

CALIFORNIA POLYTECHNIC STATE UNIVERSITY
San Luis Obispo, California 93407
ACADEMIC SENATE

FILE COPY

Academic Senate Executive Committee
Tuesday, April 16, 1996
UU 220, 3:00-5:00pm

3.26.96 minutes were reviewed

- I. Minutes: Minutes of the Academic Senate Executive Committee meeting of March 26, 1996 (to be distributed).
- II. Communication(s) and Announcement(s):
- III. Reports:
 - A. Academic Senate Chair:
 - B. President's Office:
 - C. Vice President for Academic Affairs:
 - D. Statewide Senators:
 - E. CFA Campus President:
 - F. Staff Council representative:
 - G. ASI representatives:
 - H. IACC representative:
 - I. Other:
- IV. Consent Agenda:
- V. Business Item(s):
 - A. **Formation of an ad hoc committee to review the Library Committee.**
 - B. **Resolution on External Review:** Peck, chair of the Program Review & Improvement Committee (p. 2).
 - C. **Resolution to Approve Procedures for External Program Review:** Peck, chair of the Program Review & Improvement Committee (pp. 3-7).
- VI. Discussion Item(s):

The Cal Poly Plan: ongoing discussion.
- VII. Adjournment:

Adopted:

ACADEMIC SENATE
OF
CALIFORNIA POLYTECHNIC STATE UNIVERSITY
San Luis Obispo, California

RESOLUTION ON EXTERNAL REVIEW

AS- 96/

- WHEREAS, The Commitment to Visionary Pragmatism document has identified external program review as necessary; and
- WHEREAS, specialized accreditation is not available for some programs or available accreditation may be deemed unnecessary by the department and the Vice President for Academic Affairs, be it therefore
- RESOLVED, that all programs, in consultation with their college dean, will seek either specialized accreditation or undergo external review; and be it further
- RESOLVED, that the timing of all review efforts be coordinated with the Academic Senate Program Review & Improvement Committee to minimize the workload of the program faculty in preparing for review; and be it further
- RESOLVED, that the results of specialized accreditation review or external review will be communicated to the college dean, the Academic Senate Program Review & Improvement Committee, and to the President or his/her designee; and be it further
- RESOLVED, that program faculty will have an opportunity to respond in writing to all findings and recommendations raised during the review process; and be it further
- RESOLVED, that the President or his/her designee will report to the program, the college dean, and to the Academic Senate Program Review & Improvement Committee within six months regarding recommendations made to the program during the review process.

Proposed by the Academic Senate
Instruction Committee and the Academic
Senate Program Review & Improvement
Committee
xxxxx, 1996

Adopted

ACADEMIC SENATE
OF
CALIFORNIA POLYTECHNIC STATE UNIVERSITY
San Luis Obispo, California

RESOLUTION TO APPROVE PROCEDURES
FOR EXTERNAL PROGRAM REVIEW

AS- -96/

RESOLVED, That the attached procedures for external program review be approved,
and be it further

RESOLVED, the attached procedures for external program review be forwarded to the
President for approval and implementation.

Proposed by the Academic Senate Program Review
and Improvement Committee

xxxxxx,1996

PROCEDURES FOR EXTERNAL PROGRAM REVIEW

The purpose of external program review is to provide the opportunity for outside input on academic programs, resulting in suggestions for program improvement. It is recommended that external review occur every five years, preferably taking place the year before the program is scheduled for review by the Academic Senate Program Review and Improvement Committee.

The Review Panel

The review panel will be composed of three persons not affiliated with Cal Poly. The panel will include at least one academic representative of the discipline from another institution, and may include a representative from industry or a public agency where appropriate. The panel may also include an academic member from a closely related discipline or an academic administrator.

The Vice President of Academic Affairs will prepare a list of at least six potential reviewers. The list of potential reviewers will be developed in consultation with the department and its respective dean. The department will then select review team members from this list.

One of the academic members of the review team will be selected to chair the committee. The chair will be responsible for submitting a final report.

Preparation for Review

In preparation for external review, the following items are to be submitted to the reviewers at least one month prior to their campus visit:

1. Faculty vitae
2. Statement of department mission, goals, and objectives.
3. Curricular requirements, including a comparison to similar programs in California and the nation.
4. *An expanded course outline, statement of learning objectives, and syllabus for each course offered by the department. Samples of course materials, student work, exams and other assessments, grading policy, and grade distributions need not be sent prior to the visit unless requested by the review team, but should be available for review during the campus visit.*
5. Description of relevant facilities, including library and computer facilities.

6. Program data, including:
 1. Faculty demographics and faculty recruiting plan
 2. Student demographics and student recruitment efforts
 3. Demand for the program, including number of applications received and percent admitted.
 4. Average GPA and SAT scores for entering students and MCA criteria
 5. Retention and graduation rates
 6. Assessment of job market for graduating students
 7. Awards and honors received by students

Campus Visit

The department will develop a schedule for the campus visit. The campus visit should include meetings with department faculty individually or in small groups, meetings with appropriate administrators including the Department Chair/Head, Dean, and Vice President for Academic Affairs, and a meeting with representative students. The campus visit should conclude with an exit interview with the Department Chair/Head, the Dean, and the Vice President for Academic Affairs.

Reviewer Guidelines

Reviewers should consider the following issues in conducting their review, and should address these issues in their report:

1. Department Objectives
 - a. What are the program goals of the department for the next five years?
 - b. Are department goals and objectives judged to be appropriate given general trends in the discipline?
 - c. How does the department plan to meet its five-year goals?
2. Academic Program
 - a. Program
 - i. How does the academic program compare to that of comparable institutions?
 - ii. What are the distinguishing features of the academic program?
 - iii. What significant changes have been made in the academic program in the last five years?

b. Curricular Content

- i. Are there emerging trends or areas within the discipline which should be included or expanded in the curriculum?
- ii. Are there out-of-date elements which should be phased out or deleted?

c. Instructional Methods

- i. Are instructional methods employed and use of technology appropriate given the learning objectives of the program?

d. Learning Objectives

- i. Are course learning objectives appropriate and linked to observable behaviors that demonstrate or imply competence?
- ii. What evidence is there about the degree to which students attain these objectives?

e. Strengths and Weaknesses

- i. In what ways could the program be strengthened and improved?

3. Faculty

- a. Are the faculty active in curricular development, instructional design, and university service.
- b. Is there an appropriate level of professional development across the department faculty?
- c. What research projects are each of the department faculty pursuing?
- d. What consulting and special projects are each of the faculty pursuing, and how are they linked to the academic program?
- e. Is there an appropriate faculty recruitment plan that addresses gender and ethnic diversity goals?

4. Summary

- a. Is the department meeting its program, instructional, and learning objectives?
- b. What are the strengths and achievements of the program?
- c. What suggestions for improvement can be made?
- d. What are the most important challenges facing the department?

Written Report

The chair of the review team is responsible for the written report organized around the above guidelines. A draft report should be submitted to the Department for an accuracy check of factual information at least 10 days prior to submission of the final report. The final written report should be submitted no later than 45 days after the review. The report will be submitted to the Vice President for Academic Affairs, with copies to the Dean and Department Chair.

Expenses

The Vice President for Academic Affairs will cover the expenses of external review.

Post Review Recommendations

The President or his/her designee will respond to the department, the college dean, and the Academic Senate Program Review and Improvement Committee within six months regarding the recommendations of the external review team. The department, in consultation with the Dean, will respond to any concerns, problems, or issues identified in the external review and in the President's response by developing an action plan that addresses these issues. The department's response and action plan shall be presented to the Program Review and Improvement Committee, which will work in consultation and collaboration with the department to implement the plan and monitor its progress.

Amos - Sec 4/16/96

To whom it may concern:

The concept of the Institute arose from conversation with Dr. J. Tietje and P. Gerhardt at the Center for Microbial Ecology at Michigan State University. The conversations centered around fundability of interdisciplinary research in the molecular sciences at 4 year colleges with no Ph.D. programs. It was the consensus of the meeting that an institute with well defined career goals and scientist members with a solid publication record could help in the funding of research programs.

During the ensuing months the institute began to take shape. It was decided that molecular biology skills in gene engineering and molecular methods of microbial and DNA detection in our laboratory could serve as a focal point for applied microbiology studies. Bioremediation, an applied science involving modern microbiological, molecular biology, and engineering techniques is becoming the new frontier of biotechnology. It was this to become the focal point of the institute. We recognized this as an unmet need in Cal Poly and we thought that as an Institution focusing on the applied sciences that we should have such a program. such an institute would not only provide a base of operations for scientists involved in research requiring extramural funds but also to provide our students with an excellent opportunity to interact with scientists of various disciplines and participate in real-life situation in which they apply their knowledge to develop, evaluate, and apply novel methods for restoring damaged environments.

A parallel focus of the institute is to discover, characterize, and store microorganisms and their genes (including ancient microorganisms) that could be used in applied microbiological problems, not only in restoration projects but also in other aspects of biotechnology (e.g., natural product discovery, biopolymers, etc.). These are to be shared with the scientific community at large, and in particular with other faculty in the CSU system in there research and teaching projects.

It was not, however, until Dr. Christopher Kitts joined the Biological Sciences Faculty from Los Alamos National Laboratories, that the team was assembled. The team consisted of six core individuals with national and international reputations and ample evidence of research in the area of bioremediation, molecular biology, and analytical chemistry. The core consisted of two microbiologists (Dr. Kitts — Bioremediation specialist and Dr. Cano — molecular biology and gene engineering) a Soil Scientist (Dr. Ruehr); and Analytical Chemist (Dr. Wills), and two engineers experienced in in-situ and ex-situ bioremediation and bioprocessing (Dr. Pal and Dr. Sczechowski). After some deliberations it was thought that Dr. Williams could be of great help in ex-situ bioremediation projects based on his bioprocessing expertise. Drs. Kiel, Gambs, and Holland could serve as resource persons based on their skills in Plant, Animal, and Restoration Ecology skills. These would be useful during the restoration aspects of a bioremediation project

We did not, at any time, considered the purview or mission of the institute site assessment studies or environmental impact reports. As such we did not see any overlap with the CRI.

Respectfully yours;



Raul J. Cano, Ph.D.
Professor of Microbiology

Grins - Syc 4/16/96

FACULTY AND STAFF SURVEY STUDENT ADVISING PROGRAM

Since past surveys have indicated that advising is a high priority for students, the University is exploring appropriate revisions in how advising is handled on the campus. The purpose of this survey is to obtain information about a broad range of services that faculty and staff may be performing for students, and about their level of interest in doing so.

For purposes of this survey, "advising" is defined as one-to-one focused discussion about any of the topics described in the items presented below. Such discussion may occur anywhere, any time, and not necessarily with "assigned advisees."

For each item, if you perform the activity or offer the service described, please indicate:

- (a) approximately how many students you see for that purpose each quarter; and
- (b) the approximate total number of times you do this activity for students each quarter.

[PLEASE NOTE: Although it may be difficult to decide on an actual number reflecting the approximate number of students that you see for advising matters each quarter, or the approximate total number of advising contacts that you have with students about these matters, please provide the best number estimate that you can. Subjective responses (e.g., "a lot," "for all my students," "everyday," etc.) cannot be coded and will be recorded as missing data.]

Use the space below each item for any comments that you may have regarding that particular advising service (e.g., how it ought to be handled, who ought to do it, if it should be offered, etc.).

I. ACADEMICALLY RELATED FEATURES

1. Provide up-to-date information about students' current academic records.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

2. Provide up-to-date information about curricular changes and course substitutions.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

3. Provide up-to-date information about student progress towards a degree (e.g., units completed, units left until graduation, etc.).

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

4. Provide feedback on status regarding critical requirements (e.g., ELM, Graduation Writing Requirement, specific program requirements, etc.).

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

5. Review grades and GPA, and discuss how to improve a low or declining GPA.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

6. Offer next-quarter course scheduling advice.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

7. Discuss long-range course scheduling options.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

8. Supply information about graduate school requirements (e.g., application procedures and strategies, program characteristics, required admission tests, etc.)

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

9. Offer academic encouragement and motivation.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

10. Assist with academic goal clarification.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

11. Offer advice about specific class choices (e.g., helpful prerequisites, personal usefulness, appropriateness for career goals, etc.)

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

12. Discuss students' personal goals and how these might best be enhanced when selecting electives and GE&B courses.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

13. Assist with long-range academic planning in support of personal and career goals.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

14. Offer advice regarding improving academic skills (e.g., study skills, learning strategies, time management, etc.).

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

15. Discuss students' reactions to their academic experience (e.g., important insights, implications, applications, etc.).

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

II. SOCIAL ISSUES

16. Provide assistance in connecting with co-curricular activities (e.g., events, programs, ASI, student organizations, community service, etc.).

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

17. Provide assistance in connecting with other individual students in order to expand sources of social resources and support.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

18. Discuss social occurrences or situations that are puzzling or troublesome.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

19. Discuss social and intellectual diversity issues and concerns (e.g., dealing satisfactorily with peers who are from different backgrounds and have dissimilar or conflicting value systems, etc.).

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

III. PERSONAL SUPPORT

20. Provide support during periods of personal development and change.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

21. Discuss ethical issues and value judgments.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

22. Provide information about campus services and resources.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

23. Provide professional referral for personal issues requiring specialized assistance.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

IV. ROLE MODELING

24. Consciously and deliberately demonstrate effective and appropriate communication skills.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

25. Consciously and deliberately demonstrate professional behavior connected with your career area.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

26. Consciously and deliberately demonstrate personal and social responsibility and dependability.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

27. Consciously and deliberately demonstrate mature and effective behavior.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

V. PERSONAL DEVELOPMENT

28. Assist with personal goal clarification.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

29. Assist in developing a personal life plan (i.e., purpose, direction, etc.).

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

30. Assist in determining a way for students to monitor and assess their individual life plan.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

VI. CAREER-RELATED ISSUES

31. Review career options.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

32. Assist in developing career-related goals.

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

33. Provide information about career-related resources and about career-related experiences (such as, Co-op, internships, etc.).

I do this for about _____ students per quarter.

I have a total of about _____ student contacts for this purpose each quarter.

My level of interest in doing this is:

none	low	moderate	high	very high
1	2	3	4	5

Memorandum

mins Exec 4/16/96
RECEIVED
San Luis Obispo
APR 9 1996 93407

Academic Senate

To : Deans and Department Heads/Chair

Date : April 5, 1996

File No. :



From : Warren J. Baker
President

Copies : Paul Zingg
Bill Kellogg
Harvey Greenwald
George Lewis
Mike Suess

Subject: Performance Salary Step Increases (PSSI)

Performance Salary Step Increases (PSSIs) were awarded to 55 faculty unit employees under the new collective bargaining agreement. The relatively small allocation of \$58,184 limited the number of awards this year. The salary increases will be retroactive to January 1, 1996.

PSSIs were recommended by faculty committees at the college and university levels based on procedures and criteria developed by the Academic Senate. Of the 155 applicants/nominations, 18 faculty members were "highly recommended" by the University Committee, 70 received a favorable "recommendation," and 67 were not recommended.

With one exception PSSI awards were made on the following basis:

- 1) those "highly recommended" by both the University Committee and the College Committee (17 awards);
- 2) those "highly recommended" by either the University Committee or the College Committee and "recommended" by the other committee (31 awards); and
- 3) those "recommended" by both the University Committee and the College Committee who were also recipients of a distinguished teaching award (6 awards).

The following faculty are recognized for their contributions to the University through their record of outstanding teaching and meritorious professional accomplishments and/or service:

Christina Bailey (Chemistry and Biochemistry)
Stephen Ball (Philosophy)
Ronald Brown (Physics)
W. Chris Buckalew (Computer Science)
Lee Burgunder (Global Strategy and Law)
Charles Burt (Agricultural Engineering)
Raul Cano (Biological Sciences)
Michael Cirovic (Electrical Engineering)
Nancy Clark (History)
George Cotkin (History)
John Culver (Political Science)
Russell Cummings (Aeronautical Engineering)
Leonard Davidman (University Center for Teacher Education)
Gerald DeMers (Physical Education and Kinesiology)
Jay DeNatale (Civil and Environmental Engineering)
Jay Devore (Statistics)
Donna Duerk (Architecture)
Susan Duffy (Speech Communication)
Leslie Ferreira (Dairy Science)
Richard Frankel (Physics)
Harvey Greenwald (Mathematics)
Kellie Hall (Physical Education and Kinesiology)
John Hampsey (English)
David Henry (Speech Communication)
Kenneth Hoffman (Physics)
Paula Huston (English)
David Keil (Biological Sciences)
V. L. Holland (Biological Sciences)
William Little (Foreign Languages and Literatures)
Nancy Loe (Library)
Donald Maas (University Center for Teacher Education)
John Marlier (Chemistry and Biochemistry)
Susan McBride (University Center for Teacher Education)
Raymond Nakamura (Physical Education and Kinesiology)
Mary Pedersen (Food Science and Nutrition)
Douglas Piirto (Natural Resources Management)
William Preston (Social Sciences)
Robert Reynolds (Art and Design)
Jack Robison (Accounting)
Philip Ruggles (Graphic Communication)
Craig Russell (Music)
Donald Ryujin (Psychology and Human Development)
Joseph Sabol (Agricultural Education)

Deans and Department Heads/Chairs

April 4, 1996

Page Three

Tal Scriven (Philosophy)

Rami Shani (Management)

Mark Shelton (Crop Science)

Charles Slem (Psychology and Human Development)

Edward Sullivan (Civil and Environmental Engineering)

Linda Vanasupa (Materials Engineering)

James Vilkitis (Natural Resources Management)

Joseph Weatherby (Political Science)

James Webb (Physical Education and Kinesiology)

Michael Wenzl (English)

Calvin Wilvert (Social Sciences)

Donald Woolard (Architecture)

Please share this information with faculty in your area.

Pres - Exec 4/10/96

State of California
Memorandum

CAL POLY

SAN LUIS OBISPO
CA 93407

To: Harvey Greenwald, Chair
Academic Senate

Date: April 10, 1996

From: Paul J. Zingg 
Interim Vice President for Academic Affairs

Copies: Warren Baker
Susan Opava
Philip Bailey
Raul Cano

Subject: **Request for Review of Proposed Institute for
Environmental Restoration and Microbial Diversity**

At the Deans' Executive Session meeting on April 1, 1996, conceptual approval was received for the proposed Institute for Environmental Restoration and Microbial Diversity, submitted by Dr. Raul Cano, Biological Sciences Department. As a result of this action, I would appreciate the Academic Senate reviewing this matter as soon as possible, but prior to the close of the academic year.

Thank you for your assistance in this matter.

Enclosure

INSTITUTE FOR ENVIRONMENTAL RESTORATION AND MICROBIAL DIVERSITY

*California Polytechnic State University
San Luis Obispo, CA 93407 USA*

Aristotle said it more than two millennia ago: "What we have to learn to do, we learn by doing." California Polytechnic State University (Cal Poly) is an institution known for its undergraduate education in the applied sciences. The educational philosophy of "learn by doing" has been the underlying reason for this institution's success in training and educating undergraduate students. Largely because of our commitment to undergraduate education and academic excellence, Cal Poly has been cited as one of America's best universities in undergraduate science education by U.S. News and World Report. It is in the spirit of the Cal Poly philosophy of providing "hands on" experience to students and faculty alike that the Institute for Environmental Restoration and Microbial Diversity is based.

The use of microbes for environmental restoration (bioremediation) continues to grow in prominence as a method for detoxifying our environment. Bacteria have proven efficacious in environmental clean ups such as the Exxon Valdez oil spill. This highly publicized and successful use of bioremediation helped allay fears regarding the use and manipulation of microorganisms in environmental remediation projects as well as addressing doubts regarding the efficacy of using microorganisms in environmental clean-up efforts. Bioremediation is fast becoming the only viable option for dealing with contaminated sites. The removal of contaminants and their subsequent incineration has proven to be too costly and ineffective, while off-site storage merely postpones the eventual release of the contaminants into the environment. Moreover, storage sites for hazardous materials are becoming scarce as more local communities adopt a "not in my backyard" policy.

Microorganisms abound in our environment, where they perform myriad useful functions, without which, life on our planet would be impossible. Microorganisms recycle nutrients, degrade organic materials, and make it possible for other life forms to survive and thrive in every environment on the planet. It is well known that science has documented less than 5% of the microbial diversity present in natural ecosystems. In spite of the obvious beneficial applications that microorganisms possess, current efforts to systematically characterize these indispensable members of our ecosystem are minimal at best. The Institute for Environmental Restoration and Microbial Diversity (the Institute) will endeavor to isolate, characterize, catalog, and store novel microorganisms as well as to develop methods to optimize the recov-

ery and characterization of such organisms.

The Institute at Cal Poly will accrue many benefits to both the University and to the citizens of the Central Coast of California. The environmental impact of oil and solvent spills that have plagued the Central Coast will be felt for hundreds of years. As a result environmental remediation and restoration efforts of the affected habitats will be required on a long-term basis. Cal Poly, with its "learn-by-doing" philosophy, can take advantage of this "natural laboratory" opportunity by engaging students and scientist mentors in this real life situation. Our students will certainly benefit by increasing their value to companies and communities facing similar situations in many places around the world. Additionally, this Institute will allow the affected communities on the Central Coast to experience the positive impact that joint efforts between business and academia can have on both the economy and the environment.

Cal Poly is also in close proximity to many other potential restoration sites where contaminants include petroleum products, heavy metals, polychlorobiphenyls (PCBs), pesticides, farm wastes, and sewage. These undesirable contaminants are encountered in both terrestrial and aquatic/marine ecosystems, both of which are within easy reach of the Cal Poly campus. In addition Cal Poly has a growing Biotechnology program, which includes training in the genetic engineering of microbes and the use of advanced techniques for microbial enzyme isolation and applications.

The Cal Poly Environmental Restoration and Microbial Diversity Institute would encompass several roles, all revolving around the common theme of restoring polluted terrestrial and aquatic/marine environments to their original fertility and beauty. All bioremediation has the same underlying theme, the use of microorganisms to break down undesirable compounds, but there are myriad ways in which this can be accomplished. The Institute would be involved in the analysis and development of protocols for many techniques. The areas of concern can be classified into broad categories, that will overlap so that information obtained through one study will be of value to all other studies.

A major focus of the Institute, spearheaded by faculty from the Cal Poly Biology Department, will be to study microbial communities in terrestrial and aquatic ecosystems, both from present-day and ancient environments (such as those preserved in amber and other fossilized biopreserving materials). The goal of these studies is to

assess the essential community composition of diverse environments and monitor the evolution of important microorganisms in those environments. Additionally, genes of interest will be isolated and cloned and their nucleic acid sequences determined. These organisms, their genes, and genetic sequences will be stored and managed by the Institute in order to serve an important source of biological information to scientists throughout the world, and in particular investigators from laboratories in the CSU system. The purpose of these efforts would not only be to study the evolution of microbial communities and describe the microbial diversity, but also to develop new molecular methods for measuring microbial diversity and to develop culture methods to recover and grow yet undiscovered microbes. These microorganisms, from ancient and contemporary ecosystems, will be evaluated for their potential in industrial applications such as environmental restoration, production of novel and useful pharmaceuticals, and secretion of enzymes with various applications. New assays, databases, and software to assess and describe such microbial diversity, as well as educational materials will be developed at the Institute. Whenever possible, the Institute will strive to patent and license its intellectual property.

Another major area of concern for the Institute will involve the characterization of contaminated sites to determine the feasibility of in situ as opposed to off-site remediation. Because in situ bioremediation involves the action of the indigenous microbial population, site characterization must include an evaluation of microbial diversity for the site in question. The molecular methods developed by the Institute for characterizing microbial communities and the microbial and genetic libraries created, can be used effectively in these studies.

Another part of site characterization involves an assessment of the chemical compounds contaminating a site. This knowledge combined with a description of the microbes present at a contaminated site allows for the determination of the biochemical pathway(s) involved in the biodegradation processes. The Institute will seek the advice and expertise of Faculty from the appropriate Departments in the various Colleges at Cal Poly.

Once the microorganisms involved are identified and the degradative pathways resolved, a consortium of microorganisms, both genetically altered and/or indigenous, can be assembled to more effectively remediate the site. The genetic enhancement of microorganisms, both ancient and isolated from contaminated sites for the purpose of producing a more efficient clean-up process will be another Institute focus requiring the expertise of faculty in the Cal Poly Biology and Chemistry Departments. These microorganisms will also be added to the microbial library of the Institute.

As with any environmental restoration effort, an in situ

bioremediation treatment must be followed by an evaluation of the "biological health" of the soil after treatment. Again the molecular methods developed at the Institute will help characterize the soil microbial communities before and after treatment. The Institute will also have the expertise of scientists in the Soil Sciences Department at Cal Poly to help develop post remediation therapies for decontaminated soils to restore their productivity.

Finally, the Institute will develop and analyze multiple approaches to the application of both in situ and off-site bioremediation processes. The application of bioremediation to a contaminated site is often an extremely site-specific process. Using the expertise of faculty members in the Cal Poly Colleges of Agriculture and Engineering, the Institute will study bioremediation applications and determine the unifying factors that may allow for a more standardized and easily utilized approach to remediating contaminated sites.

An overall training program for the Institute will tie these diverse disciplines together to form a coherent program. All of the skills and processes for site evaluation, remediation, and restoration developed at the Institute will be made available for educational purposes and can be used to attract collaborations with businesses interested in acquiring skilled employees. In addition to training Cal Poly students, the Institute will serve as a training site for students and scientists from across California, the West, as well as internationally. Additionally, seminars and workshops will be regularly scheduled to inform and educate the Central California community of the Institute's efforts and advances and as well as progress in bioremediation in general.

If such a project is developed, Cal Poly could become the "Bioremediation Center of the West Coast". Undoubtedly, a large-scale program such as this would allow the parties involved access to many microorganisms from outside sources, making the Institute even more influential and productive. Moreover, a joint program could be coordinated with bioremediation programs elsewhere in the U.S., such as the University of Tennessee's Institute for Environmental Biotechnology.

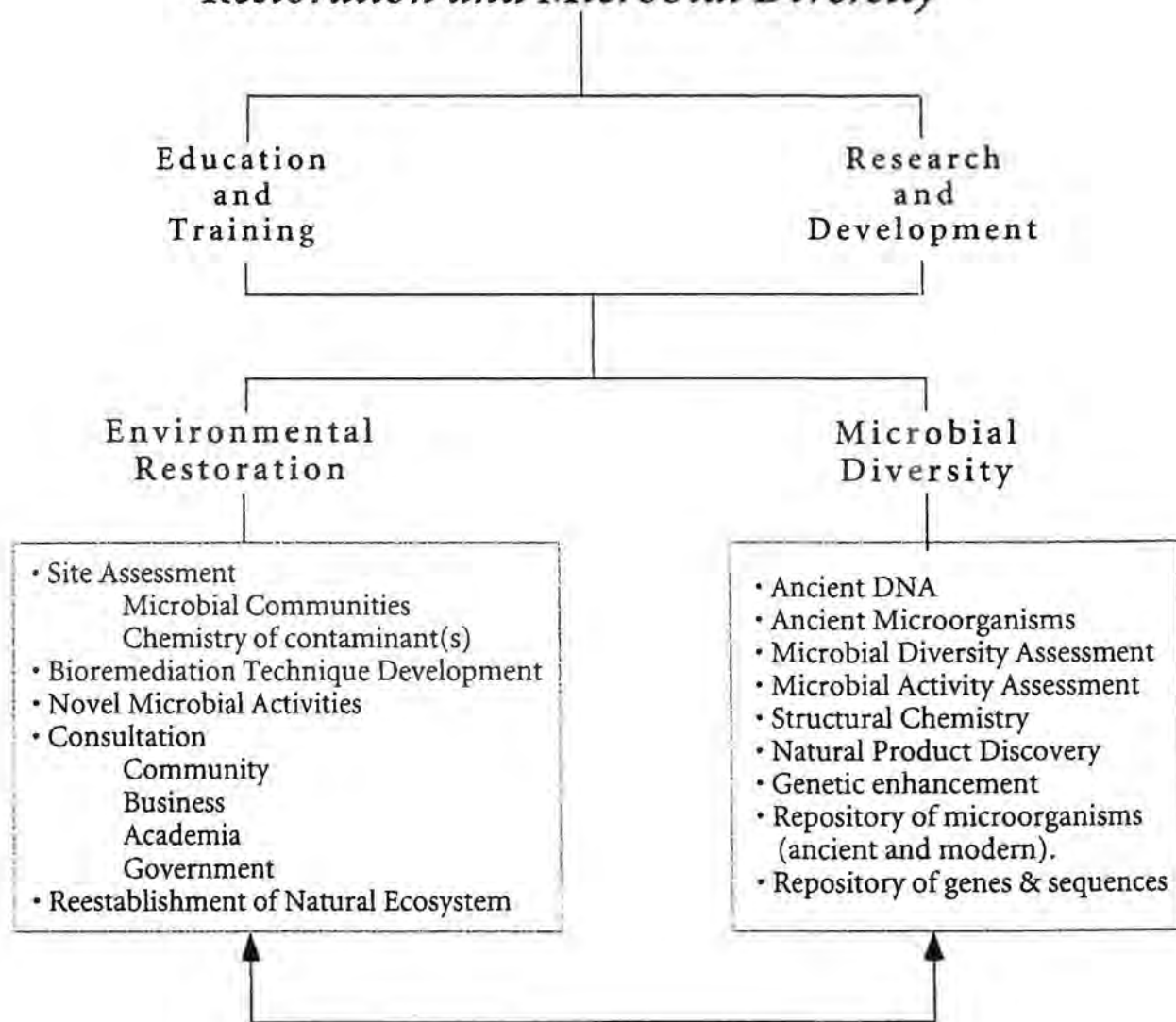
The Institute will initially be housed in Fisher Science Hall, on the Cal Poly campus. The basic infrastructure for the isolation, cultivation, characterization, and genetic manipulation of the organisms from fossilized materials (e.g., amber) deep ocean cores, and contaminated sites, is already in place, requiring only additional equipment, supplies and personnel to meet the expected research and training needs. Classroom and laboratory space for training courses are available and will be reserved for use in workshops and scientific meetings. It is also anticipated that the Institute will sponsor scientific meetings and symposia on the Cal Poly campus.

The Institute will be directed by Dr. Raúl Cano,

Biological Sciences Department and assisted by Dr. Christopher Kitts, Biological Sciences Department. The Institute will enlist the collaboration of scientists and engineers in the Colleges of Science and Mathematics, Agriculture, and Engineering. These scientists will bring essential expertise in the areas of microbial ecology, analytical chemistry, bio-instrumentation, agronomy, and systems design. Interdisciplinary undergraduate, gradu-

ate and post-doctoral research will be conducted at the Institute. The Institute will also strive to bring in outstanding scientists and interested students from other institutions, both from the United States and abroad, for consultation or to conduct independent research at the Institute. The figure below summarizes the proposed activities of the Institute.

Institute for Environmental Restoration and Microbial Diversity



Institute By-Laws

MISSION:

To improve and restore the environment through the intervention of microorganisms and other biological entities and to promote learning and understanding of the microbial diversity in ecosystems. To achieve this the Institute shall: (1) foster and encourage communication of ideas and information among its membership for mutual professional development; (2) endeavor to attract students to CPSU for graduate research in the molecular biological sciences, microbial ecology, and molecular paleobiology and to encourage them to develop an interdisciplinary understanding of their particular area of emphasis; (3) foster an active research program among its membership on problems best addressed through an integrated approach that applies the disciplines of chemistry, agriculture, engineering, physics, computational sciences and biology; and (4) seek ways of improving the individual teaching performance of its members through interdisciplinary communication at all levels of instruction; (5) provide the infrastructure for the training of, and communication of ideas to, the scientific and lay communities through publications, seminars, lectures, and workshops.

PURPOSE:

The President of California Polytechnic State University, San Luis Obispo, authorizes the establishment of the Institute for Environmental Restoration and Microbial Diversity Cal Poly State University (CPSU), for the purpose of promoting an atmosphere conducive to research, creative activity, education, and training in the areas molecular paleobiology, microbial ecology, and bioremediation.

MEMBERSHIP:

Appointments to the Institute shall be recommended to the President or his designee by the existing members. Candidates will be considered according to their individual abilities to contribute to the Institute within the guidelines of its particular purposes and functions.

1. The initial membership of the Institute shall be comprised of the signatories of these By-Laws, these individuals to be known as Charter Members of the Institute.
2. Thereafter, individuals who hold full-time faculty positions at CPSU may be nominated for mem-

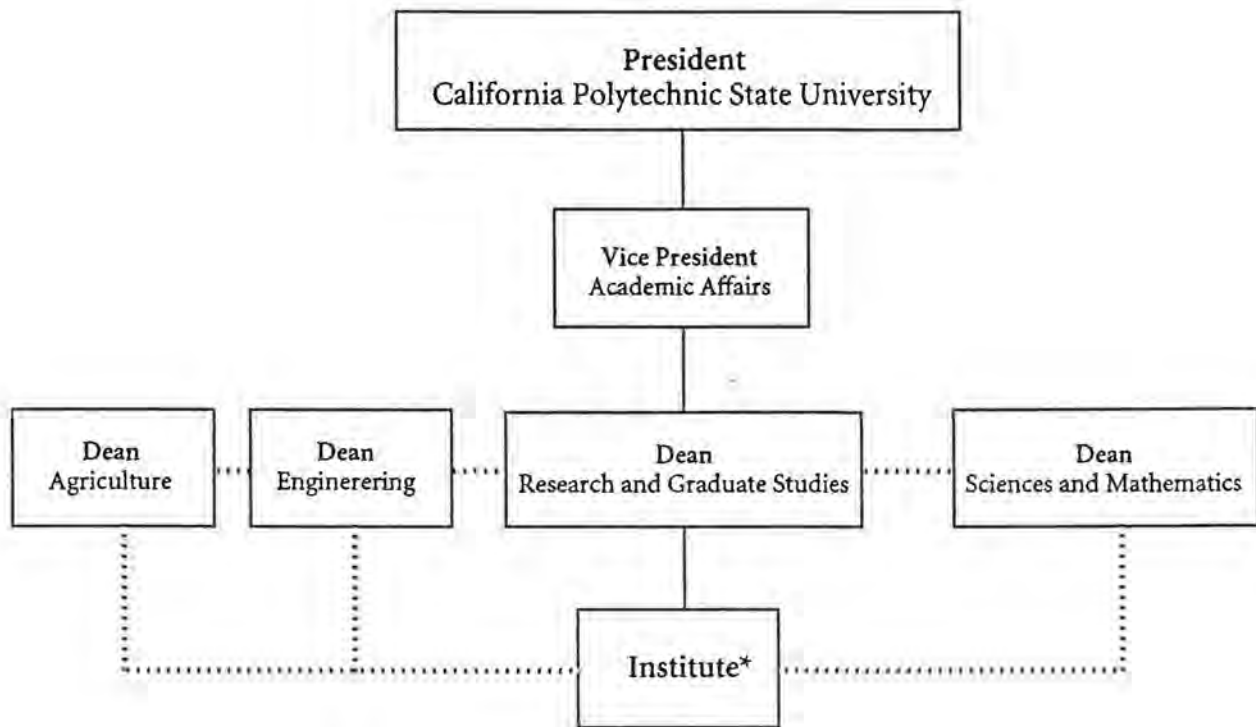
bership by the existing members. In general, the guidelines for such nomination shall be as follows:

- a. The nominee shall have a demonstrated and continuing interest in scientific research
 - b. The nominee, shall show evidence of a background and research interest strongly oriented toward the biological, biotechnological sciences, chemical, physical sciences, or agriculture.
 - c. The nominee's previous research shall focus in areas of investigation that fall within the mission of the Institute.
3. A nominee shall be recommended for membership in the Institute by a two-thirds (2/3) vote of the voting membership, the election to be conducted by closed ballot.
 4. Since it is recognized that a great variety of disciplines may be able to contribute to the Institute in a valuable manner, Associate Members may be nominated if their discipline is construed as a useful adjunct to molecular biology or biotechnology, even though their background does not fit the guidelines for full membership. Such nominees shall become Associate Members of the Institute by the same balloting procedure as is done for election of Members. An Associate Member will be a non-voting member, but will otherwise be a full participating member of the Institute.

STRUCTURE:

The organizational chart below summarizes the administrative hierarchy governing the Institute. It is the intent of the Charter Membership that the internal governance of the Institute be largely free of administrative hierarchy. However, it is recognized that some administrative structure is necessary, and for that reason the following shall be implemented.

1. The membership of the Institute, by closed ballot, shall elect a Director, whose general function shall be to exert leadership and such organization as shall be necessary to implement the purposes of the Institute. Election of the Director shall require a two-thirds (2/3)



* Faculty reporting lines will be within their respective Colleges

majority of the voting membership, and will be held in the last month of the academic year. His/Her term of office will be four (4) years, and he/she may be reelected.

2. The duties of the Director shall be general and in keeping with the intent of the office expressed above:
 - a. The Director shall call meetings, appoint committees when needed and coordinate the activities of the Institute as deemed necessary.
 - b. The Director shall maintain the files of the Institute and act as the liaison between the membership and the administration and any other outside agencies with which the Institute does business.
 - c. The Director will be the official signatory of the Institute on all official documents, such as research grant applications and letters pertaining to the entire membership.
 - d. In keeping with the philosophy of the Institute, the Director will strive at all times to keep administrative duties (both his own and those of the membership) at a minimum, on

the assumption that time spent in administration is time lost for teaching and research. Within this context, all Members and Associate Members of the Institute agree to perform such administrative tasks as may be asked of them by the Director.

3. These By-Laws may be amended by a two-thirds (2/3) vote of the Members of the Institute and the approval of the Dean for Research and Graduate Studies.

ACTIVITIES:

Since one of the prime purposes of the Institute is to foster interdisciplinary cooperation among its Members and Associates, it is therefore assumed that joint projects involving two or more of the membership will be highly encouraged. In order to facilitate this kind of cooperation, it shall be a standing function of the Institute to carry out the following projects and functions:

1. Seminar Series
The Institute shall sponsor a continuing sem-

inar series which shall involve the membership, their graduate students and outside research persons as speakers. It is also the goal of the Institute to establish a Distinguished Lectureship in Microbial Ecology, patterned after the Robbins Lectureship at Claremont College, to attract Nobel status scientists to CPSU.

2. Research Grants

The Institute shall actively seek outside research grant support for its activities. These efforts may be initiated by one or more members, either alone or with non-members as collaborators, on behalf of the Institute as a whole. It is hoped, but it is by no means necessary, that proposals be initiated in the name of the Institute and that internal review take place prior to submission.

3. Solicitation of Additional External Support

A major goal of the Institute is to obtain outside funding to promote microbial ecology, bioremediation, and biotechnology at CPSU. This shall include developing proposals for a graduate training program in Molecular Biology and Biotechnology, equipment grants, and specialized seminar series.

4. Publications

The membership will be actively encouraged to publish the results of their researches, individually or collectively. It is suggested that when this is done that the following format be employed:

Name(s)

Institute for Environmental Restoration and Microbial Diversity, Department of _____

The Director of the Institute shall maintain a file of copies of all publications of the Institute, and shall be responsible for assigning each with a number. In addition, the Director will submit an Annual Report of the Institute to the Vice President, Academic Affairs through the Dean of Research and Graduate Studies.

5. Consultation

The Institute shall serve as an entity to advise and be consulted by the administration and the community on affairs relative to the molecular and environmental sciences and

biotechnology. The Institute will be concerned with future hiring patterns, and it shall feel free to make recommendations to the administration relative to research and teaching in the molecular biological sciences and biotechnology.

6. Repository of Microorganisms and Genes

The Institute shall represent a repository of ancient microorganisms, genes, and nucleic acid sequences. The Institute will also serve as a repository of microorganisms obtained from modern habitats rich in biodiversity with bioactive properties. These will be available at no cost to the scientific community at large, in particular collaborating laboratories in the CSU system for the purpose of studying biological processes, or other basic research activities. The Institute shall retain all rights to microorganisms, genes, nucleic acid sequences and their products for commercialization purposes. Licenses and rights will be granted to interested parties on an individual basis and only after negotiations with the Institute, California Polytechnic State University, and the California Polytechnic State University Foundation, as appropriate.

6. Teaching

The membership of the Institute shall be encouraged to make use of state-of-the-art technology and pedagogical devices in the various classes taught by them, utilizing the resources of the Institute to enrich these courses.

7. Institute for Environmental Restoration and Microbial Diversity Brochure

The Institute will communicate its existence annually and distribute a formal brochure to appropriate undergraduate departments at various institutes of higher learning to attract students to CPSU for graduate research in the molecular biological sciences and biotechnology.

8. Master's Degree in Special Major

The Institute will collaborate with the appropriate department(s) and college(s) to establish a multidisciplinary Masters Degree Program in a Special Major entitled "Molecular Biology and Biotechnology."

8. Ph.D. Program in Special Major

The Institute will cooperate in the development of a joint doctoral program in collaboration with the University of California and/or other Ph.D.-Granting Institutions in the US and abroad.



Charter Membership

Raúl J. Cano, Ph.D., Director
Professor, Biological Sciences

Thomas A. Ruehr, Ph.D
Professor, Soil Science

Christopher Kitts, Ph.D., Assoc. Director
Assistant Professor, Biological Sciences

Doug Williams, Ph.D
Professor, Agricultural Engineering

V. L. Holland, Ph.D.
Professor Biological Sciences

Max Wills, Ph.D
Professor, Chemistry

David J. Keil, Ph.D
Professor, Biological Sciences

Nirupam Pal, Ph.D.
Assistant Professor, Civil & Environ Engr.

Roger D. Gambs, Ph.D
Professor, Biological Sciences

Jeffrey G. Sczechowski
Assistant Professor, Civil/ Env. Engineering Dept.

Signed:

Warren J. Baker
President

Date

Vice President, Academic Affairs

Date

Susan Opava
Dean, Research and Graduate Education

Date