: The Center for Ecological Health Research (non-MRU, non-ORU) is one of four environmental research centers funded nationwide by United States Environmental Protection Agency, National Center for Environmental Research and Quality Assurance. The center brings together scientists from many disciplines to study transport and fate, ecology and toxicology in specific watersheds (the Sacramento river, the Lake Tahoe basin and Clear Lake). The combining of disciplines to focus on these specific geographic areas provides an infrastructure to promote long-term multi-process-environmental studies that more closely reflect the ways ecosystems function. The central goal of the center is to understand how multiple stresses interact to affect

biological and ecological processes in aquatic and terrestrial systems. Natural stresses such as drought, salinity, and climate change and anthropogenic stresses such as toxic compounds, nutrients, species introductions and habitat destruction are cumulative impacts on ecosystems.

- *John Muir Institute of the Environment – UCD*: This ORU is a center of excellence for research and outreach programs related to the biological, physical, and human environment. The Institute encourages and facilitates interdisciplinary environmental research and outreach programs on the Davis campus. It provides an administrative home for existing and proposed research centers and focused workgroups related to the environmental sciences; and it coordinates with environmental extension units and graduate groups as appropriate. Affiliated Research Programs include, *the Aquatic Ecosystems Analysis Laboratory*, the *Center for Health and the Environment*, the *Center for Integrated Watershed Science and Management*, the *Center for Natural Resources Policy Analysis*, the *Information Center for the Environment*, the *Public Service Research Program*, the *Putah-Cache Bioregion Project*, the *Road Ecology Center*, the *Tahoe Research Group and Castle Lake Limnological Research Station* and the *UC Davis Natural Reserve System*.
- *Institute for Environmental Science and Engineering – UCB*: This ORU has current research programs in sanitary engineering and environmental health research. Traditional areas of activity include water and waste-water treatment systems, water reclamation and reuse, the impact of water quality on aquatic ecosystems, the impact of environmental contamination to human health, indoor air quality monitoring, industrial hygiene and ergonomics and biomechanics. The Mission of the Institute for Environmental Science and Engineering is to support research and teaching in the sciences and technology that are essential to understand and improve the environment. The Institute is multi-disciplinary and included not only a broad representation of the engineering disciplines but also a wide variety of other natural and social sciences. It plays an increasing role as a bridge between basic research, often associated with an academic environment, and the more applied studies necessary for sound environmental management.
- *Institute for Research on Climate Change and its Societal Impacts (IRCCSI) - LLNL*: Improved understanding of the societal impacts of climate change, e.g. impacts on water resources, agriculture, human health, etc., is needed to inform policy decisions involving climate change and energy production. This MRU aims to provide that understanding by fostering collaborative research into the societal impacts of climate change. IRCCSI's *modus operandi* is to link the climate modeling capabilities at UC-operated labs and UC campuses with expertise in societal impacts, which is resident primarily at the campuses.
- *White Mountain Research Station – UCSD*: The White Mountain Research Station is a multicampus research unit (MRU) of the University of California Office of Research, with a campus office located at UC San Diego. The station includes a base facility (Owens Valley Lab; elevation 4000 ft.) located in high desert near the town of Bishop, as well as three facilities in the White Mountains: a montane station at Crooked Creek (elev. 10,200 ft.), an alpine station at Barcroft (elev. 12,500 ft.), and a remote high alpine lab on the summit of White Mountain Peak (elev. 14,250 ft.). The combination of facilities, geologic exposure,

high elevation and winter access make the station uniquely valuable for scientific study and educational purposes. The mission statement of the White Mountain Research Station is, “to provide room, board and facilities for any qualified research or educational group that wishes to utilize the Station’s high altitude laboratories or surrounding environment for research or field courses”, and “to be a UC Center of Excellence in “Environmental Science” focusing on high altitude and the Eastern Sierra/Western Great Basin regions”.

Each of the aforementioned programs has some thematic overlap with the SNRI. Additionally the White Mountain Research Station also operates field stations for investigators conducting mountain research. Nevertheless the aggregate of SNRI’s programs is unique. SNRI’s existing and proposed field stations in Yosemite and Sequoia/Kings Canyon National Parks are physical assets that will facilitate the research and education programs of SNRI faculty, students and investigators. Whereas, the SNRI would have the same research and education agenda without these facilities, the same is not true for the White Mountain Research Center, whose principal focus is to operate high altitude research centers.

Several of the programs listed above focus on various aspects of climate change, hydrology, water quality, atmospheric science, ecology and environmental policy and economics, but we are unaware of any other research program or institute within the University of California that attempts to link environmental research between the San Joaquin Valley and the Sierra Nevada range, nor one that is attempting to address each environmental issue from the molecular to the landscape scale. With the inclusion of faculty in the social sciences, we contend that SNRI will be able to focus on a unique range of topics that are otherwise inaccessible to UC faculty and students.

10. FIVE-YEAR RESEARCH PLAN

The SNRI is a faculty-based research institute. Its research activities will consist of a combination of traditional, individual investigator projects as well as large multi-investigator activities. We are still in a mode of active faculty recruitment in many areas that will fall under the research mission of SNRI. Thus, it is not possible to present a fully articulated five-year research plan. Nevertheless, it is clear that many of the broad research topics listed in Section 4 will become areas of emphasis over the next five years. The current faculty in SNRI are developing broad research programs exploring the interactions between hydrology, water resources, water quality, climate, and biota. As a group, we plan to study, the chemical, physical, biological and social connections between Sierra Nevada and San Joaquin Valley ecosystems. Particular emphasis is on the interconnections between Climate Change, Hydrology, Biogeochemistry and Ecosystem Science.

11. FACULTY VITAE

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Research Interests

Mountain hydrology and biogeochemistry, polar snow and ice, climate impacts and water resources.

EDUCATION

Ph.D. 1985 Environmental Engineering Science, California Institute of Technology

M.S. 1984 Social Science, California Institute of Technology

M.S. 1975 Civil Engineering, University of California, Berkeley

B.S. 1974 Civil Engineering, Purdue University

EMPLOYMENT

2003-present: School of Engineering, University of California, Merced (Professor and founding faculty member).

1984-2003: Department of Hydrology and Water Resources, University of Arizona, (Assistant Professor 1984-1989, Associate Professor 1989-1995, Professor 1995-2004).

1980-84: Graduate Research Assistant, California Institute of Technology.

1975-80: Project Manager and Project Engineer, Brown and Caldwell, Pasadena, California

REGISTRATION

Civil Engineer 27677, California

OTHER APPOINTMENTS

2004-present. Member, Hydrology Graduate Group, University of California, Davis.

2000-2003: Deputy Director NSF, Center for the Sustainability of Semi-Arid Hydrology and Riparian Areas, University of Arizona

2000-2003: Member, Committee on Remote Sensing and Spatial Analysis, University of Arizona.

1999-2003: Director, Regional Earth Science Applications Center, University of Arizona

1997-1999: Director, Institute for the Study of Planet Earth, University of Arizona

1994-2003: Member, Interdisciplinary Committee for Global Change, University of Arizona. Chair, 1994-1997.

1994-2000: Investigator, Center for Toxicology, University of Arizona.

1994-1995: Visiting Fellow, Udall Center for Studies in Public Policy, University of Arizona.

1989-93: Associate Researcher, Department of Geography, University of California, Santa Barbara.

PROFESSIONAL SOCIETIES

American Geophysical Union (Fellow), American Society for the Advancement of Science (Fellow), American Meteorological Society (Fellow), American Society of Civil Engineers, American Chemical Society, Association of Environmental Engineering Professors.

PROFESSIONAL ACTIVITIES

2004-present. Member, Committee on Integrated Hydrologic Observations, Water Science and Technology Board, National Research Council.

2003-present: Member, Committee on Metrics for Global Change Research, National Research Council.

2002-2004: Member, Committee on Geophysical and Environmental Data, National Research Council.

2001-present: Member Representative, Consortium of Universities for the Advancement of Hydrologic Science, Inc. 2001-2004 Member, Board of Directors. 2001-2003 Member, Executive Committee. 2000-2001 Chair, steering committee to form consortium and PI on grant that funded the consortium.

2000-present: Steering Committee Chair and Science Coordination Office Director, Summit Greenland Environmental Observatory.
 1999-2000, Chair, Steering Committee, Southwest Regional Assessment, U.C. Global Change Research Program; Member, Regional Assessment Team.
 2000-2002: Member, Advisory Committee, Geosciences Directorate, National Science Foundation.
 2000-2002, Steering Committee, Eos, Transactions, American Geophysical Union. Hydrology Editor, 1997-2001.
 1999-2002: Member, Committee on Hydrologic Sciences, National Research Council.
 1999-2001: Chair, Ice Core Working Group. Member, 1997-1999.
 1999-2000: Member, Water Cycle Study Group, U.S. Global Change Research Program.
 1994-1996: Hydrology section secretary, American Geophysical Union.
 1992-1996: Associate editor, Water Resources Research.
 1992-1996: Member, Committee on Glaciology, National Research Council.
 1991-1996: U.S. representative, International Commission on Water Quality, International Association of Hydrologic Sciences.
 1991-1995: Chair, Snow-Atmosphere Chemical Exchange Working Group, International Commission for Snow and Ice.
 1990-1993: Fall meeting program chair, Hydrology Section, American Geophysical Union.
 1987-1990: Steering Committee, Snow Chemistry Working Group, International Commission for Snow and Ice.
 1985-1990: Water Quality Committee, Hydrology Section, American Geophysical Union.
 1989-1991: Coagulation Research Committee, American Water Works Association.

SELECTED JOURNAL PUBLICATIONS

J.F. Burkhart, M.H. Hutterli, R.C. Bales, J.R. McConnell, Seasonal accumulation timing and preservation of nitrate in firn at Summit, Greenland, *J. Geophys. Res.*, D19302, 2004
 M.A. Hutterli, J.R. McConnell, G. Chen, R.C. Bales, D.D. Davis, D.H. Lenschow, Formaldehyde and hydrogen peroxide in air, snow and interstitial air at South Pole, *Atmos. Environ.* 38:5439-5450, 2004.
 T. Meixner, J.R. Shaw, R.C. Bales, Temporal and spatial variability of cation and silica export in an alpine watershed, Emerald Lake, California. *Hydrol. Proc.* 18(10): 1759-1776, 2004.
 A.K. Huth, A. Leydecker, J.O. Sickman, R.C. Bales, A two-component hydrograph separation for three high-elevation catchments in the Sierra Nevada, California, *Hydrol. Proc.* 18 (9):1721-1733, 2004.
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 T. Meixner, C. Gutmann, R.C. Bales, A. Leydecker, J. Sickman, J. Melack, J. McConnell, Multidecadal hydrochemical response of a Sierra Nevada watershed: sensitivity to weathering rate and changes in deposition, *J. Hydrology*, 272-285, 2003.
 J.A. Rohrbough, D.R. Davis, R.C. Bales, Spatial variability of snow chemistry in an alpine snowpack, southern Wyoming, *Water Resour. Res.*, 39(7): 1190-1201, 2003.
 M.A. Hutterli, R.C. Bales, J.R. McConnell, R.W. Stewart, HCHO in Antarctic snow: Preservation in ice cores and air-snow exchange, *Geophys. Res. Lett.*, 29(12): 1587 & 29(8):1235, 2002.
 H.W. Jacobi, M.M. Frey, M.A. Hutterli, R.C. Bales, O. Schrems, N.J. Cullen, K. Steffen, C. Koehler, Measurements of hydrogen peroxide and formaldehyde exchange between the atmosphere and surface snow at Summit, Greenland, *Atmos. Environ.*, 36(15-16): 2619-2628, 2002.
 J.F. Burkhart, M.A. Hutterli, R.C. Bales, Partitioning of formaldehyde between air and ice at -35 degrees C to -5 degrees C, *Atmos. Environ.*, 36(13): 2157-2163, 2002.

CURRENT STUDENTS AND POSTDOCS

Ph.D. John Burkhart, Ricardo Cisneros, Kevin Dressler, Markus Frey.
 M.S. Sarah Martin.
 Postdoctoral. M. Glueck, F. Liu, R. Rice

FORMER STUDENTS AND POSTDOCS

M. S.: J. F. Burkhart, B. J. Cadle, S. M. Carroll, J. Clemmons, S. Hinkle, D. Hunter, A. Kramer-Huth, D. G. Kebler, T. Kinoshita, A. Klein, T. W. Kroeger, D. Lawler, P. W. Lawson, D. McCaulou, K. L. McClellan, P. A. Noppe, C. Peters, C. E. Petersen, J.A. Rohrbough, J.R. Shaw, D. A. Stanley, K. Stocking, P. Whitaker, T. W. Whitehead, J. R. Winterle, B. D. Wolaver.

Ph. D.: Z. K. Chowdhury, R. Harrington, A. Kramer-Huth, S. Li, R. A. Matzner, J. R. McConnell, T. Meixner, N. Molotch, D. L. Pardieck, R. H. Galarraga-Sanchez, J. E. Szecsody, M. P. Valdez, R. A. Wolford.
Postdoctoral: M. Anklin, C. Brown-Mitic, D. W. Cline, S. R. Fassnacht, M. Hutterli, H. W. Jacobi, J. Morrill, A. Seth,

OTHER INFORMATION

Current Research Collaborators: M. Albert, C. Anastasio, T. Cahill, J. Dibb, J. Dozier, J. Frew, G. Huey, J. Kahl, B. Lefer, J. McConnell, N. Miller, A. Nolin, T. Painter, R. Shetter, R. Stewart, D. Tanner.
Graduate Advisor: J. J. Morgan.

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RESEARCH INTERESTS

Metal transport in natural waters, surface water/shallow groundwater interactions, biogeochemistry, organic chemical distribution in soil and ground water, chemical processes in snow, K-12 environmental education.

EDUCATION

Ph.D. 1986 Environmental Engineering Science
California Institute of Technology
M.S. 1980 Environmental Engineering Science
California Institute of Technology
B.A. 1976 Physics
Mount Holyoke College

EMPLOYMENT

2003-present: Professor, School of Engineering, University of California, Merced
1987-2003: Department of Hydrology and Water Resources, University of Arizona (Assistant Research Hydrologist 1987-89, Research Assistant Professor 1989-90, Assistant Professor 1990-1996, Associate Professor 1996-2002, Professor 2002-2003).
1986-87: Associate Engineer, Environ Corp., Washington, D.C.
1979-86: Graduate Research Assistant, California Institute of Technology.
1976-79: Air Quality Scientist, Environmental Research & Technology, Concord, Massachusetts.

OTHER APPOINTMENTS

1998-1999: Fellow, Udall Center for Studies in Public Policy, University of Arizona.
1994-present: Investigator, Center for Toxicology, University of Arizona.
1994-present: Member, Interdisciplinary Committee for Global Change, University of Arizona.

PROFESSIONAL ACTIVITIES

1994-2003: Investigator, Center for Toxicology, University of Arizona.
1994-2003: Member, Interdisciplinary Committee for Global Change, University of Arizona.
1994-2003: An investigator in a NIEHS superfund program, the Southwest Hazardous Waste Program
1996-2003: PI for two NSF-funded EGB proposals combining field experiments and characterizing natural attenuation of metals
1997-2001: Horton Research Grant Committee and Publications Committee, Hydrology Section, American Geophysical Union
1999-2002: Associate Editor, *Water Resources Research*.
1998-1999: Fellow, Udall Center for Studies in Public Policy, University of Arizona.
1999-2003: One of the investigators in a hydrology NSF-funded Science and Technology Center entitled Sustainability of semi-Arid Hydrology and Riparian Areas
2000: Chair, Editor Search Committee, *Water Resources Research*, American Geophysical Union.
2001-present: PI for Hydrology in the GLOBE program, K-12 science and education program
2003: Participant in the American Meteorology Summer Policy Colloquium
2004: Member, Editor Search Committee, *Water Resources Research*, American Geophysical Union.

2003-present: Science advisor to the Mariposa Watershed Council
2004: Member, NRC Committee on USGS Water Resources Research
2004: Member, NRC Committee on River Science at the USGS

PROFESSIONAL SOCIETIES

American Geophysical Union, American Society of Limnology and Oceanography, Association of Environmental Engineering and Science Professors, American Chemical Society, American Society for the Advancement of Science, American Water Resources Association.

SELECTED PUBLICATIONS

- J.E. Villinski, J.E. Saiers and M.H. Conklin, The effects of reaction-product formation on the reductive dissolution of MnO_2 by Fe(II). *Environmental Science and Technology*, **37**, 5589-5596.
- N. Melitas, M. Conklin and J. Farrell. Electrochemical study of arsenate and water reduction on iron media used for arsenic removal from potable water. *Environmental Science and Technology*, **36**, 3188-3193, 2002.
- J.A.K. Silva, R. G. Bruant and M.H. Conklin. Equilibrium partitioning of chlorinated solvents in vadose zone: Low f_{oc} geomeia, *Environmental Science and Technology*, **36**, 1613-1619, 2002.
- J. Villinski, P.A. O'Day, T.L. Corley and M.H. Conklin. In situ spectroscopic and solution analyses of the reductive dissolution of MnO_2 by Fe(II). *Environmental Science Technology*. **35**, 1157-1163, 2001.
- J.T. Kay, M. H. Conklin, C.C. Fuller and P.A. O'Day. Processes of nickel and cobalt uptake by a manganese oxide forming sediment in Pinal Creek, Globe Mining District, Arizona. *Environmental Science and Technology*, **35**, 4719-4725, 2001.
- J. Villinski, P.A. O'Day, T.L. Corley and M.H. Conklin. In situ spectroscopic and solution analyses of the reductive dissolution of MnO_2 by Fe(II). *Environmental Science Technology*. **35**, 1157-1163, 2001.
- R.G. Bruant, Jr., and M.H. Conklin. Adsorption of trichloroethene at the air/water interface. *Environmental Science & Technology*, **35**(2), 362-364, 2001.
- R.G. Bruant, Jr., and M.H. Conklin. Dynamic determination of vapor/water interface adsorption for volatile organic compounds (VHOCs) using axisymmetric drop shape analysis: Procedure and analysis of benzene adsorption. *The Journal of Physical Chemistry B*, **104**(47), 11146-11152, 2000.
- J. Choi, M.H. Conklin, R.C. Bales, R.A. Sommerfeld. Experimental investigation of SO_2 uptake in snow. *Atmospheric Environment*, **34**: 793-801, 2000

CURRENT STUDENTS

Ph.D.: Glenn Shaw (University of California, Merced).

CURRENT POSTDOCTORAL FELLOWS

Sarah May, Fengjing Liu

FORMER POSTDOCTORAL FELLOWS

Jean Morrill, John Villinski

FORMER PHD STUDENTS

Robert Bruant, Chunming Yu, Ingrid Padilla, Jungyill Choi, David Quanrud, John Villinski.

COLLABORATORS

Michael Hoffman (dissertation advisor), Christopher Fuller (USGS), G. Bryant Hudson (LLNL), Jean Moran (LLNL), Gregory Nims (LLNL), Roger Bales (UCM), Jon Chorover (UA), David Goodrich (USDA ARS)

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PROFESSIONAL PREPARATION

Education

University of California, Los Angeles	Civil and Environmental Engineering	B.S.	1992
University of California, Berkeley	Civil and Environmental Engineering	M.S.	1994
University of California, Berkeley	Nuclear Engineering	Ph.D.	2001

Postdoctoral Institutions

Rocky Mountain Biological Laboratory, Colorado	2001
Macquarie and Sydney University, Australia	2002 - 2003
University of California, Davis	2003 - 2004

APPOINTMENTS

- July 2004 – present **Assistant Professor.** School of Natural Sciences, University of California, Merced, California.
- Fall 2004 **Visiting Scholar.** Center for Theoretical Studies at the Institute for Advanced Studies at Charles University and the Academy of Sciences of the Czech Republic.
- 2002 – 2004 **Postdoctoral Fellow.** University of Sydney; Macquarie University; University of California, Davis (UCD). *Bioinformatics analysis of the effects of spatial scale and phylogenetic resolution on biodiversity theory: tests in a microbial landscape.* NSF Postdoctoral Fellowship in Biological Informatics DEB/DBI-0107555.
- 2004 **Affiliated Faculty.** Complex Systems Summer School, Santa Fe Institute.
- 2003 - 2004 **Lecturer.** Department of Environmental Science and Policy, UCD. Theoretical Ecology and Mathematical Methods in Population Biology.
- 2001 **Postdoctoral Fellow.** University of California Postdoctoral Fellowship. Declined.
- 2001 **Postdoctoral Researcher.** Rocky Mountain Biological Laboratory, Colorado. PI: John Harte.
- 2000-2001 **Graduate Fellow.** University of California President's Dissertation-Year Fellowship.
- 2000 **Graduate Fellow.** Phi Beta Kappa Northern California Association Graduate Fellowship.
- 2000 **Teaching Assistant.** University of California, Berkeley (UCB). Engineering Thermodynamics (Graduate Student Instructor Teaching Effectiveness Award).
- 1999-2000 **Graduate Fellow.** UC Toxics Research and Teaching Fellowship Program.
- 1997 **Research Assistant.** Ecology Group, Los Alamos National Laboratory. PI: Phil Fresquez.
- 1993-1994 **Research Assistant.** Department of Civil and Environmental Engineering, UCB. PI: Lisa Alvarez-Cohen (Microbiology).
- 1992-1993 **Environmental Engineer.** Defense Nuclear Facilities Safety Board, Washington D.C.
- 1990-1992 **Research Assistant.** Department of Mechanical, Aerospace, and Nuclear Engineering. PI: William Kastenberg.

MOST RELEVANT PUBLICATIONS

- Green, J.L.,** Hastings, A., Arzberger, P., Ayala, F., Cottingham, L., Cuddington, K., Davis, F., Dunne, J., Fortin, M.J., Gerber, L., Neubert, M. Complexity in ecology and conservation: mathematical, statistical, and computational challenges. In press *Bioscience*.
- Green, J.L.,** Holmes, A.J., Westoby, M., Oliver, I., Briscoe, D., Dangerfield, M., Gillings, M., Beattie, A. 2004. Spatial scaling of microbial eukaryote diversity. *Nature* 432: 747-750.
- Ostling, A., Harte, J., **Green, J.L.,** A. Kinzig. 2004. Self-similarity, the power-law form of the species-area relationship, and a probability rule: a reply to Maddux. *American Naturalist* 163: 627-633.
- Green, J.L.,** A. Ostling. 2003. Endemics-area relationships: the influence of species dominance and spatial aggregation. *Ecology* 84: 3090-3097.

Green, J.L., Harte, J., Ostling, A. 2003. Species richness, endemism and abundance patterns: tests of two fractal models in a serpentine grassland. Ecology Letters 6: 919-928.

FIVE OTHER PUBLICATIONS

Harte, J., Ostling, A., **Green, J.L.**, A. Kinzig. 2004. Climate change and extinction. Nature 430: 145-148.

Green, J.L., Harte, J., Ostling, A., 2001. Climate change and biodiversity loss, in *Biotic Homogenization: the Loss of Diversity Through Invasion and Extinction*. Edited by J. L. Lockwood and M. McKinney, Kluwer Academic/Plenum Publishers, New York.

Ostling, A., Harte, J., **Green, J.L.**, 2000. Self-similarity and clustering in the spatial distribution of species. Science 290: 671a.

Banavar, J.R., **Green, J.L.**, Harte, J., Maritan, A., 1999. Finite size scaling in ecology. Physical Review Letters 83: 4212-4214.

Harte, J., Kinzig, A., **Green, J.**, 1999. Self-similarity in the distribution and abundance of species. Science 284: 334-336

SYNERGISTIC ACTIVITIES

- Founding faculty at the University of California at Merced, the tenth campus in the University of California and the first American research university to be built in the 21st century.
- Synthesized outcome of a NSF Foundation sponsored workshop on Quantitative Environmental and Integrative Biology (QEIB), invited participant of the National Center for Ecological Analysis and Synthesis "Patterns in Microbial Biodiversity" workshop and the Santa Fe Institute "Scaling Biodiversity" workshop.
- Actively working to engage students in quantitative environmental problem solving, by teaching courses in the Nuclear Engineering Department at UC Berkeley on Ecological Risk Analysis and at the Santa Fe Institute Complex Systems Summer School.
- Enhancing public interest in environmental science through art; most recent Exhibition "Forms of non-constrained chance", Gallery Wren, Sydney, November 2002.
- Reviewer: Nature, Ecology Letters, Ecology, Global Ecology and Biogeography, National Science Foundation, Austral Ecology, The Modeling and Simulation Society of Australia and New Zealand.

COLLABORATORS

F. Ayala (University of California, Irvine), A. Beattie (Macquarie University), B. Bohannan (Stanford), R. Condit (Smithsonian Tropical Research Institute), K. Cottingham (Dartmouth College), F. Davis (University of California, Santa Barbara), J. Dunne (Pacific Ecoinformatics and Computation Ecology Lab), M. Fortin (University of Toronto), L. Gerber (Arizona State University), J. Harte (UC Berkeley), A. Hastings (UC Davis), A. Holmes (University of Sydney), F. He (University of Alberta), M. Horner-Devine (Stanford), J. Hughes (Brown University), A. Kinzig (Arizona State University), M. Neubert (Woods Hole Oceanographic Institution), A. Ostling (Princeton University), M. Westoby (Macquarie University)

ADVISORS

Masters: Lisa Alvarez-Cohen (University of California, Berkeley)

Ph.D.: John Harte and William Kastenberg (University of California, Berkeley)

Postdoc: Alan Hastings (University of California, Davis), Mark Westoby (Macquarie University, Australia), Andrew Holmes (University of Sydney, Australia)

SHAWN KANTOR

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EMPLOYMENT

Professor of Economics and Founding Faculty, University of California, Merced, July 2004 – present.
Professor of Economics, University of Arizona, July 1999 – present.
Research Associate, National Bureau of Economic Research, September 1997 – present.
Senior Economist, Federal Home Loan Mortgage Corporation, January 1999 – January 2000.
Associate Professor of Economics, University of Arizona, July 1996 – June 1999.
Faculty Research Fellow, National Bureau of Economic Research, October 1991 – September 1997.
Visiting Professor of Economics, Universidad Carlos III de Madrid, January – June 1997.
Assistant Professor of Economics, University of Arizona, August 1990 – June 1996.
Instructor, Pasadena City College, February 1988 – January 1989.

EDUCATION

Ph.D., Social Science, California Institute of Technology, June 1991.
M.S., Social Science, California Institute of Technology, June 1988.
B.A., Economics and History, University of Rochester, June 1987.

HONORS AND AWARDS

A Prelude to the Welfare State: The Origins of Workers' Compensation awarded the Richard A. Lester Prize for the Outstanding Book in Labor Economics and Industrial Relations published in 2000.
A Prelude to the Welfare State: The Origins of Workers' Compensation awarded the 2000 TIAA-CREF Institute Certificate of Excellence for Outstanding Scholarly Writing on Lifelong Financial Security.
Politics and Property Rights: The Closing of the Open Range in the Postbellum South nominated for a 1999 Pulitzer Prize.
Arthur H. Cole Prize. Economic History Association award for the outstanding article published in the *Journal of Economic History*, September 1996 to June 1997.
Columbia University Prize in American Economic History in Honor of Allan Nevins. Economic History Association award for the outstanding dissertation in North American economic history completed during 1990–1991.

RESEARCH INTERESTS

Political economy, law and economics, U.S. economic history, economic development, and public economics.

PUBLICATIONS

Books

A Prelude to the Welfare State: The Origins of Workers' Compensation (Chicago: University of Chicago Press for the National Bureau of Economic Research, 2000) (with Price V. Fishback; winner of the 2000 TIAA-CREF Institute Certificate of Excellence; winner of the 2001 Richard A. Lester Prize).
Politics and Property Rights: The Closing of the Open Range in the Postbellum South (Chicago: University of Chicago Press, 1998).

Journal Articles

- “Did New Deal Grant Programs Stimulate Local Economies? A Study of Federal Grants and Retail Sales During the Great Depression,” *Journal of Economic History*, 65 (March 2005) (with Price V. Fishback and William C. Horrace).
- “Can the New Deal’s Three Rs Be Rehabilitated? A Program-by-Program, County-by-County Analysis,” *Explorations in Economic History*, 40 (July 2003), pp. 278-307 (with Price V. Fishback and John Joseph Wallis).
- “The Impact of New Deal Programs on Black and White Infant Mortality in the South,” *Explorations in Economic History*, 38 (January 2001), pp. 93-122 (with Price V. Fishback and Michael R. Haines).
- “The Adoption of Workers’ Compensation in the United States, 1900-1930,” *Journal of Law & Economics*, 41 (2) (part 1) (October 1998), pp. 305-41 (with Price V. Fishback).
- “The Political Economy of Workers’ Compensation Benefit Levels, 1910-1930,” *Explorations in Economic History*, 35 (April 1998), pp. 109-39 (with Price V. Fishback).
- “How Minnesota Adopted Workers’ Compensation,” *The Independent Review*, 2 (Spring 1998), pp. 557-78 (with Price V. Fishback).
- “The Durable Experiment: State Insurance of Workers’ Compensation Risk in the Early Twentieth Century,” *Journal of Economic History*, 56 (December 1996), pp. 809-36 (with Price V. Fishback; winner of the 1997 Arthur H. Cole Prize).
- “Precautionary Saving, Insurance, and the Origins of Workers’ Compensation,” *Journal of Political Economy*, 104 (April 1996), pp. 419-42 (with Price V. Fishback).
- “Nonfatal Accident Compensation and the Common Law at the Turn of the Century,” *Journal of Law, Economics, and Organization*, 11 (October 1995), pp. 406-33 (with Price V. Fishback).
- “Supplanting the Roots of Southern Populism: The Contours of Political Protest in the Georgia Hills,” *Journal of Economic History*, 55 (September 1995), pp. 637-46
- “Did Workers Pay for the Passage of Workers’ Compensation Laws?” *Quarterly Journal of Economics*, 110 (August 1995), pp. 713-42 (with Price V. Fishback).
- “The Political Economy of Coalition-Formation: The Case of Livestock Enclosure in the Postbellum South,” *Explorations in Economic History*, 32 (January 1995), pp. 82-108.
- “The Economic and Political Determinants of Fence Reform in Postbellum Georgia,” *Journal of Institutional and Theoretical Economics*, 150 (September 1994), pp. 486-510.
- “Common Sense or Commonwealth? The Fence Law and Institutional Change in the Postbellum South,” *Journal of Southern History*, 59 (May 1993), pp. 201-42 (with J. Morgan Kousser).
- “Two Visions of History: A Rejoinder,” *Journal of Southern History*, 59 (May 1993), pp. 259-66 (with J. Morgan Kousser).
- “‘Square Deal’ or Raw Deal? Market Compensation for Workplace Disamenities, 1884-1903,” *Journal of Economic History*, 52 (December 1992), pp. 826-48 (with Price V. Fishback). Reprinted in *Economic Analysis of Contract Law, Antitrust Law, and Safety Regulations*, edited by Jenny B. Wahl (New York: Garland Publishing, Inc., 1998.)
- “Property Rights and the Dynamics of Institutional Change: The Closing of the Georgia Open Range, 1870-1900,” *Journal of Economic History*, 52 (June 1992), pp. 456-59.
- “Razorbacks, Ticky Cows, and the Closing of the Georgia Open Range: The Dynamics of Institutional Change Uncovered,” *Journal of Economic History*, 51 (December 1991), pp. 861-86.

Chapters in Books

- “Coalition Formation and the Adoption of Workers’ Compensation: The Case of Missouri, 1911 to 1926,” in Claudia Goldin and Gary D. Libecap, eds., *The Regulated Economy: A Historical Approach to Political Economy* (Chicago: University of Chicago Press for the NBER, 1994), pp. 259-97 (with Price V. Fishback).
- “Fatal Accident Compensation Under the Negligence Liability System,” in Carol S. Leonard and B. N. Mironov, eds., *Hours of Work and Means of Payment: Proceedings of the Eleventh International Economic History Congress* (Milan: Universita Bocconi, 1994), pp. 37-45 (with Price V. Fishback).
- “Why Did Coal Miners Work So Few Hours? Labor-Leisure Choice in the Face of Severe Time Constraints,” in Ian Blanchard, ed., *Labour and Leisure in Historical Perspective: Thirteenth to Twentieth Centuries* (Stuttgart: Franz Steiner Verlag, 1994), pp. 125-35 (with William Boal and Price V. Fishback).

VALERIE J. LEPPERT

Professional Preparation

Sonoma State University	Biology	B.A.	1986
Sonoma State University	Physics/Chemistry	B.A. (with distinction)	1987
Northwestern University	Mater. Sci. and Eng.	Ph.D.	1994
University of California, Davis	Postdoctoral Rsh. Assoc.		Mar. 1995–Nov. 1999

2. APPOINTMENTS

- 07/03 - present Assistant Professor, Founding Faculty, University of California at Merced, School of Engineering
- 07/03 - present Visiting Assistant Professor, University of California at Davis, Department of Chemical Engineering and Materials Science
- 08/01 – 07/03 Assistant Professional Researcher, University of California at Davis, Department of Chemical Engineering and Materials Science
- 11/99 – 08/01 Assistant Adjunct Professor, University of California at Davis, Department of Chemical Engineering and Materials Science
3. 03/95 – 11/99 LECTURER AND POST-GRADUATE RESEARCHER, UNIVERSITY OF CALIFORNIA AT DAVIS, DEPARTMENT OF CHEMICAL ENGINEERING AND MATERIALS SCIENCE
4. 09/87 – 12/93 RESEARCH ASSISTANT, NORTHWESTERN UNIVERSITY, DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING
- 12/84 – 09/96 Biologist, Anatec Laboratories, Santa Rosa, CA

5. SAMPLE PUBLICATIONS

J. Jasinski, I.M. Kennedy, K.E. Pinkerton, and V.J. Leppert, "Surface Oxidation State of Combustion-Synthesized γ - Fe_2O_3 Nanoparticles Determined by Electron Energy-Loss Spectroscopy in the Transmission Electron Microscope", *Sensors and Actuators A*, submitted September, 2004

Y.M. Zhou, A. Aust, I.M. Kennedy, V.J. Leppert, S.V. Teague, and K.E. Pinkerton, "Reduced Lung Cell Proliferation Following Short-Term Exposure to Ultrafine Soot and Iron Particles in Neonatal Rats: Key to Impaired Lung Growth?", *Inhal. Toxic.* **16**:1 (2004)

Zhou, Y.M., C.Y. Zhong, I.M. Kennedy, V.J. Leppert, and K.E. Pinkerton, "Oxidative Stress and Activation of NF_κB in the Lungs of Healthy Adult Rats: A Synergistic Interaction Between Soot and Transition Metal Iron Particles," *Toxic. and Appl. Pharm.* **190**:157 (2003)

Madewell, B.R., S.M. Griffey, M.C. McEntee, V.J. Leppert, and R.J. Munn, "Feline Vaccine-associated Fibrosarcoma: An Ultrastructural Study of 20 Tumors (1996-1999)," *Vet. Path.* **38**:196 (2001)

Yang, Y., V.J. Leppert, S.H. Risbud, B. Twamley, P.P. Power, and H.W.H. Lee, "Blue Luminescence from Amorphous GaN Nanoparticles Synthesized *In Situ* in a Polymer," *Appl. Phys. Lett.* **74**, 2262 (1999)

Leppert, V.J., A.S. Harvey, G.D. McCool, F.T. Quinlan, J. Feng, G. Shan, P. Stroeve, S.H. Risbud, B.D. Hammock, and I.M. Kennedy, "Long-Wavelength Emitting Nanocrystals for Bioassay Applications, in Nanoscale Optics and Applications," *Proc. of SPIE* **4809**:110 (2002)

Leppert, V.J., A.K. Murali, S.H. Risbud, M. Stender, P.P. Power, C. Nelson, P. Banerjee, and A.M. Mayes, "Microscopy and Microanalysis of Ordered Arrays of Size-controlled Ga-Nitride Nanoclusters in a Block Copolymer Matrix," *Phil. Mag. B* **82**:1047 (2002)

Leppert, V.J., C.J. Zhang, H.W.H Lee, I.M. Kennedy, and S.H. Risbud, "Observation of Quantum Confined Excited States of GaN Nanocrystals," *Appl. Phys. Lett.* **72**:3035 (1998)

Leppert, V.J., S. Mahamuni, N.R. Kumbhojkar, and S.H. Risbud, "Structural and Optical Characteristics of ZnSe Nanocrystals Synthesized in the Presence of a Polymer Capping Agent," *Mater. Sci. Erg. B* **52**:89 (1998)

Leppert, V.J., S.H. Risbud, and M.J. Fendorf, "High-resolution Electron Microscopy and Microanalysis of ZnSe Quantum Dots in Glass Matrices," *Phil. Mag. L.* **75**:29 (1997)

6. SYNERGISTIC ACTIVITIES

1. UC Merced PI for NSF NSEC that focuses on providing internship opportunities in nanoscale science and engineering to high school and community college students from under-represented groups in the California Central Valley. Students work with faculty to create a national database of nanoscience engineering modules.
2. UC Merced PI for Engineering Projects in Community Service Sub-Award from Purdue University to establish an undergraduate engineering service learning program at UC Merced. Program has demonstrated effectiveness for recruitment and retention of under-represented groups in engineering, delivering ABET accreditation content to the curriculum, and benefits the community. One service learning group is working with the Castle Science and Technology Center in Atwater, CA, and will be constructing a nanoscience exhibit as part of this effort.
3. As founding faculty at UC Merced, developing interdisciplinary curriculum, including a course on nanotechnology and the environment. Building electron microscopy central facility that focuses on nanoscale characterization for campus.
4. Outreach: Presented 4 seminars to California State University students and the general public on interdisciplinary materials research, Grand awards judge for Intel 2001 International Science and Engineering Fair, Instructor for COSMOS (UCD residential summer school for top high school students in science and mathematics).
5. Integration of Research and Teaching: Created graduate electron microscopy class focusing on publication quality research using advanced TEMs at NCEM. During the 10-week course qualifying students submit research proposals, prepare samples, conduct TEM investigations, and submit publication quality papers. Many projects result in peer-reviewed publications

7. Honors and Awards

2004 Invited Participant, National Academy of Engineering 10th Annual Symposium on Frontiers of Engineering

2004 Fellowship Invitation, International Center for Young Scientists, Japan National Institute of Materials Science

2003 Finalist, UC Davis Academic Federation Award for Excellence in Research

2002 NSF Advance Fellows Award - Electron Microscopy of Nanomaterials

1992 ASM Honor Society

1987 Graduation with Distinction in Chemistry, SSU

Organizations: Materials Research Society, Microscopy Society of America, Soc. of Women Engineers, American Physical Society, Northern California Society for Microscopy

8. Collaborators:

P. Banerjee, MIT; A. Barve, UCD; B.S. Bendre, U. of Pune, India; K. Borgohain, U. of Pune, India; D. Cooke, LLNL; L. Davilla, UCD; J. Feng, UCD; T.J. Goodwin, KLA Tencor; S. Guha, NRL; L.W. Hrubesh, LLNL; J. Jasinski, UCM; I. Kang, Cornell; I.M. Kennedy, UCD; N.R. Kumbhojkar, U. of Pune, India; K. Lam, UCDCM; H.W.H. Lee, LLNL; J.J. Liang, UNM; S. Mahamuni, U. of Pune, India; A.M. Mayes, MIT; A.K. Murali, UCA; C. Nelson, LBNL; K. Pinkerton, UCD; S. Risbud, UCD; D. Shon, Harvey-Mudd; C.A. Smith, LLNL; Y.Y. Won (MIT); Y. Yang, UNM; A. Zetyl, UCB

Ph.D. Advisor: R.P.H Chang, Northwestern U.

Postdoctoral Advisor: S.H. Risbud, UC Davis

Current Graduate Students:(3) Rebecca Chacon, Ashley Harvey, Geoff McCool

Peggy A. O'Day
Associate Professor

SCHOOL OF NATURAL SCIENCES, UNIVERSITY OF CALIFORNIA, MERCED

Education 1992 Ph.D., Stanford University, Stanford, CA, Applied Earth Sciences
 M.S., Cornell University, Ithaca, NY, Geological Sciences
 B.S., University of California, Davis, CA, Geology, *with Honors*

PROFESSIONAL EXPERIENCE

2003-present: Associate Professor, University of California, Merced
2002-2003: Department of Chemistry & Biochemistry, Arizona State University, joint position
2000-2003: Associate Professor, Department of Geological Sciences, Arizona State University
2000-2001: Visiting Scholar, Lawrence Livermore National Laboratory, Livermore, CA
1994-2000: Assistant Professor, Geology Department, Arizona State University
1992-1994: Post-Doctoral Research Fellow, University of California, Berkeley
1987-1992: Ph.D. Candidate, Applied Earth Sciences, Stanford University
1986-1987: Research Assistant, Environmental Science & Engineering, Rice University
1984-1985: Geologist, U.S. Geological Survey, Menlo Park, CA

PROFESSIONAL ACTIVITIES AND AWARDS

Guest Lecturer, Goldschmidt Conference, Geochemical Society, Copenhagen DK, 2004
Panel Review Member, NSF EAR Instrumentation and Facilities Program, 2003-2005
Associate Editor, *Geochimica et Cosmochimica Acta*, 2001-2004
American Chemical Society, Geochemistry Division, Program Chair, 2001; Chair, 2002
Mineral & Rock Physics Committee Member, American Geophysical Union, 2000-2002
GeoSync Society, American Geophysical Union, Chair, 2000-2001
National Science Foundation, Faculty Early Career Award, 1996-2000
Mineralogical Society of America, National Visiting Lecturer, 1995-1996
National Science Foundation, Post-Doctoral Research Fellow, Earth Sciences, 1992-1994

EXPERIENCE AND RESEARCH INTERESTS

Mineral-aqueous interface geochemistry; chemistry and mobility of contaminants in the environment; geochemical and biogeochemical applications of spectroscopy and microscopy, in particular synchrotron X-ray methods; inorganic, organic, and microbial chemistry at ambient and hydrothermal conditions.

PROFESSIONAL ORGANIZATIONS

American Chemical Society
American Geophysical Union
Geochemical Society
International XAFS Society
Mineralogical Society of America

SYNERGISTIC ACTIVITIES

NIEHS/NIH, Superfund Basic Research Program Review Panel, 2004
Participant, Sally Ride Science Festival, Arizona State University, 2003
Participant, *DSV Alvin/Atlantis* Cruise Extreme 2002, 9°N East Pacific Rise
Participant, *DSV Alvin/Atlantis* Cruise Extreme 2001, 9°N East Pacific Rise
Participant, Interdisciplinary Workshop on Nanogeoscience, 2002
Faculty Participant, ASU "Down-to-Earth" K-12 Education and Outreach Program, 2000-2003
Faculty Participant, NSF-IGERT Program in Urban Ecology, 2000-2003
Participant, NASA Astrobiology Institute, Roadmap Planning Workshop, 1998

Selected Recent Publications

- O'Day, P. A., Vlassopoulos, D., Root, R., and Rivera, N. (2004) The influence of sulfur and iron on dissolved arsenic concentrations in the shallow subsurface under changing redox conditions, *Proc. Nat. Acad. Sciences* **101**, 13703-13708.
- O'Day, P. A., Rivera, N., Root, R., and Carroll, S. A. (2004) X-ray absorption spectroscopic study of iron reference compounds for the analysis of natural sediments, *Am. Miner.* **89**, 572-585.
- O'Day, P. A., Vlassopoulos, D., Meng, X. and Benning, L. G., Editors, (2005) *Advances in Arsenic Research: Integration of Experimental and Observational Studies and Implications for Mitigation*, American Chemical Society Symposium Series (in press).
- Savage, K. S., Bird, D. K., and O'Day, P. A. (in press) Arsenic speciation in jarosite: natural and synthetic samples, *Chemical Geology*.
- Kneebone, P. E., O'Day, P. A., Jones, N., and Hering, J. G. (2002) Deposition and fate of arsenic in iron-and arsenic-enriched sediments, *Environ. Sci. Tech.* **36**, 381-386.
- Carroll, S. A., O'Day, P. A., Esser, B., and Randall, S. (2002) Speciation and fate of trace metals in estuarine sediments under reduced and oxidized conditions, Seaplane Lagoon, Alameda Naval Air Station (USA), *Geochem. Trans.* **3**(10), 81-101.
- Melitas, N., Wang, J., Conklin, M., O'Day, P., and Farrell, J. (2002) Understanding soluble arsenate removal kinetics by zerovalent iron media, *Environ. Sci. Tech.* **36**, 2074-2081.
- Farrell, J., Wang, J., O'Day, P. and Conklin, M. (2001) Electrochemical and spectroscopic study of arsenate removal from water using zerovalent iron media, *Environ. Sci. Tech.* **35**, 2026-2032.
- Kay, J. T., Conklin, M. H., Fuller, C. C., and O'Day, P. A. (2001) Processes of nickel and cobalt uptake by a Mn-oxide forming sediment in Pinal Creek, Globe Mining District, Arizona, *Environ. Sci. Tech.* **35**, 4719-4725.
- Savage, K. S., Tingle, T. N., O'Day, P. A., Waychunas, G. A., and Bird, D. K. (2000) Arsenic speciation in pyrite and secondary weathering phases, Mother Lode Gold District, Tuolumne County, California, *Appl. Geochem.* **15**, 1219-1244.
- O'Day, P. A. (1999) Molecular environmental geochemistry, *Rev. Geophys.* **37**, 249-274.

Graduate Student Advisees

<i>UC Merced</i>	Nelson Rivera (Ph.D.)	Robert Root (Ph.D.)
<i>Arizona State University</i>		
Lara Heister (M.S. '97)		Dawn Ashbridge (M.S. '02)
Katherine Geiger (M.S. '99)		Robert Root (M.S. '03)
Jill Best (M.S. '02)		Ken Voglesonger (Ph.D. '04)
Nelson Rivera (M.S. '04)		

Post-Doctoral Scholars (current): Virginia Illera Ramon; Sunkyung Choi

Previous: Nita Sahai (Univ. of Wisconsin)

Graduate Advisors: George A. Parks, Gordon E. Brown, Jr. (Stanford University)

Post-graduate Sponsor: Harold C. Helgeson (UC Berkeley)

SAMUEL JUSTIN TRAINA

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EDUCATION: B.S., SOIL SCIENCE, 1978, UNIVERSITY OF CALIFORNIA, BERKELEY; PH.D., SOIL CHEMISTRY, 1983, UNIVERSITY OF CALIFORNIA, BERKELEY.

Professional Experience: Postdoctoral Scientist, Department of Soil and Environmental Sciences, University of California, Riverside (1983-1984); Assistant Research Professor, Department of Soil and Environmental Sciences, University of California, Riverside (1984-1985); Assistant Professor, Department of Agronomy, Assistant Professor, Environmental Biology, The Ohio State University, (1985-1991); Associate Professor, Department of Agronomy, Associate Professor, Environmental Science, The Ohio State University (1991-1994); Associate Professor, School of Natural Resources, Associate Professor, Environmental Science, Associate Professor, Department of Geological Science, The Ohio State University, (1994-1997); Director of the Graduate Program in Environmental Science, The Ohio State University, (1995-1998); Professor, School of Natural Resources, Professor, Environmental Science and Professor, Department of Geological Science, The Ohio State University, (1997-present); Cox Visiting Professor of Earth Sciences, Stanford University (1998). Co-Director, The Ohio State University EMSI (2000-July 1, 2002), Adjunct Professor, OSU, (2002- present). Professor of Natural Science, University of California, Merced; Founding Director, Sierra Nevada Research Institute, University of California, Merced (7/1/02 - present).

Professional Service: Review of DOE Subsurface Science Program, Deep Microbiology and Co-contaminants Programs (1994); US EPA, Exploratory Research Program, Panel Member (1994); USDA, National Research Initiative, Panel Member (1994); USDA National Research Initiative. Panel Chair (1996); DOE, ER-NABIR Program, Panel Member (1996); DOE, ER-NABIR Program, Biogeochemical Dynamics Group, Panel Chair (1997); National Academy of Science/National Research Council Panel on Remediation of Naval Weapons Sites, Panel Member (1997-1998); DOE, OS-ER-EMSP, Hydrogeology Panel Chair (1999); Clay Minerals Society Technical Program Chair (1999); Chair of Clarke Medal Committee, The Geochemistry Society (1999). DOE-EMSP Chemistry Panel Member (2001). Panel Review of Heavy Element Chemistry Group, Los Alamos National Laboratory (2001), Panel Review of Earth Science Division of LBL (2003). DOE- ERD subcommittee of BERAC, 2003-present

Honors: Distinguished Graduate Teaching Award, UC Berkeley, 1981. Distinguished Research Award, Ohio Agricultural Research and Development Center, 1990; Multidisciplinary Team Research Award, Ohio Agricultural Research and Development Center, 1998; Cox Visiting Professor, School of Earth Sciences, Stanford University, 1998. Fellow Soil Science Society of America, 2001.

Research Interests: Environmental chemistry, soil chemistry and geochemistry of organic and inorganic contaminants in terrestrial and aquatic environments; thermodynamic, kinetic and spectroscopic studies of contaminant solution and surface chemistry; remediation of contaminants in soils, sediments and aquatic systems. Spectroscopic studies of contaminant-surface interactions.

Selected Publications (115 total)

Zachara, John M.; Ainsworth, Calvin C.; Brown, Gordon E.; Catalano, Jeffrey G.; McKinley, James P.; Qafoku, Odeta; Smith, Steven C.; Szecsody, James E.; Traina, Sam J.; Warner, Jeffrey A. Chromium speciation and mobility in a high level nuclear waste vadose zone plume. 2004. *Geochimica et Cosmochimica Acta* 68(1), 13-30.

Klupinski, Theodore P.; Chin, Yu-Ping; Traina, Samuel J. 2004. Abiotic Degradation of Pentachloronitrobenzene by Fe(II): Reactions on Goethite and Iron Oxide Nanoparticles. *Environ. Sci. Tech.* 38:4353-4360.

He, Y.T., C.C. Chen, and S.J. Traina. 2004. Inhibited Cr(VI) reduction by aqueous Fe(II) under hyperalkaline conditions. *Environ. Sci. Technol.* 38:5535-5539.

He, Y.T., and S.J. Traina. 2005. Cr(VI) reduction and immobilization by magnetite under alkaline pH conditions: the role of passivation. *Environ. Sci. Technol.* in press.

He, Y.T., J.M. Bigham, and S.J. Traina. 2005. Biotite dissolution and Cr(VI) reduction at elevated pH and ionic strength. *Geochem. Cosmochim. Acta* in press.

Myneni, S.C.B., S.J. Traina, G. Waychunas and T.J. Logan. 1998. Experimental and theoretical vibrational spectroscopic evaluation of arsenate coordination in aqueous solutions, solids and at mineral-water interfaces. *Geochem. Cosmochim. Acta.* 62. 3285-3300.

Templeton, A.S., T.P. Trainor, S.J. Traina, A.M. Spromann and G.E. Brown, Jr. 2001 Pb(II) distributions at biofilms metal oxide interfaces. *Proceed Nation. Acad. Sci.* 98(21), 11897-11902.

Williams, D.J., J.M. Bigham, C.A. Cravotta, S.J. Traina, J.E. Anderson and J.G. Lyon. 2002. Assessing mine drainage water quality from the color and spectral reflectance of chemical precipitates. *Appl. Geochem.* 17:1273-1286.

Gagliano, W. B.; Brill, M. R.; Bigham, J. M.; Jones, F. S.; Traina, S. J. 2004. Chemistry and mineralogy of ochreous sediments in a constructed mine drainage wetland. *Geochim. Cosmochim. Acta* 68:2119-2128.

Z. He, S. J. Traina, J. J. Bigham, and L. K. Weavers. 2005. Sonolytic Desorption of Mercury from Aluminum Oxide, *Environmental Science and Technology* 39(4), 1037-1044.

Ph.D. Advisor: Harvey Doner, University of California, Berkeley

Post-Doctoral Advisor: Garrison Sposito, University of California, Riverside

Colaborators in the last 48 months, students and postdocs last 60 months:

Aiken, G.	Hayes, K.	Radosevich, M.
Ainsworth, C.	He, X.	Reinhard, M.
Bigham, J.	Hersman, L.	Roberts, L.
Brown, G.	Hille, R.	Sayre, R.
Cai, X.,	Kaufman, D.	Schwartz, F.
Carlson, E.	Laperche, V.	Schwertmann, U. Sims, K.
Cattalano, J.	Lappin, J.	Sharma, S.
Chalmers, J.	Loch, A.	Stamper, D.
Chattopadhyay, S.	Logan, T.	Stinner, B.
Chen, Chia-Chen	Lower, S.	Sutton, S.
Chin, Y.	Luthy, D.,	Versteeg, D.
Crawford, J	Ma, Q.	Walker, H.
Cunningham, P.	Martinez, G.	Wander, M.
Danielsen, K.,	Maurice, P.	Wang, L.
Dudley, R.	McAvoy, D	Waychunas, G.
Fuller, B.	Myneni, S.	Weavers, L.
Gaddam, P.	Newville, M.	Weber, W.
Grandinetti, P.	O'Loughlin, E.	Westall, J.
Gschwend, P.	Onken, B.	Wolff-Boenisch, D.
Gustafson, T.	Ostrofsky, E.	
Hatcher, P.	Pinatello, J.	

Current SNRI faculty¹

Name	UC Merced School	Research Area
Andy Aguilar	Natural Science	Evolution and Conservation Biology
Roger Bales	Engineering	Mountain Hydrology
Yishu Chen	Engineering & SSHA	Environmental Economics
Martha Conklin	Engineering	Hydrology and Biogeochemistry
Mike Dawson	Natural Science	Evolution and Ecology
Benoit Dayrat	Natural Science	Invertebrate Systematics
Phil Duffy	Natural Science & LLNL	Climate Modeling
Qinghua Gao	Engineering	Spatial analysis – Remote sensing
Jessica Green	Natural Science	Applied and Theoretical Ecology
Tom Harmon	Engineering	Contaminant hydrology – Enviro Sensors
Kathleen Hull	SSHA	Anthropological archeology
Shawn Kantor	SSHA	Economics
Lara Kupers	Natural Science	Ecosystem Ecology
Valerie Leppert	Engineering	Nano-materials
Peggy O'Day	Natural Science	Geochemistry
Mike Sprague	Natural Science	Fluid mechanics
Samuel Traina ²	Natural Science & Engineering	Soil chemistry
Christopher Viney	Engineering	Materials science - biomaterials
Tony Westerling	Engineering – SSHA	Environmental policy
Jeff Wright	Engineering	Water resources – operations research

Faculty positions in search

Atmospheric chemistry

Air quality

Microbial ecology

¹ As of December, 2006

² SNRI Director

UNIVERSITY OF CALIFORNIA

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SANTA BARBARA • SANTA CRUZ

OFFICE OF THE ACADEMIC SENATE
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October 11, 2007

STEVE KANG, CHANCELLOR
KEITH E. ALLEY, EXECUTIVE VICE CHANCELLOR AND PROVOST

RE: Establishment of the Sierra Nevada Research Institute as an Organized Research Unit

The Academic Senate has completed its review of the proposal to designate the Sierra Nevada Research Institute (SNRI) as an Organized Research Unit (ORU). At the October 7, 2007, Divisional Council meeting, members voted strongly in favor of forwarding a positive recommendation.

By way of background, the SNRI proposal came to the Senate via Executive Vice Chancellor and Provost Keith Alley's verbal request at the January 3, 2007, GRC meeting. A subcommittee of the GRC was established to review the proposal and an external review committee was identified and charged with conducting a review of the proposed ORU. The GRC subcommittee reviewed the reports of the external reviewers, sought additional information from SNRI Director Traina, and ultimately recommended that the GRC approve and forward the proposal to the Divisional Council, which the GRC ultimately did early this semester.

The main question that arose in the Divisional Council's consideration of the SNRI proposal pertained to certain financial aspects of SNRI's activities. Since ORUs are designed primarily to provide a venue to manage and support multidisciplinary research that transcends departmental or school boundaries, members questioned the rationale and cost-effectiveness of central campus 19900 fund contributions to SNRI as an ORU. These concerns were addressed by Acting Director Roger Bales who provided the Council with a report of the grant activity of SNRI affiliated faculty over the last few years. In fact, SNRI-related research activities have been resoundingly successful in attracting extramural funding. The Council's judgment was that if UC Merced had an indirect cost return plan in place, SNRI most likely would have been able to support its own activities even without central campus funds.

Chancellor Kang
EVC/Provost Alley
Re: SNRI
10/11/07
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The Divisional Council's consideration of the financial viability of SNRI as an ORU once again raises the serious issue of indirect cost return as a means of encouraging and supporting research on campus. Faculty should have an incentive to organize other ORUs that can meet their research management needs, yet there is very little incentive now to propose ORUs without the promise of indirect cost return. The Divisional Council strongly recommends the prompt consideration of an indirect cost return policy for the Merced campus. Indeed, if SNRI is to flourish as an ORU, some degree of indirect cost return will be necessary for it to expand its operations to meet researchers' needs.

If you have any questions please do not hesitate to contact me.

A handwritten signature in black ink that reads "Shawn Kantor". The signature is written in a cursive, flowing style.

Shawn Kantor, Chair

cc: Divisional Council
Senate Director Clarke

THE SIERRA NEVADA RESEARCH INSTITUTE

Strategic Plan, Academic Year 2009-10

Mission

The mission of the Sierra Nevada Research Institute is to discover and disseminate new knowledge that contributes to sustaining the environment and ecosystems of California, and related regions worldwide, through integrated research in natural science, social science, and engineering. This mission is accomplished through:

- Collaborative, multidisciplinary research conducted by faculty, students, and staff from multiple schools and graduate groups at UCM;
- Strong interactions with related research units within the UC system and close collaborative relations with scientists and managers at national laboratories (particularly LLNL) and local, state, and federal agencies;
- Creation of research facilities on the UCM campus and within the Central Valley and Sierra Nevada regions of California;
- Sharing of research results, data and information with public and private stakeholders in the region through publications, fora and workshops;
- Fostering links between understanding of the natural environment, cultural understanding and management of natural resources in the region.

Background

The Sierra Nevada is known for its spectacular landscapes and its many recreational and natural resources. It both provides water that sustains the state's \$1.6-trillion-dollar economy, and houses unique biological resources. The eight-county San Joaquin Valley, part of California's Central Valley, the Sierra Nevada watershed, is home to 5 of the 10 most agriculturally productive counties in the United States. By a wide range of indicators, the San Joaquin Valley is also one of the most economically depressed regions of the United States.

All of California is legendary for its vast natural resources, physical and biological diversity and cultural heritage. However, climate change; rapid population growth; competition for natural resources; air, water and soil pollution; human exposure to anthropogenic pollutants; and competing, unsustainable land uses pose serious threats to the sustainability of these attributes of the state.

Over the next twenty years the populations of the San Joaquin Valley and Sierra Nevada Regions are projected to increase by 2.5 million and 1 million residents, respectively; a rate nearly 20% higher than the projected statewide average. Population growth in the San Joaquin Valley could convert 20% of current cropland to urban use by the year 2040. If current development patterns continue, low density housing in the Sierra foothills would consume half of all private land in the region by 2040, fragmenting habitats and creating enormous safety concerns due to wildfire. Public lands are also under increasing pressure. For example, Yosemite

National Park now accommodates between three and four million visitors every year, including nearly one-quarter million overnight stays.

Since 1990, there have been repeated calls for a Sierra Nevada research center within the UC that could help address regional ecological and social issues by conducting and coordinating regionally focused, issue-oriented research while disseminating data, information and analytical tools to local stakeholders.¹ Moreover, population growth, land use change, and environmental sustainability are issues not just for California, but also for most areas of the globe. Thus, although regionally focused, the Sierra Nevada Research Institute pursues research in principles and theories that are applicable elsewhere. SNRI research is also promoted through comparative studies in other regions, through cooperative research and exchange programs, and through formal agreements.

The Sierra Nevada Research Institute has thus far been and will continue to be a boon to the new campus by supporting faculty recruitment efforts of the schools, while signaling UCM’s commitment to innovative, multidisciplinary research and teaching programs that are rooted in the region. Importantly, the SNRI also fosters lasting, synergistic relationships between the campus and County, State and Federal agencies, as well as the private sector.²

For FY 2008-09, SNRI faculty were responsible for 25% of the research grants awarded to UC Merced, down from 55% in FY 2007-08 (Table 1). Informal discussions with both academic colleagues and regional stakeholders suggest that in the few years since its founding, SNRI has become a recognized and respected research organization, known both for its science and its contributions to the region.

Table 1. Grant amounts for FY 2007-08 and FY 2008-09

Category	Amount, million		Percent		ICR, million ^c	
	FY 07-08	FY 08-09	FY 07-08	FY 08-09	FY 07-08	FY 08-09
Extramural grants	\$16.4	\$14.2				
Research grants ^a	\$11.3	\$14.0	100	100	\$3.4	\$4.2
Research grants to SNRI faculty ^b	\$6.2	\$3.5	55	25	\$1.9	\$1.1

^aExtramural funds less grants for education, small business, etc. to non-faculty

^bSee <https://snri.ucmerced.edu/snri/people/html>

^cAssumed to be 30% of grant amount; may be higher.

¹ For example, in 1994 the Sierra Nevada Planning Team recommended creation of a research center that would be: independent, responsive to identified information needs, a repository for existing information, engaged in research that supports decision making, continue to develop new funding sources, and located in the region (Sierra Nevada Planning Team, 1994, “Critical questions for the Sierra Nevada: recommended research priorities and administration,” Centers for Water and Wildland Resource Report 34).

²The interdisciplinary concept of SNRI follows a recent trend in UC to design institutions that promote engagement between the natural and social sciences (e.g., Berkeley’s reorganization of several departments into Environmental Science, Policy, and Management, and Santa Barbara’s opening of the Donald Bren School of Environmental Science and Management).

Current research

SNRI faculty and research scientists are carrying out both basic and applied research on physical, biological, social and cultural aspects of the region. Some of this original research uses the region as a natural laboratory to understand fundamental processes governing its human and natural systems. Other research is strategically designed to build the knowledge base needed to address emerging regional problems. SNRI faculty have well-established research programs in hydrology, climate, geochemistry, ecology, anthropology and related interdisciplinary fields. Some highlights of the SNRI faculty and their research groups follow. For highlights of research published in the past year, see SNRI's annual report (Appendix A).

- Tony Westerling has an active research program studying climate-fire connections in the Western U.S., a field that he pioneered and that has important policy implications for resource management in the West.
- Lara Kueppers studies climate-ecosystem interactions, with projects ranging from field measurements of carbon, water and energy fluxes in mountain ecosystems to using a regional climate model to estimate ecosystem feedbacks to climate change in California.
- Peggy O'Day studies arsenic speciation and fate in the environment, carries out a number of other studies of abiotic and biotic geochemical cycling, and works on application and development of remediation technologies.
- Roger Bales is studying the Sierra Nevada snowpack and the hydrologic and biogeochemical response of mountains catchments to climate change.
- Martha Conklin studies the flow paths and residence times that water takes as it moves from high-elevation snowpacks, through soil and bedrock, and finally to downstream rivers and groundwater basins.
- Henry Forman focuses on the molecular biology and biochemistry of signal transduction and cellular adaptation to reactive oxygen species and other electrophiles relevant to the response of the lung to environmental pollution.
- Sam Traina studies carbon cycling in the Sierra Nevada region, as well as the fate and transport of emerging pollutants.
- Tom Harmon carries out a variety of projects pertaining to soil moisture, groundwater, and surface water quality, spanning agricultural, riparian, groundwater, and wetlands related problems in California.
- Kathleen Hull studies the cultural impact of colonial encounters on native people of North America, the interplay of demography and culture, and identity and ethnogenesis in pre-literate societies; she has an ongoing project in Yosemite National Park.
- Qinghua Guo develops and applies geospatial techniques to solve large-scale ecological and geographical problems, with emphasis on the effects of invasive species, climate change, and human disturbance on terrestrial ecosystems in California.
- Benoît Dayrat studies biodiversity, and he also has an NSF-supported undergraduate research program in Yosemite National Park.

- Yihsu Chen does interdisciplinary research focusing on energy and environment, with an immediate focus on the interactions of environmental policies and industry activities.
- Andy Aguilar is applying genetic analyses to evolutionary questions and species conservation, particularly the role that natural selection plays in the generation and maintenance of genetic variation at different evolutionary scales.
- Mike Dawson is continuing his research on elucidating the origins, maintenance, and loss of biodiversity.
- Jeff Wright is building information systems that serve a variety of regional applications, using open-source tools.
- Wolfgang Rogge is establishing a laboratory to study the sources, fate and transformation of air pollutants in urban, regional, and remote environments.
- Valerie Leppert studies nanomaterials for application in technology and the environment.
- Steve Hart focuses on controls on biogeochemical processes and productivity in managed and wildland ecosystems.
- David Ardell does research on computational metagenomics, and has an interest in natural systems.
- Asmeret Behre studies carbon cycling in ecosystems, including the Sierra Nevada.
- Elliott Campbell does research on the sustainability of bioenergy, and studies the global carbon cycle.
- Teamrat Ghezzehei focuses his research on flow and transport in soil and groundwater, and contaminant hydrology.
- Caroline Frank studies genome evolution in prokaryotes and yeast, and has interests in natural systems.
- Jason Raymond studies environmental genomics and has interests in natural ecosystems.
- Michael Sprague is an applied mathematician who works on fluid mechanics problems, and has interests in environmental fluid mechanics.
- Roland Winston works on solar energy, with a current emphasis on applications of non-imaging optics to solar concentration.
- Michael Beman studies biogeochemistry and ecology of oceanic and terrestrial systems.

SNRI faculty and researchers have also initiated several multi-investigator, multi-disciplinary studies in the region.

- Martha Conklin, Qinghua Guo and Roger Bales are working with colleagues from UCB and UCD on a long-term, multi-faceted, forest adaptive management study in the Sierra Nevada (<http://snamp.cnr.berkeley.edu>). The focus is on lands under the management of the U.S. Forest Service, with the state's Resources Agency also a major partner in the project.
- Anthony Westerling is conducting joint research projects with the USDA Forest Service's Pacific Southwest, Rocky Mountain, and Southern Research Stations, focused on climate applications for fire, fuel and forest management, including fire climatology, seasonal forecasts, and climate change projections.

- Yihsu Chen is collaborating with Shmuel Oren at Berkeley examining the economic and emissions implications of the load-based, source-based and first-seller emissions trading programs that are now under consideration by the California Energy Commission.
- Lara Kueppers is leading a collaborative, experimental project with UCB, USFS, and other researchers on the migration of treelines in the high mountains of the Western U.S. in response to climate warming.
- Peggy O'Day, Valerie Leppert and Sam Traina were awarded a NSF Major Research Instrumentation (MRI) grant in 2004 for an Environmental Scanning Electron Microscope, and O'Day, Leppert, Traina, and Viney were awarded another NSF-MRI award in 2006 to fund the acquisition of a powder X-ray diffractometer, both in support of interdisciplinary environmental research.
- Tom Harmon and Nigel Quinn (Adjunct Researcher) have obtained two grants aimed at understanding and managing Central California wetlands to preserve this resource while reducing the impact of salinity drainage on the San Joaquin River.
- Anthony Westerling is leading the wildfire component of the Scenarios Project, a climate change impact assessment for the State of California that incorporates climate change and socio-economic scenarios. In 2010-2011, this project will focus on adaptation scenarios for the state. The Scenarios project is coordinated by the California Climate Change Center in partnership with the California Energy Commission and CalEPA.
- Roger Bales, Martha Conklin and colleagues from six other campuses have initiated an NSF-funded Critical Zone Observatory in the southern Sierra, to carry out integrated studies of water and geochemical cycles in the soils, streams and forests across the rain-snow transition, a segment of the mountains that is particularly vulnerable to climate change (<https://snri.ucmerced.edu/CZO>).
- Tom Harmon and colleagues from UCLA, UC Riverside, USC, and Caltech successfully renewed an NSF-funded Science & Technology Center which supports technology development in support of environmental and ecological observations in terrestrial and aquatic systems.

Research focus areas

The above existing and emerging areas of research help define some focus areas, or areas that build the Institute's and University's reputation and research portfolio. SNRI faculty have also identified opportunities to develop additional research foci. Four major existing, emerging and planned focus areas are described, followed by some additional smaller areas of focus that contribute to SNRI's foundational programs.

Climate and hydrology. UC Merced plays a leadership role in multiple aspects of climate and hydrology within the UC system and nationwide. Our climate applications work fills a critical niche in the UC system, connecting fundamental climate science with climate impacts, mitigation and adaptation. The Sierra Nevada and Central Valley offer outstanding opportunities as natural laboratories for research. Together, they offer the research infrastructure and settings to study many of the challenges facing the nation. For example, the snow-dominated hydrology

of the Sierra Nevada makes the range particularly vulnerable to climate change. This is in part because the Sierra Nevada has relatively warm snowfall and snowpacks, and a temperature shift of even just 1-3°C would signal a major shift from rain to snow and earlier snowmelt. Process understanding, technology and predictive tools developed in the Sierra Nevada have application across the West. The vast Central Valley, heavily developed for irrigated agriculture, has extensive areas with declining groundwater levels, saline and nutrient-laden wastewater streams, contaminants leaching from soils, and crops that are sensitive to temperature shifts. The hydrology and climate of the Sierra Nevada and Central Valley have generally received much less research attention than have these topics in coastal California and the Sacramento-San Joaquin Delta, and the need for new knowledge and technology transfer is very large. UCM is beginning to fill a critical niche in the research community and the state through its hydrology, water quality and climate research in the region. Research needs that could be filled by new faculty include climate applications to water resource management, hydroelectric infrastructure management, public health and infectious diseases, air pollution management, and agriculture and forestry. Climate applications include climate-sector interactions, forecasting climatic influences by sector at monthly, seasonal and interannual timescales, climate change impact assessment, and strategies for climate change adaptation and mitigation. Faculty currently involved in climate and hydrology research: Bales, Campbell, Chen, Conklin, Duffy, Ghezzehei, Guo, Harmon, Hart, Kueppers, O'Day, Traina, Westerling.

Ecology and ecosystem science. UC Merced is poised to play a leadership role in the ecology and ecosystem science community in California and the nation. Again, the Sierra Nevada and Central Valley offer outstanding opportunities as natural laboratories for research. Ecosystems are undergoing rapid change, in response to the dual pressures of climate change and land use change, both driven by aspects of population growth. Sierra Nevada forests, which are both critical habitats for diverse fauna and the source of much of California's water supply, are now especially vulnerable to catastrophic wildfire. Extended dry periods under a more variable and changing climate will further stress these ecosystems, through reduced evapotranspiration, greater susceptibility to pests and disease vectors, and shifting fire and recovery patterns. Over the next few decades the Central Valley will undergo extensive and enormous ecosystem restorations activities, involving investments of several billion dollars. Water now used for agriculture will be diverted to sustain wetlands and riparian areas, and new entities will be established to manage these large tracts of land. In both the Sierra Nevada and Central Valley, the scientific knowledge base for ecosystem management is weak. Yet the potential ecosystem services to be derived from these areas is enormous and absolutely critical to the state's economy and quality of life. UCM has talented junior faculty who had established research projects in other parts of the world before joining UCM, and would like to develop research in this region when the opportunity arises. Additional hires of tenured faculty are needed, both at UC Merced and in the UC system; however, we are unaware of efforts by other UC campuses to add faculty who will use the SNRI region as a base for their research. Current SNRI faculty: Aguilar, Ardell, Beman, Berhe, Dawson, Dayrat, Frank, Guo, Hart, Kueppers, Raymond.

Air pollution and public health. The San Joaquin Valley shares the distinction, with the Los Angeles region, of having the worst air quality in the nation. The population of the region is growing more rapidly than in any other air basin in the state, bringing with it increases in vehicle miles traveled and urbanization. Climate change impacts are also expected to worsen air pollution in the region. These factors counteract progress in emission reductions, threatening to give the San Joaquin Valley the nation's worst air quality. Without further action, the problem will only get worse. Poor air quality is affecting the region's public health, economy and general quality of life. These problems make the Central Valley and Sierra Nevada region an excellent natural laboratory for air pollution and environmental health research. Further, research has the potential to have important and direct impacts on public policy. Air pollution sources are diverse and only partially understood. While there is a good general knowledge of health effects in the region, details of causes, mechanisms and impacts of mitigation are poorly known. Two additional connections between health and the environment are important in the region and nationwide: climate-health links, and water-health links. UCM has a pivotal role to play in building the knowledge base on the science of air pollution, its health effects and engineering solutions. Current SNRI faculty contributing to this focus: Forman, Leppert, O'Day, Rogge, Traina.

Environmental economics, policy and management. Social science aspects of ecosystems and the environment also offer multiple, unique opportunities for research in the Sierra Nevada-Central Valley region. Again, the combination of population growth, land use change, land-cover change and climate warming interact to place unprecedented stresses on existing infrastructure and institutions. While Sierra Nevada forests have traditionally been managed for timber, recreation and habitat, two main economic issues are water supply and hydropower, and a major new issue now on the policy agenda is management of Sierra Nevada forests for sustainable carbon sequestration. Hydropower generates considerable direct revenue, and the Sierra Nevada water supply is essential for the state's economy. Research in environmental and resource economics, policy and management is sorely needed to develop and explore valuation issues, markets, incentives, institutions, capacity building, social attitudes and ecosystem sustainability. Sustainable development of the Central Valley in response to population pressures poses multiple challenges, for transportation, air quality, public health, land use, energy, cultural heritage, and their intersections with political, social and cultural values. UC Merced is poised to develop research programs that will both build a knowledge base that will benefit regional decision makers, and also provide general insight into issues relevant across the nation. Current SNRI faculty contributing to this focus are: Campbell, Chen, Hull, Westerling, Wright.

Additional foundational areas and opportunities. In addition to the above four major areas of focus for the institute, SNRI faculty are known (inter)nationally for research in biogeochemistry, environmental engineering, anthropological archaeology, environmental fluid mechanics, glaciology, renewable energy, soil science and materials science.

Organization

SNRI personnel include a faculty director (appointed by the Chancellor), affiliated faculty, researcher scientists, support staff, postdoctoral researchers, and student researchers. Note especially that researchers supported by grants play a critical role in defining breadth and depth of SNRI's programs. Visiting scholars are also expected to play an important role. SNRI is designed to support the overall development of UC Merced. This requires close coordination with other UCM campus development efforts, and has included recruiting some established leaders for the SNRI faculty. These individuals are helping to build programs in their respective disciplines, thereby ensuring that the Institute is integrated into the larger intellectual enterprise of the campus.

The SNRI is organized around an integrated systems model. This model combines the earth sciences (hydrosphere, cryosphere, lithosphere, atmosphere), with biological sciences (biosphere, ecology, molecular biology, genomics), engineering (environmental, systems, computer) and social science (economics, policy, sociology, anthropology) in integrated studies of multi-faceted problems at the systems level. Through these balanced research efforts, SNRI aims to serve as a source of objective scientific information as California faces the growing challenge of sustaining the integrity and quality of its human and natural resources into the future.

The Institute functions as an Organized Research Unit (ORU), in which the Director (a tenured faculty member) holds a fulltime appointment, and whose ladder-rank faculty researchers hold full appointments in their respective Schools. SNRI has adopted bylaws governing membership in and affiliation with SNRI.

SNRI has a formal advisory committee appointed by the chancellor, an internal users committee for its Environmental Analytical Laboratory, a membership committee, and plans for an external advisory committee:

- SNRI advisory committee: This committee, required by UC policy, is primarily comprised of faculty, but may also include members from the professional research series or from outside the university. The committee provides counsel to the Director and Executive Vice Chancellor on all matters pertaining to the unit, including budgetary matters and personnel.
- Environmental Analytical Laboratory (EAL) users group: This ad hoc committee is appointed by the SNRI director from among the SNRI members to provide oversight of the EAL. It is open to any active user of the EAL.
- Membership committee: This committee is appointed by the SNRI director from among the SNRI members to provide screening and approval of requests for SNRI membership.
- External Advisory Committee: It is planned to form an External Advisory Committee comprised of individuals from the public and private sectors to provide the Director with advice on research issues of relevance to the region, and resource issues.

University-supported positions. The memo of December 17, 2007 from the UCM Chancellor establishing SNRI as an organized research unit (ORU) envisioned a transition to a budget level based at least in part on indirect cost return. At present SNRI operations are largely supported by state funds. Some fraction of SNRI operations are beginning to be supported by recharge and user fees, but delays in consolidating SNRI facilities and in establishing recharge accounts and

procedures for the campus has made that source of revenue quite limited in the past. It is expected to ramp up that source of revenue in the FY 2010-11 budget.

The success of research and educational activities nurtured by SNRI depends on adequate staffing to cover administrative, laboratory and operations support: Current SNRI staff consist of:

- SNRI director: Roger Bales
- Management Services Officer: Sandra Steaples
- Administrative assistant to the director: vacant
- Field station director: Eric Berlow
- Environmental analytical lab director: Liying Zhao (0.5 FTE state support, 0.5 FTE lab startup grant)
- Field station maintenance manager: Tim Rumble (0.5 FTE)

With the formation of SNRI as an ORU and scope of program building activities underway, the demands for administrative support continue to greatly exceed what SNRI staff can provide. The level of administrative support needed for coordinating meetings, scheduling appointments, handling correspondence, tracking vehicles, supporting facilities, assisting with hiring, assisting with financial transactions, managing business operations and operating the SNRI office have all grown. New initiatives include expansion of SNRI field facilities, establishment of some as UC Natural Reserves, setting up policies and procedures for SNRI, addition of new faculty to SNRI, and increases in the level of most other SNRI activities. Two positions are needed to further support the research expenditures and research accounting of SNRI faculty, research scientists and students.³ Both positions are justified given the level of research activity associated with SNRI faculty and research scientists. SNRI provides research support to faculty, research scientists and students for purchasing and travel. Additional university-supported positions needed, in order of priority, include:

- Environmental analytical lab director (0.5 FTE): The 0.5 FTE supported by a lab startup grant from NSF ends in spring 2010. State support is needed to replace this 0.5 FTE in order to continue operation of the EAL.
- Administrative specialist (2 FTE). See above.
- Sequoia/Kings Canyon station manager (0.75 FTE). This position was proposed in the original SNRI prospectus.
- Education and Outreach Coordinator (0.5 FTE minimum). This position was proposed in the original SNRI prospectus.

Additional positions are planned from other sources of funds:

- Environmental analytical lab assistant (recharge position)
- Campus Reserve director (campus reserve funds)

³ Discussions continue as to how these services should be organized campuswide. An informal poll of SNRI faculty suggests that there is a strong preference for these services to be provided by SNRI for contracts and grants, rather than by staff assigned to a school dean's office.

Research positions. As an ORU, SNRI offers an academic home for research scientists who are not tenure-track faculty and offers appointments to project-related personnel, career-track research scientists and scientists from outside UC Merced. Project-related personnel will include post-doctoral researchers and research staff with appointments of one or more years. SNRI also serves as home for a select group of career-track researchers who provide important continuity and breadth to SNRI research programs. These researchers are largely supported by contracts and grants, with supplemental support for teaching selected courses. They are also involved in supervising graduate students, supported on their grants. One immediate challenge concerns how SNRI and UC Merced can be a professionally attractive home for these individuals, and provide the continuity of resources needed for them to be successful. Scientists whose primary position is outside UC Merced but who desire an affiliation with SNRI also contribute to our breadth and strength. These include both courtesy (unpaid) and paid appointments. For example, researchers with federal or state agencies, or research industrial affiliates, often complement the disciplines and perspectives of full-time UCM personnel by providing research breadth or research-applications partnerships. It is expected that these affiliates will serve as research collaborators, e.g. co-investigators on grants, co-supervisors of graduate students, supervisors of undergraduate research, and may also contribute to graduate education through workshops or co-teaching courses.

Facilities

The Institute's offices are in the first Science and Engineering (SE1) building, at the UC Merced campus. SNRI has a well-developed field station in Wawona, in Yosemite National Park, a developing field station in Sequoia-Kings Canyon National Parks, and is planning is underway for additional field facilities elsewhere in the Sierra Nevada and Central Valley.⁴ SNRI-affiliated faculty offices, labs and space for research groups are currently in SE1, at Castle, and in the first classroom building. Some SNRI faculty share a small field staging facility located at Castle. SNRI research projects use several field sites in the Central Valley and Sierra Nevada region. In order to sustain its research activity, SNRI must look for opportunities for campus research space to supplement that available through the schools. We recommend that in addition, space in one or more of the modular buildings be designated for SNRI-affiliated research offices and laboratories, beyond what is currently assigned or can be accommodated in SE1. This space would accommodate faculty and researchers from all three of UCM's schools who would benefit by being co-located. SNRI is also exploring opportunities to secure donor-supported space on campus.

SNRI operates the EAL, which was recently relocated to campus and consolidated in SE 201. This is a campus-wide multi-user facility dedicated to elemental and speciation analyses of liquid, solid, and gas environmental samples. There are currently eight major items of instrumentation in this laboratory, plus supporting sample-processing equipment (Table 2). Currently, partial support for the laboratory director's salary is provided by a three-year National Science Foundation (Earth Sciences Division) technician support grant. User fees will soon

⁴*Strategic Plan for Field Facilities*, Sierra Nevada Research Institute, UC Merced. August 2008.

begin to offset some of the operating and maintenance costs of these instruments, but ramp-up of recharge to a significant revenue stream will require several years. SNRI-affiliated faculty are working on NSF proposals to add analytical equipment to the EAL. Over the next five years, they envision acquisition of a liquid chromatography-mass spectrometry (LC-MS) instrument, a capillary electrophoresis-MS and one or more mass spectrometers. These and other instruments will be added to the EAL as grant dollars and/or gift money become available. There are also plans to establish a stable isotope facility, either as part of or in parallel with EAL.

Table 2. EAL equipment

ICP-MS for trace multi-element analysis (~ mid-ppt to ppb range) in water, sediment, soil and other environmental/biological samples.
ICP-OES for multi-element analysis (~ mid-ppb to ppm range) in water, sediment, soil and other environmental/biological samples.
AA-GF for inorganic analysis of major and trace elements.
GC-MS for quantification and characterization of trace levels of low MW organic compounds in environmental and biological samples
TOC/N for total organic and inorganic carbon and nitrogen determination in water and solid samples.
FIA for determination of major nutrients, including nitrite, nitrate, ammonia, silica, phosphorous, etc. in water samples
Isotope Analyzer for measurement of hydrogen and oxygen isotope ratios in liquid water samples
IC (2) for analysis of major anions and cations in river, snow and rainfall water samples
Automated microwave digestion system (for solids digestion) and muffle furnace

In May 2004 the UC, NPS and USGS dedicated the SNRI field station at Wawona. . The first Station Director was hired in February 2006. This station has recently been admitted to the UC Natural Reserve System as the Sierra Nevada Research Stations, Yosemite Field Station (YFS). The mission of the Yosemite 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 will be much more effective if a visual artist helps creatively communicate the results to a general audience. To achieve this mission, the YFS provides logistical support (office space, high-speed 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 liaison between the university and the science and education divisions of Yosemite. User days at YFS averaged 224, 364, and 376 per month, and totaled 2,511, 4372, and 4512 per year for the 2006-2007, 2007-2008, and 2008-2009 fiscal years, respectively. Current facilities include:

- Office building – This 1,420 ft² 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.
- Detached classroom and workshop – This historic stable contains one class/meeting room space and a general use workshop and storage space. The class/meeting room can accommodate groups of 20-25 people. It can also be used for temporary office space.

- Station director's residence – This 3-bedroom, 3.5-bath house was refurbished in the spring/summer of 2006.
- 6 Guest Houses – The 2-bedroom, 1-bath Vincent house was refurbished in the spring/summer of 2006. The spacious 5-bedroom, 3-bath Livingston house was refurbished in 2009 and sleeps up to 16 people. It has a very large kitchen/living room and an expansive deck that can accommodate large groups (e.g., 30-40 people). Both the Vincent and Livingston houses are furnished to accommodate professors and research families in addition to students or research crews. Two other 3 bedroom, 2 bath houses (Joyce and Dull) have 9 beds each, mostly as bunks or twin beds, and serve to house students participating in summer programs. Two other 1-bedroom, 1-bath houses (Bruce and River Rd cabins) are being refurbished this winter. All houses except the last two (Bruce and River cabins) have phone and wireless internet access.
- Through a partnership with the Yosemite Association, the Yosemite Field Station has access to one additional two-bedroom house in Wawona that is designated for student use.
- Through a partnership with the Wawona Elementary School, the Yosemite Field Station has access to camp sites, showers, a kitchen, and classroom space for 10 students that participate in a SNRI-sponsored summer high school English literacy and leadership training program in the park.
- Through our partnership with Yosemite National Park, for larger gatherings (e.g., lectures), SNRI has access to the Wawona Community Center, which can accommodate ~80 people.

Together, the guest housing capacity by spring 2010 will be enough to house a critical mass of high school students, undergraduates, graduate students, researchers, professors, and field crews to create a vibrant learning community in Yosemite.

UCM also renewed its MOU with Sequoia and Kings Canyon, and Yosemite National Parks, which provides for establishment of a SNRI field station in Sequoia and Kings Canyon National Parks. Like YFS-Wawona, the field station proposed for Sequoia and Kings Canyon will be available for use by faculty, staff and students of the University of California, as well as the larger academic community. The current annual operating costs for YFS are about \$150,000. User fees to offset some of the operating costs of field facilities have been proposed, and will be implemented when administrative review within UCM is completed.

In fall 2007, SNRI submitted a proposal to gain NRS designation for YFS, along with a broader plan for development of field facilities on the west slope of the Sierra Nevada. The proposal was favorably received by the UC-NRS committee, approved by the UC Regents, and the facility is now part of the NRS.

SNRI prepared a separate strategic plan for field facilities, outlining an integrated network of facilities along both North-South and East-West in the Sierra Nevada and Central Valley:

- North-South transect – SNRI will focus on establishing facilities on the west slope of the Sierra Nevada. There already exists a strong network of field stations in the Eastern Sierra and in the Central Valley. SNRI field stations will fill a critical gap in research facilities on the west slope of the Central and Southern Sierra. Facilities along this North-South gradient will span important gradients in regional climate, precipitation, and air pollution patterns.

- East-West transects – each field station will provide a base for research along elevation gradients that span from grassland to chaparral to montane to sub-alpine communities. A vernal pool reserve near the UCM campus will complete a larger East-West transect from the Central Valley to the Sierra crest. Research foci will be established by investigator-defined priorities of critical environmental and socio-economic issues facing the broader Sierra Nevada Eco-Region.

Discussions with land owners/managers are ongoing, and it is planned to develop four more facilities over the next few years, in addition to YFS, SNRI will seek NRS designation for some of these facilities. Sites include:

- Sequoia National Park: The goal is to develop a field station in the park, incorporating the current work space with high-speed internet and telephone and a cabin at Wolverton.
- Kings River Experimental Watershed (KREW):) in the Sierra National Forest: The Pacific Southwest Research Station (PSW) of the U.S. Forest Service (USFS) is planning a new year-round research building along Dinkey Creek Road, at the Dinkey Mill site. With a major UCM research program now starting at KREW, plus a NEON presence proposed for the site, the goal is for SNRI to develop UC research space in conjunction with the PSW expansion.
- San Joaquin Experimental Range (SJER): Proposed as the NEON core site for California, SJER is currently operated by the USFS and Fresno State. Discussions with UC colleagues planning NEON in California, and PSW are ongoing. SNRI is taking the lead role in planning and eventually managing the NEON facilities, when funds become available from NSF.
- Campus Reserve: The goal is to enhance research opportunities in the vernal pool ecosystems that are being preserved as part of the campus development. The Trust land is over 6,000 acres, with an adjacent 4,000-acre parcel also protected.

There are two further research infrastructure projects that provide substantial and unique opportunities for research in the region, both of which are in the early stages of implementation:

- CalEON: The California Ecological Observatory Network (CalEON) is a regional network of field sites, natural history museums, and university labs (<http://www.caleon.org>). One proposed new component of CalEON is near the UC Merced campus. The National Ecological Observatory Network has designated a central California site for a major research infrastructure investment, with SNRI taking responsibility for developing and managing the facilities. While research will be carried out by researchers from other UC campuses and around the world, the close proximity of the CalEON facilities in the region offers special opportunities for ecological and related research.
- Sierra Nevada-San Joaquin Hydrologic Observatory. SNRI faculty are working with colleagues from other campuses and governmental researchers to build research infrastructure for hydrologic and related research in the Sierra Nevada and San Joaquin Valley. We have established five instrumented research sites on the west slope of the Sierra Nevada and two in the San Joaquin Valley.

Educational activities

Although SNRI will not offer graduate or undergraduate courses, it does nurture a number of educational activities. SNRI faculty contribute to multiple undergraduate degrees and graduate groups. Three-fourths of the SNRI faculty are also members of the Environmental Systems graduate group; overall, SNRI faculty are drawn from six of UCM's nine graduate groups.

The Environmental Analytical Laboratory (EAL) is engaged in the educational mission of UC by providing access to instrumentation for relevant laboratory courses and supporting graduate and undergraduate research. Now that the EAL is consolidated on campus, SNRI faculty plan to offer an upper division/graduate course in Instrumental Methods in Environmental Systems (ES 206/ ESS 106) based on EAL instruments and supporting facilities.

While the Yosemite Field Station was originally intended to be primarily a physical space that facilitates investigator-initiated projects or class field trips, we have established several funded programs to encourage K-12, undergraduate, and graduate education and research at SNRI. The broader vision for these educational programs is an integrated, inter-generational youth leadership program that creates a pipeline of students at different stages from early high school to recent graduates and graduate students. High School programs in AY 2008-09 include:

- *Adventure, Risk, Challenge* (ARC) – ARC is a year-round educational outreach program that partners UCM and Yosemite National Park with public high schools and underserved communities of the Central Valley to engage English language learner (ELL) high school students. A 6-week immersion summer course at the field station integrates a rigorous curriculum of outdoor education, leadership training, English literacy, and science. ARC addresses the needs of at-risk ELL students and enables them to be successful high school students, highly competitive college applicants, and ultimately our next leaders.
- *Yosemite High School* (Oakhurst, CA) AP Environmental Science program – The 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 assist with the study design and the research permitting process.
- *Environmental Science Academy* (Merced Union High School District, MUHSD) – Under this program 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 Yosemite as summer interns and as seasonal park rangers.
- *Robert Fore Fellowship* (Merced Union High School District, MUHSD) – This program provides training for 16 high school science teachers in the MUHSD. The teachers learn about ongoing research by SNRI, U.S. Geological Survey (USGS) and Yosemite National Park researches. They discuss issues at the interface of science and conservation, and share ideas about how to incorporate new material into their lesson plans.

Undergraduate and other programs in AY 2008-09 included:

- *Yosemite Leadership Program (YLP)* undergraduate summer internship – This program provides UC Merced undergraduates with diverse internship opportunities in Yosemite that range from serving as bilingual interpretive rangers leading tours of the giant sequoias, to managing invasive weeds in the park, to saving lives as part of the Yosemite Search and Rescue team. Students are provided housing, park uniforms, books, a small stipend, and a \$2500 scholarship. The YLP internship in Yosemite fulfills one requirement of the 2-year extracurricular environmental leadership certificate program on campus.
- *Research Experience for Undergraduates (REU)* Program – This program complements the YLP non-science internships by providing opportunities for undergraduates to conduct independent research projects at the interface of science and natural resource management. Most of the students are co-mentored by a UCM professor and a park or USGS scientist.
- *Science Friday Seminar* – Both YLP and REU students have the opportunity to enroll in this 2-credit summer seminar. This seminar includes: 1) weekly lectures by university and park researchers on topics that focus on the role of science in natural resource management; 2) weekly readings and discussions about topics at the interface of science and wilderness management; and 3) independent projects that lead to a final paper and presentation at a SNRI Student Symposium in Yosemite Valley that is open to the public.
- *SNRI Scientific Visualization Fellowship (SciViz)*. This \$3,500 fellowship provides 3 months of free housing and a \$1500 stipend to support a visual arts student interested in applying his/her skills to creative visualization and communication of scientific information.

Future faculty needs

SNRI draws faculty from all of UCM's schools. The research initiatives that we are pursuing, and the graduate and undergraduate degree programs associated with them, span the university. Thus, long-range planning requires a university-wide view of programmatic development and needs. The faculty hiring plan is derived from the need for balanced growth among the thematic areas described above, graduate and undergraduate teaching demands, and identification of cross-school and cross-discipline hires that support multiple degree programs and research areas. The following are the SNRI priorities for faculty hiring. Table 3 lists priorities and maps these positions onto undergraduate teaching in the schools, and possible graduate group affiliations. SNRI faculty especially recommend broadening the disciplinary base of SNRI, to include areas not currently represented.

Recommended positions are grouped in four areas, with approximate priority ranking within each area. Ranking is approximate, because while SNRI faculty did express preferences, we did not try to achieve an absolute priority ranking. That is, the positions higher in the list are highest

SNRI strategic research opportunities

Ecosystem restoration in Central Valley &

Sierra Nevada: The recommended positions in ecological engineering, and all of the ecosystem science positions could contribute.

Climate applications: Most of the recommended positions could contribute to UCM's growing strength and visibility in this cross-cutting area.

Public health: Air pollution is perhaps the greatest public health issue in the region & several positions could address this need.

Environmental management: Several of the recommended positions will contribute to the development of a broad-based management program at UCM

priority for filling immediately, while ones lower in the list could be deferred to a later year. In each area two highest priority positions are identified. Nevertheless, all positions listed would make important contributions toward building our vision of a vigorous, balanced and relevant research portfolio at UCM. We hope that through strategic partnerships with undergraduate majors, graduate groups and planned institutes we can achieve this.

Table 3. Summary of faculty hiring priorities^a

Area ^a	Possible undergraduate teaching				Possible grad group
	SoNS	SoE	SSHA	SoM	
<i>Climate & hydrology</i>					
→ Ecological engineering or ecohydrology		x			ES, BEST
→ Climate: paleoclimate or atmospheric dynamics	x				ES
Earth surface processes	x	x			ES
Hydrometeorology	x	x			AM, ES
<i>Ecology & ecosystem science</i>					
→ Ecological or ecosystem modeling	x				ES
→ Global change ecology or paleoecology	x				ES
Wildlife conservation biology	x				ES
Ecology of infectious diseases	x				QSB, ES
<i>Air pollution and public health</i>					
→ Air pollution, modeling, management & control		x		x	ME, ES
→ Environmental health or epidemiology	x				ES, BEST, QSB
Environmental toxicology	x				QSB
Environmental health policy	x			x	SCS
<i>Environmental economics, policy & management</i>					
→ Natural resources management				x	ES, SCS
→ Environment and society			x	x	SCS, WC
Sustainability & land use planning		x	x	x	SCS, ES
Environmental ethics			x	x	SCS, WC

^a→ arrow indicates position is highest priority; see also Appendix B, tables in CAPRA format.

Brief description of highest priority areas:

→ ***Ecological engineering or ecohydrology.*** We recommend an assistant or associate level search for a faculty member who uses engineering principles to design sustainable systems that integrate human activities with the natural environment, with particular emphasis on the linkage between hydrologic and ecological systems. Possible areas of research emphasis include interactions among hydrologic, biogeochemical, physiological, and soil processes; hydrologic ecosystem services, integrating water quality, water cycling; spatial analysis and scaling. Use of remote sensing, field-based measurements, laboratory experiments and modeling are all of interest. As a discipline, ecohydrology addresses the bi-directional regulation of hydrologic and ecological processes, e.g., the flow regime and pollutant levels

of water in wetlands regulate the species and the populations that live in the ecosystem, while ecological processes in the wetland regulate the timing and magnitude of water and nutrient fluxes through the system. Ecological engineering involves the design, construction, restoration and management of aquatic and terrestrial ecosystems that have value to both humans and the environment, using principles from engineering, ecology, economics, and natural sciences. The extensive and large-scale ecosystem restoration efforts planned in the Central Valley provide excellent opportunities for both natural laboratories, and research support through applications partnerships with local landowners and conservation entities. Similar efforts are being carried out across the Western U.S. This position would have collaborative opportunities and synergy with Campbell, Bales, Conklin, Harmon, Guo in SoE and Aguilar, Dayrat, Kueppers, O'Day, Traina in SoNS.

- ***Climate: dynamics or paleoclimate.*** We recommend an open rank search for a faculty position with research on climate and environmental changes on a variety of time scales, but with particular emphasis on the Holocene. Research could focus on paleoclimate data analysis, climate dynamics/modeling, field/laboratory studies or some combination. In the modeling area, research could address theoretical or modeling aspects of synoptic and/or mesoscale processes, or could combine knowledge of atmospheric dynamics with expertise in global or regional climate modeling. The position is also central to sustaining and building our strength in climate applications. This position would have collaborative opportunities and synergy with Bales, Campbell, Westerling in SoE, Kueppers in SoNS, and Hull in SSHA.
- ***Ecological or ecosystem modeling.*** We recommend an assistant or associate professor search in the area of ecological or ecosystem modeling. Mathematical models and systems analysis are frequently used to describe population, community, and ecosystem dynamics, and for the control of environmental pollution and management of resources. Research areas could include population and species interactions, ecological responses to global change, forest ecosystem dynamics, or agroecosystems. This position would provide a strong complement to other positions emphasizing field observation and experimentation, including searches in progress, ecohydrology, restoration ecology, global change ecology and others. This position would have collaborative opportunities and synergy with Campbell and Westerling in SoE and Aguilar, Behre, Beman, Dawson, Dayrat, Hart, Kueppers in SoNS.
- ***Global change ecology or paleoecology.*** We recommend an open rank search, with an emphasis on ecophysiology, invasive species or ecosystem processes. Agroecology is another possible area of emphasis. Paleoecology provides necessary context to ecological management, and paleoecological field methods are a critical component for graduate programs in environmental systems and ecology. Someone who works on the effects of human activities on remaining grassland systems would also be of particular interest. The Sierra foothills and San Joaquin valley offer tremendous natural laboratory opportunities, including research infrastructure, linkages with research by land management agencies and applications partnerships. This is a particular opportunity within the UC system. This position is an excellent complement to research by Berhe, Guo, Hart, Kueppers, Westerling, Bales, Conklin, Guo, Campbell.

- ***Air pollution modeling, management and control.*** We recommend an assistant or associate professor position, preferably someone with both a management and technology focus in the area of air quality engineering. A background in mechanical engineering is desirable. This position could focus on engineering design of systems, technology for air pollution control, or modeling and impacts of air pollution. California's Central Valley offers an excellent natural laboratory for research to devise air pollution control systems. Organic and inorganic particulates, persistent organic pollutants, and precursor gases for ozone formation are produced during routine agricultural practices and weekday commutes. These pollutants are lofted into the atmosphere to interact with other chemicals or microbes and are eventually deposited in the respiratory systems of humans and animals, as well as on plant leaves. The resulting effects on human and ecosystem health are devastating. A significant air pollution-related research effort aimed at the understanding and mitigating the escalating air quality problems in the Central Valley, Sierra Nevada, and elsewhere has already been initiated in the Environmental Systems graduate group. This new position could also be helpful in understanding the effects of air quality on climate and of climate policy on air quality. This position is central to our developing strength in the air pollution area, and is an excellent complement to research by Rogge, Traina, Westerling.
- ***Environmental health or epidemiology.*** This position contributes to an environmental health/air pollution focus. This person should be either a biostatistician/epidemiologist and/or molecular epidemiologist. Priorities would be for research focusing on asthma, lung cancer or cardiovascular disease as these are major problems associated with air pollution, which are the leading causes of health problems with major financial impact on the San Joaquin Valley. This position is an excellent complement to research of Forman, Traina, and Leppert, and as well as the two other proposed environmental health positions. The teaching role for this person could be in statistics, molecular biology or physiology dependent upon their expertise. As this would be the first epidemiologist, a senior position is recommended.
- ***Natural resource management.*** It is recommended that a tenured faculty member at the full or associate professor level be hired in this area. It is expected that this person would help lead the planning for a natural resources management track within the proposed management program and eventual School of Management. A research emphasis on water, forest, or range would complement existing faculty and help fill an important niche in the UC system. This person could also contribute to planning for a Center for Spatial Analysis that is being investigated by faculty in SoE and SSHA, contribute to developing a Geography degree at UCM, and contribute to refocusing of the Earth Systems Science degree in the School of Natural Sciences. At the graduate level, a number of discussions have taken place around starting a program in Public Lands Management, with linkages to the NPS, USFS and other land-management agencies; and this person could also anchor that program. This position should complement Hart, who has some expertise in this area, having been on the faculty in natural resource programs for 19 years before coming to UCM; Hull, who has 20 years experience in cultural resource management, and potentially UCM's World Heritage program.

→ ***Environment and society.*** Natural disasters and ecosystem change are fundamental processes that occur without human influence, but most environmental processes are affected by and affect humans and their social organizations. Technical solutions currently exist for many environmental problems, but they cannot be implemented without consideration of the human dimensions of the environment, including the diverse values, understandings, and perceived needs of various constituencies. A mid-career or senior faculty member in the area of environment and society would be invaluable to the SNRI, providing leadership in our research and educational efforts in this area. As noted in the Sierra Nevada Ecosystem Project, such research might encompass approaches to integrative adaptive management, or alternatively, consider diverse issues such as environmental justice and the place of “clumsy institutions” in environmental politics and policy. Collectively with Professors Chen, Hull and Westerling, this position in SSHA would build the social sciences core at UC Merced in the broad area of environmental social sciences. This combination of positions would create a core of excellence that could contribute to the research agenda of SNRI as well as the management program. Finally, this position would contribute greatly to the development of a cross-school undergraduate minor and/or major in the environment.

Brief descriptions of the second priority positions:

- ***Earth Surface Processes.*** Quantitative study of physical processes at and near the Earth’s surface, including areas such as process geomorphology, landform/landscape evolution and forecasting, land surface geochronology, sediment transport/hydrogeology, and land use-ecosystem interactions. Many individuals in this field are employing remote sensing and GIS methods, as well as surface age dating and other geochemical approaches that would interface well with SNRI initiatives, as well as supply much needed expertise in physical surface processes. This is a critical area that can help provide integration among current SNRI strengths in hydrology, geochemistry/biogeochemistry, ecosystem science and spatial analysis. This type of individual would strongly contribute to graduate research in Environmental Systems and to the development of an interdisciplinary cross-school major. The position could also be central to our strengths in climate applications. In its AY 2006-07 strategic plan, SoNS listed Earth surface processes as one of its future priorities.
- ***Hydrometeorology.*** We recommend an assistant professor position with a research emphasis on precipitation processes, boundary-layer meteorology, meteorological hazards, environmental/atmospheric fluid mechanics and/or climate change impacts on extreme hydrologic events. Due to the extensive coupling between the atmosphere and hydrosphere, it is necessary to consider the entire system in order to understand the role of individual components. Research in hydrometeorology is expected to focus on environmental prediction, at scales that are relevant for engineered systems such as dams, levees, drainage networks, transportation networks and urban development. This position could build our strength in climate applications for the region’s water resources.
- ***Wildlife conservation biology.*** We recommend an open rank search, with an emphasis on research opportunities in the Sierra Nevada and/or Central Valley. The need for an ecologist who can bring modern techniques to the study of wildlife populations is great, and not being

met by other campuses. The timing is particularly critical, given the habitat changes that will result from climate change and land use change, plus the active restoration activities in the region. Priority research areas include: population biology, behavioral ecology, conservation, behavioral endocrinology and evolutionary ecology. We should seek an individual whose research is based on field studies (including GIS), generally using observational rather than experimental methods. This position is an excellent complement to research by Aguilar and Dawson.

- ***Ecology of infectious diseases.*** We recommend an open rank search for a person who will focus on understanding the ecological and biological processes that govern relationships between human-induced environmental changes and the emergence and transmission of infectious diseases. This is an interdisciplinary research area that will draw upon both ecological and biomedical methods to study how environmental events—such as habitat alteration, biological invasion, climate change and pollution—alter the risks of emergence and transmission of viral, parasitic, and bacterial diseases in humans and other animals. Prediction and control are of primary importance. Infectious disease agents affect all living organisms, can have complex life histories involving multiple species, and can be specialists or generalists in terms of host preference. The interface between humans and both domestic and wild animals is a region rife with opportunity for emerging diseases – those that were not pathogenic in the original host, but are in the new host (e.g., Hantavirus, SARS). Evolution of infectious agents and their plant and animal hosts is also a critical component of research for understanding the ecology of infectious disease. UCM is uniquely positioned for research in this area, literally located in the transition zone between suburban, agricultural and natural ecosystems. Migratory birds use Central Valley agricultural fields as stopover points, and human migration supports the agricultural industry. Air pollution can make stressed organisms more susceptible to infection. This position was identified in prior AY SoNS strategic plans.
- ***Environmental toxicology.*** This position contributes to an environmental health focus. This person should be either a biochemist/molecular biologist or pathophysiologicalist. Priorities would be for research focusing on air- and water-borne toxicants as these are major issues in the San Joaquin Valley. This position is an excellent complement to research of Forman, Traina, Leppert, Rogge and O’Day as well as the two other new environmental health positions. The teaching role for this person could be in biochemistry/molecular biology or physiology dependent upon their expertise. An open search is recommended.
- ***Environmental health policy.*** This position contributes to an environmental health/air pollution focus. This person should be a health economist/political scientist. The greatest obstacle to implementing the clean air act in the San Joaquin Valley is probably not the availability of technology. Rather, understanding and resolving the economic and political implications of compliance appears to be the major problem. Balancing the economic, political and health implications while interacting with scientists and engineers (such as Forman, Traina, Leppert, Rogge and the other two new environmental health recruits, as well as Westerling), who are bringing new information to the table would be the goal of this

individual. The teaching role for this person could be in economics or political science dependent upon their expertise. A senior search is recommended as this is a new area.

- ***Sustainability and land use planning.*** We recommend an open-rank search for an individual who will contribute to an emerging focus at UCM in sustainable development, with this focus on community development and land use. Land use planning will play an important role in both climate change adaptation and mitigation strategies, and this position could help to build climate applications capacity at UC Merced that supports policy making in the state and nationally. This position could link to the proposed restoration ecology, conservation biology, air pollution management, environmental health policy, and resource management positions, as well as to current faculty. There are multiple opportunities for applications partnerships in the region, particularly associated with the recently initiated, long-term valley-wide planning activity.
- ***Environmental ethics.*** A cross-disciplinary position intended to foster interdisciplinary understanding of human life in relation to the natural world. Such a position might identify and analyze ways in which culturally constructed representations of Nature (e.g., in literature, the arts, popular culture, scientific and social scientific rhetoric, environmental discourses, and everyday common sense) shape the ethics of human interactions with the natural environment and shape perceptions of environmental problems and solutions. Specific areas might include environmental law, diplomacy, trans-national activism, natural resource use, global change, sustainable development, biodiversity, and transboundary pollution control, even extending to consider cultural assumptions and social models embedded in the language of environmental science and the policies and practices surrounding the term environmental justice.

Appendix A: SNRI 2008-09 Annual Report. See
<https://snri.ucmerced.edu/files/public>

Appendix B: Faculty hiring priorities in CAPRA format (attached)

First priority positions recommended by SNRI faculty for recruitment in 2010-11, 2011-12, and 2012-13

Priority	Position	Level	Primary ug major	Secondary ug major	Primary grad group	Secondary grad group	Startup costs	Space needs	Special needs & strategic issues
1	Ecological engineering or ecohydrology	Assistant or associate	Bioengineering	Environmental engineering	ES	BEST	\$300-500k	Office + 1,200 sf wet/dry lab	Possible use of GIS or field facilities
1	Climate: paleoclimate or atmospheric dynamics	Open rank	Earth system science	Environmental or mechanical engineering	ES		\$200-300k	Office + 800 sf dry lab	Possible use of GIS facility
1	Ecological or ecosystem modeling	Assistant or associate	Biology	Earth system science	ES	QSB	\$200-300k	Office + 1,200 sf dry lab	Possible use of GIS facility
1	Global change ecology or paleoecology	Open rank, full if possible	Biology	Earth system science	ES	QSB	\$300-800k	Office + 1,200 sf wet/dry lab	Possible use of GIS or field facilities
1	Air pollution, modeling, management & control	Assistant or associate	Mechanical or environmental engineering	Management	ES	ME	\$200-300k	Office + 1,200 sf dry lab	Possible use of GIS facility
1	Environmental health or epidemiology	Senior associate or full	Biology	Earth system science	QSB	ES	\$300-500k	Office + 800 sf dry lab	Possible use of GIS facility
1	Natural resources management	Senior associate or full	Management	Earth system science	ES	SCS	\$300-500k	Office + 1,200 sf dry lab	Possible use of GIS or field facilities
1	Environment and society	Senior associate or full	Anthropology, Sociology or political science	Management	SCS	WC	\$100-200k	Office	Possible use of GIS facility

Second priority positions recommended by SNRI faculty for recruitment in 2010-11, 2011-12 and 2012-13

Priority	Position	Level	Primary ug major	Secondary ug major	Primary grad group	Secondary grad group	Startup costs	Space needs	Special needs & strategic issues
2	Earth surface processes	Assistant or associate	Earth system science	Environmental engineering	ES		\$300-500k	Office + 1,200 sf dry lab	Possible use of GIS or field facilities
2	Hydrometeorology	Assistant or associate	Earth system science or math	Physics or environmental engineering	ES	AM	\$200-300k	Office + 800 sf dry lab	Possible use of GIS facility
2	Wildlife conservation biology	Open rank, senior if possible	Biology	Earth system science	ES	QSB	\$200-300k	Office + 1,200 sf dry lab	Possible use of GIS or field facilities
2	Ecology of infectious diseases	Open rank, senior if possible	Biology	Earth system science	QSB	ES	\$300-800k	Office + 1,200 sf wet lab	
2	Environmental toxicology	Open rank, senior if possible	Biology	Chemistry	QSB		\$200-300k	Office + 1,200 sf dry lab	
2	Environmental health policy	Open rank, senior if possible	Biology	Management	SCS	QSB	\$200-300k	Office + 800 sf dry lab	Possible use of GIS facility
2	Sustainability & land use planning	Open rank, senior if possible	Management	Political science or environmental engineering	SCS	ES	\$200-300k	Office + 800 sf dry lab	Possible use of GIS facility
2	Environmental ethics	Open rank, senior if possible	Sociology or political science	Management	SCS	WC	\$100-200k	Office	Possible use of GIS facility

Proposed Charge: Senate Administration IT Advisory Council

The Senate-Administration IT Advisory Council for IT Governance supports UC Merced's Information Technology functions through its advisory role to the Chief Information Officer. In executing its charge the Council informs the CIO's decision-making, and management of budget and staff resourcing, necessary to prioritizing campus-wide IT academic and administrative projects and advancing UC Merced's IT capacity and value as a resource for learning and research. The Council meets for a minimum of four times per calendar year.

Specifically, the Council is charged to

1. Adopt and disseminate standard processes and criteria for developing, submitting, reviewing, prioritizing and acting on proposed IT initiatives and recommends resolution to issues or conflicts that, if unresolved, would jeopardize the successful completion of approved IT initiatives.
2. Advise the CIO on strategic goals, tactical objectives and institutional policies in the following areas as they relate to UCM information technologies:
 - a. Security and identity management
 - b. Funding models, including resource planning
 - c. Strategic technology plans for classroom and academic needs
 - d. Research Computing
 - e. Disaster recovery planning
 - f. University-wide technology systems that support university business and communication needs
3. Develop and recommend IT policy development, review, and dissemination,
4. Reviews and understands the financial context for IT, forwarding recommendations for project funding levels to the Provost/EVC and Budget Advisory Committee in an effort to optimize investments in technology.
5. Tracks initiative progress throughout their lifecycle, and reporting on whether the stated benefits are realized.
6. Works with the CIO to communicate the status of IT initiatives to the University community.
7. On an as needed basis, establishes task forces to deal with pressing, immediate issues such as:
 - a. Protecting e- data from unauthorized access and disclosure.
 - b. Developing a plan to recover critical business services if a major IT disruption occurs.
 - c. Internal Audit actions

8. On an as needed basis, establishes task forces to inform a review of IT services or campus-wide application upgrades or migrations, such as the:
 - a. Learning Management System
 - b. Lecture Capture System
 - c. Portal Application and Strategy

Membership:

Academic Senate	Administration
1	1
2	2
3	3

The committee will be chaired by the Chief Information Officer. The Chief Information Officer does not vote.

Convening Committee:

For the committee to be convened, a minimum of two of three designated faculty seats must be filled to establish a “working representation” of faculty.

Quorum:

A vote requires a balanced representation of the Senate and the Administration. A majority of members present at the meeting constitutes a quorum. In the absence of a quorum the Council may discuss business and vote on action items electronically.

Reporting:

As a joint Senate-Administration body, the Council shall report its recommendations to the Administration (through the Provost’s Office), the Academic Senate (through Division Council), and to the Schools (through the Executive Committee representatives and Dean), and/or as indicated in the charge.



SCHOOL OF SOCIAL SCIENCES, HUMANITIES AND ARTS
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July 17, 2014

**To: Ignacio Lopez-Calvo, Senate Chair
Jay Sharping, UGC Chair**

**From: Mark Aldenderfer, SSHA Dean
James Ortez, SSHA Assistant Dean**

Re: Course Evaluation and Appraisal Forms, request for suspension of Appraisal Form

In Fall 2010, the Academic Senate established the UC Merced Appraisal Form which accompanies the Course Evaluation Form. Since the Spring 2011 semester, SSHA has continuously implemented both of the forms. The Appraisal Form was established to collect data on students' exposure and training in the areas loosely mirroring the UC Merced Eight Guiding Principles of General Education. The potential data was envisioned for institutional assessment purposes. Attached is the memo from the Ad-hoc Committee on Course Evaluations that further elucidates the origins.

Since the start, there have been several challenges faced in SSHA with the coordination and processing of Appraisal Forms including the following.

- The purpose of the form is unclear to faculty and students, as the resulting data is not currently used for institutional decision-making, nor used by SSHA administration. Students complete the Appraisal Form, but the results are not utilized to inform academic or administrative processes.
- To prompt students to complete each of the two forms (each form is presented separately to students) may distract or confuse students about the completion of the Course Evaluation Form. Faculty members have voiced the concern that the Appraisal Form may detract from the Course Evaluation Form.
- Two forms, even if collapsed into a single form, lengthens the document and requires more time for completion. This could potentially decrease the response rate for Course Evaluations or increase the response rate of partially completed Course Evaluations.

At this time, we request that the Appraisal Form be suspended until a strategy is developed for the purpose and process of the Appraisal Form and its resulting data.

During the 2014-2015 AY, we can, under the instruction of the UGC and Academic Senate, pilot a change to the Appraisal Form including one or more of the possibilities below. The ideas listed below do not represent the entirety of possibilities, but rather ways that SSHA might be of support in transforming our campus' Appraisal Form. Additionally, the ideas could be collapsed into one approach.

- Center the Appraisal Form content on Program Learning Outcomes (PLOs) or Course Learning Outcomes (CLOs) that each discipline chooses to have listed in the form across all of the discipline's offered courses for one AY. This change to the Appraisal Form could provide meaningful data for the disciplines to utilize in annual PLO assessment, periodic program review

and other planning needs. This idea frames the Appraisal Form as individualized by discipline, not course. Individualized Appraisal Forms by course is unfeasible for SSHA staff workload and likely the results would not prove useful for higher order analysis.

- Collapse the two forms, making the Course Evaluation Form and the Appraisal Form one document. This reduces the number of requests that students receive to complete forms at the close of each semester. This second option should also include a scaling back of the amount of content in the Appraisal Form in order to align with what we know of survey completion tendencies.

We recommend that if a pilot does take place in the 2014-2015 AY, that upon completion, the pilot undergo assessment to ensure that the changes made to the Appraisal Form are meaningful to all stakeholders. Criteria for judging the impact of the piloted approach might include usability by students, value of results for faculty in decision-making, ease of process management by staff and so on. A timeline for carrying forward with a piloted new Appraisal Form would best align with current timelines in the SSHA Instructional Services office which coordinates the Course Evaluation and Appraisal Forms. If a pilot were to be implemented Fall 2014, pilot guidelines from the Academic Senate and coordination with each of SSHA's majors and stand-alone minors would need to be established no later than October 1, 2014. If a pilot were to take place in Spring 2015, guidelines and coordination would need to be completed by March 1, 2015.

Mark Aldenderfer, Dean
James Ortez, Assistant Dean
SSHA

CC: Laura Martin, Coordinator of Institutional Assessment
Megan Topete, SSHA Manager of Instructional Services
Morghana Young-Alfaro, SSHA Manager of Student & Program Assessment

Attachments:

Revised Course Evaluation Forms Memo Nov 2010-1.pdf

MEMO

To: Patti LiWang, Chair, Curriculum Committee, School of Natural Sciences
Ariel Escobar, Chair, Curriculum Committee, School of Engineering
Jan Wallander, Chair, Curriculum Committee, School of Social Sciences, Humanities and Arts

From: The Ad-hoc Committee on Course Evaluations
Carolyn Frank (GRC)
Laura Martin (SACA)
Nella Van Dyke (DIVCO, chair)

Date: 11/19/10

Re: final course evaluations

CC: Mark Aldenderfer, Dean, School of Social Sciences, Humanities and Arts
Maria Pallavicini, Dean, School of Natural Sciences
Dan Hirleman, Dean, School of Engineering
Cristian Ricci, Chair, SSHA
Mike Colvin, Chair, School of Natural Sciences
Tom Harmon, Chair, School of Engineering
Evan Heit, Senate Chair
Susan Amussen, UGC Chair
Chris Kello, GRC Chair

The Ad-hoc Committee on Course Evaluations once again appreciates the timely and helpful feedback on our proposal provided by the School Curriculum Committees and faculty chairs. All three schools approved the 14 uniform course evaluation questions. All three also approved the 8 questions for evaluating learning outcomes, although SSHA requested 2 additional questions and had suggestions for improving the instructions. We provide additional information on these in the pages that follow, along with the final evaluation questions. We leave it to the schools to implement the new evaluations in the manner they see fit (e.g., scantron, online, etc). We request that the new questions be used for the Spring 2011 course evaluations.

The Committee would again like to thank the three schools for their prompt and helpful attention to this project.

Objective 1: Establish Uniform Course Evaluation Questions

All three schools approved the 14 questions for course evaluation. SSHA's faculty chair suggested some question re-wording which the Committee seriously considered. However, we chose to retain the original wording. The final set of questions, which will be used for student evaluations for every course on campus, are included in the following pages.

Course Evaluation Form

Please print the name of your instructor and the course title and number.

Instructor: _____

Course title and number: _____

Please indicate how this course fits in with your academic program. It is:

1 in my major 2 in my minor 3 a general education requirement 4 an elective 5 other

Use the scale below to rate the following statements:

Disagree Strongly			Neither Agree nor Disagree			Agree Strongly	Not Applicable N/A
1	2	3	4	5	6	7	

Score

1. This instructor was effective overall.	
2. The instructor's explanations were clear.	
3. In this class, I was treated with respect.	
4. Materials used in this course (text, readings, notes, websites, etc) were useful.	
5. Assigned work was valuable to my learning.	
6. This class was well organized.	
7. I knew what was expected of me in this class.	
8. The instructor was well prepared for class.	
9. There was sufficient time in class for questions and discussion.	
10. The instructor displayed enthusiasm for the subject matter.	
11. Methods of evaluation in this course were fair.	
12. Feedback on my work was valuable to my learning.	
13. The instructor was available for consultation outside of class.	
14. I learned a great deal in this course.	

Please answer the following questions:

1. What do you like most about the course and instructor?

2. What could the instructor do to improve the course, if anything?

3. Other comments or suggestions.

Objective 2: Establish Questions to Evaluate Student Learning Outcomes

Natural Sciences and Engineering faculty approved the set of 8 learning outcome questions proposed by the Course Evaluation Committee in fall of 2010 as well as the proposed method for ensuring that it is clear which outcomes are relevant to a specific class. The SSHA Curriculum Committee approved the 8 questions but had a suggestion and a request. First, they suggested that in addition to instructors completing a form indicating which outcomes are relevant to their course, we include a recommendation that instructors tell their students which outcomes are relevant before they begin the evaluation. This will ensure that students know which questions to focus on and which to indicate were not applicable (N/A). We have modified the instructor form to include this suggestion.

SSHA requested that the final set of learning outcome questions include two questions from the previous version that we had cut: those regarding “gaining factual knowledge” and “understanding fundamental concepts and principles,” for a total of 10 questions. In order to accommodate their request while addressing faculty concerns regarding questionnaire length, we have provided two versions of the student learning outcomes evaluation forms. One includes the 8 questions proposed by the Course Evaluation Committee in the fall of 2010, the other includes the 8 questions and the additional 2 requested by SSHA. Faculty in Natural Sciences and Engineering can choose which form they would prefer to use.

Version 1: 8 Learning Outcome Questions (schools must select which version to use)

Instructor Form:

Instructor: _____

Course title and number: _____

As part of course assessment students are being provided with a series of questions regarding learning objectives. They are asked to indicate the extent to which the course contributed to their progress on UCM's institutional learning objectives.

We recommend that you tell your class which learning outcomes are relevant to your course before they begin completing their evaluation form.

Please indicate which of the following are desired learning outcomes for your course by putting an X by each relevant objective. If the objective is not one that is applicable to your course, then leave it blank. Turn this form in to the office staff who handle course evaluations.

	1. Learning to apply knowledge, concepts, principles, or theories to a specific situation or problem.
	2. Learning to analyze and critically evaluate ideas, arguments or points of view.
	3. Developing communication skills (oral or writing).
	4. Learning to value diverse perspectives in both global and community contexts.
	5. Following ethical practices in the profession or discipline.
	6. Acquiring skills in working with others as a member of a team.
	7. Gaining a broader appreciation of intellectual/cultural activity (music, science, literature, etc.)
	8. Gaining skills that will help me realize my full potential.

Student Form

Appraisal of Progress (Note: only to be included with primary instructor evaluation)

Instructor: _____

Course title and number: _____

How much did this course contribute to your progress on the following UC Merced institutional learning objectives?

Use N/A if the learning objective was not specifically addressed in this course.

Not at all			Moderately			Very highly	Not Applicable N/A
1	2	3	4	5	6	7	

Statements

Score

1. Learning to apply knowledge, concepts, principles, or theories to a specific situation or problem.	
2. Learning to analyze and critically evaluate ideas, arguments or points of view.	
3. Developing communication skills (oral or writing).	
4. Learning to value diverse perspectives in both global and community contexts.	
5. Following ethical practices in the profession or discipline.	
6. Acquiring skills in working with others as a member of a team.	
7. Gaining a broader appreciation of intellectual/cultural activity (music, science, literature, etc.)	
8. Gaining skills that will help me realize my full potential.	

Version 2 - 10 Learning Outcome Questions (Schools must select which version to use)

Instructor Form:

Instructor: _____

Course title and number: _____

As part of course assessment students are being provided with a series of questions regarding learning objectives. They are asked to indicate the extent to which the course contributed to their progress on UCM's institutional learning objectives.

We recommend that you tell your class which learning outcomes are relevant to your course before they begin completing their evaluation form.

Please indicate which of the following are desired learning outcomes for your course by putting an X by each relevant objective. If the objective is not one that is applicable to your course, then leave it blank. Turn this form in to the office staff who handle course evaluations.

	1. Gaining factual knowledge.
	2. Understanding fundamental concepts and principles.
	3. Learning to apply knowledge, concepts, principles, or theories to a specific situation or problem.
	4. Learning to analyze and critically evaluate ideas, arguments or points of view.
	5. Developing communication skills (oral or writing).
	6. Learning to value diverse perspectives in both global and community contexts.
	7. Following ethical practices in the profession or discipline.
	8. Acquiring skills in working with others as a member of a team.
	9. Gaining a broader appreciation of intellectual/cultural activity (music, science, literature, etc.)
	10. Gaining skills that will help me realize my full potential.

Appraisal of Progress (Note: only to be included with primary instructor evaluation)

Instructor: _____

Course title and number: _____

How much did this course contribute to your progress on the following UC Merced institutional learning objectives?
Use N/A if the learning objective was not specifically addressed in this course.

Not at all			Moderately			Very highly	Not Applicable N/A
1	2	3	4	5	6	7	

Statements

Score

1. Gaining factual knowledge.	
2. Understanding fundamental concepts and principles.	
3. Learning to apply knowledge, concepts, principles, or theories to a specific situation or problem.	
4. Learning to analyze and critically evaluate ideas, arguments or points of view.	
5. Developing communication skills (oral or writing).	
6. Learning to value diverse perspectives in both global and community contexts.	
7. Following ethical practices in the profession or discipline.	
8. Acquiring skills in working with others as a member of a team.	
9. Gaining a broader appreciation of intellectual/cultural activity (music, science, literature, etc.)	
10. Gaining skills that will help me realize my full potential.	



Academic Senate Faculty Research Grants Call For Proposals

Deadline For Submission: March 14, 2014

PURPOSE

Faculty research grants are designed to support the research activities of UC Merced faculty and provide seed funds to assist in the development of extramural proposals to support research at UC Merced.

ELIGIBILITY CRITERIA

1. Each full-time member of the UC Merced Division of the Academic Senate, including emeritus members, is eligible to submit one grant proposal in response to this call.
2. Each faculty member may request up to \$5000 in research funding. Funds may be requested for most research costs, with some exceptions. (See Allowable and Unallowable Expenses, below.)
3. Faculty members may collaborate to submit a joint proposal, in which case the collaborators may not also submit individual proposals. Each faculty member may participate in only one proposal. Joint proposals may request funding up to an amount which is a multiple of \$5000, with the multiple being the number of collaborators contributing to the proposal. Regardless of the number of participating faculty, awards may not exceed \$20000, however.
4. Faculty on sabbatical leave or leave of absence (in residence or elsewhere) may apply for research funds. Grants will not be awarded, however, without assurance that the awardee will return to UC Merced after the absence.
5. Undergraduate students, graduate students, and postdoctoral researchers are not eligible to submit proposals, but faculty members may request funds to support student research activities under the supervision of the faculty member, provided that such activities are integral to a program of research being pursued by the

faculty member. Funds may not be applied to the support of postdoctoral researchers or of other research staff, however.

6. Non-tenured faculty members without extramural support are particularly encouraged to apply.

PROPOSAL CONTENT AND FORMAT

Each proposal must include all of the following:

1. **Cover Sheet:** This must include the name(s) of the participating faculty member(s), academic title(s), school affiliation(s), graduate group affiliation(s), electronic mail address(es), a proposal title, and a proposal abstract. The abstract must not exceed 350 words.
2. **Proposed Research:** This section should explain the research to be conducted with the requested funds, providing adequate background information and context to allow for a clear understanding of the proposal by an academic but non-expert reader. This description should be as specific and detailed as possible, given space limitations and the need to remain accessible to non-experts. This section should explain the potential impact that funding will have on the research program(s) of the proposing faculty member(s), as well as how this funding could assist in the development of research group(s) and faculty career trajectories. All requests for equipment, or other forms of infrastructure, must include an equipment management plan in this section. *The contents of this section may not exceed 3 single-spaced pages, with margins no smaller than 1 inch and fonts no smaller than 11 point.*
3. **Reference List:** This section should provide a bibliography of work referenced elsewhere in the proposal document. *This section may not exceed 1 single-spaced page, with margins no smaller than 1 inch and fonts no smaller than 11 point.*
4. **Budget:** How provided funds are to be used should be presented in a tabular format, listing the amount required for each line item.
5. **Budget Justification:** Each line item in the budget should be explained and justified, particularly with regard to constraints on allowable expenses (see below).
6. **Extramural Funding:** This section must list all pending and awarded extramural grants and contracts received by the proposing faculty member(s) for at least the last five years. For each award, the project title, funding amount, start date, and duration should be specified.
7. **Internal Funding:** This section must list all pending and awarded funds received by the proposing faculty member(s) from UC Merced sources, including Academic Senate funding programs, covering at least the last five years. For each award, the

project title, funding amount, start date, and duration should be specified. For each award granted by an Academic Senate program, a single-paragraph report on the results of the award should be included.

8. **Alternative Funding:** A brief justification of the proposed request for funding when alternative sources of extramural funding for the budgeted items are currently available to the proposing faculty member(s) should be provided in this section. If no such alternative sources of extramural funding are available, that fact should be clearly stated and justified. *This section may not exceed 1 single-spaced page, with margins no smaller than 1 inch and fonts no smaller than 11 point.*
9. **Seed Funding:** If the requested funds will support the preparation of one or more proposals for extramural funding, details concerning the extramural funding programs to which such proposals are to be submitted should be provided in this section. If recent attempts to secure extramural funding for the proposed budget items have been made, details concerning those submissions should be itemized. If the requested funds are not to be used as seed funding to assist in the preparation of extramural funding proposals, then that fact should be clearly stated. If extramural funds have not and will not be pursued for the proposed work due to the lack of an appropriate existing extramural funding program, this section should provide evidence that no such programs exist, describing efforts that have been made to identify possible funding sources.
10. **Human Subjects Approval:** If the proposal involves research on human subjects, information concerning institutional ethical review and approval of the proposed work should be presented in this section.
11. **Animal Subjects Approval:** If the proposal involves research on non-human animals, information concerning institutional ethical review and approval of the proposed work should be presented in this section.
12. **Curriculum Vitae:** This section must contain a CV for each faculty member participating in the proposal.

These sections should be assembled into a single document file in Adobe's *Portable Document Format* (PDF). While sections should appear in the order shown above, each section does *not* need to begin on a fresh page, but each section must be clearly labeled. The proposal file should have a name that begins with "COR_2014", followed by the last names of all participating faculty, separated by underscore characters. For example, a proposal submitted by faculty members Smith and Jones should be named "COR_2014_Smith_Jones.pdf".

ALLOWABLE EXPENSES

Categories of allowable expenses include the following:

- **Research Assistance:** Proposals requesting support for assistants must include a statement of each assistant's exact duties, budgeted hours of labor, and rate of pay. For graduate student support, the student to be supported must be identified. This information is to be included in the Budget Justification section of the proposal document.
- **Supplies and Equipment:** Awarded funds may be used to purchase research equipment and supplies. The purchase of such items is subject to the policies outlined in *UC Business and Finance Bulletin BUS 29*. Equipment purchased with awarded funds will be the property of the University of California. Books, reports, journals, video or audio recordings, and similar research materials may be purchased with awarded funds, but these should be itemized and their purchase justified in the Budget Justification section of the proposal. Similarly, budget line items for computer equipment or computer software are allowed, but they should be explicitly justified as essential for the research activities proposed, providing capabilities not present in the computer equipment currently available to the proposing faculty member(s). Miscellaneous supply and service costs (e.g., telephone, fax, copying, postage) must be justified as essential for the proposed work.
- **Recharge Fees:** Awarded funds may be applied to recharge fees associated with the use of core research facilities or other shared or institutional research resources. The Budget Justification section should explain how each requested recharge payment is required by the proposed work.
- **Travel for Research Purposes:** Expenses incurred for investigative travel and field work may be allowed if such travel is important for the proposed research. For example, such travel may be necessary to collect data or to inspect materials that cannot be procured by other means. Travel expenses for both the participating faculty member(s) and supervised graduate students may be budgeted. The Budget Justification section should explain the need for the proposed travel, and the Budget should break down such expenses into standard travel categories (e.g., flight costs, ground travel costs, housing costs, food costs, etc.).
- **Dissemination of Research Findings:** Expenses incurred for travel to academic conferences or other meetings to present research results arising from the proposed work are allowed. Travel expenses for both the participating faculty member(s) and supervised graduate students may be budgeted. The Budget Justification section should specify and describe intended forums for presenting research findings, and the Budget should break down such expenses into standard travel categories (e.g., flight costs, ground travel costs, housing costs, food costs, etc.). Research findings may also be disseminated through publication, and reasonable required publication fees may also be included in the Budget section.

Other kinds of expenses may be considered, but they will require special justification in the proposal document.

UNALLOWABLE EXPENSES

Categories of expenses that are *not* allowed to be covered by awarded funds include:

- **Research Assistance:** Awarded funds may *not* be used for faculty salary support, salary support for postdoctoral fellows, or salary support for other research staff. These funds may *not* be used to support curricular, administrative, or teaching aids.
- **Supplies and Equipment:** In general, awarded funds may *not* be used to purchase equipment that serves routine productivity purposes (e.g., printers, scanners, mobile telephones, mobile telephone service, calculators). Similarly excluded are standard office and computer supplies (e.g., paper, pens, pencils, flash drives), office furniture, and costs associated with the maintenance, operation, or repair of standard office equipment. Individual subscriptions to periodicals and professional society dues are also considered inappropriate budget items.
- **Travel:** If a participating faculty member will be on sabbatical leave or a leave of absence during the period of an award, then, except under special circumstances, awarded funds may *not* be used for travel between the Merced campus and the locale of leave. Also, subsistence during the period of leave is not fundable.

HUMAN AND ANIMAL SUBJECTS

- **Human Subjects:** Proposed research involving the use of human subjects must be approved by the Institutional Review Board before funds will be allocated. A copy of the approval or protocol number and applicable dates must be provided prior to the awarding of funds.
- **Animal Subjects:** Proposed research involving the use of non-human animals must be approved by the Institutional Animal Care and Use Committee. A copy of the approval or protocol number and applicable dates must be provided prior to the awarding of funds.

USE OF FUNDS

- **Budget Adaptation Post-Award:** Each line item in the proposal Budget must be justified in terms of the specific research activities being proposed. Expenditures of awarded funds are expected to generally conform to budgeted allocations by category and purpose. Faculty who receive awards must request approval from the Committee on Research (COR) prior to any change in the use for which funds were allocated. Reasonable requests within the scope of the proposed research activities will typically be granted.

- **Award Period:** Grants awarded by this program have a period of a single year. All award monies must be spent before June 1, 2015. Funds will not be provided for expenses incurred prior to the date upon which a grant is awarded. Faculty awardees are responsible for the administration of their grants, including the covering of overdrafts. Faculty awardees are expected to promptly return any funds that will not be spent before their grants expire. Any unexpended funds remaining on the grant expiration date will automatically revert to the Executive Vice Chancellor and Provost for redistribution.
- **Equipment:** Any equipment purchased with awarded funds will be the property of the University of California, and possession is retained by the University of California beyond the completion of the period of the grant.
- **Compliance:** All expenditures are subject to applicable University of California regulations.

EVALUATION CRITERIA

Proposals will be reviewed and evaluated by the Committee on Research (COR) of the Academic Senate. Proposals that are incomplete or do not meet minimum conformance standards to the requirements outlined in this document will not undergo further review. The remaining proposals will be ranked according to the following criteria, in the specified order:

1. *Evidence of funding need:* Proposals that demonstrate a lack of alternative available extramural funds for the proposed research activities will be preferred over those for which other extramural funds are available.
2. *The existence of past efforts to secure extramural funding for the proposed research activities:* Proposals for which any such past efforts exist will be preferred over requests for funds that have not been previously sought from some extramural source. Proposals that make a convincing case that no appropriate extramural funding programs exist will be ranked highly, along with those for which previous extramural proposals have been submitted.
3. *Time since the receipt of a research award from the Academic Senate:* Faculty members who have not recently received support through this program (or its predecessor) will be ranked above those who have recently received such support. For proposals involving multiple faculty members, the time since last award will be ascertained for each faculty member, and the largest value across participants will be used to rank the proposal. In this way, recent award recipients benefit by teaming with faculty members who have not previously received an award, or have not received an award in a while.
4. *Targeted extramural funding programs:* Proposals that request seed funds to support the preparation of one or more proposals to explicitly specified extramural

funding programs will be preferred over proposals for which no specific plan for the pursuit of extramural funds is provided.

5. *Juniority:* All other factors being equal, junior tenure track faculty will be preferred over more senior tenure track faculty, and tenure track faculty will be preferred over other members of the Academic Senate. For proposals involving multiple faculty members, the rank of the most junior participant will be used to assess the joint proposal.

While many of these criteria can be determined in a fairly objective manner, assessments requiring judgment will be resolved by majority vote of the COR membership.

It is anticipated that available funds will be insufficient to fully fund all ranked proposals. In general, funds will be allocated to proposals in the order in which they have been ranked, according to the above criteria, until available funds are exhausted. In some situations, however, COR may, based on a majority vote, reduce the size of some awards below requested amounts so as to increase the number of awards granted. Also, in an effort to produce an award portfolio that reflects the range of research being conducted at UC Merced, COR reserves the right to adjust rankings, using an approach that is regularly employed by federal funding agencies.

The proposal rankings and award recommendations produced by COR will be communicated to the Academic Senate Divisional Council, and they will be provided to the Vice Chancellor for Research and the Executive Vice Chancellor to guide the administration in the delivery of award funds. Once an award is made, funds will become immediately available to the participating faculty member(s).

APPLICATION PROCESS

Each proposal must consist of a single PDF file, formatted and named according to the instructions provided above. Completed proposal documents should be delivered to the Academic Senate Office c/o Simrin Takhar: stakhar@ucmerced.edu. Proposals must be received by the end of the day (i.e., before midnight) on March 14, 2014.

If an award is made, funds will become available immediately. All award monies must be spent before June 1st, 2015.