

The Regents of the University of California

**COMMITTEE ON EDUCATIONAL POLICY**

May 15-16, 2013

The Committee on Educational Policy met on the above dates at the Sacramento Convention Center, 1400 J Street, Sacramento.

Members present: Regents Island, Kieffer, Reiss, Rubenstein, and Stein; Ex officio members Brown, Lansing, and Yudof; Advisory members Feingold, Flores, and Jacob; Staff Advisors Barton and Smith

In attendance: Regents Blum, De La Peña, Makarechian, Mendelson, Pattiz, Ruiz, Varner, and Zettel, Regent-designate Schultz, Faculty Representative Powell, Secretary and Chief of Staff Kelman, Associate Secretary Shaw, General Counsel Robinson, Chief Investment Officer Berggren, Provost Dorr, Executive Vice President Brostrom, Senior Vice Presidents Dooley and Stobo, Vice Presidents Allen-Diaz, Beckwith, Duckett, Lenz, and Sakaki, Chancellors Birgeneau, Block, Blumenthal, Drake, Katehi, Khosla, Leland, and Yang, Acting Chancellor Conoley, and Recording Secretary McCarthy

The meeting convened at 1:20 p.m. with Committee Chair Reiss presiding.

**1. APPROVAL OF MINUTES OF PREVIOUS MEETING**

Upon motion duly made and seconded, the minutes of the meeting of March 13, 2013 were approved.

**2. ACADEMIC PERFORMANCE INDICATORS AT THE UNIVERSITY OF CALIFORNIA**

[Background material was provided to Regents in advance of the meeting, and a copy is on file in the Office of the Secretary and Chief of Staff.]

Committee Chair Reiss stated that this discussion about academic performance indicators at UC was in response to a request from Regents for an evaluation of whether the University is meeting its academic mission, with a particular focus on the importance of UC's faculty.

Provost Dorr said she was pleased to respond to the Regents' request for a report on how UC is meeting its instructional mission and the work of the ladder-rank faculty who are key to achieving this mission. She noted that this discussion would not cover faculty in the health sciences, because that field is so different that it merits its own presentation; this discussion would focus on students and faculty at UC's general campuses.

Ms. Dorr said that she would focus on four topics: (1) major UC educational accomplishments despite existing challenges; (2) factors that contribute to these accomplishments; (3) future challenges; and (4) ways to manage these challenges well.

Ms. Dorr emphasized that UC has achieved tremendous accomplishments during very difficult financial times when the viability of public research universities has been questioned. UC undergraduate graduation rates and time to degree have improved over the past two decades, for students who enter both as freshmen and as transfers. She displayed a chart showing four-, five-, and six-year graduation rates for the past 20 years for students entering as freshmen. While six-year graduation rates for these students increased from 76 percent to 83 percent, their four-year graduation rates during that period increased from 37 percent to 60 percent. Ms. Dorr noted that six-year graduation rates are the nationally recognized performance measure. Graduation rates for transfer students are similar, but on a two- and four-year scale, with two-year rates having increased from 29 percent to 54 percent in the last 20 years; the four-year rates have increased from 77 percent to 85 percent, which Ms. Dorr characterized as excellent, similar to six-year rates for students admitted as freshmen.

Ms. Dorr explained that data presented would show comparisons of UC over time, or UC compared with its peer elite research institutions, mostly others in the Association of American Universities (AAU), as a way to look for signs of degradation as a result of UC's funding challenges. The AAU is a consortium of 60 U.S. and two Canadian elite public and private research universities. Six UC campuses, Berkeley, Davis, Irvine, Los Angeles, San Diego, and Santa Barbara, are members of the AAU, a number far exceeding any other public university.

UC's undergraduate four- and six-year graduation rates are higher than rates at other AAU public universities and lower than at AAU private universities. The 26 AAU private universities' average four-year graduation rate is 81 percent and their six-year average is 90 percent.

Ms. Dorr displayed a graph comparing the freshman graduation rates of UC's six AAU campuses with the rates of flagship campuses of other AAU public universities. The University of Virginia has the highest four- and six-year rates, followed closely by the University of Michigan at Ann Arbor. UC's four-year graduation rates are distributed in the middle of this group, but all six UC AAU campuses exceeded the six-year graduation rates of the University of Illinois at Urbana-Champaign, the University of Wisconsin at Madison, the University of Texas at Austin, and the University of Washington at Seattle, an achievement Ms. Dorr characterized as outstanding.

Ms. Dorr emphasized UC's point of pride that it educates many undergraduates from low-income families, students who are the first in their families to attend college, and students whose first language is not English. She displayed a chart showing the percentages of students who receive Pell Grants, University-wide and by individual UC campus, and selected private and public comparator universities. Pell Grants are awarded to students whose families earn less than \$50,000 per year. UC exceeds all comparators

and Ms. Dorr said that UC does equally well in the percentage of first-generation college students and those whose first language is not English. Students who received Pell Grants take slightly longer to graduate than do students who have never received a Pell Grant. Ms. Dorr said this is probably attributable to their lack of familiarity with college, and that they may come from schools that did not prepare them for college as well. At UC, 80 percent of students who entered as freshmen and received a Pell Grant graduated within six years, compared with 84 percent of freshmen who entered at the same time and never received a Pell Grant.

Ms. Dorr discussed graduate academic and professional students, an essential part of UC as a world-class public research university. Graduates of UC's professional programs contribute doctors, nurses, veterinarians, optometrists, lawyers, and business people to the state; UC's graduate academic programs educate the next generation's leaders in creativity and citizenship. Ms. Dorr said that UC lags behind its AAU public and private peers in its proportion of graduate students, currently 22 percent, compared with 27 percent in AAU public and 53 percent in AAU private universities. It has long been a goal of the University to increase this proportion. Ms. Dorr said that, while the number of UC's graduate students has increased, its number of undergraduates has also increased, so the ratio of graduate to undergraduate students has remained the same.

Ms. Dorr displayed a slide showing time to degree for Ph.D. programs in various fields, comparing UC's systemwide rates to those of private and public AAU universities. She noted there are substantial variations in time to degree expectations and pedagogical practices among Ph.D. programs in different fields. Average time to Ph.D. degree at UC systemwide and AAU public and private universities is identical at 5.7 years; however, Ph.D.s in arts and humanities take longer on average than those in engineering and science. UC's time to Ph.D. in all fields is the same or lower than AAU public and private universities, except in psychology and the social sciences. Ms. Dorr expressed her view that it is reasonable to ask whether these times to degree are quick enough.

Ms. Dorr addressed the question of whether the reduced time to undergraduate degree has come at the cost of the quality of the undergraduate education. UC faculty approve all UC courses and periodically review every degree program, providing some assurance that the courses and programs are of good quality. She displayed results of the biennial University of California Undergraduate Education Survey (UCUES). The 2012 UCUES survey revealed no change in the percentage of UC undergraduates who expressed considerable satisfaction with their overall academic experience and the quality of faculty instruction. The only UCUES answer that had changed was a response to a question about the value of a UC education for the price the student was paying; students' evaluations have gone down as tuition has increased, showing that students are quite aware that they are paying more for the same education.

Ms. Dorr said that UC's accomplishments during a time of great financial stress can be attributed to many factors. The campuses have used multiple strategies to protect educational programs while coping with decreased funding and increased mandatory costs. Faculty have done their part, as shown by comparisons over time and with peer

universities in measures of degree productivity and instructional effort. She displayed a chart showing that UC's number of bachelors' degrees per ladder-rank faculty member was much greater than at both AAU private and public peer universities in 2005-06 and that UC's had increased since then. Ms. Dorr displayed a graph showing that UC's student/faculty ratio had increased from 20:1 to 23.5:1 in the 20 years from 1990-91 to 2010-11, requiring more faculty time advising, mentoring, holding office hours, and teaching. The budgeted student/faculty ratio of 18.7:1 had not been achieved since some time before those 20 years. Another graph showed that UC's student body has grown at a faster rate than its faculty has, since the University's capacity to hire new faculty has been greatly reduced and the University has chosen to continue to meet its obligations under the California Master Plan for Higher Education, admitting every eligible resident student who applied. From 1990-91 to 2010-11, UC's student population increased from 143,000 to 220,000; its number of faculty increased from 7,200 to 9,400. The graph showed that the growth rate of students and faculty is increasingly divergent, since the growth rate of the faculty has not been keeping up with the growth rate of the student population. This trend has resulted in more students per each faculty member.

Ms. Dorr said that one way in which this higher student/faculty ratio has been handled is by ladder-rank faculty teaching more student credit hours. She displayed a graph showing that in 1990-91 each ladder-rank faculty member taught an average of 693 student credit hours; by 2010-11 that average had increased to 782 student credit hours. Ms. Dorr said times of increased teaching loads through the years have corresponded to times of budget cuts. The graph also demonstrates that, during times of increased funding, the number of student credit hours per ladder-rank faculty had decreased, allowing faculty more time for their other responsibilities in addition to teaching. Even if class sizes are increased, faculty are nonetheless working harder, because they have more students to advise, more papers to grade, more teaching assistants to supervise, and must devote more attention to ways to handle larger groups of students. Large classes require creating opportunities for students to interact in smaller groups with teaching assistants, with fellow students, and with problem sets for which students get immediate feedback. Depending on how they are structured, larger classes do not necessarily mean a reduced educational experience for students. More student credit hours per ladder-rank faculty member can also be the result of faculty's teaching more courses, and in fact the average number of courses ladder-rank faculty teach has increased. Ms. Dorr expressed her view that the nationally recognized measure of student credit hours per ladder-rank faculty is a much better indicator of faculty workload than is the number of courses taught. Student credit hours simultaneously consider both the unit value of a course and the number of students in the course.

Ms. Dorr commented that the University should be proud of its faculty's increased productivity, but cautioned that it is unknown whether greater efficiency and productivity would lead to a decrease in the quality of a UC education or faculty attainments in research and service. She emphasized the necessity for vigilance going forward to maintain UC's excellence in its teaching, research, and public service missions, during a time that is likely to continue to be financially challenging. UC's ladder-rank faculty are

essential to its continued success, and are needed in large enough numbers to be able to be fully engaged in all parts of the University's mission.

Ms. Dorr said that the job description for UC ladder-rank faculty states clearly that superior accomplishment in both teaching and research, or other creative activity is required. Time estimates have shown that faculty spend about half their time on instruction. Close to half of all undergraduate, lower-division student credit hours are attributable to ladder-rank faculty.

Research funding, one measure of the amount of research being performed by faculty and extremely important for the University, has increased over the past 20 years, although the rate of increase has slowed. Ms. Dorr noted that research funding would be reduced in the upcoming year because of automatic federal budget cuts known as sequestration that began on March 1, 2013, in addition to other prior reductions to federal research funding.

Ms. Dorr said it is likely that continuing to provide a high-quality education to undergraduates and graduate students would become increasingly challenging. While Governor Brown had called for a five-percent increase in UC funding, the University faces increased mandatory costs that will consume most, if not all, of that additional funding. There is currently no provision for funding for enrollment growth and there is a clear expectation that tuition will be frozen for multiple years at its current level. While UC has been creative at developing new revenue streams, these have not come close to replacing reduced State funds and providing for increased mandatory costs. Extensive cutting and control of costs also cannot make up the lost funding. Ms. Dorr said that UC's faculty salaries are low compared with its competitors', particularly considering the cost of living in California. UC's faculty and staff are aging and it will be difficult to find high-quality replacements at current salary levels. Ms. Dorr cautioned about asking the University to accomplish too much with too few resources, after it has given so richly to the people of California.

Should current trends continue, Ms. Dorr said the University would not have funds to hire sufficient faculty, while continuing to accept eligible California high school graduates, further exacerbating the student/faculty ratio. Ms. Dorr expressed her view that UC will find itself in difficult financial circumstances for years to come and that maintaining its quality will take a great deal of work and creativity. As in the past, ladder-rank faculty will do their part. It is projected that student credit hours per ladder-rank faculty member will increase ten percent over the upcoming five years.

Ms. Dorr said the background material provided for the discussion offers suggestions of ways to sustain graduation rates and educational quality. Faculty-focused strategies include having faculty teach more, even though there would be some negative consequences. Another strategy could be to increase the proportion of instruction offered by academic appointees who do not have research responsibilities, saving money and freeing ladder-rank faculty to fulfill all their responsibilities. Another strategy would be to increase instructional responsibilities and re-balance other duties for ladder-rank faculty who find that instruction is their area of greatest interest and strength.

Ms. Dorr emphasized the importance of focusing on outcomes that are in accord with the University's goals and values, even in times of financial difficulty. Once these goals are established, then it can be determined how the University as a whole and its campuses can orchestrate those outcomes for their particular students and programs. The following goals were developed in consultation with the faculty: (1) reasonable graduation rates; (2) increasing four-year graduation rates for students entering as freshmen and two-year rates for transfer students; (3) decreasing time to degree for carefully selected doctoral programs; and (4) sustaining students' and faculty's positive evaluations of the quality of a UC education. Ms. Dorr advocated use of systemwide outcome-based goals with campus-specific implementation that would include contributions from ladder-rank faculty.

Governor Brown stated that Ms. Dorr's presentation and the information contained therein were very useful and provoked further questions, given the number of relevant variables. Regarding information provided about four-, five-, and six-year graduation rates for the general campuses from 1992 through 2007, Governor Brown stated his preference for focusing on the four-year graduation rates. He noted that the four-year rates vary among the campuses, and asked whether any specific factors could be identified to explain times at various campuses when their four-year graduation rates increased noticeably. If the four-year graduation rates could be improved, more students would be able to pass through the University. Governor Brown expressed his view that it would be beneficial to explore factors underlying this data further, particularly any correlations between external events, students' financial circumstances, or factors under the University's control and four-year graduation rates.

Governor Brown asked what the appropriate goal for the proportion of graduate to undergraduate students would be.

Chairman Lansing congratulated Ms. Dorr on her presentation and commended the faculty for embracing discussion of these issues in the context of maintaining the quality of a UC education. Chairman Lansing said she would be interested in statistics on the relationship between the number of hours students have jobs and the students' time to degree. She recalled hearing from many students during her campus visits that they could not complete their degree in four years because they had to work at a job substantial hours to augment their financial aid or to pay for living expenses. Chairman Lansing pointed out that students at some UC campuses were likely better prepared for college-level coursework when they come to UC, contributing to those campuses' higher four-year graduation rates. Chairman Lansing requested information about how large an effect the availability of courses has on students' time to degree. She agreed that it would be important to try to specify which factors contribute to variations in time to degree, so that the University can make necessary adjustments in factors that are within its control. Committee Chair Reiss agreed that it would be valuable to focus on reasons why a particular campus might be improving its four-year graduation rate.

Ms. Dorr agreed that further exploration into underlying causes of increases in graduation rates could be helpful, and could lead to reasonable improvement goals for each campus.

She emphasized that there are multiple variables underlying these data. Governor Brown expressed hope that it would be possible to learn what factors increase four-year graduation rates at any campus, and the relative importance of different factors, so that the Regents could learn what changes would be most effective.

Ms. Dorr stated that strategies effective in reducing time to degree have been developed by the campuses. She said it is known that it is not the case that there are huge bottlenecks on campuses accounting for all of the difficulties; it is also known that undergraduates' employment complicates their ability to accomplish their academic goals. There is a good deal of research on the effects of confidence levels of students who do not feel as though they belong at a UC campus, for instance first-generation college students, those from underrepresented ethnic groups, or women who are in majors largely populated with men. Ms. Dorr affirmed that UC would not change its commitment to educate first-generation students from low-income families that are a significant portion of UC's student population. If that accounts for some increase in time to degree, then it has to be either accepted or other ways must be found to help these students have more time for their studies so they can move along more rapidly.

President Yudof expressed his long-time support for attempting to tabulate characteristics of students and programs leading to better predictors of outcomes. He stated that his reviews of the data have shown that students' holding jobs did not matter very much. While having to work was a strain on students, it did not correlate with students' grade point averages. Data show that selectivity at entry level is very important; campuses with more students with higher SAT scores and higher high school GPAs have higher four-year graduation rates. President Yudof added that the economy is also an important factor. He expressed his view that part of the reason that UC's time to degree is decreasing is the cost of higher education in a difficult economy. Economic pressure on families can result in students' wanting to complete their education more quickly. Degree complexity, such as requiring too many prerequisites or too many courses in a major, can delay students. President Yudof said that UCLA had been leader in degree simplification, through faculty reexamination of requirements. He noted that these factors can be difficult to quantify. Parents' encouraging their children to graduate on time is an important factor. Counseling and computer notification programs that help students keep track of their progress toward their degrees are effective. President Yudof agreed with Governor Brown that the four-year graduation rate would be the preferable performance measure, rather than the six-year rate. He noted that there is a four to six-year lag in obtaining data, so that it is difficult to know quickly whether intervention measures have been successful. President Yudof said that the University supports efforts to increase graduation rates, so long as they are practical and respectful of students. He cautioned that linking graduation rates to specific factors has proven elusive in higher education.

Governor Brown responded that, if parental expectations are a factor in reducing time to degree, then perhaps the University could use its in loco parentis role to the same end. Ms. Dorr stated that one of the University's recommendations is to keep track of students' progress and begin counseling students promptly who are progressing slowly. She reported that the only effective intervention a UC Santa Barbara study found was

providing students with a counselor who paid attention to them quickly and consistently. Governor Brown emphasized the importance of knowing the reasons underlying the improvement in UC's graduation rates, so that future efforts can be effective. Committee Chair Reiss said that campuses have information about best practices that have helped increase their four-year graduation rates. Ms. Dorr encouraged a review of the structure-focused strategies recommended in the background materials provided.

Regent Blum stated that the campuses' graduation rates must be viewed in terms of the majors of their graduates, since some fields may require more difficult coursework than others.

Regent Island thanked Ms. Dorr for her presentation. He expressed pride in the percentage of UC undergraduates who receive Pell Grants, and concern about focusing on time to degree, noting that data would support becoming more selective to reduce time to degree. Although more highly qualified students could graduate more quickly, that is not UC's mission. Regent Island stated that time to degree could be decreased by hiring more faculty, adding more classes, and giving students more scholarships so they did not have to work several jobs. He expressed his view that time to degree is a cost driver for families, but not for the University. Regent Island said that it would be inappropriate to focus solely on time to degree, and become more selective, closing doors to underrepresented minority students, whom UC already had difficulty admitting in sufficient numbers. Even when UC finds underrepresented minority students who meet its admission standards, these students are often unable to attend UC because of their fear of the cost of a UC education. He urged the Regents to stay focused on UC's higher mission to provide a high-quality education to the largest number of qualified students in the state.

Regent-designate Flores expressed her view that the Board should take a holistic approach in evaluating time to degree, in particular for those students who work two or three jobs to pay for their education and living expenses. Issues such as having sufficient course offerings and campus institutional support for students are some of the complicated factors affecting students' time to degree.

Regent Makarechian asked whether there was any time limit on the \$15,700 average financial aid received by 65 percent of UC's undergraduates to which President Yudof had referred in his State of the University report. Interim Director for Student Financial Support David Alcocer stated that there are no specific time limits for eligibility for financial aid; rather eligibility is tied to students' making some satisfactory academic progress, based on the philosophy that if an admitted student is maintaining his or her academic standards, then the University should continue to provide aid, so that the University can remain affordable to the student. Regent Makarechian asked whether a student who remained an undergraduate at UC for eight or nine years would still get financial aid. Mr. Alcocer responded that a student who took that long to graduate would have lost eligibility at some point, since it was unlikely the student would have passed a sufficient number of units. He said the standard for satisfactory academic progress varies



slightly among campuses, but in general requires a student to be enrolled full time, taking a minimum of 12 units and to maintain a minimum grade point average.

Governor Brown said he had proposed that the Cal Grant Program have grade point average requirements and time limits, but his proposal had not been well received. He said his office is searching for ways to align incentives to encourage students to graduate on time. He noted that if the University could increase its four-year graduation rate, students from low-income families would benefit since the University could accommodate more students.

Faculty Representative Powell commended the collaboration among Ms. Dorr and the faculty representatives in preparing for this discussion, and reported that the Academic Council is generally supportive of her comments. Mr. Powell agreed with Regent Blum's comments that time to degree must be examined for individual majors; he added that the systematic nature of engineering degree programs can make it easier to move through the coursework in a timely fashion. In considering curriculum reform, Mr. Powell emphasized the importance of student advising, which has been greatly threatened by budget cuts, with the ratio of advisors to students increasing in recent years. Strategic use of summer sessions is also extremely important in reducing time to degree, although as the financial model changes for summer sessions, this is also being threatened. The culture among students is also important; juniors and seniors can be effective mentors for freshmen and transfer students. Mr. Powell expressed the faculty's commitment to the importance of accessibility, in agreement with Regent Island's comments. Mr. Powell stated that, while focusing on time to degree is important, it should not be over-emphasized. Many students who graduate in five years have had significant educational experiences during that time that will enhance their careers going forward.

Committee Chair Reiss thanked Ms. Dorr for her presentation. She pointed out that the focus of the current discussion was not just time to degree, but rather the broader topic of whether UC is meeting its educational mission.

Regent Kieffer agreed that parental expectations play a role in reducing time to degree, particularly if tuition is high. He expressed his view that student selectivity and preparation for college-level studies have a large bearing on time to degree. Regent Kieffer asked why the time to a Ph.D. is so much longer for graduate students in the humanities and social sciences than for those in STEM (science, technology, engineering, and mathematics) fields. Ms. Dorr responded that the expectation for STEM doctoral candidates is that they write a dissertation typically tied closely to their advisors' research, after which they would become post-doctoral scholars, then find positions at universities if they intend to become academics. On the other hand, in the humanities and social sciences, the expected product might more closely resemble a book than a single study. She added that the STEM fields are generally better funded than the humanities, so students have more support as research assistants. If humanities and social science graduate students receive support from the University, they are often teaching assistants with work not directly related to their own research. Regent Kieffer recommended a

review of core curriculum requirements in the various disciplines, including general education requirements.

Chairman Lansing asked that Ms. Dorr update the Committee further at a future meeting.

The Committee recessed at 2:50 p.m.

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The Committee reconvened at 10:50 a.m. on May 16, 2013, with Committee Chair Reiss presiding.

Members present: Regents Island, Kieffer, Reiss, Rubenstein, and Stein; Ex officio members Lansing and Yudof; Advisory members Feingold and Flores; Staff Advisors Barton and Smith

In attendance: Regents Blum, De La Peña, Makarechian, Mendelson, Ruiz, Varner, and Zettel, Regent-designate Schultz, Secretary and Chief of Staff Kelman, Associate Secretary Shaw, General Counsel Robinson, Provost Dorr, Executive Vice President Brostrom, Senior Vice Presidents Dooley and Stobo, Vice Presidents Allen-Diaz, Duckett, Lenz, and Sakaki, Chancellors Birgeneau, Blumenthal, Leland, and Yang, Acting Chancellor Conoley, and Recording Secretary McCarthy

### 3. **INVESTING IN CALIFORNIA: THE UNIVERSITY OF CALIFORNIA'S DIVISION OF AGRICULTURE AND NATURAL RESOURCES**

[Background material was provided to Regents in advance of the meeting, and a copy is on file in the Office of the Secretary and Chief of Staff.]

Committee Chair Reiss stated that this discussion of UC's Division of Agriculture and Natural Resources (UC ANR) would be another reminder of why UC is the top public university in the world. Provost Dorr introduced Vice President of Agriculture and Natural Resources Allen-Diaz, who holds the prestigious Russell Rustici Chair in Rangeland Management in the College of Natural Resources at UC Berkeley. After earning her undergraduate, master's degree, and Ph.D. from UC Berkeley, Ms. Allen-Diaz spent six years as a regional ecologist, then returned to UC Berkeley where she has been a faculty member since 1986. In 2007, she took a leave from UC Berkeley to serve in her current position at UC Office of the President.

Ms. Allen-Diaz began her presentation by noting the widespread influence of UC ANR. California would not be able to produce as much food as it does for the state, the nation, and the world without UC ANR's discovering more varieties of crops, safe ways to produce more food per acre, methods to improve conservation of water, new irrigation systems, technologies for nutrient management, Integrated Pest Management Program to

reduce the amounts of pesticides used, and other programs linking students and the public with food, nutrition, and human health.

Ms. Allen-Diaz recounted UC's history as a public land grant university, founded by the Morrill Act 150 years prior. UC ANR was delegated the responsibility of leading the Agricultural Experiment Station and the Cooperative Extension arms of UC. Agricultural Experiment Stations, founded by the Hatch Act of 1887, were attached to the land grant universities to focus on research of importance to agriculture and conservation. UC's three Agricultural Experiment Station campuses are UC Berkeley, UC Davis, which was recently ranked first in the world in agricultural research and education, and UC Riverside, originally the citrus experiment station. These three campuses were charged with carrying out UC's mission of education and research in agriculture, natural resources, nutrition, and youth programs. The second part of UC ANR is the Cooperative Extension, started in 1913 in anticipation of its establishment by the 1914 Smith Lever Act, to conduct local, problem-solving research, and provide local communities with the best science-based solutions to their problems and science-based educational programs. Cooperative Extension is the face of UC in many communities and its programs improve local individuals' production practices, soil conservation, pest and disease reduction, and water conservation. The third part of UC ANR is the research and extension center system, nine centers and facilities spread throughout the state, providing academics places to conduct innovative research.

Ms. Allen-Diaz emphasized that UC's place in agriculture and natural resources is a triumph of federal, State, and local funding, resulting in innovative research coupled with on-the-ground academics solving some of the most vexing problems in areas such as plant and animal productivity, food safety, water and soil conservation, and invasive pests and diseases. With UC as a vital partner, California producers grow more than 400 crops, and employ 800,000 workers on more than 81,000 farms. Over the past 30 years, with UC's help, California has increased its production of milk more than 40 percent, processing tomatoes by more than 69 percent, and almonds by 122 percent. New production methods have helped growers save more than 100,000 acre-feet of water per year.

UC ANR also sponsors 4-H and nutrition education programs that reach more than 225,000 K-12 students. UC ANR's Master Gardener program has more than 5,000 UC-trained adult volunteers who provide the public ways to grow food, conserve water, eradicate invasive species, reduce pesticide use, develop community gardens, and establish farmers' markets. UC's science-based solutions address issues of nitrate pollution, development of new varieties of strawberries and mandarin oranges, currently in the top 25 of income-producing patents, production of olive oil and wine, and feeding the earth's growing population.

Ms. Allen-Diaz emphasized that UC ANR works in partnership with industry, UC campuses, California State University campuses, and federal, State, and local government organizations. UC ANR is a critical link between local issues and the power of UC research. Like every other part of the University, UC ANR continues to implement new

models of service delivery with reduced numbers of employees, to increase fundraising efforts, reduce administrative overhead, and reinvest savings into programs. Ms. Allen-Diaz expressed UC ANR's view that many of the developments necessary to meet the challenge of producing safe, affordable, sustainable, and nutritious food are public benefits that are not easily expressed in dollar amounts. She expressed pride in UC ANR's role as part of the fabric of the University's research, education, and public service mission. She showed a brief film tribute to the 100th anniversary of Cooperative Extension.

Committee Chair Reiss commented that the presentation was an important part of UC's advocacy campaign in communicating the importance of UC's research to the people of California.

Regent Blum noted the importance of the work of UC ANR. His own work on issues of global poverty has shown that issues of food security are a primary concern worldwide. He said the Agency for International Development has a \$2 billion annual program regarding food security. Regent Blum said that close to one billion people worldwide currently suffer from malnutrition or starvation, and the world's population is expected to grow to nine billion by 2050. In order to meet the world's need for food, production will need to be increased by 70 percent. The work of UC campuses in this area is critically important for both California and the world. Regent Blum expressed concern that the number of staff at UC ANR had been reduced. Given that the federal government is aware of the importance of UC's work in the crucial area of food security, Regent Blum asked whether UC ANR needed more help with advocacy for federal funding of its programs. Ms. Allen-Diaz responded that UC ANR has had budget constraints like all of UC. More academics are retiring than can be replaced, even though an aggressive hiring program is in place and there is enormous interest among young academics. Ms. Allen-Diaz said it would take a broad range of expertise to address these serious food supply questions; no one solution will solve the problems of human hunger and poverty.

Regent Makarechian recalled the National Laboratories' presentation the prior day regarding climate change, a predicted reduction in rainfall, and the importance of water supply issues. He asked whether UC ANR exchanges information with the National Laboratories, and if UC ANR has any involvement with Governor Brown's proposal to move water from northern to southern California. Ms. Allen-Diaz responded that UC ANR is actively involved in putting together groups of researchers to address some of these questions. She stated that the Laboratories' presentation focused on their research regarding climate modeling, while UC ANR's work focuses on biological adaptations and mitigation. UC ANR uses the modeling data from the National Laboratories to help focus efforts on plant productivity, adaptation of plants to climate change, water use efficiency, and efforts to increase the capacity of irrigation systems. Integration occurs across these areas, since UC ANR works with growers who are actively trying to solve these problems and remain economically viable. UC is working at the forefront and on multiple levels to pursue solutions.

Regent Ruiz thanked Ms. Allen-Diaz for her presentation and stressed the importance of the work of the UC ANR for California, the nation, and the world. While particularly aware of the importance of UC ANR's work regarding food issues because of his own background in the food industry, Regent Ruiz said its work is crucial in many other areas that are essential for everyone's lives, such as air and water quality. Regent Ruiz reported enormous international interest in California's food industry practices and research, since California plays such an important role in feeding the world. He expressed support for educating the Regents to better understand the importance of UC ANR's work.

Committee Chair Reiss asked Ms. Allen-Diaz to communicate to her team the Regents' support for the work of UC ANR.

The meeting adjourned at 11:20 a.m.

Attest:

Secretary and Chief of Staff