

Free Summary



Rising Above the Gathering Storm, Revisited: Rapidly Approaching Category 5

By Members of the 2005 "Rising Above the Gathering Storm" Committee; Prepared for the Presidents of the National Academy of Sciences, National Academy of Engineering, and Institute of Medicine

ISBN: 978-0-309-16097-1, 104 pages, 7 x 10, paperback (2010)

This free summary is provided by the National Academies as part of our mission to educate the world on issues of science, engineering, and health. If you are interested in reading the full book, please visit us online at <http://www.nap.edu/catalog/12999.html>. You may browse and search the full, authoritative version for free; you may also purchase a print or electronic version of the book. If you have questions or just want more information about the books published by the National Academies Press, please contact our customer service department toll-free at 888-624-8373.

*In the face of so many daunting near-term challenges, U.S. government and industry are letting the crucial strategic issues of U.S. competitiveness slip below the surface. Five years ago, the National Academies prepared *Rising Above the Gathering Storm*, a book that cautioned: "Without a renewed effort to bolster the foundations of our competitiveness, we can expect to lose our privileged position." Since that time we find ourselves in a country where much has changed--and a great deal has not changed. So where does America stand relative to its position of five years ago when the *Gathering Storm* book was prepared? The unanimous view of the authors is that our nation's outlook has worsened. The present volume, *Rising Above the Gathering Storm, Revisited*, explores the tipping point America now faces. Addressing America's competitiveness challenge will require many years if not decades; however, the requisite federal funding of much of that effort is about to terminate. *Rising Above the Gathering Storm, Revisited* provides a snapshot of the work of the government and the private sector in the past five years, analyzing how the original recommendations have or have not been acted upon, what consequences this may have on future competitiveness, and priorities going forward. In addition, readers will find a series of thought- and discussion-provoking factoids--many of them alarming--about the state of science and innovation in America. *Rising Above the Gathering Storm, Revisited* is a wake-up call. To reverse the foreboding outlook will require a sustained commitment by both individual citizens and government officials--at all levels. This book, together with the original *Gathering Storm* volume, provides the roadmap to meet that goal. While this book is essential for policy makers, anyone concerned with the future of innovation, competitiveness, and the standard of living in the United States will find this book an ideal tool for engaging their government representatives, peers, and community about this momentous issue.*

This summary plus thousands more available at www.nap.edu.

Copyright © National Academy of Sciences. All rights reserved. Unless otherwise indicated, all materials in this PDF file are copyrighted by the National Academy of Sciences. Distribution or copying is strictly prohibited without permission of the National Academies Press <http://www.nap.edu/permissions/> Permission is granted for this material to be posted on a secure password-protected Web site. The content may not be posted on a public Web site.

Executive Summary

In 2005, bipartisan requests from the United States House of Representatives and the United States Senate prompted the National Academies to conduct a study of America's competitiveness in the newly evolved global marketplace. An Academies committee comprised of twenty individuals of highly diverse professional backgrounds, supported by the staff of the Academies and many others, subsequently conducted a review of America's competitive position and released a report that has become popularly referred to as the "*Gathering Storm*" report after the first line in its title.

The Academies' review culminated in four overarching recommendations, underpinned by twenty specific implementing actions. Generally strong bipartisan support was granted these findings on Capitol Hill and in the White House and a number of the recommendations were eventually implemented. However, the preponderance of the enabling financial resources was provided in the American Recovery and Reinvestment Act ("Stimulus Legislation") which is presumed to be a one-time, albeit two-year, initiative. Similarly, the Authorizing Legislation to implement many of the *Gathering Storm* recommendations, known as the America COMPETES Act, was specified to expire after three years; i.e., in the 2010 fiscal year.

Although significant progress has been made as a result of the above legislation, the *Gathering Storm* effort once again finds itself at a tipping point. It is widely agreed that addressing America's competitiveness challenge is an undertaking that will require many years if not decades; however, the requisite federal funding of much of that effort is about to terminate. In order to sustain the progress that has begun it will be necessary to (1) reauthorize the America COMPETES Act, and (2) "institutionalize" funding and oversight of the *Gathering Storm* recommendations—

or others that accomplish the same purpose—such that funding and policy changes will routinely be considered in future years' legislative processes.

It would be impossible not to recognize the great difficulty of carrying out the *Gathering Storm* recommendations, such as doubling the research budget, in today's fiscal environment...with worthy demand after worthy demand confronting budgetary realities. However, it is emphasized that actions such as doubling the research budget are *investments* that will need to be made if the nation is to maintain the economic strength to provide for its citizens healthcare, social security, national security, and more. One seemingly relevant analogy is that a non-solution to making an over-weight aircraft flight-worthy is to remove an engine.

The original *Gathering Storm* competitiveness report focuses on the ability of America and Americans to compete for jobs in the evolving global economy. The possession of quality jobs is the foundation of a high quality life for the nation's citizenry.

The report paints a daunting outlook for America if it were to continue on the perilous path it has been following in recent decades with regard to sustained competitiveness.

The purpose of the present report is to assess changes in America's competitive posture in the five years that have elapsed since the *Gathering Storm* report was initially published and to assess the status of implementation of the National Academies' recommendations.

Robert Solow received a Nobel Prize in economics in part for his work that indicated that well over half of the growth in United States output per hour during the first half of the twentieth century could be attributed to advancements in knowledge, particularly technology.¹ This period was, of course, before the technology explosion that has been witnessed in recent decades. The National Academies *Gathering Storm* committee concluded that a primary driver of the future economy and concomitant creation of jobs will be *innovation*, largely derived from advances in science and engineering. While only four percent of the nation's work force is

¹ R.M. Solow, "Technical Change and the Aggregate Production Function." *Review of Economics and Statistics*, 39: 312-320, 1957.

composed of scientists and engineers, this group disproportionately creates jobs for the other 96 percent.²

When scientists discovered how to decipher the human genome it opened entire new opportunities in many fields including medicine. Similarly, when scientists and engineers discovered how to increase the capacity of integrated circuits by a factor of one million as they have in the past forty years, it enabled entrepreneurs to replace tape recorders with iPods, maps with GPS, pay phones with cell phones, two-dimensional X-rays with three-dimensional CT scans, paperbacks with electronic books, slide rules with computers, and much, much more.³ Further, the pace of creation of new knowledge appears by almost all measures to be accelerating.⁴

Importantly, *leverage* is at work here. It is not simply the scientist, engineer and entrepreneur who benefit from progress in the laboratory or design center; it is also the factory worker who builds items such as those cited above, the advertiser who promotes them, the truck driver who delivers them, the salesperson who sells them, and the maintenance person who repairs them—not to mention the benefits realized by the user. Further, each job directly created in the chain of manufacturing activity generates, on average, another 2.5 jobs in such unrelated endeavors as operating restaurants, grocery stores, barber shops, filling stations and banks.⁵ Progress enabling products such as those mentioned above in the information fields is built upon the work of a few individuals who decades ago were investigating something called solid state physics—none of whom probably ever thought about CT scans, GPS or iPods—the latter of which can enable one to hold 160,000 books in one’s pocket—any more than one today can predict the breakthroughs a half century hence.⁶

² National Science Board, *Science and Engineering Indicators 2010*. Arlington, VA: National Science Foundation (NSB 10-01), Figure 3-3.

³ In 1971, the Intel 4004 Processor had 2300 transistors. See: http://download.intel.com/pressroom/kits/events/moores_law_40th/MLTimeline.pdf. In 2009, Intel released the Xeon® ‘Nehalem-EX’ Processor with 2.3 billion transistors. See: <http://www.intel.com/pressroom/archive/releases/2009/20090526comp.htm>.

⁴ Beyond Discovery: The Path from Discovery to Human Benefit is a series of articles that explore the origins of various technological and medical advances (www.beyonddiscovery.org/).

⁵ J. Bivens, Updated Employment Multipliers for the U.S. Economy (2003), Economic Policy Institute Working Paper, August 2003. Available at: http://www.epi.org/page/-/old/workingpapers/epi_wp_268.pdf.

⁶ For a 64 gigabyte iPod, holding books with an average file size of 400 kilobytes.

The *Gathering Storm* report assessed America's position with respect to each of the principal ingredients of innovation and competitiveness—Knowledge Capital, Human Capital and the existence of a creative “Ecosystem.” Numerous significant findings resulted—for example, with regard to Knowledge Capital it was noted that federal government funding of R&D as a fraction of GDP has *declined* by 60 percent in 40 years.⁷ With regard to Human Capital, it was observed that over two-thirds of the engineers who receive PhD's from United States universities are not United States citizens.⁸ And with regard to the Creative Ecosystem it was found that United States firms spend over twice as much on litigation as on research.⁹ However, the most pervasive concern was considered to be the state of United States K-12 education, which on average is a laggard among industrial economies—while costing more per student than any other OECD country.¹⁰

So where *does* America stand relative to its position of five years ago when the *Gathering Storm* report was prepared? The unanimous view of the committee members participating in the preparation of this report is that our nation's outlook has worsened. While progress has been made in certain areas—for example, launching the Advanced Research Projects Agency-Energy—the latitude to fix the problems being confronted has been severely diminished by the growth of the national debt over this period from \$8 trillion to \$13 trillion.¹¹

Further, in spite of sometimes heroic efforts and occasional very bright spots, our overall public school system—or more accurately 14,000 systems—has shown little sign of improvement, particularly in mathematics and science.¹² Finally, many other nations *have* been markedly progressing, thereby affecting America's relative ability to compete effectively for new factories, research laboratories, administrative

⁷ Federal R&D was 1.92 percent of GDP in 1964 and 0.76 percent of GDP in 2004. See: <http://www.nsf.gov/statistics/nsf10314/pdf/tab13.pdf>.

⁸ National Science Foundation, Division of Science Resources Statistics, *Survey of Earned Doctorates*. See <http://www.nsf.gov/statistics/nsf09311/pdf/tab3.pdf>.

⁹ NSB, 2010, Appendix Tables 4-8 and 4-9; Towers Perrin, *2009 Update on U.S. Tort Cost Trends*, Table 5.

¹⁰ NSB, 2010, Appendix Tables 1-9, 1-10, and 1-11; and Organization for Economic Cooperation and Development, *Education at a Glance 2009: OECD Indicators*; Table B-1. See: http://www.oecd.org/document/24/0,3343,en_2649_39263238_43586328_1_1_1_37455,00.html.

¹¹ See Table 7.1, Federal Debt at the End of the Year: 1940:2015 at: <http://www.whitehouse.gov/omb/budget/Historicals/> (accessed August 23, 2010).

¹² National Center for Education Statistics, Numbers and Types of Public Elementary and Secondary Local Education Agencies, From the Common Core of Data: School Year 2007–08. See: <http://nces.ed.gov/pubs2010/2010306.pdf> (accessed August 23, 2010).

centers—and *jobs*. While this progress by other nations is to be both encouraged and welcomed, so too is the notion that Americans wish to continue to be among those peoples who do prosper.

The only promising avenue for achieving this latter outcome, in the view of the *Gathering Storm* committee and many others, is through *innovation*. Fortunately, this nation has in the past demonstrated considerable prowess in this regard. Unfortunately, it has increasingly placed shackles on that prowess such that, if not relieved, the nation's ability to provide financially and personally rewarding jobs for its own citizens can be expected to decline at an accelerating pace. The recommendations made five years ago, the highest priority of which was strengthening the public school system and investing in basic scientific research, appears to be as appropriate today as then.

The *Gathering Storm* Committee's overall conclusion is that in spite of the efforts of both those in government and the private sector, the outlook for America to compete for quality jobs has further deteriorated over the past five years.

The *Gathering Storm* increasingly appears to be a Category 5.

A Few Factoids

Thirty years ago, ten percent of California's general fund went to higher education and three percent to prisons. Today, nearly eleven percent goes to prisons and eight percent to higher education.¹

China is now second in the world in its publication of biomedical research articles, having recently surpassed Japan, the United Kingdom, Germany, Italy, France, Canada and Spain.²

The United States now ranks 22nd among the world's nations in the density of broadband Internet penetration and 72nd in the density of mobile telephony subscriptions.³

In 2009, 51 percent of *United States* patents were awarded to non-United States companies.⁴

The World Economic Forum ranks the United States 48th in quality of mathematics and science education.⁵

Of Wal-Mart's 6,000 suppliers, 5,000 are in China.⁶

There are sixteen energy companies in the world with larger reserves than the largest United States company.⁷

IBM's once promising PC business is now owned by a Chinese company.⁸

The legendary Bell Laboratories is now owned by a French company.⁹

Hon Hai Precision Industry Co. (computer manufacturing) employs more people than the worldwide employment of Apple, Dell, Microsoft, Intel and Sony combined.¹⁰

No new nuclear plants and no new petroleum refineries have been built in the United States in a third of a century, a period characterized by intermittent energy-related crises.¹¹

Only four of the top ten companies receiving United States patents last year were United States companies.¹²

United States consumers spend significantly more on potato chips than the government devotes to energy R&D.¹³

The world's largest airport is now in China.¹⁴

In 2000 the number of foreign students studying the physical sciences and engineering in United States graduate schools for the first time surpassed the number of United States students.¹⁵

Federal funding of research in the physical sciences as a fraction of GDP fell by 54 percent in the 25 years after 1970. The decline in engineering funding was 51 percent.¹⁶

GE has now located the majority of its R&D personnel outside the United States.¹⁷

Manufacturing employment in the U.S. computer industry is now lower than when the first personal computer was built in 1975.¹⁸

In the 2009 rankings of the Information Technology and Innovation Foundation the U.S. was in sixth place in global innovation-based competitiveness, but ranked 40th in the rate of change over the past decade.¹⁹

China has now replaced the United States as the world's number one *high-technology* exporter.²⁰

In 1998 China produced about 20,000 research articles, but by 2006 the output had reached 83,000 . . . overtaking Japan, Germany and the U.K.²¹

Eight of the ten global companies with the largest R&D budgets have established R&D facilities in China, India or both.²²

During a recent period during which two high-rise buildings were constructed in Los Angeles, over 5,000 were built in Shanghai.²³

In a survey of global firms planning to build new R&D facilities, 77 percent say they will build in China or India.²⁴

China has a \$196 billion positive trade balance. The United States' balance is negative \$379 billion.²⁵

Sixty-nine percent of United States public school students in fifth through eighth grade are taught mathematics by a teacher without a degree or certificate in mathematics.²⁶

Ninety-three percent of United States public school students in fifth through eighth grade are taught the physical sciences by a teacher without a degree or certificate in the physical sciences.²⁷

Of the Big Three American automakers, one is now owned by a firm in Italy (after having been previously sold by a German firm), and another is 60 percent owned by the United States government.²⁸

The United States ranks 27th among developed nations in the proportion of college students receiving undergraduate degrees in science or engineering.²⁹

Forty-nine percent of United States adults do not know how long it takes for the Earth to revolve around the Sun.³⁰

The United States graduates more visual arts and performing arts majors than engineers.³¹

The total *annual* federal investment in research in mathematics, the physical sciences and engineering is now equal to the *increase* in United States healthcare costs every nine weeks.³²

Bethlehem Steel marked its 100th birthday by declaring bankruptcy.³³

The United States ranks 20th in high school completion rate among industrialized nations and 16th in college completion rate.³⁴

In less than 15 years, China has moved from 14th place to second place in published research articles (behind the United States).³⁵

China's real annual GDP growth over the past thirty years has been 10 percent.³⁶

According to OECD data the United States ranks 24th among thirty wealthy countries in life expectancy at birth.³⁷

For the next 5-7 years the United States, due to budget limitations, will only be able to send astronauts to the Space Station by purchasing rides on Russian rockets.³⁸

The average American K-12 student spends four hours a day in front of a TV.³⁹

China's Tsinghua and Peking Universities are the two largest suppliers of students who receive PhD's—in the United States.⁴⁰

Sixty-eight percent of U.S. state prison inmates are high school drop-outs or otherwise did not qualify for a diploma.⁴¹

The United States has fallen from first to eleventh place in the OECD in the fraction 25-34 year olds that has graduated high school. The older portion of the U.S. workforce ranks first among OECD populations of the same age.⁴²

When MIT put its course materials on the worldwide web, over half of the users were outside the United States.⁴³

Six of the ten best-selling vehicles in the United States are now foreign models.⁴⁴

Since 1995 the United States share of world shipments of photovoltaics has fallen from over 40 percent to well under 10 percent—while the overall market has grown by nearly a factor of one hundred.⁴⁵

Among manufacturers of photovoltaics, wind turbines and advanced batteries, the top ten global firms by market capitalization include two, one and one United States firms, respectively. The other firms are from China, Denmark, France, Germany, India, Spain, Taiwan and the U.K.⁴⁶

An American company recently opened the world's largest private solar R&D facility . . . in Xian, China.⁴⁷

By 2008, public spending in the United States on energy R&D had declined to less than half what it was three decades ago in real purchasing power. By 2005, private investment had declined to less than one-third of the total.⁴⁸

A single Japanese automobile model constitutes about half of the U.S. hybrid market.⁴⁹

Last year Mitsubishi introduced the world's first mass-produced all-electric car.⁵⁰

A Japanese company produces over 75 percent of the world's nickel-metal hydride batteries used in vehicles.⁵¹

Japan has 1524 miles of high speed rail; France has 1163; and China just passed 742 miles. The United States has 225. China has 5612 miles now under construction and one plant produces 200 trains each year capable of operating at 217 mph. The United States has none under construction.⁵²

Roughly half of America's outstanding public debt is now foreign-owned—with China the largest holder.⁵³

The increase in cost of higher education in America has substantially surpassed the growth in family income in recent decades. United States current and former students have amassed \$633 billion in student loan debt.⁵⁴

There are 60 new nuclear power plants currently being built in the world. One of these is in the United States.⁵⁵

In 2008, 770,000 people worked in the United States correction sector, a number which is projected to grow. During the same year there were 880,000 workers in the entire United States automobile manufacturing sector.⁵⁶

Between 1996 and 1999, 157 new drugs were approved in the United States. In a corresponding period ten years later the number dropped to 74.⁵⁷

All the National Academies *Gathering Storm* committee's recommendations could have been fully implemented with the sum America spends on cigarettes each year—with \$60 billion left over.⁵⁸

Youths between the ages of 8 and 18 average seven-and-a-half hours a day in front of video games, television and computers—often multi-tasking.⁵⁹

In 2007 China became second only to the United States in the estimated number of people engaged in scientific and engineering research and development.⁶⁰

In January 2010, China's BGI made the biggest purchase of genome sequencing equipment ever.⁶¹

In May 2010, a supercomputer produced in China was ranked the world's second-fastest.⁶²

Almost one-third of U.S. manufacturing companies responding to a recent survey say they are suffering from some level of skills shortages.⁶³

According to the ACT College Readiness report, 78 percent of high school graduates did not meet the readiness benchmark levels for one or more entry-level college courses in mathematics, science, reading and English.⁶⁴

ENDNOTES

1 J. Steinhauer, Schwarzenegger Seeks Shift From Prisons to Schools, *The New York Times*, January 6, 2010.

2 J. Karlberg. Biomedical Publication Trends by Geographic Area. *Clinical Trial Magnifier*. 2 (12), December, 2009.

3 S. Dutta and I. Mia, *Global Information Technology Report 2009–2010: ICT for Sustainability*, World Economic Forum, 2010.

4 T. Donohue, Testimony to the House Committee on Science and Technology on The Reauthorization of the America COMPETES Act, January 20, 2010. Available at: https://www.uschamber.com/issues/testimony/2010/100119_ameriacompetes.htm. See also: <http://www.ificlaims.com/IFI%202009%20patents%20011210%20final.htm>.

5 World Economic Forum, *The Global Information Technology Report 2009-2010*, Available at: [http://www.weforum.org/en/initiatives/gcp/Global Information Technology Report/index.htm](http://www.weforum.org/en/initiatives/gcp/Global%20Information%20Technology%20Report/index.htm).

6 P. Goodman and P. Pan, Chinese Workers Pay for Wal-Mart's Low Prices: Retailer Squeezes Its Asian Suppliers to Cut Costs, *The Washington Post*, February 8, 2004.

7 See: http://www.petrostrategies.org/Links/Worlds_Largest_Oil_and_Gas_Companies_Sites.htm (accessed August 23, 2010).

8 N. Augustine, *Is America Falling Off the Flat Earth?* National Academy of Sciences, National Academy of Engineering, Institute of Medicine, 2007, page 17; Available at: <http://www.nap.edu/openbook.php>.

9 J. Zarroli, French Telecom Company Alcatel Merging with Lucent, *NPR*, April 3, 2006.

10 J. DiPietro, Silicon Valley Is Dead, *The Motley Fool*, July, 27, 2010. Available at: <http://www.fool.com/investing/general/2010/07/27/silicon-valley-is-dead.aspx>.

11 N. Augustine, 2007.

12 T. Donohue, 2010.

13 For 2009 U.S. potato chip sales of \$7.1 billion, see <https://www.aibonline.org/resources/statistics/2009snack.htm>. For U.S. federal government spending on energy R&D of \$5.1 billion, see American Energy Innovation Council, *A Business Plan for America's Energy Future*, 2010.

14 Beijing's Giant Airport Terminal To Open, *BusinessWeek*, February 27, 2008.

15 *Measuring the Moment: Innovation, National Security, and Economic Competitiveness*, The Task Force on the Future of American Innovation. Available at: http://futureofinnovation.org/PDF/BII-FINAL-HighRes-11-14-06_nocover.pdf.

16 N. Augustine, 2007.

17 R. Hira, U.S. Workers in a Global Job Market, *Issues in Science and Technology*, Spring 2009, Available at: <http://www.issues.org/25.3/hira.html>.

18 A. Grove, How to Make an American Job Before It's Too Late, *Bloomberg*, July 1, 2010.

19 Information Technology and Innovation Foundation, *The Atlantic Century: Benchmarking EU & U.S. Innovation and Competitiveness*, February 2009. See: <http://www.itif.org/files/2009-atlantic-century.pdf>.

20 T. Meri, Eurostat: *Statistics in Focus*, 2009; Available at: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-09-025/EN/KS-SF-09-025-EN.PDF.

21 J. Adams, Science heads east, *New Scientist*, Volume 205, Issue 2742, January 9, 2010.

22 From R. Atkinson, The Globalization of R&D and Innovation: How Do Companies Choose Where to Build R&D Facilities? Testimony, Committee on Science and Technology, Subcommittee on Technology and Innovation, U.S. House of Representatives, October 4, 2007.

23 H. Fineberg, Address to The Academy of Medicine, Engineering & Science of Texas Annual Meeting, January 5, 2006.

24 T. Goldbrunner, Y. Doz, and K. Wilson The Well-Designed Global R&D Network, *Strategy+Business*, May 30, 2006.

25 For China, J.R. Wu, China's Exports Turn Upward in December, *The Wall Street Journal*, January 11, 2010; for the United States, see: <http://www.census.gov/foreign-trade/Press-Release/2010pr/01/ft900.pdf>.

26 National Center for Education Statistics, *Qualifications of the Public School Teacher Workforce: Prevalence of Out-of-Field Teaching 1987-1988 and 1999-2000*, Washington, DC: U.S. Department of Education, 2003.

27 Ibid.

28 D. Silver, General Motors Files Bankruptcy, *WStreet.com*, June 2, 2009. Available at: http://www.wstreet.com/investing/stocks/17551_general_motors_files_bankruptcy.html.

29 Organization for Economic Cooperation and Development, *Education at a Glance 2009: OECD Indicators*; Table A-3.5.

30 National Science Board, *Science and Engineering Indicators: 2010*, Arlington, VA, Appendix Table 7-9.

31 National Center for Education Statistics, *Digest of Education Statistics: 2009*, Washington, DC. See: http://www.nces.ed.gov/programs/digest/d09/tables/dt09_271.asp?referrer=list.

32 For figures on research, see NSB, 2010, Appendix Table 4-23. For figures on healthcare spending see Centers for Medicare & Medicaid Services, National Health Expenditures Aggregate, Per Capita Amounts, Percent Distribution, and Average Annual Percent Growth, by Source of Funds: Selected Calendar Years 1960-2008. Available at: <http://www.cms.gov/NationalHealthExpendData/downloads/tables.pdf>.

33 N. Augustine, Learning to Compete, *Princeton Alumni Weekly*, March 7, 2007. Available at: http://www.princeton.edu/~paw/archive_new/PAW06-07/09-0307/perspective.html.

34 OECD, 2009. Rankings include OECD members and partners, and college graduation ranking is based on Tertiary-A institutions. See: Tables A2.1 and A3.1 in http://www.oecd.org/document/24/0,3343,en_2649_39263238_43586328_1_1_1_1,00.html.

35 J. Pomfret, China pushing the envelope on science, and sometimes ethics, *The Washington Post*, June 28, 2010.

36 International Monetary Fund data available here: <http://www.imf.org/external/pubs/ft/weo/2010/01/weodata/weoselgr.aspx>.

37 Organization for Economic Cooperation and Development, *Health at a Glance 2009*, Paris, 2009. Available at: <http://www.oecd.org/health/healthataglance>.

38 Obama aims to send astronauts to Mars orbit in 2030s, *PhysOrg.com*, April 15, 2010. Available at: <http://www.physorg.com/news190564316.html>.

39 P. McDonough, TV Viewing Among Kids at an Eight-Year High, *Nielsen Wire*, October 26, 2009. Available at: http://blog.nielsen.com/nielsenwire/media_entertainment/tv-viewing-among-kids-at-an-eight-year-high/.

40 J. Mervis, Top Ph.D. Feeder Schools Are Now Chinese, *Science*, July 11, 2008.

41 C. Harlow, Educational and Correctional Populations, *Bureau of Justice Statistics Special Report*, January 2003. Available at: <http://bjs.ojp.usdoj.gov/content/pub/pdf/ecp.pdf>.

42 OECD, 2009. See Chart A1.2 at <http://www.oecd.org/dataoecd/41/25/43636332.pdf>.

43 MIT OpenCourseWare, *2005 Program Evaluation Findings Report*, June 5, 2006. Available at: http://ocw.mit.edu/ans7870/global/05_Prog_Eval_Report_Final.pdf.

44 The Best Selling Cars of 2009, *U.S. News and World Report*, January 4, 2010. Available at: <http://usnews.rankingsandreviews.com/cars-trucks/daily-news/100104-The-Best-Selling-Cars-Of-2009/>.

45 From the Statement of Arun Majumdar, Director, Advanced Research Projects Agency-Energy (ARPA-E), U.S. Department of Energy, Before the Committee on Science and Technology, U.S. House of Representatives, January 27, 2010.

46 The President's Economic Recovery Advisory Board, Memorandum for the President on Energy, the Environment and Technology, June 17, 2009. Available at: http://www.whitehouse.gov/sites/default/files/microsites/090520_perab_climateMemo.pdf.

47 Applied Materials Opens Solar Technology Center in Xian, China, *TechOn*, October 27, 2009. Available at: http://techon.nikkeibp.co.jp/english/NEWS_EN/20091027/176977/.

48 J. Dooley, U.S. Federal Investments in Energy R&D: 1961-2008, U.S. Department of Energy, PNNL-17952, October 2008. Available at: <http://www.greentechhistory.com/wp-content/uploads/2009/07/federal-investment-in-energy-rd-2008.pdf>. See also: D. Kammen and G. Nemet, Reversing the Incredible Shrinking Energy R&D Budget, *Issues in Science and Technology*, Fall 2005.

49 Best Selling Hybrid Cars in 2009, *Hybrid Cars*, March 4, 2010. Available at: <http://www.hybrid-cars.org/announcements/top-hybrid-car-2009>.

50 Mitsubishi unveils first mass-market electric car from a major car maker, *The Guardian*, January 20, 2010. See: <http://www.guardian.co.uk/technology/2009/jan/20/greentech-travelandtransport>.

51 M. Huckerbee, S. Wong, T. Cai, China's intervention in global M&A heats up while AML private actions cool down, Mallesons Stephen Jaques website, November 2009, See: <http://www.mallesons.com/publications/2009/Nov/10131333w.htm>.

52 K. Richburg, China is pulling ahead in worldwide race for high-speed rail transportation, *The Washington Post*, May 12, 2010.

53 Information on foreign holdings of U.S. treasury securities is available at: <http://www.ustreas.gov/tic/mfh.txt>. Total debt held by the public is available at: <http://www.treasurydirect.gov/NP/NPGateway>.

54 A. Damast, Asking for Student Loan Forgiveness, *BusinessWeek*, March 24, 2009.

55 International Atomic Energy Agency. See: <http://www.iaea.org/cgi-bin/db.page.pl/pris.reaucct.htm> (Accessed August 26, 2010).

56 S. Kirchhoff, *Economic Impacts of Prison Growth*, Congressional Research Service, 7-5700, April 13, 2010

57 Approvals of new molecular entities (NMEs) are counted. See J. Owens, 2006 Drug Approvals: Finding the Niche, *Nature Reviews Drug Discovery*, February 2007. Available at: http://www.nature.com/nrd/journal/v6/n2/fig_tab/nrd2247_F1.html; M. Martino, 2007 FDA Approvals, *Fierce Biotech*, January 14, 2008. Available at: <http://www.fiercebiotech.com/special-reports/2007-fda-approvals>; and M. Arnold, FDA BLA approvals rose in 2009 while NMEs stumbled, *Medical Marketing and Media*, December 31, 2009. Available at: <http://www.mmm-online.com/fda-bla-approvals-rose-in-2009-while-nmes-stumbled/article/160496/>.

58 For spending on cigarettes, see: http://www.cdc.gov/tobacco/data_statistics/fact_sheets/economics/econ_facts/. For cost estimates of the *Gathering Storm* committee's recommendations, see National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*, Washington, DC, 2007, Appendix E.

59 V. Rideout, U. G. Foehr, and D. F. Roberts, *Generation M²: Media in the Lives of 8- to 18-Year-Olds*, Kaiser Family Foundation, January 2010.

60 NSB, 2010.

61 J. Pomfret, China pushing the envelope on science, and sometimes ethics, *Washington Post*, June 28, 2010.

62 Ibid.

63 Deloitte, Oracle, and the Manufacturing Institute, *People and profitability: A time for change*, 2009.

64 Note that the ACT estimates that students meeting the readiness standard in a given subject have a 75 percent chance of getting a C and a 50 percent chance of getting a B in an entry level course. Information available at the ACT website: <http://www.act.org/news/releases/2008/crr.html>.

RISING ABOVE THE GATHERING STORM, REVISITED

Rapidly Approaching Category 5

By Members of the 2005 “Rising Above the Gathering Storm” Committee

Prepared for the Presidents of the

National Academy of Sciences

National Academy of Engineering

Institute of Medicine

NATIONAL ACADEMY OF SCIENCES,
NATIONAL ACADEMY OF ENGINEERING, AND
INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

THE NATIONAL ACADEMIES PRESS

Washington, D.C.

www.nap.edu

THE NATIONAL ACADEMIES PRESS • 500 Fifth Street, N.W. • Washington, DC 20001

Support for this project was provided by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the organizations or agencies that provided support for the project.

International Standard Book Number-13: 978-0-309-16097-1 (Book)

International Standard Book Number-10: 0-309-16097-9 (Book)

International Standard Book Number-13: 978-0-309-16098-8 (PDF)

International Standard Book Number-10: 0-309-16098-7 (PDF)

Additional copies of this report are available from the National Academies Press, 500 Fifth Street, N.W., Lockbox 285, Washington, DC 20055; (800) 624-6242 or (202) 334-3313 (in the Washington metropolitan area); Internet, <http://www.nap.edu>

Copyright 2010 by the National Academy of Sciences. All rights reserved.

Printed in the United States of America

THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine

The **National Academy of Sciences** is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. Upon the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Ralph J. Cicerone is president of the National Academy of Sciences.

The **National Academy of Engineering** was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. Dr. Charles M. Vest is president of the National Academy of Engineering.

The **Institute of Medicine** was established in 1970 by the National Academy of Sciences to secure the services of eminent members of appropriate professions in the examination of policy matters pertaining to the health of the public. The Institute acts under the responsibility given to the National Academy of Sciences by its congressional charter to be an adviser to the federal government and, upon its own initiative, to identify issues of medical care, research, and education. Dr. Harvey V. Fineberg is president of the Institute of Medicine.

The **National Research Council** was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both Academies and the Institute of Medicine. Dr. Ralph J. Cicerone and Dr. Charles M. Vest are chair and vice chair, respectively, of the National Research Council.

www.national-academies.org

2005 “RISING ABOVE THE GATHERING STORM” COMMITTEE MEMBERS PARTICIPATING IN “THE GATHERING STORM, REVISITED”¹

NORMAN R. AUGUSTINE [NAE/NAS] (Chair) is the retired chairman and CEO of the Lockheed Martin Corporation and a former Undersecretary of the Army. He is a recipient of the National Medal of Technology.

CRAIG BARRETT [NAE] is retired chairman and CEO of Intel Corporation.

GAIL CASSELL [IOM] is vice president for scientific affairs and a Distinguished Lilly Research Scholar for Infectious Diseases at Eli Lilly and Company. She is the former president of the American Society for Microbiology and former member of the Food and Drug Administration Science Board and Advisory Committees to the Director of the National Institutes of Health and the Center for Disease Control.

NANCY GRASMICK is the Maryland state superintendent of schools.

CHARLES HOLLIDAY JR. [NAE] is the retired chairman of the Board and CEO of DuPont.

SHIRLEY ANN JACKSON [NAE] is president of Rensselaer Polytechnic Institute. She is a past president of the American Association for the Advancement of Science and was chairman of the U.S. Nuclear Regulatory Commission.

ANITA K. JONES [NAE] is University Professor Emerita at the University of Virginia. She served as director of defense research and engineering at the U.S. Department of Defense and was vice-chair of the National Science Board.

RICHARD LEVIN is president of Yale University and the Frederick William Beinecke Professor of Economics.

C. D. (DAN) MOTE JR. [NAE] is president emeritus of the University of Maryland and the Glenn L. Martin Institute Professor of Engineering.

¹Additional members of the 2005 Committee:

STEVEN CHU [NAS], a Nobel Laureate in physics, is currently serving as U.S. Secretary of Energy.

ROBERT GATES, former president of Texas A&M University, is currently serving as U.S. Secretary of Defense.

JOSHUA LEDERBERG [NAS], recipient of the Nobel Prize in physiology/medicine, passed away on February 2, 2008.

CHERRY MURRAY [NAS/NAE] is dean of the School of Engineering and Applied Science at Harvard University. She is immediate past president of the American Physical Society and a past deputy director for science and technology at Lawrence Livermore National Laboratory. She was formerly a senior vice president at Bell Labs, Lucent Technologies.

PETER O'DONNELL JR. is president of the O'Donnell Foundation of Dallas, a private foundation that develops and funds model programs designed to strengthen engineering and science education and research.

LEE R. RAYMOND [NAE] is the retired chairman of the Board and CEO of Exxon Mobil Corporation.

ROBERT C. RICHARDSON [NAS] is the F. R. Newman Professor of Physics and the vice provost for research at Cornell University. He was a co-winner of the Nobel Prize in physics in 1996.

P. ROY VAGELOS [NAS/IOM] is the retired chairman and CEO of Merck & Co., Inc.

CHARLES M. VEST [NAE] is president of the National Academy of Engineering and is president emeritus of MIT and a professor of mechanical engineering. He is a recipient of the National Medal of Technology.

GEORGE M. WHITESIDES [NAS/NAE] is the Woodford L. & Ann A. Flowers University Professor at Harvard University. He has served as an adviser for the National Science Foundation and the Defense Advanced Research Projects Agency.

RICHARD N. ZARE [NAS] is the Marguerite Blake Wilbur Professor of Natural Science at Stanford University. He was chair of the National Science Board from 1996 to 1998.

“Gentlemen, we have run out of money. It is time to start thinking.”

Sir Ernest Rutherford, Nobel Laureate (Chemistry)

Foreword

We are pleased to present this report authored by members of the committee that produced the 2005 report, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*.¹ We requested this new report to get the perspective of the original committee on progress and change since the 2005 report.

BACKGROUND

Rising Above the Gathering Storm was prepared in response to a request by a bipartisan group of Senators and Members of Congress who asked the National Academies to respond to the following questions:

*What are the top 10 actions, in priority order, that federal policymakers could take to enhance the science and technology enterprise so that the United States can successfully compete, prosper, and be secure in the global community of the 21st century? What strategy, with several concrete steps, could be used to implement each of those actions?*²

These questions were posed in the context of rapid and deep changes in the global economy, investment patterns, advancing science and technology, and the global redistribution of skilled workforces, education, and innovation-driven industries. Moreover, there was widespread unease about long-term trends in U.S. investments in research, develop-

¹ NAS/NAE/IOM, *Rising above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*, National Academies Press, 2007. The initial report release was in 2005, with the final, edited book issued in 2007.

² Letters from Senators Jeff Bingaman and Lamar Alexander, dated May 27, 2005, and Congressmen Sherwood Boehlert and Bart Gordon, to NAS President Bruce Alberts.

ment and higher education, and special and deepening concern about the competitiveness of U.S. businesses and the state of the primary and secondary education attained by vast numbers of our children. *Rising Above the Gathering Storm* was drafted by a group of 20 distinguished Americans including then current or former corporate CEOs; university presidents; scientists, including three Nobel Laureates; philanthropists, former government officials; and education leaders.³ Norman R. Augustine, retired CEO of Lockheed Martin and former Under Secretary of the Army, chaired the committee. A vast relevant literature was reviewed, updated, and summarized; a diverse group of 66 stakeholders was convened to help frame and contextualize the issues; and the committee formed consensus on its recommendations. Peers drawn from many relevant backgrounds and experiences reviewed the report prior to its release.

The original report informed the debate in Congress and within two presidential administrations, and, together with other reviews of America's competitive position and innovation environment, led to the passage with strong bipartisan support of the America COMPETES Act of 2007⁴ that has formed the basis for debating and structuring federal policy and budgets, and prompted a great deal of activity at local, state, and regional levels as well.

THE CURRENT REVIEW

In the five years that have passed since *Rising Above the Gathering Storm* was issued, much has changed in our nation and world. Despite the many positive responses to the initial report, including congressional hearings and legislative proposals, America's competitive position in the world now faces even greater challenges, exacerbated by the economic turmoil of the last few years and by the rapid and persistent worldwide advance of education, knowledge, innovation, investment, and industrial infrastructure. Indeed the governments of many other countries in Europe and Asia have themselves acknowledged and aggressively pursued many of the key recommendations of *Rising Above the Gathering Storm*, often more vigorously than has the U.S. We also sense that in the face of so many other daunting near-term challenges, U.S. government and industry are letting the crucial strategic issues of U.S. competitiveness slip below the surface.

³ The Committee on Prospering in the Global Economy of the 21st Century: An Agenda for American Science and Technology was authorized under the auspices of the NAS/NAE/IOM Committee on Science, Engineering, and Public Policy (COSEPUP). Its overall charge was to address cross-cutting issues in science and technology policy that affect the health of the national research enterprise.

⁴ America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act, Public Law 110-69, August 9, 2007.

For these reasons, we believed that the nation would be well served by an update of the global context and events since the original report. We therefore asked Mr. Augustine, assisted by National Academies staff, to prepare a first draft of this update document and then work with the available members of the original committee to refine it. Each of the available members of the committee generously agreed to do so as a matter of national service. The resulting report was then anonymously peer reviewed by ten individuals with a wide range relevant expertise and experience. The results of this process are reported herein and have the unanimous support of the available members of the 2005 committee.⁵

As presidents of the National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, we are pleased to convey this report to interested readers. We believe that it will serve to inform the public and policy makers, rekindle and advance an urgent national dialogue, and stimulate further strong and sustained bipartisan effort to ensure the future competitiveness, innovation capacity, economic vitality, and job creation in the opening decades of this century.

Ralph J. Cicerone
President, National
Academy of Sciences

Charles M. Vest
President, National
Academy of Engineering

Harvey V. Fineberg
President, Institute
of Medicine

⁵ One member, Joshua Lederberg, is now deceased. Steven Chu is currently serving as U.S. Secretary of Energy and Robert Gates is currently serving as U.S. Secretary of Defense and therefore they could not participate.

PREFACE

During the summer of 2005, the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine undertook a study of America's evolving competitiveness in the global economy. The study resulted in a 500-page volume that became known as the "*Gathering Storm*" report. It focused upon the ability of Americans to compete for employment in a job market that increasingly knows no geographic boundaries.

The Executive Summary of the original report began, "The United States takes deserved pride in the vitality of its economy, which forms the foundation of our high quality of life, our national security, and our hope that our children and grandchildren will inherit ever-greater opportunities." But the report concluded that, "Without a renewed effort to bolster the foundations of our competitiveness, we can expect to lose our privileged position." Contained in the initial report were twenty specific actions that were intended to help assure that America could in fact remain competitive.

Five years have passed since the initial report was prepared, a period in which a great deal has changed...and a great deal has not changed. The recommendations included several actions that relate specifically to the physical sciences and engineering. Reflecting evolving federal budget priorities, the present report also briefly considers the biological sciences, which after a period of growth have begun to see their funding erode. This document, unanimously approved by participating members of the original *Gathering Storm* committee, revisits and updates the earlier findings.

CONTENTS

Executive Summary	1
1.0 The Gathering Storm, Revisited	16
2.0 Efforts to Avert the Storm	24
3.0 Changing Circumstances	33
4.0 The Ingredients of Innovation	43
4.1 Knowledge Capital, 44	
4.2 Human Capital, 47	
4.3 Environment, 54	
5.0 A Category 5 Storm	63
Appendixes	
A Some Perspectives	69
B Report Reviewers	81
C Project Staff	82
D Bibliography	83

Agenda Item J4-1 : NIFA Update
Review of Experience with FY2010 AFRI CAP Proposals

Presenter: Franklin E. Boteler
Assistant Director, Institute of Bioenergy, Climate, and Environment
NIFA

Background:

Boteler will present NIFA information in two parts.

Part 1 will be the update on recent NIFA activities with an emphasis on reviewing the current status of the FY2011 AFRI program.

Part 2 will review some of the experience with FY2010 AFRI CAP Proposals with an eye towards identifying the principal components of successful applications.

Action Requested: For information

NIFA-USDA
Report to
Western Region Extension and Research Directors
March 29, 2011¹
www.NIFA.usda.gov

GENERAL NIFA GRANT INFORMATION	2
NIFA Grants Through Grants.Gov	2
Current NIFA Grant Opportunities	2
CURRENT NIFA GRANT OPPORTUNITIES	2
Current Grant Opportunities	2
AFRI—GENERAL REVIEW	2
NIFA ORGANIZATION PUT INTO PLACE	3
BUDGET MATTERS	4
STAFFING NEWS	6
OTHER SIGNIFICANT INFORMATION	6

1. Franklin E. Boteler, Assistant Director, NIFA Institute of Bioenergy, Climate, and Environment.
fboteler@NIFA.usda.gov
(202) 720-0740.

1. GENERAL NIFA GRANT INFORMATION

All NIFA Grants Through Grants.Gov.

Grants.gov <<http://www.grants.gov/>> is the source to find and apply for Federal government grants. The National Institute of Food and Agriculture (NIFA) uses Grants.gov to post NIFA discretionary funding opportunities and, in some cases, other NIFA funding opportunities, and receive electronic applications. **Applicants are advised to submit early.**

2. CURRENT NIFA GRANT OPPORTUNITIES

For information on currently open NIFA grant opportunities go to: <http://www.NIFA.usda.gov/fo/recentReleasedGrants.cfm>

Critical Issues: Plant and Animal Pests and Diseases

Open Date: 03/11/2011

Due Date: 04/25/2011

Women and Minorities in Science, Technology, Engineering, and Mathematics

Open Date: 03/10/2011

Due Date: 05/10/2011

3. AFRI—GENERAL REVIEW

AFRI will support interdisciplinary, multi-functional projects in five “societal challenge” areas to achieve significant and measurable outcomes and achieving goals. The five goals include:

- Food Security--Keep American agriculture competitive while ending world hunger.
- Obesity Reduction--Improve nutrition and end child obesity.

4. NIFA—RESPONSE TO FARM BILL PROVISIONS—ORGANIZATION

- Food Safety: Improve food safety for all Americans.
- Bioenergy--Secure America’s energy future through renewable biofuels.
- Climate Science: Variation and Change: Mitigate and adapt agriculture to variations in climate.

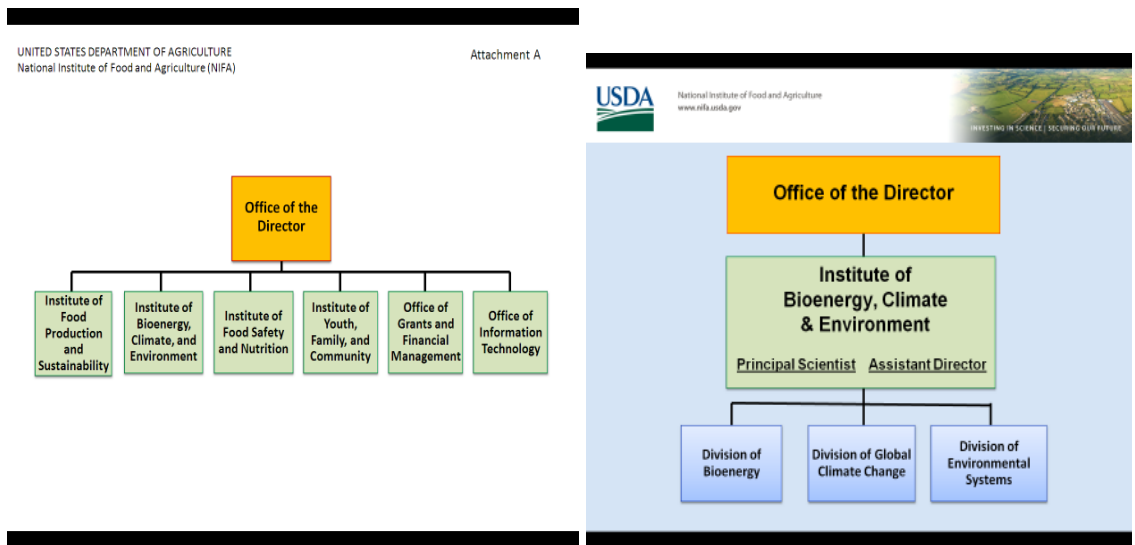
Current Status of FY2011 AFRI Program:

Foundation Programs (at least 30% of AFRI total) released/closed.

RFA on Childhood Obesity Prevention released—closes May 18.

Other FY2011 AFRI RFA’s being revised to reflect FY2011 budget.

4. NIFA ORGANIZATION PUT INTO PLACE.





NATIONAL INSTITUTE OF FOOD AND AGRICULTURE
U.S. DEPARTMENT OF AGRICULTURE

NIFA

FACTSHEET

BACKGROUND

The National Institute of Food and Agriculture was established by the 2008 Farm Bill to serve the nation's needs by supporting exemplary research, education, and extension that addresses many challenges facing the nation. NIFA works with the best and brightest scientists at universities and colleges throughout the United States and around the world to find innovative solutions to global problems. With a timely, integrated approach and collaboration with other federal science agencies, NIFA will also serve as a vital contributor in science policy decision-making.

Research enables us to develop the knowledge needed to solve many of the issues facing our nation and the world. *Education* strengthens schools and universities to train the next generation of scientists, educators, producers, and citizens. *Extension* brings the knowledge gained through research and education to the people who need it most—in the United States and around the world.

PRIORITY SCIENCE AREAS

Global Food Security and Hunger

NIFA supports new science to boost U.S. agricultural production, improve global capacity to meet the growing food demand, and foster innovation in fighting hunger by addressing food security for vulnerable populations.

Climate Change

NIFA-funded projects generate knowledge to develop an agriculture system that maintains high productivity in the face of climate changes. This will help producers plan for and make decisions to adapt to changing environments and sustain economic vitality and can take advantage of emerging economic opportunities offered by climate change mitigation technologies.

Sustainable Energy

NIFA contributes to the President's goal of energy independence with a portfolio of grant programs to develop biomass used for biofuels, design optimum forestry and crops for bioenergy production, and produce value-added bio-based industrial products.

Childhood Obesity

NIFA-supported programs ensure that nutritious foods are affordable and available and provide guidance so that individuals and families are able to make informed, science-based decisions about their health and well-being.

Food Safety

NIFA food safety programs work to reduce the incidence of food-borne illness and provide a safer food supply by addressing the causes of microbial contamination and antimicrobial resistance, educating consumer and food safety professionals, and developing food processing technologies.

LEADERSHIP

Roger Beachy, *Director*

EMPLOYEES

Approximately 320

STRUCTURE

Institute of Food Production and Sustainability

- Enhancing global food security through productive and sustainable agricultural systems

Institute of Bioenergy, Climate, and Environment

- Ensuring energy independence through clean, biobased energy systems
- Ensuring sustainable and adaptive agro-ecosystems in response to climate change

Institute of Food Safety and Nutrition

- Ensuring a safe food supply
- Improving citizens' health through nutrition
- Reducing childhood obesity
- Improving food quality

Institute of Youth, Family, and Community

- Enabling vibrant and resilient communities
- Preparing the next generation of scientists
- Enhancing science capacity in minority-serving institutions
- Enhancing youth development

Center for International Programs

- Educating the next generation of scientists in developing economies
- Sharing research discoveries to enhance food production and stabilize economies

BUDGET

Total FY10	\$1,488,335,000
Research	736,027,000
Education	68,363,000
Extension	494,923,000
Integrated	60,022,000
Mandatory	129,000,000

PARTNER LAND-GRANT INSTITUTIONS

Total	109
1862 Land-Grant Universities	57
1890 Land-Grant Universities	18
1994 Land-Grant Universities	34

WWW.NIFA.USDA.GOV

5. BUDGET MATTERS:

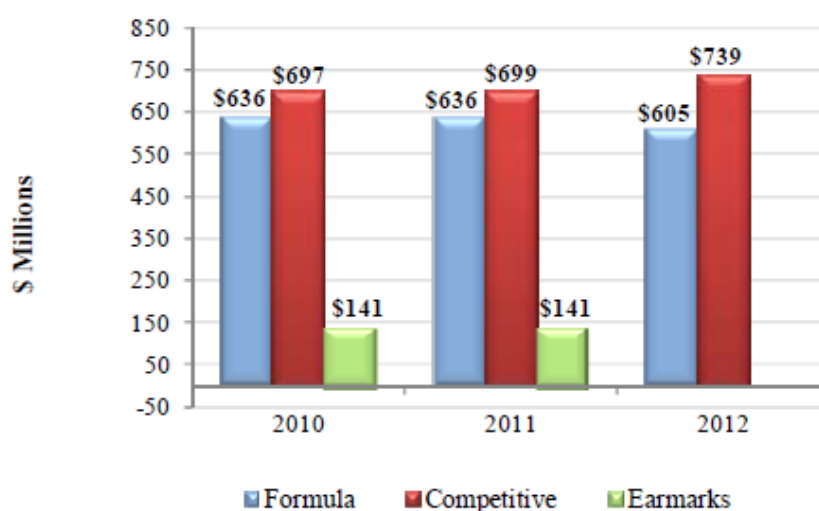
FY2012 USDA Budget Proposal--<http://www.obpa.usda.gov/budsum/FY12budsum.pdf>

Roger Beachy's testimony to House Appropriation Committee--

http://appropriations.house.gov/_files/031611TestimonyofDrRogerBeachyNIFA.pdf

Overview of Budget Proposal for NIFA:

2012 NIFA Budget Authority



*Does not include endowment funds

The FY 2012 Budget Request includes approximately \$1.2 billion in discretionary funding for the National Institute of Food and Agriculture (NIFA)-- a decrease of \$137.95 million or approximately 10.23% below the FY 2011 Annualized Continuing Resolution discretionary funding amount of \$1.35 billion. The Budget increases funding of competitive grants, continues funding for capacity building through formula programs (5% cut), and eliminates funding for Congressional earmarks.

The FY 2012 Budget also proposes to expand support for minority serving institutions through establishment of a new Hispanic Serving Agricultural Colleges and Universities Endowment Fund and sustained support for the Native American Endowment Fund. The FY 2012 Budget Request proposes approximately \$21.9 million for both endowment funds, an increase of \$10 million over the FY 2011 level.

The FY 2012 Budget for NIFA also includes mandatory funding totaling \$140 million for the following programs: Organic Agriculture Research and Extension Initiative, Beginning Farmers and Ranchers Program, Biomass Research and Development, Specialty Crop Research Initiative, Agriculture Risk Management Education Program, Biodiesel Fuel Education Program, and

Community Food Projects Competitive Grants Program. This is an increase of \$9.0 million over the FY 2011 level.

Some highlights of the FY 2012 President's Budget request for NIFA are:

NIFA proposes \$324.7 million for the Agriculture and Food Research Initiative (AFRI). This is an increase of approximately \$62.2 million over the FY 2011 level. \$40M in 406 programs are not moved forward. The budget also proposes to redirect funding from the Graduate Fellowships Program (\$3.85M) and Institution Challenge Grants Program (\$5.65M) into AFRI. This redirection will allow efficiency in management and alignment of medium to long-term research goals with scientific training opportunities and directions.

The budget proposes increased funding for the Secondary and 2-year Post Secondary Program to support science, technology, engineering, and mathematics education. Funds will allow educators to update and revise curricula and encourage coordination in research and extension activities in the food and agricultural sciences at rural secondary, and 2-year post secondary, and higher education institutions.

In addition to support for Hispanic and Native American Endowment Funds, the budget also proposes increases to: expand the number of Federally-Recognized Tribes receiving Extension programs through the Federally-Recognized Tribes Extension Program; pilot a food and nutrition program in a number of Native American communities through competitive grants supported by the 1994 Extension Program funding; support multi-State alliances under the 1890 Capacity Building Grants Program; support alliances among Hispanic-Serving Institutions (HSI) under the HSI Education Grants Program; and support activities to reach American Indian students under the Tribal Colleges Education Equity Grants program.

In FY 2012, NIFA proposes increased funding for research, education, extension, and integrated activities related to sustainable agriculture. Sustainable agriculture efforts will continue to increase knowledge about - and help farmers and ranchers adopt - practices that are profitable, environmentally sound, and good for communities. Included in the requested funding is a new State-Federal matching program which will leverage State and/or private funds and build the long-term capacity to guide the evolution of American agriculture to a more highly, productive, sustainable system.

The FY 2012 proposes to consolidate funding for Expert Integrated Pest Management Decision Support System, Pest Management Alternative, and Integrated Pest Management and Biological Control into a single program to improve the efficiency of program implementation resulting in research investments with greater focus, more appropriate scale, and enhanced impact.

In FY 2012, NIFA proposes a change in the General Provisions language to increase the indirect cost cap from 22% to 30% on competitively awarded programs.

6. STAFFING NEWS

- Catherine E. Wotecki, Under Secretary for Agriculture for Research, Education and Economics, Department of Agriculture.

- Ann Bartuska, Deputy Under Secretary, Research, Education, Economics

Krysta Harden, Chief of Staff, Office of the Secretary

Since April of 2009, Krysta has worked as Assistant Secretary for Congressional Relations at the department. Before arriving at USDA, Krysta served as Chief Executive Officer for the National Association of Conservation Districts (NACD) from 2004-2009. Operating from NACD headquarters in Washington, D.C., she was responsible for the association's policy development and member services programs and coordinated strategic planning, budget formulation and related business operations. Krysta previously served as the Senior Vice President of Gordley Associates, a Washington, D.C. consulting firm. In that capacity, she worked with a variety of commodity organizations, most notably the American Soybean Association. Prior to working for Gordley, Krysta served in various positions on Capitol Hill for 12 years. While on the Hill, Harden served as a professional staff member for the House Agriculture Committee and as Chief of Staff for former House member Charles Hatcher of Georgia. Krysta holds a Bachelor of Arts degree in Journalism from the University of Georgia.

Courtney Rowe, Press Secretary, Office of Communications

Courtney Rowe joins us as a Press Secretary. Courtney has served in a variety of capacities on Capitol Hill, most recently as Communications Director for the U.S. Senate Committee on Agriculture, Nutrition, and Forestry. Prior to this position, she served as Associate Director of the Senate Democratic Steering and Outreach Committee where she directed Senate Democratic Leadership's outreach efforts to rural, agriculture, faith, veterans, and Native American leaders and organizations. Courtney is originally from Stamps, Arkansas and is a graduate of Arkansas State University.

Tina Buch, NIFA Budget Officer. Retired effective March 3, 2011, concluding 30 years in Federal government service. Tina has made tremendous contributions to the overall success of NIFA and USDA throughout her career. While we are recruiting to fill behind Tina, we have asked Karen Lawson to serve as the Interim Budget Officer for NIFA.

Ellen Danus, NIFA Policy Chief. Retired effective March, 2011.

7. OTHER SIGNIFICANT INFORMATION

USDA Chief Scientists

The Secretary of Agriculture has published the final rule for establishing a Chief Scientist for the Department along with the delegations of authority for this position. The Office of the Chief Scientist (OCS) within the Research, Education, and Economics (REE) mission area of USDA. OCS exists to provide leadership and coordination to ensure that research supported by and scientific advice provided to USDA and external stakeholders are held to the highest standards of intellectual rigor and scientific integrity. Also responsible for coordinating the agricultural research, education, and extension activities of the Department.

- Provide to the Secretary information on topics that can benefit from scientific input to ensure informed decision-making at the highest levels of Government.

- Facilitate the coordination and collaboration within the Department on high priority science issues that will benefit from intra-Departmental collaboration, including coordinating the assessment of the relevance, quality, performance, and impact of the Department's efforts in science.
- Build partnerships within the scientific community by serving as a point of contact for interactions with other agencies of science, universities, and other external members of the scientific community for the purpose of leveraging and promoting relationships to explore common scientific interests and shared goals.
- Develop mechanisms to address scientific integrity within the Department.
- Serve as Chair of the USDA Science Council.

Through a series of divisions (headed by Division Chiefs/Senior Advisors) organized by the following focus areas:

- Renewable energy, natural resources, and environment;
- Food safety, nutrition, and health;
- Plant health and production and plant products;
- Animal health and production and animal products;
- Agricultural systems and technology; and
- Agricultural economics and rural communities.

The divisions will be known collectively as the Research, Education, and Extension Office.

8. RECENT SIGNIFICANT PUBLICATIONS

- USDA Strategic Plan Available at—
<http://www.ocfo.usda.gov/usdasp/sp2010/sp2010.pdf>

▪New Biology Report:

A recent report from the National Research Council entitled "A New Biology for the 21st Century: Ensuring the United States Leads the Coming Biology Revolution" is gaining a lot of attention from NIFA leadership. Video summary can be found at:

<http://dels.nas.edu/dels/viewreport.cgi?id=5953>

- Toward Sustainable Agricultural Systems in the 21st Century.** The committee who wrote this report was chaired by Julia Kornegay (Head, Dept of Horticultural Science, NCSU). The press release can be seen at <http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=12832> and the direct URL to this publication is http://books.nap.edu/catalog.php?record_id=12832

- Pasteur's Quadrant: Basic Science and Technological Innovation.** Donald E. Stokes. Brookings Institution Press. 1997.

Guidance and Lessons Learned on Large Coordinated Agricultural Project Proposals¹

Tips on Constructing the Proposal

In general, the most successful CAP proposals have four qualities:

- (1) the work is novel or innovative (for the large projects must be exciting, bold);
- (2) the work is doable given the time allotted and other resources;
- (3) the team is multidisciplinary and fully capable of carrying out the work.
- (4) results are measurable and have impact on the societal challenge.

Read the RFA thoroughly before considering submission, then read it again 2-3 more times throughout the project design, proposal outlining, writing, and reviewing, and pre-submission phases. At NIFA we “pour over” the wording quite a bit.

Check in with your administrators (Extension/Experiment Station Directors, Deans, ...) who may be more aware of the “larger picture” NIFA is working within.

Contact your sponsored programs office early and identify resources they have, which might be useful to you, e.g., grant writers, budget preparation, training etc. Also, work with them to identify deadlines, and work backward from those dates to ensure an on-time submission.

Develop a core team of the best and brightest (“dream team”), not necessarily your usual collaborators. Don’t forget to include stakeholders in some meaningful way.

If the project is integrated (research, education, extension), everyone needs to be at the table early on. Integrated components added ex post facto are easy for reviewers to spot, and most often result in projects that are poorly integrated.

Delay proposal writing until a clear, tightly integrated “storyboard” has been created. Don’t start writing until all team members are identified and engaged. When writing begins, make sure that all the RFA’s evaluation criteria have been adequately addressed. Writing must be flawless. Articulate the roles of each team member.

Consider the audience--reviewers/panelists. What makes their job easier and makes your proposal easier to read and understand (a joy to read)? The panel is all technical experts and scientists—but not all are technical experts in your field. “Put yourself in the shoes of a reviewer who will read between 15 and 20 proposals.” Write the proposal for the reviewers. Write a meaningful and engaging project summary.

Writing must be flawless. Well-designed and professional graphics not only look good, but they convey concepts clearly and concisely for reviewers. A Gantt chart (or similar timeline

¹ Franklin E. Boteler. Assistant Director, Institute of Bioenergy, Climate, and Environment. NIFA. (202) 720-0740
fboteler@nifa.usda.gov

of activities) of who is doing what and when, is very informative. Consider including a logic model to illustrate your project. Proposals should have good balance and flow, and present a compelling argument.

Allow time to have non-team reviewers read and critique the proposal. The final proposal should read as though it was written by a single individual presenting a well-coordinated agricultural project, not a patchwork of different PIs, each with a pet project that needs funding.

Large projects can benefit greatly from including a project manager role on the team (separate from PD). For the large grants, the project management plan component is often reviewed by panelists who have MBA's. Project management is key to success. Collaborators may come from different institutional or disciplinary cultures and may have different motivations, making integration across groups/teams difficult at times. It may be the case that not all components of a large, complex project will be fully successful, so adjustments mid-stream may be required. Call for yearly goals and regular progress reports (with feedback) to help keep separate teams focused and on track. Establish a regular communication schedule and protocols, e.g., teleconferences, videoconferences, IT tools, reporting, etc. Finally, keep the project "sold" by going beyond the required agency reporting, and instead providing continuous, easy to explain, reliable evidence that the project is succeeding.

Do not underestimate the time required to get signatures and budgets from multiple collaborating institutions.

Some Specifics on Grants.Gov

Tips for Preparing an Electronic Submission: <http://www.nifa.usda.gov/funding/electronic.html>

Pay attention to the detailed expectations for formatting and submission—LOI's included.

E.g.'s

- All attachments in the application must be submitted in the Portable Document Format (PDF) and be consistent with other attachment requirements in Part III 3.1 of the NIFA Grants.gov Application Guide. Applications that do not follow the guidelines for attachments will not be reviewed.
- Applicants must ensure that the abstract and project narrative attachments meet the required page limits regardless of whether the document is single or double spaced. Applications that exceed required page limits will be excluded from review.
- PDF documents submitted as a part of the application must also adhere to the following guidelines or risk being excluded from review:
 - Margins not less than 1" or 2.5 cm on all sides;

- Type no less than 12 point font size regardless of whether it is single or double spaced;
- Font type should be “Times New Roman, Geneva, Helvetica, or Arial”; and
- Tables and graphics may be included; text for captions, headings and graphic explanations must not be smaller than 9 point and must be the same font type as the rest of the application.
- PDF files must not be password protected.

PDF file names must not contain any special characters

Common Reasons for Lower Ratings from Panels

- Little or no relevance to NIFA mission and/or RFA priorities
- Insufficient preliminary data or evidence from literature
- Exceeds page limit, poorly written, unclear objectives or hypotheses
- Low scientific merit, basic flaws in logic, demonstrates lack of scientific understanding
- Not innovative, little new information gained
- Inappropriate methods or methods too vague
- Poor progress or few results from previous funding
- For integrated proposals, a failure to truly integrate the research, education and/or extension components of the project—missing one part. Large proposals must demonstrate a clear integration of components, so that the whole is greater than the sum of its parts.

Research—new knowledge needed.

Education—preparation of next generation of professionals.

Extension—putting knowledge into action.

Some Questions Asked During a Recent Reverse Site Panel Review

1. Your proposal did not fully demonstrate your capability to coordinate transdisciplinary research, education, and extension. Detail the management strategies and tactics you will use to build integration among team members with different disciplinary backgrounds and at different institutions.
2. The AFRI peer review panel felt that your proposal did not adequately define a performance evaluation plan in which project objectives and metrics against which you will measure success in achieving your objectives. Please define specific project objectives milestones, and performance metrics within your project timeline. Identify potential risks in meeting your objectives and mitigation strategies. Identify acceptable incremental outcomes for objectives that might not be achieved.
3. Provide a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis for your project.

4. How will your project impact rural economic development, and how will you maximize that impact through execution of your project management plan?
5. What are the economic, social, and other sustainability challenges your project faces? What are your strategies to address these challenges, and contingency plans in these areas?
6. How will stakeholder interaction occur, both in person and throughout the work?
7. What are the major technical barriers and potential pitfalls of your project? What contingencies are in place for them?
8. Many of the activities described in your proposal may have significant public impact, how will you engage and inform policymakers during the course of your project?
9. Describe the integration of extension, education, and research in detail.
10. What leveraging is being proposed among different entities? If prior funding sources are being leveraged for this project, how will the consortium differentiate deliverables of this project from those of prior funding sources? What new activities are we getting for this new money, and how is this taking us to the next level? How will USDA be able to identify the return on this investment?

Last bit of advice--The best way to understand what constitutes a great proposal (and hence help you write one) is to serve on a peer-review panel, preferably for the program for which you are most interested.

Some Examples of Funded CAPs

I. LOBLOLLY PINE GENOME SEQUENCING:

Excerpts from Press Release: Beachy also announced a \$14.6 million NIFA award to a team led by Dr. David Neale to sequence the loblolly pine genome, and the genomes of two other conifers: sugar pine and Douglas fir. Pine genomes are extremely large at 10 times the size of the human genome. The genome sequence of these important species will accelerate breeding efforts and are expected to enhance their uses as feedstocks for biofuels and biopower. Increased planting of fast growing varieties of loblolly pine and other agroforestry crops will also contribute to carbon sequestration and help to mitigate the effects of climate change.

UC Davis is the lead institution on the 5-year Loblolly Pine Genome CAP and will be joined by the Children's Hospital of Oakland Research Institute, Washington State University, Texas A&M University, Indiana University and the University of Maryland. The pine germplasm to be sequenced comes from the North Carolina State University Cooperative Breeding Program and was produced by a mating made by the Virginia Department of Forestry.

II. Regional Approaches to Climate Change CAP Award --“Approaches to Climate Change for Inland Pacific Northwest Agriculture”

Lead Institution: University of Idaho

RFA Program Area Priority

“A Regional Integrated CAP will bring together a multi-state, multi-institutional, and trans-disciplinary team to integrate scientific discoveries and technology with practical application.....A CAP contains the needed science-based expertise in research, teaching, and extension, as well as expertise from principal stakeholders and partners to accomplish project goals and objectives....to address the mitigation, adaptation, education, and outreach goals within a region defined by climate variables....These projects must be trans-disciplinary , involve multiple investigators, and address a significant regional issue with respect to greenhouse gas mitigation and adaptation through increased resiliency in agriculture production and sustainable natural resources management under variable climates.”

Project Objectives

- Create a theoretical framework that integrates biophysical and socioeconomic aspects of regional cereal production systems under current and projected climate scenarios.
- Establish a baseline and monitor changes in soil carbon and nitrogen levels and GHG emissions related to mitigation and adaptation to climate change in the region’s agriculture.
- Determine the effects of current and potential alternative cropping systems on GHG emissions and carbon, nitrogen, water, and energy budgets as well as local and regional farm income impacts using models and replicated field trials.
- Determine social and economic factors influencing agricultural management, technology adoption, and development of policy to improve production efficiency while mitigating greenhouse gas emissions.
- Introduce innovative agricultural approaches to climate change mitigation and adaptation into K-12 and undergraduate and graduate curricula to prepare citizens and professionals for climate related challenges and defining agriculture’s role in providing food, energy and ecosystem services.
- Incorporate stakeholder perspectives and needs in research design and translation of science into policy and practice that is effective for climate change mitigation and adaptation through enhanced extension networks and capacities.
- Develop the regional capacity for continued, long-term research, education, and extension efforts to mitigate and adapt to climate change.
- Address climate change effects with a transdisciplinary research focus to enable researchers, stakeholders, students, the public, and policymakers to acquire a more holistic understanding of how agriculture is interrelated with climate change.

What are the outcomes?

- The region possesses some of the most productive dryland grain-producing soils in the world, producing 13% of the nation’s wheat supply and 80% of its specialty soft white wheat for export, thus anchoring regional economies.
- Projections of climate change indicate that current cropping systems and practices in the region will no longer be suitable over large areas, requiring shifts in distribution of current practices or development and implementation of novel practices to adapt to changes.
- Development and implementation of tools and strategies will allow the Inland Pacific Northwest region to continue to produce cereal and other crops under an increasingly variable climate, thus anchoring the local economies, while also mitigating factors that lead to climate change

- An increase in the number of scientists, educators, and extension professionals with the skills and knowledge to address climate change and help producers adopt practices that impart the greatest resiliency.

Project Participants

University of Idaho

PD: Eigenbrode, Sanford D., CO-PD: Abatzoglou, John T. CO-PD: Gessler, Paul E., CO-PD: Gosz, James R., CO-PD: Johnson-Maynard, Jodi , CO-PD: Painter, Kathleen M. CO-PD: Walden, Von P. ,CO-PD: Wulforst, Jeffrey D., CO-PD: Wolf, Kattlyn J. ,

Washington State University

CO-PD: Kruger, Chad E., CO-PD: Lamb, Brian K. , CO-PD: Burke, Ian C. , CO-PD: Pan, William L., CO-PD: Stöckle, Claudio O.,

Oregon State University

CO-PD: Antle, John M., CO-PD: Capalbo, Susan, CO-PD: Mote, Philip W., CO-PD: Petrie, Steven

USDA-ARS, Pullman WA

CO-PD: Huggins, David R., CO-PD: Paulitz, Timothy C.

Purdue University

CO-PD: Shepson, Paul B.

With connections to *The Oregon Climate Change Research Institute*, the award-winning *ClimateFriendly Farming* project at WSU, two *NSF IGERT* projects (“Evaluating resilience of economical and social systems in changing landscapes: a doctoral research and education program in Idaho and Costa Rica” and “Nitrogen Systems: Policy-oriented Integrated Research and Education (NSPIRE)). and the NSF- Kellogg Biological Station Long- Term Ecological Research Site

Funding Amount

- \$20,000,000 for 5 years (\$4,000,000 per year)

Funding split: UI: \$7.62M (38.1%); WSU: \$6.46M (32.3%); OSU: \$4.12M (20.6%); ARS: \$1.8M (9%)

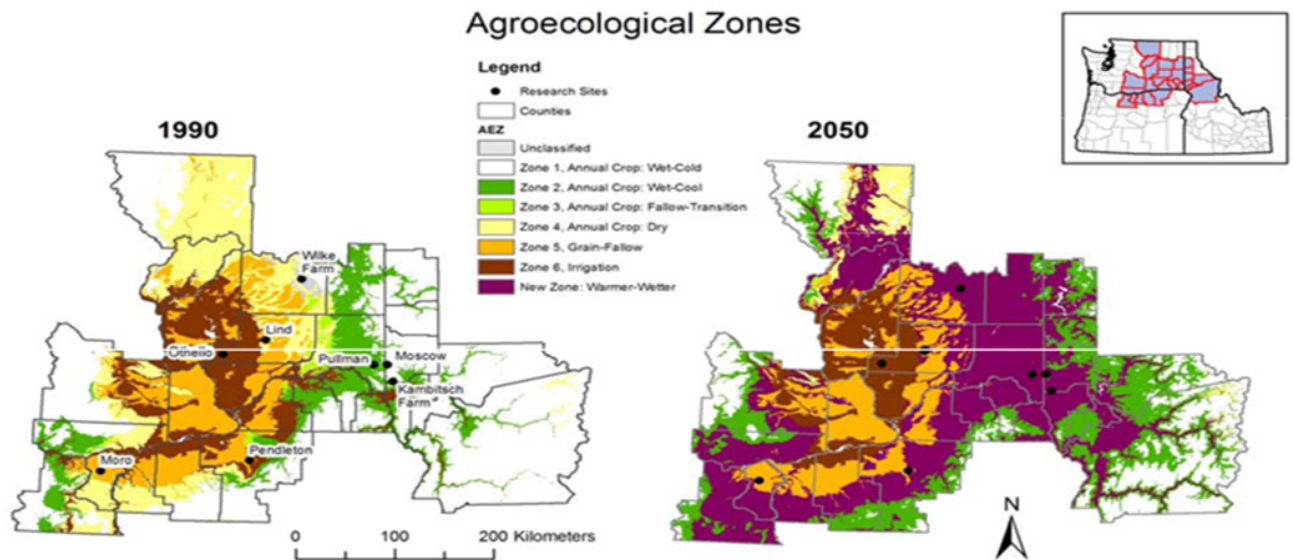
Pre-Award Review Process

- CAP Panel Review – October 5-7, 2010
- Reverse Site Visit – November 9, 2010
- Post-Reverse Site Visit: Additional information requested and accepted: December 6, 2010

Post Award Management

- NIFA Climate CAP Management and Review Team:
 - Michael Bowers, National Program Leader, Ecology, mbowers@nifa.usda.gov, 202-401-4510
(lead NIFA liaison)

- Fen Hunt, National Program Leader, Natural Resource Economics, fhunt@nifa.usda.gov, 202-720-4114
- Eric R. Norland, CF, National Program Leader, Forest Resource Management, enorland@nifa.usda.gov, 202-401-5971
- Mary Ann Rozum, National Program Leader, Conservation, mrozum@nifa.usda.gov, 202-401-4533
- NIFA Representative to attend annual meetings of the stakeholder advisory committee
- NIFA Continuation Grant Review – Years 2, 3, 4, and 5
- Other processes and engagements to be determined (e.g. project executive committee conference calls)



III. CAP Award: *Climate Change, Mitigation, and Adaptation in Corn-Based Cropping Systems*

To: Iowa State University

RFA Program Area Priority

A3101 Regional Approaches to Climate Change- Cropping systems: cereal production systems (corn)

Project Background

- 2010 NASS Statistics (United States)
 - 12.4 billion bushels produced
 - 152.8 bushels per acre yield
 - 81.4 million acres harvested
- Average US corn price (2009)- \$3.70 per bushel (approximately \$45.9 billion annually)
- Project states compose approximately 64% of total corn grain yield and 37% of total corn silage yield in the United States

	Grain		Silage	
	1,000 Bushels	% of US	1,000 Tons	% of US
Illinois	1,946,800	16%	1,980	2%
Indiana	898,040	7%	2,730	3%
Iowa	2,153,250	17%	5,160	5%
Michigan	315,000	3%	5,365	5%
Minnesota	1,292,100	10%	7,000	7%
Missouri	369,000	3%	900	1%
Ohio	533,010	4%	2,380	2%
Wisconsin	502,200	4%	14,250	13%
Total	8,009,400	64%	39,765	37%

Project Objectives

1. Develop standardized methodologies for estimating C, N, and water footprints of corn production in the region and perform baseline monitoring.
2. Perform field tests across 21 baseline sites in eight states to evaluate the impacts of a suite of crop management practices (including no-till, extended crop rotations, drainage water management, cover crops, and canopy N-sensors) on C, N, and water footprints.



3. Apply climate and physical models to synthesize results from the field tests and extend them to predict climate and economic scenarios.
4. Perform comprehensive life cycle analyses (LCA) of the proposed practices and evaluate the socio-economic-environmental willingness of producers and farmers to adopt new cropping systems through feedback loops between social science research, biophysical field research, monitoring, and modeling of agricultural production systems.
5. Integrate education, extension, outreach, and stakeholder participation across all aspects of the program. Focus will be on place-based education and outreach programs. Farmers will participate via I-FARM (<http://i-farmtools.org/>), an interactive tool to analyze the economic, agronomic, and social acceptability of these practices.

Project Highlights

- 11 institutions from nine states
- Multi-disciplinary team including background in: Environmental science, ecology, natural resource management, crop and soil science, plant science, agronomy, agriculture education, agriculture & rural development, agriculture engineering, human & community resource development, economics, and sociology
- Baseline measurements taken from 21 sites (greenhouse gases, carbon, nitrogen, water usage, and crop management practices)
- Data archived in central database and used in conjunction with public climate data
- Physical, climate, sociological, and economic models applied to determine strengths and weaknesses of cropping practices
- Life cycle analyses, social, and economic findings used to develop public policy recommendations and engage producers and stakeholders
- Integrated research, extension, and education project
- External advisory board will meet once a year with the executive team
- In addition to monthly conference calls, major milestones include the Annual Summer Convening (years 1-5), external evaluations (years 2 and 4), the National Conference (year 5) and producing white papers for the Farm Bill (years 2 and 5)

Project Participants

- Iowa State University (Lead Investigator)
- Ohio State University
- University of Wisconsin
- Purdue University
- University of Missouri
- Lincoln University of Missouri (1890 Institution)
- USDA/ARS- Coshocton, OH and Columbus, OH
- Michigan State University

- University of Illinois
- University of Minnesota
- South Dakota State University

Funding Amount

- \$20,000,000 for 5 years (\$4,000,000 per year)- \$8M in 2010, \$4M in 2012, 2013, and 2014

Post Award Management

- NIFA Project Representative: Mary Ann Rozum, National Program Leader, Conservation & Environment, mrozum@nifa.usda.gov, 202-401-4533
- NIFA climate review team: Michael Bowers, Fen Hunt, and Eric Norland
- NIFA representative to attend kickoff meeting February 9 and 10, 2011- Chicago, IL
- NIFA representative to attend annual meetings of the stakeholder advisory committee
- NIFA Continuation Grant Review – Years 2, 3, 4, and 5
- Other processes and engagements to be determined (e.g. project executive committee conference calls)

J6 MRC Update

MULTISTATE REVIEW COMMITTEE (MRC) (Formerly the Regional Coordination Implementation Committee (RCIC)) (Summary of 2011 Spring meeting's review activities)

1.0 The following Western Multistate Research Projects/Coordinating Committee/Development Committees are currently scheduled to terminate on September 30, 2011

Project Number and Title			Request/Renewal Submitted
	W504	Biology and Management of Spotted Wing Drosophila in Small and Stone Fruits	
•	W1005	An Integrated Approach to Prevention of Obesity in High Risk Families	extension request
	W1006	Agricultural Literacy	
•	W1112	Reproductive Performance in Domestic Ruminants	w_temp3301
	W1167	The Changing Landscape of Women in America: Understanding Work, Family, and Personal Issues	plan to terminate
•	W1173	Stress Factors of Farm Animals and Their Effects on Performance	w_temp3241
	W1192	Economic, Social, and Ecological Issues of Rangeland Fragmentation that Affect Rangeland Sustainability and Rural Communities	
	WCC1006	Management of the Mexican Wolf	
	WDC018	Meteorological and Climate Data to Support ET-Based Irrigation Scheduling, Water Conservation, and Water Resources Management (from WERA202)	
	WDC019	Coordination of Integrated Pest Management Research and Extension/Educational Programs for the Western States & Pacific Basin Territories (from WERA69)	
	WDC20	Safety and Wellbeing Issues of Wildland Firefighters Personal Protective Clothing	
•	WERA011	Western Regional Turfgrass Research	wera_temp3281
•	WERA020	Virus and Virus-Like Diseases of Fruit Trees, Small Fruits, and Grapevines.	wera_temp3201
•	WERA040	Application and Utility of the Ecological Site and Condition Concept for Monitoring Rangeland Ecological Status in the Western U.S.	extension request
	WERA066	Integrated Management of Russian Wheat Aphid and Other Cereal Arthropod Pests	
•	WERA089	Potato Virus Disease Control	wera_temp3041
	WERA099	Broodstock Management, Genetics and Breeding Programs for Molluscan Shellfish	
•	WERA1007	Curly Top virus Biology, Transmission, Ecology, and Management	wera_temp3261
•	WERA1008	Rangelands West Partnership	wera_temp3141

• Requests have been received and are itemized below

2.0 The following multistate projects were approved from 10/1/2011 - 9/30/2016

- 2.1 W2112 (W_TEMP3301) "Reproductive Performance in Domestic Ruminants (from W1112)"
- 2.2 W2173 "W_TEMP3241" "Impacts of Stress Factors on Performance, Health, and Well-Being of Farm Animals (from W1173)"

3.0 The following WERA projects were approved for five years, from 10/1/2011 to 9/30/2016.

- 3.1 WERA11 (WERA_TEMP3281) "Western Regional Turfgrass Research (from WERA_old11)"
- 3.3 WERA20 (WERA_TEMP3201) "Virus and Virus-Like Diseases of Fruit Trees, Small Fruits, and Grapevines (from WERA_old20)"
- 3.4 WERA89 (WERA_TEMP3041) "Potato Virus Disease Control (from WERA_old89)"
- 3.5 WERA1007 (WERA_TEMP3261) "Curly Top virus Biology, Transmission, Ecology, and Management (from WERA_old1007)"
- 3.6 WERA1008 (WERA_temp3141) "Rangelands West Partnership (from WERA_old1008)"

4.0 The following multistate project(s)/development committee(s)/coordinating committee(s) received one-year extensions (to 9/30/2012)

- 4.1 W1005 "An Integrated Approach to Prevention of Obesity in High Risk Families"
- 4.2 WERA40 "Application and Utility of the Ecological Site and Condition Concept for Monitoring Rangeland Ecological Status in the Western U.S."

5.0 Administrative Advisor assignments:

- 5.1 W1112 "Reproductive Performance in Domestic Ruminants" - replacement for C. C. Kaltenbach (AZ)
- 5.2 W1173 "Stress Factors of Farm Animals and Their Effects on Performance" - replacement for C. C. Kaltenbach (AZ)
- 5.3 W2001 "Population Dynamics and Change: Aging, Ethnicity and Land Use Change in Rural Communities" - Lou Swanson (CO) to replace Jim Christenson (AZ)
- 5.4 W2147 "Managing Plant Microbe Interactions in Soil to Promote Sustainable Agriculture" - replacement for Don Cooksey (CA-R)
- 5.5 W2177 "Enhancing the Competitiveness and Value of U.S. Beef" - replacement for CY Hu (HI)
- 5.6 W2185 "Biological Control in Pest Management Systems of Plants" - replacement for Don Cooksey (CA-R)

- 5.7 W2186 "Variability, Adaptation, and Management of Nematodes Impacting Crop Production and Trade" - replacement for Don Cooksey (CA-R)
- 5.8 WCC1006 "Management of the Mexican Wolf" - replacement for C. C. Kaltenbach (AZ)
- 5.9 WDC18 "Meteorological and Climate Data to Support ET-Based Irrigation Scheduling, Water Conservation, and Water Resources Management" - replacement for John Winder (WA)
- 5.10 WERA103 "Nutrient Management and Water Quality" - Rich Koenig & Ralph Cavaliere (WA) to replace Gary Peterson & Lee Sommers (CO)
- 5.11 WERA1005 "Addressing the Rural Development Concerns of the Rural West" - replacement for Rang Narayanan (NV)
- 5.12 WERA1008 "Rangelands West Partnership" - replacement for C. C. Kaltenbach (AZ)
- 5.13 WERA1010 "Reduction of Error in Rural and Agricultural Survey" - replacement for Jim Christenson (AZ)
- 5.14 WERA1011 "Sustainable Rangeland and Watershed Stewardship" - replacement for John Winder (WA)
- 5.15 WERA1014 "Intensive Pasture Management for Sustainable Livestock Production in the Western US" - replacement for Rang Narayanan (NV)

6.0 Administrative Advisors needed for following projects:

7.0 Other Business

- 7.1 Reminder to Directors, AA's and their committees that there will be a single submission date of January 15 each year beginning January 1, 2012; and plans to hold a single meeting in the spring in conjunction with the WAAESD meeting. Other MRC business will be accomplished by email and conference calls.
- 7.2 2011 Experiment Station Section Excellence in Multistate Research Award nomination - The Western nomination for the 2011 Experiment Station Section Excellence in Multistate Research Award will be forwarded to the ESCOP Science and Technology Committee. This Committee will make a recommendation for the national winner to the ESCOP Executive Committee who will make the final selection.

As approved at the ESS Meeting on September 28, 2010, in Nashville, the winning project will receive \$15,000 from the Hatch Multistate Research Funds.

Agenda Item J7: NIFA Planning and Accountability Workshop

Presenter: Mike Harrington

Background:

NIFA Planning and Accountability staff led by Bart Hewett held a workshop in New Orleans, February 21-23, to develop National Outcomes and Indicators that will be used to structure annual POW reporting. Each region was asked to identify 5 participants each from research and extension for each of the USDA/NIFA goals.

Each goal area team was comprised of 10 university participants, a facilitator, an outcomes evaluator and two subject area NPLs, one for extension and one for research. For the assigned NIFA Priority Area, each group was to develop 3-5 (*at least 3 were required*) national outcomes and associated indicators specific to research, extension and/or both.

All outputs from the workshop have been shared with the facilitators and evaluators for review and formatting for consistency.

Time line:

April 14th - National POW Webinar and publication of National Outcomes and Indicators for comment and review

Late May - Publish National Outcomes and Indicators in final form

Summer - Incorporate into the POW reporting system

Action Requested: For information

National Outcome and Indicators Workshop Teams

Name	Email Address	Phone Number	Organization	Research/Extension
Global Food Security and Hunger Team				
Paul Brown	PWB0001@auburn.edu	334-844-5546	Auburn University	Extension
Leslie Oliver	lesley.oliver@uky.edu	859-257-1084	University of Kentucky	Research
Nick Place	nplace@umd.edu		University of Maryland	Extension
Rick Rhodes	rcr3@uri.edu		University of Rhode Island	Research
Judee Richardson	jar@illinois.edu	217-244-1916	University of Illinois	Extension
Deb Hamernik	dhamernik2@unlnotes.unl.edu	402-472-2045	University of Nebraska	Research
Paul McCawley	mccawley@uidaho.edu		University of Idaho	Extension
Jeff Jacobsen	jefj@montana.edu		Montana State University	Research
Ray McKinnie	mckinnie@ncat.edu		North Carolina A&T University	Extension
Vernon Jones	vjones@luresext.edu		Langston University (Oklahoma)	Research
Bill Hoffman	whoffman@nifa.usda.gov		NIFA - Institute of Food Production and Sustainability	Extension
Dan Schmoldt	dschmoldt@nifa.usda.gov		NIFA - Institute of Food Production and Sustainability	Research
Ellen Taylor-Powell	Ellen.taylor-powell@ces.uwex.edu	608-262-2169	University of Wisconsin	Extension Evaluator
H. Michael Harrington	wdal@lamar.colostate.edu		West Regional Executive Director	Facilitator
Climate Change Team				
Bobby Fletcher	BHFletcher@agcenter.lsu.edu	225-578-2906	Louisiana State University	Extension
Saied Mostaghimi	smostagh@vt.edu	540-231-6336	Virginia Tech	Research
Linda Kay Benning	lbenning@apl.u.org		Northeast Regional Executive Director	Extension
Adel Shirmohammadi	ashirmo@umd.edu		University of Maryland	Research
Rick Koelsch	rkoelsch1@unl.edu	402-472-2966	University of Nebraska	Extension
Cathy Good	cgood@iastate.edu	515-294-4544	Iowa State University	Research
Ed Martin	edmartin@ag.arizona.edu		University of Arizona	Extension
Barbara Allen-Diaz	Barbara.Allen-Diaz@ucop.edu		University of California	Research
Frank Chukwuma	franklinc@alcorn.edu		Alcorn State University	Extension
Frieda Eivazi	eivazif@lincolnu.edu		Lincoln University (Missouri)	Research
Eric Norland	enorland@nifa.usda.gov		NIFA - Institute of Bioenergy, Climate, and Environment	Extension
Luis Tupas	ltupas@nifa.usda.gov		NIFA - Institute of Bioenergy, Climate, and Environment	Research
Johnnie Westbrook	jwestbrook@alcorn.edu		Alcorn State University	Extension Evaluator
Celvia Stovall	cestoval@ncat.edu		North Carolina A&T University	Facilitator

Food Safety Team

Evelyn F. Crayton	craytef@auburn.edu	334-844-2224	Auburn University	Extension
Douglas Archer	dlarcher@ufl.edu	352-392-1784	University of Florida	Research
Mary Jane Willis	willis@njaes.rutgers.edu		Rutgers University	Extension
Daniel Rossi	rossi@aesop.rutgers.edu		Northeast Regional Executive Director	Research
Robin Shepard	robin.shepard@UWEX.EDU		North Central Regional Executive Director	Extension
Angie Seitler	aseitler@cals.wisc.edu		University of Wisconsin	Research
Don Klingborg	djklingborg@ucdavis.edu		University of California	Extension
Larry Curtis	larry.curtis@oregonstate.edu		Oregon State University	Research
Leslie Speller-Henderson	LSPELLER@tnstate.edu		Tennessee State University	Extension
Carolyn Brooks	cbbrooks@umes.edu		1890 Region Executive Director	Research
Jan Singleton	jsingleton@nifa.usda.gov		NIFA - Institute of Food Safety and Nutrition	Extension
Jeanette Thurston	jthurston@nifa.usda.gov		NIFA - Institute of Food Safety and Nutrition	Research
Scott Cummings	s-cummings@tamu.edu	979-847-9388	Texas A&M University	Extension Evaluator
Nancy Franz	nfranz@iastate.edu	515-294-8876	Iowa State University	Facilitator

Childhood Obesity Team

Anne Sortor	asortor@uaex.edu	501-671-2109	University of Arkansas	Extension
Richard Roeder	rroeder@uark.edu	479-575-4446	University of Arkansas	Research
William Miller	wamiller@umext.umass.edu		University of Massachusetts	Extension
Paula Peters	ppeters@ksu.edu	785-532-1562	Kansas State University	Extension
Sarah Greening	greening@umn.edu		University of Minnesota	Research
Debbie Maddy	Deborah.maddy@oregonstate.edu		Oregon State University	Extension
Ron Pardini	ronp@cabnr.unr.edu		University of Nevada	Research
Carolyn Nobles	c-nobles@tamu.edu		Prairie View A&M University	Extension
Fatemeh Malekian	fatemeh_malekian@suagcenter.com		Southern University	Research
Helen Chipman	hchipman@nifa.usda.gov		NIFA - Institute of Food Safety and Nutrition	Extension
Susan Welsh	swelsh@nifa.usda.gov		NIFA - Institute of Food Safety and Nutrition	Research
Katherine Webb-Martinez	Katherine.webb-Martinez@ucop.edu		University of California	Extension Evaluator
Debra Davis	ddavis@agcenter.lsu.edu	225-578-4565	Louisiana State University	Facilitator

Sustainable Energy Team

Steven E. Taylor	taylost@auburn.edu	334-844-3534	Auburn University	Extension
Timothy Rials	trials@utk.edu	865-946-1130	University of Tennessee	Research
Dennis Harrington	dennis.l.harrington@maine.edu		University of Maine	Extension
Mike Hoffmann	mph3@cornell.edu		Cornell University	Research
Cole Gustafson	cole.gustafson@ndsu.edu	701-231-7096	North Dakota State University	Extension
Joe Latessa	jlatessa@illinois.edu		University of Illinois	Research
Fred Schlutt	fred.schlutt@alaska.edu		University of Alaska	Extension
Michael Kahn	kahn@wsu.edu		Washington State University	Research
L. Washington Lyons	llyons849@msn.com		Regional Executive Administrator	Extension
Robert Barney	rbarney@wvstateu.edu		West Virginia State University	Research
			NIFA - Institute of Bioenergy, Climate, and Environment	
Daniel Cassidy	dcassidy@nifa.usda.gov		NIFA - Institute of Bioenergy, Climate, and Environment	Extension
			NIFA - Institute of Bioenergy, Climate, and Environment	
Mark Poth	mpoth@nifa.usda.gov		University of New Hampshire	Research
Lisa Townson	lisa.townson@unh.edu		University of Tennessee	Extension Evaluator
Joseph Donaldson	jdonald2@utk.edu	865-974-7245		Facilitator

Support Team

Bart Hewitt	bhewitt@nifa.usda.gov		Planning, Accountability, & Reporting	
Katelyn Sellers	ksellers@nifa.usda.gov		Planning, Accountability, & Reporting	
Eric Young	eric_young@ncsu.edu		Southern Region Executive Director	



**Western SARE...
 A view of the year ahead...**

- Western SARE is governed by an Administrative Council that was defined by Congress...
- There has always been an AES and an ES seat on our Administrative Council...

**Western SARE...
 A.C. "Top-Ten" from Subregionals...**

Western SARE effects change through a competitive proposal process...

Sustainability will always be emphasized in all Calls for Proposals...

**Western SARE...
 A view of the year ahead...**

Western SARE receives (annually):

- \$3.1 million through Ag. Exp. Station (R&E) line item...
- \$1.1 million through Extension 3-D funds (...the PDP program @ Wyoming)...
- **This is approximately \$4.2 million per region, per year...**

**Western SARE...
 The year ahead...**

Strategic Issues:

- **INDIRECT COSTS...**

10% INDIRECT COSTS will be allowed in FY2011 R&E grants, and in FY2012 Graduate Student & P+P grants...not in FRG grants...

Western SARE...
A view of the year ahead...



Strategic Issues:

- 10% INDIRECT COSTS will now be allowed (R&E only)...
- **Cannot be allowed on 3-D funds (PDP)...**
- **Yet, Extension workers may receive IC, if awarded a competitive SARE research grant...**

Western SARE...
A view of the year ahead...



Strategic Issues:

- The **proposed FY-2012 SARE Budget** has new State Matching Grants...
- **\$10 million in new SARE funds, annually...but these funds must be "matched"...**

Western SARE...
A view of the year ahead...



Western SARE receives (annually):

- \$3.1 million through Ag. Exp. Station (R&E) line item...
- \$1.1 million through Extension 3-D funds (PDP)...
- **For FY2012...an additional \$2.5 million per region (\$10 million total), per year, is in the proposed USDA budget (yet, it must be "matched")...**

Western SARE...
A view of the year ahead...



Strategic Issues:

- The proposed FY-2012 SARE Budget and State Matching Grants is \$2.5 million per region...was killed for FY-2011...
- **For FY2011...All current SARE programs remain the same (\$3.1+\$1.1 million).**

Western SARE...
Some salient activities...



March 1-3 "A.C." mtg.

doing **MORE** with less\$



MAXIMIZING our "Measurable Impacts" during a period of level or declining budgets

Western SARE...
A.C. "Top-Ten" from Subregionals...



Western SARE...
A.C. "Top-Ten" from Subregionals...



Statutory Definition - U.S. Code Title 7, Section 3103

SUSTAINABLE AGRICULTURE



Western SARE...
A.C. "Top-Ten" from Subregionals...



ALREADY IN-PROGRESS...

1. A CFP for Sustainable Systems Projects...
2. A mechanism for projects beyond 3-5 years (conditional renewals of SARE R&E grants...

Western SARE...
A.C. "Top-Ten" from Subregionals...



ALREADY IN-PROGRESS...

3. A Cundall "3-R" Ready Response Request for competitive proposals...
-- To provide a fast research response to "hot" regional sustainability problems...

Western SARE...
A.C. "Top-Ten" from Subregionals...



1. * A CFP re: Underserved groups...
2. * A CFP re: Region-wide economic study...
3. A CFP emphasizing energy...
4. * Sponsor an Ag Conference on infrastructure...
5. * A CFP re: water policy...

Western SARE...
A.C. "Top-Ten" from Subregionals...



5. * CFP for food (sustainable) safety guides...
6. * Sustainable Speaker's Bureau...
7. Enhance the project participants process...
(...ensure that farmers and ranchers are actually involved).

Western SARE...
A.C. "Top-Ten" from Subregionals...



8. A CFP for Sustainable on-farm training...
9. Research-based fact sheets re: buying local via CFP or existing resources...

Western SARE...
A view of the year ahead...



- Western SARE is a program where research and extension are linked to 99% of all funded SARE research grants (across all programs)...
- It is a requirement in all R&E (research) proposals...

“Megatrends” for Western SARE...



Remember that Western SARE has **SEVEN** major competitive grant programs:

- **PDP (Extension 3-D): competitive...**
- **PDP State Coordinator (Extension 3-D): competitive, usually one per state/territory...**

“Megatrends” for Western SARE...



SARE-PDP State Coordinators:

- **The Administrative Council is committed to increasing support for SARE State Coordinators...**
- **How they will do that is still to be determined...**
- **The \$\$ are not available, at present...**

“Megatrends” for Western SARE...



Remember that Western SARE has **SEVEN** major competitive grant programs:

- **Research & Education: large, multi-state, multi-disciplinary, etc.**
- **R&E Graduate student fellowships (small)...**
- **R&E Farmer-Rancher grants (small)...**

“Megatrends” for Western SARE...



Remember that Western SARE has **SEVEN** major competitive grant programs:

- **R&E Professional+ Producer grants (medium): perfect for Extension faculty & Extension T&P credit (will have “overhead” allowed)...**
- **R&E “Targeted”: such as Subregional Conferences and “Systems” initiative...**

SARE still continues third-party evaluations...





From the Coordinator's Desk...

V. Philip Rasmussen





Western Rural Development Center

Working for rural prosperity

Presented by
Don E. Albrecht
Director
Western Rural Development Center

WRDC Priority Areas

- WRDC conducted Rural Development Roundtables to establish priority areas.
 1. Enhance Human Capacity through People-Based Rural Development
 2. Create Vibrant Rural Communities through Place-Based Rural Development
 3. Sustainable Natural Resource Development

WRDC Multistate Projects

- Stronger Economies Together (SET)
 - Funded by USDA-RD
 - Coordinated by the RRDCs (the WRDC and its sister centers)
 - Project team includes USDA-RD state leaders and Extension personnel
 - First year included curriculum development and pilot trainings
 - Western states selected by USDA-RD to receive training:
 - » Arizona and New Mexico
 - Now entering second year with continued USDA-RD funding
 - Western states eligible to apply for training:
 - » Colorado, Utah and Washington

WRDC Multistate Projects

- Consortium for Renewable Energy in the West (CREW)
 - Collaborative effort between WRDC, WEDA and WAAESD
 - Goals:
 - Ensure that the region moves toward greater energy independence
 - Expand production and use of renewable and alternative energy sources
 - Adoption of practices that result in increased energy efficiency
 - Increase discovery and advance bioeconomies in the West

WRDC Multistate Projects

- Community Development Extension Specialists (CDES)
 - Annual convening of Western Community Development Extension Specialists
 - Goals:
 - Share program information and research
 - Increase multi-state, multi-institutional collaboration
 - Increase regional clustering and collaboration
 - Increase regional community development planning
 - Outcomes to Date
 - Printed “CDES Report 2011: The State of Extension’s Community Development Efforts in the West”
 - » Available under ‘Publications’ at wrdc.usu.edu

Join the discussion!

Twitter: [westernrural](#)

Facebook: [Western Rural Development Center](#)

Blog: [westernrural.wordpress.com](#)

YouTube: [youtube.com/thewrdc](#)



Don E. Albrecht

Director

Western Rural Development Center

Utah State University

8335 Old Main Hill

Logan UT 84322-8335

Tel: 435.797.9732

E-mail: don.albrecht@usu.edu

Web: wrdc.usu.edu

The Western Rural Development Center (WRDC) is one of four regional centers funded by United States Department of Agriculture (USDA) National Institute of Food and Agriculture to strengthen the capacity of local citizens to guide the future of their rural communities. Each of the four Centers link the research and extension capacity of regional land-grant universities with local decision-makers to address a wide range of rural development issues. The WRDC also receives substantial support from Utah State University, Utah State University Cooperative Extension and the Utah Agricultural Experiment Station.