VICE CHANCELLOR for RESEARCH

Planning for the Office of Research of 2010

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Table of Contents

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Summary

This comprehensive plan for the Office of Research (OR) describes the revitalized functions of the Office of Research and how it will meet its objectives over the next ten years. This plan features the creation of a new entity at UCSC, the Technology Enterprise Center (TEC), and outlines different scenarios for the growth of the Office of Sponsored Projects while emphasizing the compliance and promotion responsibilities of the OR.

OR supports, facilitates and promotes world-class research and the transfer of technology from the campus to the general public. It must insure the integrity of the research process and be vigilant in all areas of compliance, particularly those involving human subjects in research. It must also promote the research achievements of UCSC in all media. This plan describes the OR's efforts in these areas.

A new activity for the OR is the TEC, the first of its kind in the UC system. The TEC will be responsible for facilitating, evaluating, writing, negotiating and closing all agreements with intellectual property (IP) clauses. The TEC will be involved with creating IP assets, developing funding for research projects, exploiting new avenues for the deployment of technologies and establishing new business enterprises. A distinguishing feature of the TEC is its teaching component. It will establish educational programs for faculty, students and staff on processes, procedures, policies, and ethics related to the management of IP. The TEC also will establish an IP management certificate program. If UCSC is to play a significant role in the new economy, both regionally and nationally, the creation of the TEC is a first-order priority, independent of budgetary cyclical changes.

The Office of Sponsored Projects (OSP) is responsible for the submission of grant proposals and represents The Regents and the campus in the acceptance and negotiation of awards and their terms and conditions. OSP is the office of record for human subjects protocols and staffs the campus' Institutional Review Board. OSP also is responsible for monitoring the financial disclosures of principal investigators.

OSP projects three levels of future, 10-year award levels that are in function with different economic and budgetary scenarios. The most optimistic scenario foresees total awards to be $233M in the year 2011 with an office staff of 33; the least optimistic predicts an award level of $103M with an office staff of 15.

Introduction

The Office of Research (OR) at the University of California, Santa Cruz (UCSC) is administered by the Vice Chancellor for Research (VCR) and forms a key asset for meeting the responsibility of the VCR. Therefore, this section will describe in an integrated fashion the goals and mandate of the OR and the VCR.

The VCR must deliver on a wide range of objectives that include the following:

- Ensure compliance of all grants and contracts for research with applicable regulations, legal requirements and obligations.

- Promote the full complement of research at UCSC, with a particular view in the next decade to facilitating an increase in research funding above the annual percentage increases in NSF and NIH funding and, specifically, to double the current fundings over the next five years.

- Manage the intellectual property (IP) of UCSC in a way that extends the academic enterprise, generates funding for research activity, creates new revenues for UCSC, and deploys technology for the public good consistent with the Bayh-Dole Act.

- Inform faculty, students, staff and the general public about UCSC research accomplishments; regulations, legal requirements and policies governing the conduct of research; and policies, processes, goals and achievements with regard to the management of UCSC IP.

- Co-ordinate with the Deans interdisciplinary research through the formation of projects, centers and institutes in a manner that increases the impact of research upon the University, the local community, the regional economy and the Nation.

The VCR will meet these objectives through the personal activities of the VCR, the combined activities of the Associate Vice Chancellor(s) for Research (AVCR), the Deans, three Directors whose units form the OR, the Office of Sponsored Projects (OSP), the Technology Enterprise Center (TEC), and the Monterey Bay Education, Science, and Technology Center (MBEST).

Compliance

No objective remains a higher priority than ensuring compliance with all regulations, legal requirements and committed obligations of the research grants and contracts undertaken by UCSC. In addition to our moral and legal obligations, nothing can jeopardize the research

enterprise so much as non-compliance with policies, rules and procedures governing the conduct of research. And these policies, rules and procedures are becoming ever more complicated, demanding and expensive as concerns increase with regard to human subjects, genetic engineering, environmental protection, student rights, financial accountability, economic development and IP management.

Compliance depends on solid knowledge of all the factors mentioned above. It also depends on co-operative and knowledgeable principal investigators (PIs), Deans, and Chairs of Departments. The VCR and OR must educate, persuade and co-ordinate PIs, Deans and appropriate committees to monitor, review, evaluate, and recommend on appropriate processes and protocols for the conduct of research. No committee is more relevant in this context than the Institutional Review Board (IRB). The VCR must be vigilant and thoughtful with regard to compliance.

Promotion

The promotion of research includes raising the visibility of research. This means providing and pressing information about UCSC research accomplishments both on the research community and the general public. It demands attention to current research results and to a wide range of publications for increasing awareness, including pamphlets, newspapers, magazines and books. The VCR should work with Deans and Chairs to guarantee that the full spectrum of disciplines is represented in UCSC materials. Visibility of UCSC research is important for documenting achievement, for raising morale, for increasing public support, and for fundraising.

Doubling the research funding at UCSC in the next five years means growing at 12% per year, which probably will on the average mean exceeding the rate of growth of NSF or NIH budgets by a factor of two. Before the budgetary restrictions of 2001/02 in California, this desired growth might have been achieved through growth in the number of faculty employed at UCSC. This now appears unlikely. In the Office of Sponsored Projects' section of this document, we present three different growth scenarios and the most optimistic assumes a 12% growth rate. This type of growth rate can be achieved only through a combination of winning some new, large, collaborative research projects and hiring a few catalytic faculty. Catalytic faculty are high-profile, senior, very experienced professors who have the proven ability to write large project grants and to manage large interdisciplinary projects such as the Center for Adaptive Optics. The VCR must work with Deans and Chairs to find new combinations of PIs who can write large project grants to a wide range of funding agencies.

Achieving the goals of compliance and promotion depends on the activities of the Office of Sponsored Projects (OSP). This Office is responsible for providing up-to-date information required for the grant application process, for several committees ensuring compliance, and for processing grants in a manner that maximizes success. This means that the OSP must provide knowledgeable, timely and thoughtful service. It means having experienced, well-directed staff in numbers adequate for coping with an increased work load. The goals, requirements and projected achievements of the OSP are developed in a later section of this document.

Management of Intellectual Property

Before 1980, the federal government held the rights to intellectual property (IP) created through federal grants at universities. Government agencies did little with this management responsibility. Consequently, the Congress passed a law giving ownership of such IP to the universities, and professional technology transfer in the US was developed. Currently, the IP of UCSC is managed by the University of California Office of the President (UCOP) in what is now a traditional (first-generation) pattern of management. That is, inventions are disclosed, are patented, and are licensed to existing business firms. This has been successful for generating and distributing revenue arising from the management of biotech patents. Now we are poised at UCSC to develop the next generation of IP management processes.

Second-generation technology transfer involves a new set of goals and processes. The goals include creating a set of IP assets, developing funding for research projects, exploiting new avenues for the deployment of technologies, and establishing new business enterprises.

IP management at UCSC will be conducted by a center known as the Technology Enterprise Center (TEC). TEC will be responsible for facilitating, evaluating, writing, negotiating and closing all agreements with IP clauses, which include the following: material transfer agreements, non-disclosure agreements, industry sponsored research agreements, IP options, and licenses. The following section of this document describes TEC in greater detail.

Information

It is important for the VCR, in co-operation with the Deans and External Relations, to develop a comprehensive set of documents illustrating research achievements arising from UCSC. These documents will be composed of "cases" or stories that describe the results and impacts of research completed throughout the University. These cases will represent the work of scholars across all the Divisions, Centers and Institutes of UCSC.

The production of the case studies or stories should be coordinated by an experienced, professional tech writer. This person normally would arise from a department of technical writing. The stories typically form excellent topics for research papers of student writers, who investigate and then describe the nature of the research results and the importance or impact of the results. The stories become extremely useful as background material for newspaper articles, book chapters, and fundraising materials designed to generate financial support for the research area. In conjunction with the UCSC Public Relations office, one professor with appropriate credentials and reduced teaching load would be sufficient for the job.

The Office of Sponsored Projects must develop enhanced communications expertise that informs and reminds faculty constantly about new funding opportunities. In addition, a communications expert within the Office of Sponsored Projects should notify the VCR at the earliest opportunity

regarding deadlines for submission of major project grants, so that the VCR can arrange with Deans and Chairs to select and convene appropriate groups of faculty with a view to submitting quality proposals. Furthermore, this person can work with the Director of OSP and the VCR to search comprehensively for possible support for major projects already conceived. Therefore, two complementary processes can work simultaneously:

1. raising awareness of funding opportunities and forming appropriate group applications, and

2. searching for possible funding for groups already self-selected.

The last major area of information transfer from OR will be related to the management of intellectual property (IP). There are constant changes in federal regulations, state laws, court decisions, University of California (UC) policies and business practice that influence the practice of IP management on a university campus. It will be the responsibility of TEC to develop seminars, workshops and written materials to describe this subject matter to the University community.

Interdisciplinary Research

Interdisciplinary research usually involves co-operation among a number of scholars who represent different, complementary disciplines. Most frequently they are brought together by a common interest in a complex problem that cannot be addressed, much less solved, by a single scholar. Normally, the group decides to form a center or an institute, to provide a rallying point or a focal point for fundraising, and for discussing, planning, coordinating and conducting a comprehensive work plan for research designed to answer important questions and to move toward a solution to the central problem.

Such activities generate a need for dedicated space, tailored graduate programs, administrative structure, financial support and sound management. All of these requirements present a call for resources, which usually can only come from the coordinated allocation from several Chairs and Deans. In addition, the VCR must play a central role with the Deans in identifying appropriate external sources of funds and coordinating excellent applications for those funds. Increasing such awards includes obligations with regard to the disposition of IP, so TEC will be essential for this activity.

The VCR should play a significant part in the management of interdisciplinary research Centers and Institutes. Specifically, the VCR should chair a committee of representative Deans any time a Center or Institute includes faculty from more than one Division of the University. If, on the other hand, all of the faculty who are members of the Center or Institute come from a single Division, then that Dean should be responsible for the finances and activities of that Center or Institute. Finally, the establishment of any Center or Institute should occur only on recommendation to and with the approval of the Executive Vice Chancellor or Provost of UCSC. This should be so because the naming of a Center or Institute is not unlike claiming a trademark.

THE TECHNOLOGY ENTERPRISE CENTER (TEC): A Plan for Managing Intellectual Property and for Creating New Enterprises

Summary

The University of California, Santa Cruz shall establish a new center—the Technology Enterprise Center (TEC)—that will be a focal point for managing intellectual property and for creating new enterprises with UCSC's Intellectual Property (IP). TEC's creation is an imperative for UCSC if it is to play a significant role in the new economy, both regionally and nationally. It will fulfill a basic need for the campus and act as a new resource for the UC system as a whole. The Center will act in a manner analogous to a department in many professional schools in that it will be a place of practice, teaching and research. Personnel will manage University IP, and they will facilitate the creation of new enterprises. They will teach IP management, at both the graduate and undergraduate levels, as well as many aspects of finance, operations, management, marketing and entrepreneurship relevant to the formation of start-up companies. They will study factors related to the success and failure of start-up companies, and they will monitor the impact of University activities on the regional economy.

By establishing a center like TEC, UCSC will provide leadership in the practice of technology transfer, IP management and enterprise creation for the UC system. Many universities have developed home offices competent in first-generation technology transfer that consists of disclosure of inventions, patenting, and licensing of patents. These offices have prospered in places with high levels of academic activity related to biotechnology. Now we are poised to develop the second-generation processes. Second-generation technology transfer develops high-value asset portfolios (of which patents are only one part), builds paying relationships with industry, creates self-sustaining academic operations, and is project-based instead of single-technology-based. UCSC can lead this development by assembling a small team experienced in managing software and various copyrighted materials. This team will establish a new practice at UCSC and from this base will demonstrate, instruct and teach this practice to other UC campuses. Empirical studies will form the foundation of a set of publications that will be instructive and useful for offices of licensing and tech transfer across the country. These offices will be the ones most capable of starting new companies and helping the knowledge-based economy most directly.

The principal objectives and responsibilities of TEC will be the following:

- Manage the intellectual property of UCSC.

- Create new companies.

- Establish educational programs for faculty, students and staff on processes, procedures and policies related to the management of IP.

- Establish an IP management certificate program.

- Co-ordinate the development of courses relevant to entrepreneurship, IP management and enterprise creation with appropriate departments at the University, at both the graduate and undergraduate levels.

- Provide relevant advice and expertise in second-generation technology transfer to the University of California Office of the President (UCOP).

- Co-ordinate research on IP management and enterprise creation among qualified faculty, students and professional staff interested in the subject matter.

- Create published materials on research related to IP management, enterprise creation and regional economic development catalyzed by University-created start-up companies.

Background and Vision

Background. Universities and the economy of the United States have evolved together over the last 150 years. When it became clear that agriculture could be improved significantly through focused teaching and research, the US government established a number of land grant universities and located them in the heart of agricultural domains. Out of these universities grew, here and elsewhere, great departments of biochemistry that transformed our knowledge of biological systems, health care and industry. In California, the Enology Department at UC Davis brought science to the wine industry and made it competitive with the European wine industry in only a few decades.

As the country moved forward into the mechanized, manufacturing age, universities created schools of engineering that trained a crucial workforce and developed new technologies that have changed the face of everyday life. Now we have launched a truly knowledge-based economy that thrives on a host of formerly disconnected disciplines, which now are interrelated, interdependent and critical for the health of the nation as a whole and California in particular.

Universities quite legitimately claim that knowledge and ideas created at their campuses form the basis of thousands of new companies that keep the US competitive in the face of the loss of hundreds of thousands of manufacturing jobs offshore. In addition, transfer of new knowledge and technology from our universities to existing companies keeps them viable when confronted with cost-effective implementation of standard practice by offshore development.

The new companies and the new jobs are dependent not only on the knowledge created at universities but on the intellectual property rights needed to leverage that knowledge into sound

financial backing and commercial development of new technology. Universities now are learning to manage intellectual property (IP) in the public interest. It has been a slow-evolving, sometimes controversial process, starting with successes at the University of Wisconsin and then spreading to Stanford, MIT, the University of Washington and beyond. And yet, virtually no programs have been developed for teaching and research on IP management in our universities and none that marry teaching, research and practice.

The University of California, Santa Cruz is in a position to take a leadership role with regard to teaching, research and practice at the cutting edge of the knowledge-based economy. UCSC can be a focal point of activity in IP management and enterprise creation for the UC system. UCSC has an opportunity to create a Technology Enterprise Center that integrates teaching, research and practice in IP management and enterprise creation. This Center will manage IP for UCSC; teach IP management, entrepreneurism and ethics; and, coordinate research in IP management, enterprise creation and economic development. The Center will help develop the next generation of managers and knowledge workers critical to the new economy, and it will study the processes that most effectively lead to successful new enterprises. The Center will be an interdisciplinary focus of practice, teaching and research for the sciences, engineering, social sciences and humanities. It will be a conduit for the expression and appropriate commercial development of knowledge, ideas and IP from all the divisions at UCSC and beyond.

UCSC is an ideal venue for this Center. It has a solid research base of about $70 million in research and 600 diversified faculty. It manages education outreach and a new center in Silicon Valley. It will be ideally positioned in the future to create "smart development"—incubators and start-up companies in Seaside at MBEST as the economic development of Silicon Valley moves south and west. UCSC has personnel who were engaged in, have benefited from and led major IP management offices elsewhere. It has the ability to recruit the best personnel in the nation.

UCSC needs such a Center. Currently, UCSC has inadequate expertise in managing intellectual property. The University is unable to advise faculty adequately regarding the disposition of IP. The University is missing licensing opportunities that could generate revenue for research and for general support of the academic enterprise. The University is unable to increase significantly its industry-sponsored research, as there are insufficient expert human resources to market, negotiate and manage appropriate agreements.

UCSC and the UC in general need a Center to develop educational materials for faculty, students and staff related to IP management and technology transfer. And finally, UCSC and UC need such a Center to investigate best practices world-wide, to insure that the public interest is best served by our deployment of UC intellectual property.

Because of these missed opportunities and the goal of UCSC to play a significant role in the future regional and national economies, we should create the TEC independent of any future economic and budgetary cyclical changes.

This proposal describes the development of a program of IP management, enterprise creation, teaching and research. It builds on the experience and results obtained by elements created at

other universities. It is, in our view, the description of the first Center that will integrate practice, teaching and research in this arena so critical to our universities and our economy.

Vision. Our vision for TEC at the UCSC is based on the premise that innovative collaborations between universities and industry, accompanied by new approaches to education, can extend our research, enhance our instructional mission, and significantly contribute to regional economic development.

New enterprises are central to the knowledge-based economy. Through technology transfer and thoughtful management of intellectual property, universities can provide many ideas that spawn new enterprises. Clear strategies are needed for successful university/industry collaboration in the development of new enterprises – facilitating their creation, studying their processes, and training successive generations of students who will lead them. This will involve integrated programs of teaching, research and practice in areas of importance to high-tech companies.

Our region is pre-eminent in the world with regard to technology development, business start-up and research universities. The challenge is to merge these in an enhanced program of education, study, intellectual property management and enterprise development. We believe that the proposed Technology Enterprise Center will be an outstanding vehicle for carrying out this vision.

Management of Intellectual Property

Universities create, obtain, manage and deploy intellectual property every hour of every day, whether or not they generate any revenue from commercial licensing. This management process is essential to everyday life in modern universities and presents both opportunities and liabilities to the university and faculty alike. Universities and faculty constantly accept biomaterials, industry-sponsored research materials, collaborative agreements, non-disclosure agreements and confidential information. Modern research cannot and does not proceed without such transfer of materials or contractual agreements. Faculty, universities and companies do not exchange valuable materials and information without conditions. Therefore, these agreements are a matter of necessity.

When the US lost its competitive position in the market place for electronic goods and was challenged in the automobile industry, part of the problem was the federal government's retention of IP-generated by research it funded, and the transfer of this valuable information to industry was negligible. Congress dealt with this impasse by passing a critical piece of legislation, the Bayh-Dole Act, which gave universities ownership of inventions developed through the use of federal funds for research. This led to the creation of tech-transfer offices in all the major research universities, to the establishment of professional IP management practice, and, subsequently, to a plethora of high-tech start-up companies arising from university-based research. This was a positive stimulus for students, investigators, universities, industry and the economy. Universities now have the right and the responsibility to manage IP, as governed by the Bayh-Dole Act. The issue, therefore, is not whether we should or can manage IP but whether

we do it well and whether we understand the mechanisms and methods most appropriate for any particular process or relationship.

A Technology Enterprise Center at UCSC will co-ordinate, facilitate and expedite the management of all appropriate IP agreements arising within UCSC. These include material transfer agreements, industry-sponsored research agreements, non-disclosure agreements, collaborative research agreements, and licenses of software, copyright, trademarks and patents arising within the UCSC enterprise. Many campuses now are forming an office that manages all these functions. It is a trend based on several factors:

- risk management (don't commit, by mistake, the same IP to two or more different receptors exclusively);
- service (do create one-stop shopping);
- expertise (generate a very knowledgeable, complementary work force); and,
- revenue (optimize opportunity for throughput and return).

Traditionally, IP for licensing was managed by one office, a Technology Licensing Office, and the other agreements (except IP *terms*) were handled by an Office of Grants and Contracts. The concept was straightforward. IP was to be managed or negotiated by one knowledgeable set of folks, and grants and contracts would be managed by another. This arrangement is rapidly breaking down for several reasons. For the most part, the overwhelming number of grants and contracts in universities come from the federal government and foundations, both of which have complex regulatory requirements and therefore require a necessary form of expertise. IP and industry-sponsored research agreements require different expertise. In addition, the number of industry-related agreements is increasing rapidly and therefore needs a staff dedicated to insuring proper compliance. Consequently, it makes great sense to develop two offices, one dedicated to all agreements incorporating IP terms and one dedicated to managing grants and contracts from foundations and governments.

The office responsible for all agreements that include IP terms or commitments will be the Technology Enterprise Center. The Center should be staffed by professional licensing officers who can describe, write, negotiate and close all manner of agreements for UCSC that include IP terms, whether they arise from patents, copyright, software, trademarks or know-how. This practice will form the core operation of the Center. The management of the IP by the Center will lead to several developments:

- new research initiatives or collaborations supported by industry,
- new companies arising from the licensing of IP, and/or
- new support for academic functions arising from license revenues.

Teaching Intellectual Property Management and Entrepreneurship

TEC will be responsible for coordinating a wide range of teaching activities for UCSC in the areas of IP management and entrepreneurship. Normally, entrepreneurship refers to talents and skills necessary for starting and managing early-stage companies. Until recently there has been little attention in entrepreneurship programs to the particular challenges of early-stage, technology-based companies and no attention to IP. This is because entrepreneurship programs have arisen in business schools, not schools of science or engineering, and are rarely taught by professors who have an understanding of IP or who have run a technology-based company. This is not to say that the current entrepreneurship programs have no value to technology-based start-ups; quite the contrary, much of the material is relevant and important. However, current programs remain incomplete and need additional resources, interdisciplinary professors and practicing professionals to make them complete. TEC will provide these assets.

Several programs and courses of instruction will be offered.

1. Some new courses specifically designed for upper class and graduate engineers and scientists will be offered. One example will be "How to start a software company." This will be modeled on a course taught jointly by the Department of Computer Science and Engineering and the School of Business and Administration at the University of Washington. Other examples will be in finance, operations management and marketing for science, engineering and other students from the full spectrum of disciplines leading to technology-based start-up companies.

2. University Extension will offer at the Silicon Valley Center a new certificate program for graduate students. The course will be taught by TEC personnel and by business and law professionals living in Silicon Valley. Students are expected to come from a variety of sources – from contract managers in industry to software company executives, practicing attorneys and others who wish to switch their field of application.

3. Third, TEC will offer short courses in IP management for faculty, students and staff at UCSC. As our obligations to our colleagues and to companies increase, as patent and copyright law evolve, and as we manage more complex relationships, it is essential that we become knowledgeable about regulatory, legal and ethical issues related to commercial development of IP created by us. TEC will be a clearinghouse and an information center for dissemination, evaluation and discussion of important changes in regulations, law and ethical principles.

4. TEC will be an important teaching resource for the UC system of professional IP managers/licensing associates or officers. While UC has wide expertise in patent protection of IP and in patent licensing, there is not much depth of experience in licensing software and copyrighted material. Neither is there adequate experience in negotiating and concluding deals with start-up companies. Although the Association of University Technology Managers performs a valuable service in short courses, there is no substitute for on-site, accessible professionals who have great experience in the discipline. TEC will provide this expertise for managing IP and for creating successful start-ups.

Research

Research in enterprise creation has been pioneered by a relatively small coterie of major scholars for several decades, but in some respects it is still a new and evolving frontier. With changing technologies, new markets and new media, basic questions must be investigated anew, and a host of new phenomena must be studied. It should be noted that these studies initially would be empirical and descriptive rather than hypothesis-based. Studies will be focused on establishing and improving best practices. The studies will depend on close communication with technology-based business. Consequently, the work will be coordinated of necessity by at least one senior, experienced professor. In this context, the following questions are critical:

- What factors contribute to homegrown business success? What role do universities play?
- How do regions nurture growth in their existing entrepreneurial firms and attract new companies?
- How important is the link between entrepreneurship/economic development and research universities?
- Can more university faculty commercialize their research? How?
- What problems arise in the university from expanded entrepreneurial activity? How are those problems managed?
- What role do new technologies play in new business ventures?
- Are there general and industry-specific regulatory concerns that impede entrepreneurial advances?
- How should small technology companies market their products in national and global markets?
- What have been the unique challenges and successful strategies of special categories of entrepreneurs – e.g., minorities, women and immigrants?
- How do large, established companies maintain an entrepreneurial culture and design mechanisms to leverage the creative instincts of their employees?
- How do entrepreneurial personalities who build major companies institutionalize an innovative and creative culture in their growing companies, offsetting the stultifying effects of scale and bureaucracy?

These questions demonstrate a vital and relevant research agenda for the Center. Graduate professional education should be based on cutting-edge research, coupled with a systematic exposure to real entrepreneurs and entrepreneurial companies. Given the fast-paced movements in technology, new ventures, global competition and venture capital, plentiful opportunities for faculty research in entrepreneurship can be carried out on the frontiers of knowledge and practice. When new technologies are coupled with the high volume of entrepreneurial activity and new wealth creation in California, and indeed throughout the Pacific Rim today, remarkable opportunities exist to study and better understand these phenomena.

Another area of study will be the tech-transfer systems of the UC itself. TEC will be the focus for examining the effectiveness of UC policies, programs and procedures. The objective, after all, of a tech-transfer system is effective deployment of technologies in the public interest. If new policies and procedures can be developed which lead to more effective deployment, TEC should uncover them and spread the word.

OFFICE of SPONSORED PROJECTS:
Fiscal Year 2001-2002 — Fiscal Year 2110-11

Organizational Mission and Charge

The mission of the Office of Sponsored Projects (OSP) is to support, facilitate and promote world-class research. OSP also will continue its responsibility to support, facilitate and promote technology transfer until the Technology Enterprise Center (TEC) is formed.

Organizational Overview

OSP is UCSC's institutional agent for submission of research proposals to governmental, private and nonprofit funding sources, and it accepts awards from these sources on behalf of The Regents and UCSC. OSP represents the University's interests in award-acceptance negotiations and oversees compliance with governmental, private and nonprofit regulations governing grants, contracts and cooperative agreements and other post-award, non-financial research administrative matters.

In compliance with federal regulations dealing with the protection of human subjects in research, OSP provides administrative support to the University's Institutional Review Board (IRB), acting as the office of record for IRB records.

OSP also coordinates transfers of technology and intellectual property between the University and the Office of the President's Office of Technology Transfer and will continue to do so until the TEC is formed. OSP then will work closely with the TEC.

Fiscal Year 2001–2002 Status

As of Fiscal Year (FY) 2001–2001, OSP has authorization for 11.0 full-time employees (FTEs) (one Director, seven professional staff, one technical person and two support persons) and a budget of approximately $650,000. OSP central offices encompass 1,200 asf, and three additional offices, located in other academic buildings, include a total of about 300 asf for an overall total of 1,500 asf.

OSP's budget is made up of two equal funding streams: state general funds and returned indirect costs. OSP does not have a recharge structure, and all of our costs are allocated to the administrative indirect cost pool.

OSP works in an Apple Macintosh environment and maintains a networked grants database on an Apple server utilizing FileMakerPro™. The database is "read" accessible by the campus if the accessing workstation has its own copy of FMP. OSP also maintains its own Website (http://www.ucsc.edu/osp) on a second Apple server.

During FY 2000–2001, OSP submitted 720 proposals, accepted 678 awards and requested 212 no-cost time extensions. The total value of awards accepted during FY 2000–2001 was $65,001,788, and the total value of proposals submitted was $205,064,713. A summary statistic, to act as a workload metric, is $9.3 million in awards per professional staff person. This metric acts as a proxy for all proposal, award and no-cost time-extension activities and compliance responsibilities.

Planning Challenges

The campus has a stated goal of doubling the award level of grants and contracts in the next five years. To achieve that level with the optimum number of staff necessary, while protecting the integrity of the research enterprise and providing appropriate services to the principal investigators (PIs), will be the major planning challenge for OSP.

Planning Principles

While carrying out the planning and execution processes over the next ten years, OSP will be guided by two principles: responsive service and responsible stewardship (**RS^2**). Responsive service means that our organization must be of the "open" type, where staff are cross-trained and able to perform a variety of functions and the dominant office culture is "can do." In contrast to a "closed" organization with highly segmented and specialized personnel, the open organization can respond quickly to new opportunities through internal reallocation of resources until the need for additional resources is more clearly defined and empirically based.

The hallmarks of responsive service are scalability and flexibility. In concrete terms, this means OSP will continually reassign staff to meet new workload demands and not request more staffing until there exists a higher and sustained demand for its services.

To increase our responsiveness, we will continue to co-locate staff in areas of high demand. Prior to FY 2000, we had only one co-located staff person (in Sinsheimer), and today we have three (Sinsheimer, Baskin SOE, and EMS). As future areas of demand develop (e.g., Long Marine Lab, Interdisciplinary Science Building, Silicon Valley Center, and MBEST), OSP will

continue its planning practice of co-location whenever a sustained demand calls for it (i.e., an award level of $9.3M) and space (i.e., 100 asf) is available. A distributed system creates a challenging management situation, but the increased responsiveness currently appears worth the effort. Faculty served through these co-locations are very supportive of this approach.

Another aspect of responsive service is to make as many of our routine, current, paper-based transactions to be either Web-based or accessible via interactive PDF forms that can be completed online. At the risk of accelerating the "clericalization" of faculty, OSP will continue to make available alternative self-servicing technologies to facilitate asynchronous transactions and expand the number and type of administrative e-transactions researchers can perform.

Responsible stewardship is the second part of our **RS^2** equation and refers to OSP's fiduciary and regulatory responsibilities to both The Regents and to the funders, to insure proper fiscal and compliance practices are in place that protect The Regents, funders, researchers and research subjects. Major areas of focus are the protection of human subjects in research, as carried out by UCSC's Institutional Review Board (IRB) and staffed by OSP, and financial disclosures and statements of economic interest, from principal investigators and maintained by OSP.

In addition to these two major areas, OSP must be cognizant of all the different guidelines and regulations required by the different funding sources and that govern grants, contracts and cooperative agreements. Last fiscal year OSP received awards from 190 different funding sources, and staff must be knowledgeable of the different policies affecting these awards.

Planning Assumptions

As with all plans, we cannot control externalities (e.g., state budget cuts and changed federal funding priorities) that may change our assumptions. Nor can we anticipate what those externalities may be (e.g., in all the individual plans that made up the spring planning phase, there was no mention of Islam, Central Asia or Afghanistan). These contingencies underscore the need for our plans to be flexible and scaleable, particularly for a support unit responsive to academic research priorities not yet fully developed.

Given these uncertainties our planning assumptions focus around the future economic activity of California and the nation. To a large extent the availability of grant funds is a function of the state and federal budget which are dependent on tax revenues. These revenues, in turn, are a function of the economy's health. Consequently we have posited three economic futures—recessionary, mixed, and expansionary—and developed three scenarios for the future of OSP over the next ten years. These scenarios are summarized below in table 1.

Table 1. Future Scenarios for the Office of Sponsored Projects

Variables	**Scenarios**		
Economy	**Recessionary**	**Mixed**	**Expansionary**
Average Award Rate of Growth	4%	8%	12%
Avg. No. New Faculty FTE/Year	11	23	34
Award Level at 5 Years	$82.1M	$102.5M	$125.9M
Award Level at 10 Years	$103.1M	$157.6M	$233.4M
OSP Service Level	Basic	Enhanced	Full
Staffing at 5 Years	13	15	17
Space at 5 Years	1,700 asf	1,900 asf	2,100 asf
Budget at 5 Years	$845,000	$975,000	$1,105,000
Staffing at 10 Years	15	23	33
Space at 10 Years	1,900 asf	2,700 asf	3,700 asf
Budget at 10 Years	$975,000	$1,495,000	$2,145,000
Funding: Gen. Funds–Indirect Costs	50–50	25–75	0–100

What follows are definitions of the variables and how we arrived at the values in table 1.

Economy, New Faculty Full-Time Employees, and Award Levels

We use three broadly defined terms to describe the general economic health that may characterize the next five to ten years: "recessionary," "mixed" and "expansionary." We use "recessionary" to characterize periods of declining economic activity, producing lower tax revenues and forcing federal and state budgets to contract and reduce discretionary funding for R & D and other non-mandated sectors. Federal budget deficits are likely in this scenario. This future will be one of retrenchment for OSP, with a 4% annual average growth in award dollars achieved mainly through inflation, and limited growth in the number faculty allowed to be hired during these budget-cutting years. We estimate that one-third, or 11, of the hoped-for increase of new faculty FTE of 34 per year would be hired during these recessionary times.

The "mixed" scenario is not as bleak as "recessionary." We predict an economy with years of mild recessions alternating with years of positive economic growth. The growth in tax revenues will be stable, if slow. Those responsible for budgets will be cautious to make long-term commitments, and research projects will be modest in scale. We posit an average annual rate of increase in awards to be 8%, largely due to inflation, and more faculty being hired. We expect 23 new faculty FTE per year to be hired, or two-thirds of the hoped-for 34 per year.

The "expansionary" scenario is one of sustained, positive economic growth that will create budget surpluses and increases in discretionary funding for R & D. The private sector also will be expanding and spending more on university research. We foresee an average annual rate of increase in award dollars to be 12%, similar to the rate during the last US expansionary period, and the hiring of 34 new faculty FTE per year.

Three Possible Futures for OSP

OSP's three possible futures are in function of the award levels described above. At the "basic" services level, and applying the workload metric of $9.3M per professional FTE, OSP has 13 staff at the "basic" level of services in five years: the required professional staff, plus an office manager, a computer support person and a clerical assistant. To this core is added a compliance officer. UCSC's OSP is the last UC sponsored projects office not to have a full-time compliance officer, to oversee human subjects research, financial disclosures and statements of economic interest. This position is a high OSP priority, and we will be requesting that it be filled as early in the next ten years as possible, independent of any particular scenario.

At the "enhanced" level of services, we add to these core staff functions an information specialist, responsible for communicating funding opportunities to the research community, and a data analysis person, to respond to ad hoc reporting requests and carry out special analyses as requested by the OR Directors and the VCR.

At the "full" level of services, we add another dissemination person, and a communications specialist to develop written and other media products to publicize the research achievements at UCSC.

Funding

Currently the OSP budget is funded 50–50 by state general funds and federal indirect costs. As our total award level increases, so shall our recovered indirect costs. We estimated federal recovered indirects could reach as high as $25M by FY 2011 under the "expansionary" scenario. If the "expansionary" scenario comes to be, OSP could be funded 100% through recovered federal indirects, thereby relieving demands on the campus' state general fund budget.

Space

Space is a function of the projected FTEs, and we assume 100 asf per FTE plus 400 asf for meeting room, computer room, printing and proposal assemblage room and file room.

Technology

Independent of any scenario, we will emphasize the use of Web-based technologies to facilitate administrative transactions between researchers and OSP. For example, a near-term goal is to enable PIs to submit for approval via the Web human subjects protocols that are exempt from having to use informed consents. Other administrative actions related to human subjects protocols would also be Web-enabled (e.g., requests for time extensions and withdrawals).

To facilitate the growing number of awarded budgets that have to be entered into BANNER, presently done manually by Extra Mural Fund (EMF), OSP will work together with EMF to create an electronic transfer of budget data from the OSP database into BANNER.

As other opportunities to minimize the amount of hands-on, paper transactions emerge, OSP will take advantage of them to increase the number and types of e-transactions.

Accountability

OSP's performance may be held accountable by the review of two metrics: number of proposals by ladder faculty and award dollars by ladder faculty. These metrics are used by the American Association of Universities and are accepted as proxies for research activity at leading universities.