

## **Report of the Committee for the Environment**

**April 2004**

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# 1. VISION FOR THE BERKELEY INSTITUTE OF THE ENVIRONMENT

During their lifetimes, current UC Berkeley students will be required to make important and difficult decisions about the future of the planet. Human-induced transformations of the Earth since the birth of the industrial revolution have been historically unprecedented, comparable in scope and magnitude to some of the epochal terrestrial events in geological history. The Environment Initiative is an effort to catalyze innovative research and teaching that will create the knowledge and the leadership skills essential for taking a proactive role in understanding, predicting, and responding to global environmental changes over the next several decades.

As has been pointed in the 1993 Advisory Panel for Environmental Ecological and Earth Sciences, the intellectual and institutional challenge at Berkeley lies not in a lack of disciplinary expertise addressing environmental problems, but in mechanisms to address complex environmental problems *in toto*: by making research tools and understanding accessible across disciplinary lines and campus academic units, fostering collaboration and new ways of thinking across disciplines about critical environmental problems.

The long-term goal of the Environment Initiative at Berkeley is to establish Berkeley as the premier institution in environmental theory and understanding, as well as in actions and solutions. The immediate goals are to establish a new organizational structure to catalyze and focus talents and resources of exception depth, range and quality; as well as to train a new generation of environmental citizens and professionals.

To ensure that the whole is greater than the sum of its parts, a new holistic approach to environmental research and education at Berkeley is needed. The establishment of a **Berkeley Institute of the Environment** will facilitate the development and implementation of:

- Research and Innovation Program that formulates diffuse environmental issues into tractable units, and supports faculty research on common issues;
- Education Program for undergraduate and graduate training that is embedded in disciplinary excellence; and
- Leadership Program that translates theory and understanding into solution and action.

## 1.1. Research and Innovation Program

UC Berkeley faculty interested in environmental issues and engaged in environmental research are exceptional in terms of quality, numbers, and breadth of expertise. While this size and diversity is a great strength, it also presents enormous challenges for effective communication, significant interactions, academic coordination and utilization of available academic resources.

A **fluid thematic structure** is needed to organize the broad area of the Environment into tractable themes, and to ensure flexibility and agility of the Institute to take on urgent issues and to sunset others. For each environmental theme, we endorse the articulation of the multi-dimensional questions of the theme, a multi-disciplinary, cross-disciplinary exploration of the thematic questions, and integration of the thematic answers. The perspectives the themes will embrace will include where appropriate (i) natural phenomena, (ii) the human context, (iii) social structures and

processes, (iv) policy, ethical, business, and legal perspectives and options, and (v) technological opportunities.

Research themes are broadly classified into Urgent Themes and Strategic Areas. Urgent themes are those where disciplinary research is of relative maturity and is ready for synthesis and integration. They are urgent also because success in these areas is desperately needed and transferable into improving human welfare. Strategic areas cover environmental issues that require incubation to sharpen the questions and to develop appropriate methodologies. Examples of Urgent Themes and Strategic Areas are:

*Urgent Themes:*

- ***Water and Society:*** Ensuring adequate supply of fresh and clean water in the context of changing climate and population demands improvement in predictive capabilities and innovative technical and non-technical solutions for developed and developing countries.
- ***Climate Change, Diversity, and Options:*** Predicting and confronting climate change requires new approaches that combine environmental science and technology with social and geopolitical explorations that recognize the diversity in human institutions and valuations of nature.
- ***Population, Human Health and Natural Resources:*** Population growth and economic development exert pressures on societies and natural systems and threaten human health; reducing or eliminating such threats requires an approach that integrates the health, social and natural sciences.

*Strategic Areas*

- *Application of genomics to understand the response of micro and macro biological systems to stresses from global change*
- *New technological and societal approaches to global, continuous monitoring of the environment and early detection of environment change*
- *New management systems and analysis for environmentally-sustainable industrial development*
- *New forms of environmental governance in the context of globalization and changing face of environment-development-security nexus*
- *Cross disciplinary research on the representation of the environment in various visual, audio and written media to understand values of the environment and their impact on policy and social action*

## 1.2 Education Program

Students are well aware of threats to the environment and the future of the planet, and many have expressed the desire to have an education that is relevant to these issues. A structure is needed for educating future generations of environmental citizens and leaders in new and effective ways.

There is a diverse array of campus environmental courses and *ad hoc* seminars on the topic of the Environment. From the student perspective they are diffuse and poorly organized. An Education Program will be established within the Berkeley Institute of the Environment for integration and promotion of campus-wide undergraduate and graduate environmental courses and research/internship opportunities. The Center will also provide the resources to coordinate and streamline offerings among existing curricula, and promote new interdisciplinary courses.

## 1.3 Leadership Program

A core UC Berkeley mission is to make academic resources available for addressing societal problems at multiple levels. Many students want to spend part of their university experience getting involved, learning-by-doing, and improving their grasp of critical environmental issues. The Environmental Leadership program will offer students and faculty multiple and on-going opportunities to contribute their knowledge and resources and to learn from a wide variety of stakeholders. The Environmental Leadership Program will also bring current senior government officials and industry and NGO executives to Berkeley to inform future generations of environmental decision makers.

- **Annual Berkeley Symposia on the Environment:** The symposium will highlight the advances made by Berkeley faculty in addressing urgent themes.
- **Berkeley Environment Leadership Program for Senior Governmental Ministers and Corporate Executives:** An annual summer program will be hosted for high-level government officials and corporate and NGO executives, in conjunction with the Annual Berkeley Symposium on the Environment, to bring the latest multi-dimensional understanding and appreciation of the environment to decision makers.
- **Berkeley Urban Environments Program:** Cooperative programs will be created between Berkeley researchers and planning and regulatory units in the public and private sectors in the San Francisco Bay Area and other large urban areas.

## 2. ADMINISTRATIVE STRUCTURE TO PROMOTE ENVIRONMENTAL RESEARCH, EDUCATION AND SERVICE

An institute is necessary to prioritize the research agenda, coordinate educational programs, and manage the leadership programs. The Institute will report directly to the Vice Chancellor for Research.

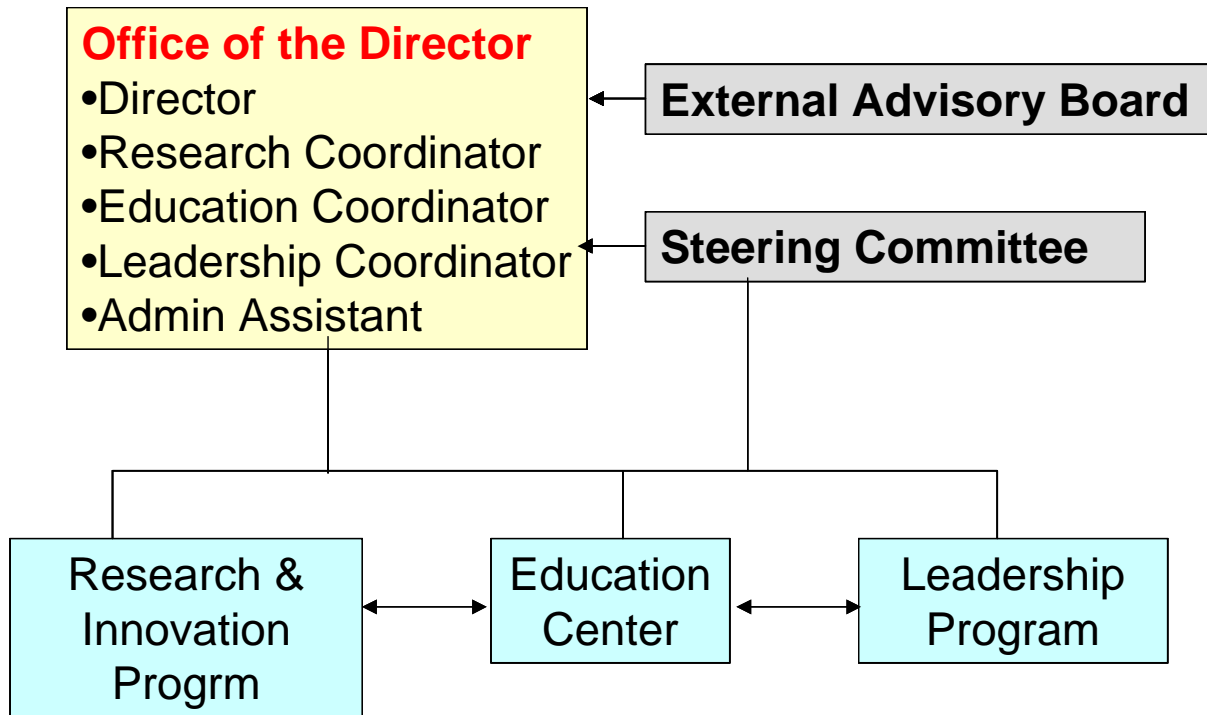
## 2.1 Governance of the Berkeley Institute of the Environment:

The governance of the Institute will consist of a Director and two advisory/steering bodies:

- **Office of the Director:** The Director will be a member of the Berkeley faculty, and will be appointed by the Chancellor, and report to the Vice Chancellor for Research. The Director's principal responsibilities are: (i) promote environmental research and education at UC Berkeley, (ii) coordinate educational efforts, (iii) provide the campus with a common vision for the environment, and (iv) raise internal and external funds for the Institute.
- **Steering Committee (SC);** consisting of broadly representative members of Deans and faculty to be appointed by the Chancellor, at the advice of the Director. To capture the breadth of the campus, a mix of seven to ten faculty and deans will be selected from
  - College of Engineering
  - College of Environmental Design
  - College of Letters and Sciences
  - College of Natural Resources
  - School of Public Health
  - Haas School of Business
  - Boalt School of Law
  - Goldman School of Public Policy
  - School of Journalism
  - Energy and Resources Group

The Steering Committee will work with the Institute Director to identify and prioritize strategic environmental themes and select faculty working groups and task forces. It will guide the development and implementation of the Education and Leadership Programs. The Director and the Steering Committee will meet once a month.

- **External Advisory Board (EAB);** consisting of UCB alumni, environmental policy makers, business leaders, governmental leaders, and other off-campus stakeholder groups to be appointed by the Institute Director and Steering Committee, in consultation with the Campus Public Relations Office and Development Office. A member of the Steering Committee will be an ex-officio member of the Board. The function of the Board is to work with the Director, the Steering Committee and the campus Development Offices to raise funds for the Berkeley Institute of the Environment; promote the Institute to the world; advise the Director on environmental issues and priorities in the private, governmental and other sectors; and connect the research at Berkeley to the implementation.



## 2.2 Operation of the Berkeley Institute of the Environment

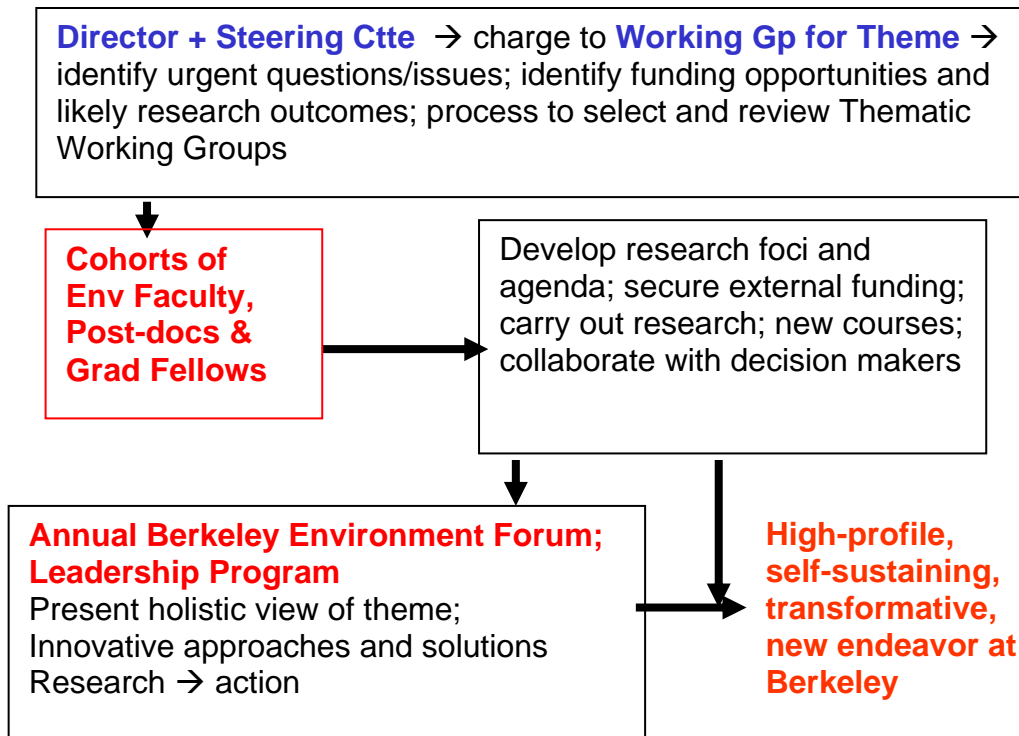
### 2.2.1. Research and Innovation Program

To foster integration of faculty across non-traditional lines and to hone the focus of each theme, a venture capital model will be adopted for the fluid thematic structure, to seed the development of high-profile transformative endeavors in the environment. Working groups of faculty will be convened to jointly explore an environmental problem requiring solutions beyond traditional disciplinary lines. It is expected that agendas for new areas of research will emerge from these working groups and be foci for collaborative proposals to federal, state agencies and private foundations for funding. The thematic working groups will be assisted by the **Research Coordinator**, a staff member whose principal responsibilities will be to provide assistance with the logistics of meetings coordination as well as with the preparation of multi-disciplinary proposals to various funding agencies.

Specifically,

- The Director and the Steering Committee will identify the environmental research theme(s) for intensive focus, and invite proposals for Environmental Working Groups from the faculty at large.
- Faculty in the selected Working Groups will be titled **Berkeley Environmental Faculty Fellows**. Each Working Group may apply to the Director and the Steering Committee for funding, which could be spent on faculty release time, partial support for postdocs and graduate students, and/or seminars; the details of the budget will be at the discretion of each working group.
- Selected working groups will be expected to develop research foci and agenda, secure external funding, carry out the proposed research, and develop new courses. They are also expected to

lead the Berkeley Symposium 3-5 years hence. The Symposium will be coordinated with the Leadership Program.



### 2.2.2. Education Program

An **Environment Education Center** will be established as part of the Berkeley Institute of the Environment to serve as a clearing-house for information on Environmental education at Berkeley for both students and faculty. It will be under the direction of the **Education Coordinator**, a staff member whose responsibility will be the coordination and integration of coherent programs for undergraduates and graduate students. The Education Coordinator will work with departments to: 1) compile and update a list of "environmental" courses each semester; 2) compile and update the environmentally relevant seminars each semester; 3) recruit and maintain a list of faculty to serve as environmental advisors and on PhD exam committees. The Education Coordinator will also provide support to the faculty as new courses, degree programs and internship and fellowship programs are developed.

### 2.2.3. Leadership Program

The Leadership Program will be funded by external funds raised by the Institute. The **Leadership Coordinator** will work to coordinate and enhance ongoing UCB environmental training and outreach activities in CNR, L&S, GSPP, CoE, ERG and other units. New program components will be established by the Director and the Steering Committee, in consultation with the External Advisory Board, and subject to the securing of external funds. The Leadership Coordinator will also coordinate with Institute faculty, the Research Coordinator and the Education Coordinator in the coordination, design and implementation of new components of the program.

### **3. OVERSIGHT AND REVIEW**

The **Director** and the **Steering Committee**, in consultation with the **External Advisory Board**, will be responsible for designing and revising three-year Strategic Plans for approval by the Vice Chancellor for Research. The Strategic Plan will cover the Research and Innovation Program, the Education Program and the Leadership Program, as well as staff, space and other resource requirements.

The Berkeley Institute of the Environment will provide to the Vice Chancellor three years after its establishment an interim report on its progress in creating an infrastructure to facilitate coordinated environmental research and education at Berkeley. Metrics for assessing progress will include:

- The generation of multi-disciplinary proposals in the Environment
- Demonstrated coordination of undergraduate and graduate instructional activities.
- Funds raised from external sources from campus seed funding.
- Visibility of the integrated Berkeley program

### **4. WHAT UNIVERSITY WIDE EFFORTS TO PROMOTE A NEW ENVIRONMENTAL THRUST AT BERKELEY?**

Research, teaching and service in the area of the environment is broadly dispersed on the Berkeley campus and as such has not received sufficient visibility with the campus administration. In order to advance the agenda for increased coordination and cooperation in the area of the environment, certain university-wide efforts are necessary.

- The Director should have access to the campus donor community for use on the External Advisory Committee and through other formal and informal contacts. Since many donors want to support programs that cut across traditional academic boundaries and address societal problems, their inclusion into the activities of the Berkeley Institute of the Environmental is essential.
- When the campus considers the next major donor campaign, the Institute should be an active participant in the setting of goals and thrust areas. The span of activities could include funding for named public lectures, undergraduate scholarships, graduate fellowships, fellowships for off-campus scholars, endowed chairs, specialized equipment and facilities, and the renovation or construction of a new building on or off campus. The Berkeley Institute of the Environment has an obligation to set realistic objectives, but it should be the lead organization to provide that input to the senior administration and development staff in the area of the environment.
- The configuration of the Berkeley Institute of the Environment has been designed to channel opportunities identified by the faculty to the campus administration through the active participation by numerous deans. This mechanism should provide an opportunity for the Institute to identify areas of opportunity for the replacement of



campus faculty positions following separation. Faculty positions in the area of the environment might not otherwise receive high priorities by the traditional mechanisms that use departments and schools as filters.

- Research funding in the United States has changed dramatically in the last decade from a focus on single investigator awards to multi-investigator, multi-institution center grants. The initial efforts of the Berkeley Institute of the Environment are partially directed at demonstrating an ability to form coalitions and identify research needs that ultimately can be funded either from governmental agencies or foundations. Such proposals usually require matching funds that are scarce on campus. The administration will need to demonstrate its commitment to promoting environmental teaching and research by declaring that environmentally-focused efforts have a high campus priority.
- The campus has an extensive program of public affairs for the dissemination of campus activities both internally and externally. The Berkeley Institute of the Environment should have direct access to Public Affairs and they should recognize that environmental activities being coordinated by the Institute have strong campus support and should be publicized broadly.

## **5. RESOURCES REQUIREMENTS**

### **5.1 Budget**

The initial budget for the Berkeley Institute of the Environment assumes an operating budget of \$250K per year through a joint matching of funds from EVCP Paul Gray and Deans. These funds are assumed to be seed funds for which significant external funding will be generated. Even though external fund raising is required, there will remain the need for the campus to continue to maintain the infrastructure once it demonstrates its ability to succeed. It is expected that costs for the Environmental Leadership Program will be supported by external funds raised by the Institute.

There are no funds associated with the salary of the Director of this Institute since the founding director should be a Berkeley faculty member who is able to obtain 50% release time from a dean to lead this effort. That release time is not being shown as a matching contribution, but does represent a significant additional commitment to the Institute.

|   | Year 1     | Year 2     | Year 3     |
|---|------------|------------|------------|
| Director  | -          | -          | -          |
| Research Coordinator                                | 75         | 75         | 75         |
| Education Coordinator/Web Administrator (part-time) | 75         | 75         | 75         |
| Administrative Assistant (50%)                      | 20         | 20         | 20         |
| Director's Discretionary Fund / Supplies            | 20         | 20         | 20         |
| Seminars  | 10         | 10         | 10         |
| Thematic Working Group 1                            | 50         |            |            |
| Thematic Working Group 2                            |            | 50         |            |
| Thematic Working Group 3                            |            |            | 50         |
| <b>Total</b>  | <b>250</b> | <b>250</b> | <b>250</b> |

## 5.2 Space:

The Director's Office will be located in Mulford, in space provided by the College of Natural Resources. Currently, the space will accommodate the Director, the Research Coordinator, the Educational Coordinator and a part-time Administrative Assistant.

It is expected that the Thematic Working Groups will convene in space in various Departments and Colleges across campus.

In the planning of the new CITRIS building is 8000 ASF commitment from College of Engineering for collocation of the Water and Society Theme of the Institute and the Berkeley Water Institute. Also, in the planning for a proposed New Campbell Hall (College of Letters and Science) is a commitment of space for the Berkeley Atmospheric Sciences Center. This space could host clusters of faculty interested in atmospheric and climatic aspects of the Environment.

## 6. PRELIMINARY SCHEDULE

Upon formal approval by the Chancellor, the Berkeley Institute of the Environment should initiate the implementation of this ambitious plan to integrate and advance environmental research, education, and leadership programs at Berkeley. A tentative schedule follows:

- The Chancellor to appoint a Director (July 1 2004)
- The Chancellor to appoint the founding members of the Steering Committee, upon recommendation of the Director (summer 2004)

- The Director and Steering Committee to work with the Vice Chancellor for University Relations to identify names for the External Advisory Committee and then make those contacts. (September-October 2004)
- The Director and Steering Committee to formulate the Strategic Plan and solicit proposals for the first one of the research themes (November 2004)
- Hire a Research Coordinator to assist Themes (November 2004)
- Hire an Education Coordinator/webmaster. (September 2004)

### **Research and Innovation Program**

The first thematic Faculty Working Group will be selected by the end of 2004, and will meet regularly through spring 2005. It is expected that they will lead the fundraising and submit large multi-disciplinary and integrative proposals to funding agencies and to private foundations by the fall 2005. They are expected to lead the Berkeley Annual Symposium in 2008.

At least one thematic Working Groups will be “rolled out” every year, subject to the availability of funds.

### **Education Program**

- Create the Environment website, a clearing-house of Environmental research and education on campus (September 2005)
- Devise the strategy for introducing environmental sections in large undergraduate classes (Sept 2006)
- Establish new Graduate Groups (September 2005)
- Initiate discussion of joint degrees

### **Leadership Program**

- Coordinate existing leadership programs in the College of Natural Resources and the Goldman School of Public Policy;
- Explore new geographic or thematic foci for Leadership Program.

## **APPENDIX: Research Centers and Facilities with Foci on the Environment**

Berkeley and the UC System have a large number of research centers and facilities relevant to the environment (incomplete list below). Yet most of these operate independently of one another, with little synergy and collaboration, and often with not much overlap. The Berkeley Institute of the Environment would coordinate and build on the resources and expertise in these centers and facilities in the development and implementation of the Research and Innovation Program and the Education Program.

### **Biology/Natural Resources**

- California Biodiversity Center
- Center for Biological Control
- Center for Environmental Public Policy
- Center for Forestry
- Center for the Assessment and Monitoring of Forest and Environmental Resources (CAMFER)
- Center for Stable Isotope Biogeochemistry
- Center for Sustainable Resource Development
- DOE Joint Genome Institute (Walnut Creek)
- Kearny Foundation of Soil Science

### **Engineering**

- Berkeley Sensor and Actuator Center (BSAC)
- Center for Information Technology Research in the Interest of Society (CITRIS)
- Center for Environmental Design Research
  - REGIS: Environmental Planning GIS at UC Berkeley
- Center for Renewable and Appropriate Energy Laboratory
- Consortium on Green Design and Manufacturing
- Institute for Environmental Science and Engineering
- Institute of Transportation Studies
- Transportation Center, University of California
- Renewable and Appropriate Energy Laboratory
- Water Resources Center Archives

### **Humanities**

- Townsend Center for the Humanities

### **Mathematics and Physical Science**

- Berkeley Atmospheric Sciences Center
- Berkeley Geochronology Center
- Berkeley Seismological Center
- Center for Isotope Geochemistry
- Center for Computational Seismology
- Earth Resources Center

### **Public Health**

Bay Area International Group (BIG) at UC Berkeley  
Center for Entrepreneurship in International Health and Development (CEIHD)  
Center for Occupational and Environmental Health  
Health, Environment and Development  
NIEHS Center for Environmental Health Sciences  
NIEHS Superfund Basic Research Program

### **Regional/Area Studies**

Center for African Studies (ORU)  
Center for Latin American Studies

### **Social Sciences**

Haas Socially Responsible Business Leadership Initiative  
Institute of International Studies  
    Berkeley Water Working Group sponsored by Berkeley Institute of International  
    Studies, and cosponsored by the Center for Sustainable Resource Development  
    Berkeley Workshop on Environmental Politics  
Center for Urban and Regional Development  
Environmental Politics Working Group  
Human Rights Center

### **Museums**

Consortium of Natural History Museums:  
    University and Jepson Herbaria  
    Essig Museum of Entomology  
    University of California Botanical Garden  
    Museum of Vertebrate Zoology  
    Phoebe A. Hearst Museum of Anthropology  
    University of California Museum of Paleontology  
Lawrence Hall of Science

### **Natural Reserve System (Systemwide)**

Ano Nuevo Island Reserve  
Bodega Marine Reserve  
Boyd Deep Canyon Desert Research Center  
Box Springs Reserve  
Burns Pinon Ridge Reserve  
Carpinteria Salt Marsh Reserve  
Chickering America River Reserve  
Coal Oil Point Natural Reserve  
Dawson Los Monos Canyon Reserve  
Eagle Lake Field Station  
Elliott Chaparral Reserve  
Emerson Oaks Reserve  
Fort Ord Natural Reserve

Hans Jenny Pygmy Forest Reserve  
Hastings Natural History Reservation  
Heath and Marjorie Angelo Coast Range Reserve  
James San Jacinto Mountains Reserve  
Jepson Prairie Reserve  
Kendall-Frost Mission Bay Marsh Reserve  
Landels-Hill Big Creek Reserve  
McLaughlin Natural Reserve  
Motte Rimrock Reserve  
Kenneth S. Norris Rancho Marino Reserve  
Quail Ridge Reserve  
San Joaquin Freshwater Marsh Reserve  
Santa Cruz Island Reserve  
Scripps Coastal Reserve  
Sedgwick Reserve  
Stebbins Cold Canyon Reserve  
Stunt Ranch Santa Monica Mountains Reserve  
Sweeney Granite Mountains Desert Research Center  
Valentine Eastern Sierra Research: Sierra Nevada Aquatic Research Lab (SNARL)  
Valentine Eastern Sierra Research: Valentine Vamp  
Younger Lagoon reserve

**Other Research Stations and Facilities**

Central Sierra Field Research Stations  
    Central Sierra Snow Laboratory  
    Sagehen Creek Field Station  
    Onion Creek Experimental Watershed  
    North Fork Association Lands  
California Cooperative Ecosystem Study Unit (CESU)  
Oxford Facilities Unit  
Richard B. Gump South Pacific Research Station  
Richmond Field Station Environmental Research Facilities

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Kyra Naumoff,  
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Ryan Buckley,  
ASUC Representative