



TEXAS A&M UNIVERSITY
Department of Wildlife & Fisheries Sciences

May 25, 1998

MEMORANDUM

To: **Participants in the 1st National Natural Resources Extension Conference**

From: **Dr. Robert D. Brown**

Subj: **"Natural Resources Challenges for Land Grant Colleges in the 21st Century"**

I have had over 50 requests from the participants at this conference for a copy of my presentation, "Natural Resources Challenges for Land Grant Colleges in the 21st Century." Rather than respond to each request, I found it easier to simply scan the list of participants into our computer, and then send each of you a copy of the presentation, along with copies of some of the slides.

Please remember that this is not a refereed journal article, only a presentation. I have checked my facts pretty carefully, but this talk has not been subjected to external review. I have been encouraged to publish this as a journal article, and I have a draft manuscript, complete with references. I prefer not to circulate that manuscript until it has been submitted, reviewed, and accepted. For additional information, you may want to see Brown, R. D. (1997) "The impact of changing demographics on wildlife and fisheries extension and outreach," pages 66-73, Trans. 62nd No. Am. Wildl. And Natur. Resour. Conf., Wildl. Manage. Inst., Washington, D.C.

Although I presented to you 10 possible solutions for the 10 challenges I posed, I did not get back to the main issue - how do we get USDA and Land Grant administrators to shift resources from commodity programs to natural resources programs? I'm not sure that we can, due to the problems I outlined. Perhaps the best we might hope for is a fairer share of the pie from future funding. The enclosed paper may serve as a start. One approach would be for you in each state to analyze the value of each commodity versus the LGCA support it receives. A second approach would be to develop relationships with our constituencies - conservation, forestry, hunting/fishing, outdoor recreation/tourism and environmental groups - to encourage them to lobby for their share of support from the LGCA's. Another approach would be to work with some of the traditional commodity groups - cattlemen's, forestry, sheep & goat, and wildlife associations - to also lobby the LGCA's for more help from natural resources faculty to help them deal with regulatory issues and income diversification. I appreciate your interest in my presentation and wish you the best of luck in your efforts.

Enclosure

Natural Resources Challenges for Land Grant Colleges in the 21st Century

by

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**A paper presented at the first National Extension Natural Resources Conference,
Deer-wood, MN, May 18, 1998**

You've just heard Dr. Gonzalez, Undersecretary of Agriculture present the "opportunities" in natural resources for Land Grant institutions. But Jim Miller asked me to cover the "challenges." Being a "bottom line" sort of person, I looked up challenges in the dictionary, and Webster says, "**Chal'lange: a calling upon one to take part in a fight, contest, etc.; an invitation or summons, verbal or written, to decide a controversy, as by a duel.**" Although we do allow concealed weapons in my state of Texas, I can assure you I didn't come armed for a duel. But, do I believe there is a controversy concerning the future of natural resources at Land Grant Colleges of Agriculture (LGCA)? I wouldn't be here if I didn't.

The land grant system, with its universities, experiment stations and extension services was a wonderful concept that made the United States the world's leader in agricultural technology and production. But the America that this system was designed for no longer exists, nor has it existed for several decades. For the past 30 years, critiques of the Land Grant System, and more recently higher education in general, have abounded (see Fig.). We have all known change is needed, but although the USDA has responded with significant reorganization and downsizing, the LGCAs have not. As early as 1996, 32 years ago, Kellogg and Knapp stated, "**Are not other users of renewable resources of soil, water, air, plants and animals who are not farmers and ranchers being neglected? What about the problems of city-based people living in suburban and mixed rural and urban communities? What about companies, cooperatives and individuals who furnish supplies to farmers and process their products? Do they get consideration in proportion to their numbers?**" Clearly, Kellogg and Knapp felt they did not.

The need for change has been called for because of improved efficiency of agriculture and declining farmer and rancher populations. The 1997 Agricultural Fact Book states that in 1996 there were just over 2 million farms and ranches in the U.S., an 8% decline over the previous decade. More importantly, our agricultural production has become bimodal. Less than 6% of U.S. farms have sales of over \$250,000, yet that 6% produced 62% of the livestock, 57% of the crops, and earned 75% of our net agricultural income. On the other hand, half of all farms and ranches have gross incomes of less than \$ 10,000. Only 2.8 million Americans live or work on farms and ranches. And the total gross farm and ranch receipts last year were \$ 186 billion.

I believe that the disenfranchised farmer, the small and middle class farm and ranch the Land Grant system was established to assist, has largely gone out of existence. We have 59 Experiment Stations, 57 Extension Services, 130 Colleges of Agriculture, 9,500 Experiment Station Scientists and 9,600 Extension Specialists in this country. The large producers have little need for Experiment Station and Extension help - they can afford to pay for what they need. The small hobby farmer and rancher could use some assistance, but how long will our urban taxpayers support a system that exists largely to sustain what has become a pleasant rural lifestyle?

On the other hand, natural resources have grown dramatically in importance, both economically and ecologically, and it is time they are given their due by the Land Grant System. Let me demonstrate to you a bit about the value and impact of just some of our natural resources in this country.

Timberland: There are 9.3 million private forest landowners in the U.S., who own 422 million acres, or 60% of the nation's timberland (see Fig.). That's over 3 times the number of farmers and ranchers in the country. The timber sales alone are worth over half of our gross farm and ranch sales. But, how many Experiment Station faculty and support positions are devoted to forestry? Actually, about 17% are devoted to the environment and all natural resources, including animal waste management and pesticide runoff (see Fig.).

What about Hunting, Fishing and Non-Consumptive Use of Wildlife? In 1996 wildlife-related recreation expenditures in the U.S. totaled \$101 billion. That's also over half of the gross income to all farmers and ranchers. In 1996, 40 million Americans went hunting or fishing, and 63 million observed, fed or photographed wildlife. Admittedly, the numbers of hunters are barely holding stable in this country, but their total expenditures are increasing, whereas the number of people fishing is increasing at twice the rate of population growth, and over the past decade birdwatching has increased 155%. In fact, on a trip this month with county agents to the King Ranch in Texas, the nation's largest cattle ranch with about 60,000

head - the managers stated that 2/3 of their income now comes from hunting leases - and 1/3 from livestock operations. So let's ask a similar question - how many Extension FTEs are allocated **to** wildlife and fisheries? The number is imbedded in the 11% of FTEs that go to the environment and natural resources combined (see Fig.). Actually, only about 4% are in natural resources, and there are 12 states with no wildlife or fisheries extension FTEs at all.

Value of Recreation and Tourism: Tourism now accounts for \$473 billion in the U.S. and 6.8 million jobs (see Fig.). International travel to the U.S. has resulted in a \$26 billion trade surplus. There were over 400 million visits to national parks and forests last year. In Texas, tourism is a \$23 billion industry, whereas livestock production is an \$8.5 billion industry. Our Experiment Station devotes 326 total positions to animal agriculture, but only 3.2 to Recreation, Parks and Tourism. I suspect this incongruity exists in many of our states.

Granted, some of the FTEs allocated to production agriculture are actually associated with environmental problems, such as air and water quality, soil loss, and waste management. But clearly natural resources are not getting an appropriate share of the pie in LGCA's.

You'll also note that so far I have only mentioned the economic value of natural resources, when in fact the true value of forests have to do **with** protection of watersheds, the true value of wildlife lies in biodiversity, and the true value of parks and recreation lie in their ability to restore and rejuvenate the human spirit. I wouldn't think of trying to sell these concepts **to** an economist, but the pressures on these natural resources to support our exploding population are enormous. I believe that it is time to shift our basic mission from agricultural production to that of land stewardship in all of its aspects. This concept is supported by Dr. James Meyer, the Chancellor Emeritus of UC-Davis, who stated in 1997: **"I suggest that the forth agricultural revolution will come about as agriculture recognizes its responsibilities as a user and a competitor for our natural resources. All sides must recognize the impending impact of overpopulation in the U.S. and worldwide as demands increase for land development, food sufficiency, and, concurrently, conservation of environmental quality."**

The question is, then, why haven't financial resources been shifted more from production agriculture to natural resources and environmental quality at LGCA's? I offer two reasons:

A. Have LGCA's Have Been Held Hostage by Ag Commodity Groups?

In George McDowell's infamous 1991 essay entitled, "If You Want To Visit Your

Extension Specialist, You'd Better Do It Soon, Cuz' He Won't Be There For Long," he suggested that Extension has been taken hostage by the agricultural commodity groups, and that agents have "gone native" and lost their objectivity. He said, **"We in the Extension system follow the farm groups around like bulls follow cows in heat."** I suggest its not just the Extension Service. One Ag Dean commented to me that such groups often not only tell us what our research should be, but what the results should be as well. They look to us for leadership, but their definition of leadership - that is to "get the environmental community off of our backs" - is simply not within the mission of our universities or agencies. McDowell said, **"Farmers have already lost the moral high ground - their only hope of getting it back is to join with the environmentalists."**

Likewise, in a 1992 symposium, none less than the Board on Agriculture of the National Academy of Sciences stated that LCRA's need to change to stay relevant. Some of the changes they suggested included shifting from "industrial agriculture" to "ecological agriculture," and shifting the focus from serving farmers to serving consumers. Ag Deans often cite how well organized the commodity groups are. Granted, conservation and natural resource groups may not be as well organized or as vocal as commodity groups, but they do exist, and some of them are large. In fact, the Conservation Directory lists 1,900 such organizations in the U.S.; there are over 80 within the city limits of Houston alone (see Figs.).

B. The Second Problem is the Lack of Attention by the USDA.

In the 1997 Agriculture Fact Book, Dan Glickman, Secretary of Agriculture, states, **"We [the USDA) are the country's largest conservation agency - carrying out voluntary efforts to protect soil, water and wildlife in the 70% of America's lands that are in private hands."** And yet in the 1997 Strategic Plan of the Cooperative State Research, Education and Extension Service (CSREES) the words, "natural resources" are never used. Of the five stated goals of the strategic plan, one is "Greater harmony between agriculture and the environment ." This goal includes words about the environment and protecting ecosystem integrity and biodiversity, but only in the context of agricultural production - never in terms of natural resources for their own values. If we look at the base budget for the plan, "Agriculture's interface with the environment" accounts for only 15.5% of the total budget (see Fig.). Natural resource allocations are buried somewhere in those figures along with waste management and other ag-related environmental issues. The five Strategic Initiatives of the plan mention IPM, water quality and waste management, but don't mention reforestation, reclaiming overgrazed rangelands or depleted marine fish stocks, or utilizing recreation for rural income.

Given the fact that perhaps our primary challenge is convincing our federal and Land

Grant University administrators of the need to shift financial resources to the areas of the environment and natural resources, what other “challenges” to we in the natural resources arena of LGCA’s face? The challenges are many, but I have selected the ones that I feel are the most compelling. Not all of these are unique to the natural resources community:

1. The National Problem of Scientific Illiteracy.

Jane Coulter (USDA) has reported that 14% of 8th graders in this country cannot use decimals, 1/3 cannot calculate the cost of a meal, and 1/2 cannot write a decent paragraph. Billy Higginbotham in Texas found that 60% of the 3rd graders in Tyler, Texas thought that white-tailed deer were an endangered species; Dale Rollins found similar misconceptions among school kids in San Angelo, Texas about coyotes. Examples of ignorance of science and natural resources in our adult population abound. We cannot explain the importance of our research findings or lobby to protect our natural resources if the public cannot understand us.

2. Conflicts between Agriculture and Natural Resources Faculty

A unique problem in natural resources is the lack of mutual understanding between ag and natural resources faculty. Due to long backgrounds of being raised, educated and employed in the ag community, some ag faculty and administrators seem to automatically view environmentalists as the enemy. Many natural resources faculty, on the other hand, are environmentalists or at least conservationists, and proud of it. Granted, they too often take a naive view of the world, failing to recognize the need of landowners to make a living.

We also need to recognize that natural resources and environmental issues are not necessarily the same. Ag faculty and administrators tend to view environmental issues as those caused by or affecting agriculture. Natural resources faculty often tend to value the “resource” - such as wildlife, forests, and wetlands - for its own sake, not for what it might produce in monetary terms. To be fair, some natural resource faculty tend to overlook agricultural environmental issues other than non-point source pollution.

3. The Disconnect between LGCA Research and Extension.

It has always been my understanding that Extension specialists are supposed to determine the problems of our clientele and bring those back to our researchers. The research scientists are supposed to solve those problems, and then the Extension specialists take the information back to the users. It rarely works that way. In my department, the Experiment Station pays part of the salaries of my research faculty, but **all** of our research is funded by

extramural grants. Thus, someone besides our clientele is deciding our research priorities. On the other hand, our Extension specialists also chase extramural grants to support their educational programs. Thus, someone else is deciding their priorities as well. It is rare to see a researcher and an Extension specialist put in a proposal for both research and education together - the RFPs simply don't call for it.

4. The "Wise Use, Brownlash or Anti-Science Movement"

More and more, we in natural resources find ourselves in the middle of a public conflict, and most of us are poorly prepared to deal with it. It is critically important for our researchers to remain neutral and objective, and for our extension specialists and agents to function as facilitators and not advocates. But is it hard to not take sides, depending on your background, and we are often naive of the political motives behind much of the commotion. The Erlich's perhaps summed the situation best in their 1997 book, Betrayal of Science and Reason: **"It is natural for some people to feel threatened by efforts to preserve the environment. This often causes loss of income or threatened lifestyle..... Many of these disenfranchised individuals are recruited into wise use movements...including corporate interests as well as private property rights activists and right wing ideologues."** In my own view, much of what is happening is little more than environmental McCartyism. Our own recent experiences in Texas with the Golden cheeked warbler, the Edwards Aquifer, our "Predators in the Classroom" 4-H Program, and the Hill Country Conservation Plan could serve as case studies.

Nonetheless, Americans continue to support the environment. In a 1995 Gallup pole over half of Americans felt environmental problems were "very serious;" 58% would choose protecting the environment over economic growth, and 65% said they would be willing to pay, higher prices so that industry could do a better job of protecting the environment.

5. The Loss of Volunteerism and Competition for People's Time.

In 1996, a Harvard sociologist, Dr. Robert D. Putnam, was told by his barber that the man's bowling league had folded. Looking into the issue, Dr. Putnam found that bowling leagues across the nation were folding. In his subsequent article, entitled "Bowling Alone," he said that participatory organizations, like the P.T.A., Boy Scouts, and the Red Cross have all suffered declines in membership. Dr. Putnam blamed television and computers, two income families and single parent families for this problem. I would argue that one of the major factors here is the array of opportunities for both children and adult's free time. This may have a major impact on 4-H volunteer and youth participation in the future. Kids have not only 4-H, but Boy Sdouts, Girl Scouts, Boys Clubs, School Band or music lessons, a

variety of school sports and clubs, Little League, Soccer, martial arts and who knows what. And, as many taxpayers are quick to point out, most of those activities are not subsidized by the government. Fortunately for us, natural resources 4-H programs are the fastest growing of all 4-H programs in the country.

6. The Loss of Credibility of Academics

In 1995 NASULGC funded a survey of over 1,100 telephone interviews about the public view of land grant universities. Participants responded that the following activities were “very important:” undergraduate teaching 72%, extension ,54%, and research 52% **If** distributing \$ 100 of state tax money, they’d put \$45 on teaching, \$30 on extension and \$25 on research (see Fig.). And yet few LCRAAs are structured that way. Ernest Boyer, in his 1990 book, Scholarship Reconsidered, stated, **“In the current climate, students are often the losers...in the glossy brochures, they’re assured that teaching is important, that a spirit of community pervades on the campus, and that general education is the core of the undergraduate experience. But the reality is that on far too many campuses teaching is not well rewarded and faculty who spend too much time counseling and advising students may diminish their prospects for tenure and promotion.”**

Clearly, universities are under fire, and LGCAs more than others. In fact, nearly 60% of Americans believe higher education in their states needs a fundamental overhaul. Numerous studies have called for a more liberal education, wherein students learn more problem solving skills, and perhaps complete internships, so that they are able to shift careers more easily. Fortunately, as we lean towards that task, enrollment in natural resources remains strong. About 17% of students at Land Grant colleges are enrolled in natural resource programs, and they are the fastest growing programs in our colleges (see Fig.). And, the job market for natural resources graduates has never been stronger.

7. Too Much Research is Seen as Inconsequential.

There are really two points I want to make here. A look at the national research funding picture makes it clear that LGCAs cannot count on the USDA for their future (see Fig.). Recalling my complaints about a lack of emphasis on natural resources at the USDA, if we count on the USDA for our future funding, we are doomed. We in natural resources are getting the “double whammy,” - the occasional cold shoulder from an agency with shrinking resources.

Clearly, the natural resource problems of this country call for the highest level research - that which can be funded by NSF and the EPA. But the work has to be meaningful, and we

have to communicate that to the public. Martin Anderson, author of Imposters in the Temple, reports that there are 40,000 scientific journals in print which publish one million articles per year - 2,740 per day! Walter Steward, a scientist at the NIH complained: "I've never met a scientist who didn't believe that 80% of the scientific literature was nonsense." One of Anderson's main points is that in academia, we value most what is read least. That is - the refereed scientific journal article, and we value least what is read most - articles in publications for the lay public which actually may impart information for the betterment of the reader. For better or for worse, most citizens and legislators agree with this point.

8. Faculty at LGCA's Have Failed to Become Agents of Social Change.

Earlier I mentioned the myriad of natural resources and environmental conflicts we face. Far too few faculty are engaged in these issues. My personal beef is that we train biologists, but they graduate from our programs ill prepared for the world of conflict that they will face. Most have little understanding of the history, laws and culture that have guided the development of our natural resource policies, much less an understanding of the political world in which humans make decisions that have biological impacts. Our own faculty are at fault for this. We simply need to produce more scientists who can speak to the public in the manner of Stephen Jay Gould, Lewis Thomas, Stephen Hawking, Carl Sagen, and E. O. Wilson.

9. The Nation's Demographic Changes Will Significantly Impact our Future

Some of you know this is a favorite topic of mine, but I won't spend much time on it here, other than to say our clientele and our support base is changing more rapidly than we could have imagined.

Population Growth: The United States is the third largest nation the world, and our population is expected grow by 50% from its current 263 million to peak around 394 million by 2050. Over half of the growth in the past decade has been in the three states of Texas, California, and Florida.

Ethnic Diversity: In the past decade, 66 percent of our population growth was due to growth of minority populations, and the projection is that 86 percent of future net population change will be due to increases in minorities. An important component of this shift in ethnic diversity has been and will be immigration. In fact, currently 1 out of 10 Americans were born in a foreign country; in California, its 1 out of 4.

Aging: There is an interesting dichotomy in the changing age structure of our

population. A full one third of the U.S. population is now comprised of the baby boomers. They are now middle-aged, and will begin becoming over 65 in the year 20 11. On the other hand, the rapidly growing segments of our population, the minorities, are relatively young. One third of Americans under 35 belong to minority groups, whereas only one fifth of those over 35 do. Thus the fastest growing segments of our population are age groups under 44 and over 65.

Urbanization: More than three fourths of our population lives in the nations' metropolitan counties. In Texas, a state most of us think of as rural, 82 percent of the population lives in urban areas, and about 60 percent of those people live in just four cities. Surprisingly, however, in some areas of the U.S. where retirement and recreation offer opportunities, small communities are growing as well. The "rural rebound," seems to be caused by commuters, retirees, and the occasional "lone eagle" who seeks pleasant surroundings while operating a business from the home.

Family Structure and Poverty: The average size of American households declined from 3.7 in 1940 to 2.6 in 1990, largely due to lower marriage rates, higher divorce rates, lower fertility, and more diverse living arrangements. Nationally, 61 percent of children will spend part of their lives in a single parent household before age 18. Economic stratification is also becoming more apparent, with households headed, by women, African Americans, Hispanics or the elderly are substantially lower than those of white, middle-aged families. Steve Murdock, the State Demographer of Texas, stated in one of his 1996 papers, **"the angler [I substitute outdoor recreationist] of the future may also be less well educated as well as have less disposable income.... less informed about fishing [outdoor] activities, less knowledgeable about management actions and needs....perhaps less supportive of management rules and regulations require lower use and access costs. Coupled with this is the likelihood of increased political power among minority and older age groups as their numbers increase."**

10. Faculty and Administrators at LGCAs Are Obstacles to Change.

In his 1995 and 1997 papers, Chancellor Meyer interviewed dozens of Deans and Directors at LGCAs. He found they agreed with the problems we've alluded to here, and that the environment should supercede production agriculture as the primary focus of LGCAs. The Deans felt that the tenure system, while necessary, impeded change, as did departmental loyalty and loyalty to one's discipline. The relatively short tenure of Deans and department heads was another problem, as was our insistence on using committees to make decisions. Deans reported that faculty do not respond positively to leadership, and Meyer complained that department chairs are more likely to be agents of their colleagues consensus than agents

of change. Meyer reported that most of the growth of the Land Grant universities were in colleges other than agriculture. Even the Deans felt that few colleges and universities have changed until they felt threatened from outside the organization. In a rather cutting preface to his 1997 paper, Meyer stated, **“the stalemate was due to mind set, uncertain mission, ineffectual leadership and inappropriate organization.”**

Conclusions:

Even though I am about to be followed by speakers who are to address these “challenges,” I would be remiss if I did not at least attempt to offer some solutions. I raised 10 challenges, so I will briefly offer 10 solutions:

1. Deans and department heads must become the agents of change. Although administrators need input from their faculty, they do not need a committee to make every decision. We need to hire administrators who can risk takes, and who will not lose their jobs if they make a few mistakes.
 2. All faculty must take part in the effort to improve scientific and environmental literacy, **This** includes K - 12 and adults. Outreach should be part of every faculty member’s job description.
 3. We must recognize and embrace our new constituency - all citizens - including landowners, environmentalists, consumers, regulatory folks, and homeowners, without totally abandoning our traditional clientele. **As Jim Miller stated at the Bellingham, WA Extension conference in 1996: “If Extension is to have a strong future, it must increase significantly its support and credibility among nonfarm Americans. But nonfarm Americans don’t need advice on controlling downy brome in winter wheat. They need to know about lawn and tree care; the basic principles of good land management, of ecosystem thinking; how to manage their woodlot or weekend property so that wildlife will thrive and improved forest can be grown. They need to know how to prevent chemicals from getting into their drinking water, how to management their fish pond, and how to make their 40 - 100 acre weekend retreat/investment pay its taxes and maybe help their kids through college.”**
 4. We must change our tenure and reward system to recognize and value all forms of creative scholarship - including teaching, research and outreach. Not all faculty need to do all things, but the three components of our programs need equal value and equal respect.
 5. We must fight the trend towards more technical education and liberalize the curricula,
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teaching problem solving, not facts and answers.

6. We must encourage multi disciplinary and regional efforts to avoid duplication and focus on what gets done, not who gets credit. We must blur the boundaries between departments, between research and extension, and between natural resources, the basic sciences, agriculture and the health sciences.

7. We must likewise eliminate the basic versus applied research mind set. Research is a continuum, and all research eventually has a purpose.

8. ALL faculty must help “market the system” in educating the public and legislatures about natural resources. Researchers can do this by publishing articles in the popular press. Extension can help by hiring natural resources, community development **and** agricultural information specialists” as county agents, people who are adept at the use of information technology, networking, GIS, and data management - rather than those who know how to run a calf or sheep judging contest.

9. We need for each LGCA and each unit within them to develop a “real” strategic plan **by** examining demographics and developing advisory boards that represent the new constituencies in proportion to their numbers.

10. We must encourage faculty to become agents of social change. We can begin by holding seminars on the natural resources issues of the day, and invite our students in to hear the faculty debate the issues. We can also encourage faculty to be active through their scientific societies and reward them for activism at the community and national levels.

And finally, as a “recovering animal scientist” or “wildlifer wannabe,” I cannot give a talk at a national meeting without quoting Aldo Leopold. I’ll do this as I show a couple of quotes about our future from some of our Land Grant leaders (see Fig.). You may recall Chancellor Meyer’s statement about the appropriate role of LGCAs as that of the use of land, what ever that might be. An unpublished note of Leopold’s states, **“there must be some force behind conservation more universal than profit, less awkward than government, less ephemeral than sport, something that reaches into all time and place where men live on land, something that brackets everything, from rivers to raindrops, from whales to hummingbirds, from land estates to window boxes. I can see only one such force: a respect for land as an organism; a voluntary decency in land use exercised by every citizen and every landowner out of a sense of love and obligation to that great biota we call America. This is the meaning of conservation and this is the task of conservation education.”**

Appendix - slides

Critiques of the Land Grant System and Higher Education

| | |
|------|---|
| 1962 | <u>Silent Spring</u> . Rachel Carson |
| 1966 | <u>The College of Agriculture-Science in the Public Service</u> . Kellogg and Knapp |
| 1972 | Research Advisory Committee of the U.S.D.A. G.S. Pound |
| 1978 | Hard Times, Hard Tomatoes. Jim Hightower |
| 1982 | Science for Agriculture. The Winrock Report. Rockefeller Foundation. |
| 1987 | <u>The Legacy</u> N. A. Kerr |
| 1992 | Rethinking the Outlook of Colleges Whose Roots Have Been in Agriculture J. H. Meyer |
| 1993 | The Stalemate in Food and Agriculture Research, Teaching, and Extension, Science. J.H. Meyer |
| 1993 | Are Land Grant Colleges Prepared to Meet the Educational Challenges of the 21st Century? H.O. Kunkel |
| 1994 | Challenges Confronting Agricultural Research in Land Grant Universities. Fisher and Zuiches |
| 1995 | Transforming the Land Grant Colleges of Agriculture for the 21st Century J. H. Meyer |
| 1996 | Future of Colleges of Agriculture and the Land Grant System. National Research Council |
| 1997 | Re Engineering the Land Grant College of Agriculture. J.H. Meyer |

Value of U.S. Timber and Forest Products

| | |
|--------------------|------------------|
| Employees | 737,700 |
| Payroll | \$ 17.3 billion |
| Value of shipments | \$ 106.5 billion |
| Value added | \$ 441 billion |

Source: AF&PA, 1996

National Allocation by Program Area of SAES Researchers

| % Total | Program Area |
|---------|--|
| 64 | Plant & animal systems, processes and products |
| 17 | Environment and natural resources |
| 15 | Social science issues and other |
| 4 | Food and nutrition |

Source: Gary Jensen, USDA, 1996

Value of Tourism in the U.S.

Nation's Second Largest Employer
Nation's Third Largest Retail Sales
Has increased 95% in Past 10 years
\$ 473 Billion in the U.S.
6.8 Million Jobs
\$ 26 Billion Trade Surplus

Source: TIAA, 1998

National Allocation by Program Area of Extension Staff

| % Total | Program Area |
|----------------|--|
| 45 | Community, family, youth and leadership |
| 34 | Ag competitiveness and profitability |
| 11 | Natural resources & environmental management |
| 10 | Nutrition, diet and health |

Source: Gary Jensen, USDA, 1996

1998 Membership in "Conservation" Organizations

| | |
|------------------------------|-----------|
| National Wildlife Federation | 4,500,000 |
| National Rifle Association | 2,800,000 |
| World Wildlife Fund | 1,200,000 |
| The Nature Conservancy | 832,000 |
| Ducks Unlimited | 600,000 |
| Sierra Club | 550,000 |
| National Audubon Society | 550,000 |

Conservation Organizations, Continued

| | |
|---------------------------------------|---------|
| National Parks and Conservation Assn. | 500,000 |
| Greenpeace | 420,000 |
| Wilderness Society | 300,000 |
| Defenders of Wildlife | 200,000 |
| Earthwatch | 100,000 |
| Trout Unlimited | 98,000 |
| National Woodland Owners Assn. | 41,000 |
| Save the Manatees | 40,000 |
| American Birding Association | 21,000 |

Source: 1998 Conservation Directory

Fall, 1996 Enrollment in Colleges of Agriculture, Natural Resource and Forestry

| | | | | |
|---------------|----------------|----------------|-------------------|------------|
| | Total | 149,733 | | |
| 2-year | 3,789 | | Women | 45% |
| B.S. | 121,311 | | Minorities | 14% |
| M.S. | 13,749 | | Foreign | 5% |
| Ph.D. | 10,884 | | | |

SESRC 1995 National Survey
1,100 phone interviews; 3% error

Are the following "Very Important" at LGCAs

| | |
|-------------------------------|------------|
| Undergraduate Teaching | 72% |
| Off-Campus Extension | 54% |
| Research | 52% |

How would you distribute \$ 100 of State tax money at LGCAs?

| | |
|-----------------------------|-------------|
| Campus Teaching | \$45 |
| Off Campus Education | \$30 |
| Research | \$25 |

Should more, less or the same tax dollars be spent on Extension programs?

| <u>Program</u> | <u>More</u> |
|--|-------------|
| 4-H and Youth | 54% |
| Family Development & Mgmt. | 54% |
| Natural Resources & Environment | 51% |
| Community Economic Development | 43% |
| Nutrition, Diet, & Health | 40% |
| Ag Production & Marketing | 34% |

* Less than 15% thought any of these should be reduced.

"Is agriculture obsolete?.....with only two percent of the population dealing with production agriculture it is tough to find support these days for a cow or a crop." C. J. Hadley, 1992

"The Land Grant System is suffering from a reputation deficit" John Paluszek, 1992

"Is it time to kiss goodbye to the Land Grant System?" J. T. Bonnen, 1992

"In my opinion, society has changed faster than we have." Don Zacharias, President, Mississippi State University, 1992.

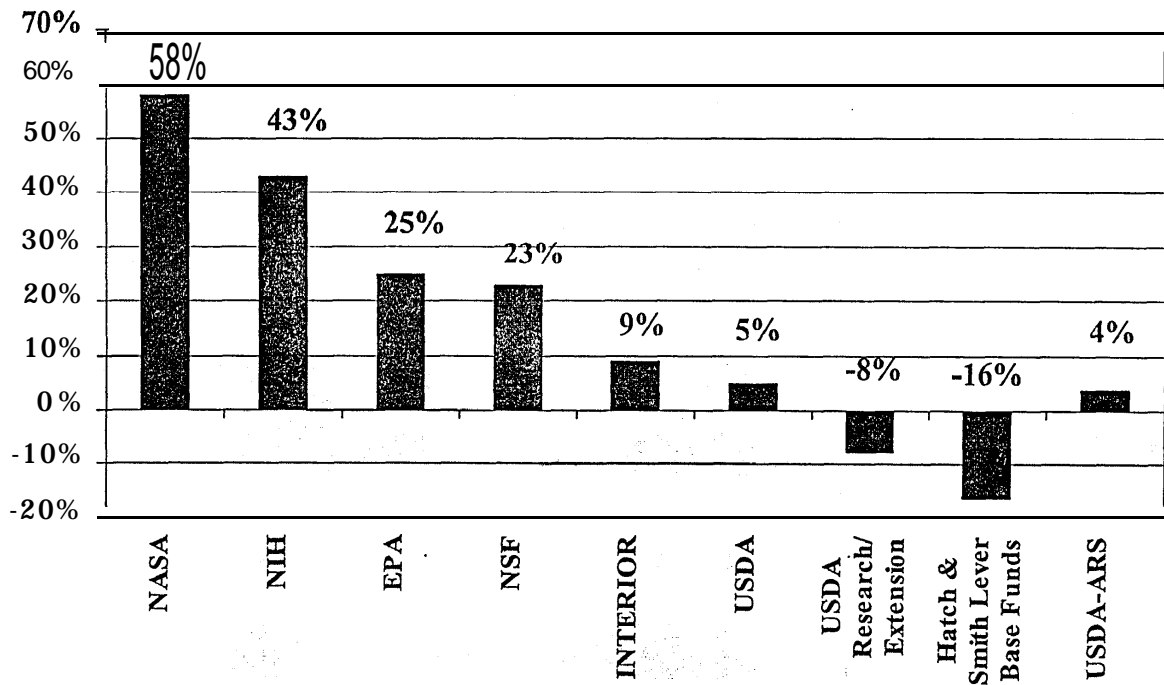
"The Land Grant College of Agriculture (LGCA) is at a turning point in its history." J.H. Meyer, chancellor Emeritus, University of California - Davis,1997

CREES 1997 - 98 Budget

| Million Dollars per Year | Basic Research | Applied Research | Developmental Research & Tech. Trans. | Extension, Outreach & Information | Higher & Education | Total by Outcome |
|--|-------------------|---------------------|---|---|-----------------------|---------------------|
| Competitive Agricultural System in the Global Economy | 128.6 | 168.6 | 53.5 | 87.4 | 6.5 | 444.6 (24.4%) |
| Safe & Secure Food & Fiber System | 188.3 | 94.0 | 95.1 | 64.0 | 3.5 | 444.9 (25.4%) |
| Healthy, Well- Nourished Population | 61.4 | 20.2 | 15.3 | 176.7 | 3.5 | 277.1 (15.8%) |
| Agriculture's Interface with the Environment | 94.0 | 66.7 | 54.2 | 54.1 | 3.5 | 272.5 (15.6%) |
| Economic Enhancement & Quality of Life | 109.2 | 80.4 | 53.7 | 65.3 | 3.3 | 311.9 (17.8%) |
| Total by Function | 581.5 (3 3.2%) | 429.9 (24.6%) | 271.8 (15.5%) | 447.5 (25.6%) | 20.3 (1.1%) | 1,751.0 |
| <i>REE Total</i> | 1,751.0 | | | | | |

Footnote: All of the above budget values are based on 1996 appropriated dollars

Federal Agencies Research & Development Funding Percent Change, 1988 - 1998 (in 1992 Dollars)



Source: NASULGC

1998