

**University of California**

**Division of Agriculture and  
Natural Resources**

**Request for Proposals**

*Released January 2012*

## **I. Overview**

The Division of Agriculture and Natural Resources' (ANR) mission is to *maintain and enhance connections that fully engage UC with the people of California and to achieve innovation in fundamental and applied research and education that supports:*

- *sustainable, safe, nutritious food production and delivery*
- *economic success in a global economy*
- *a sustainable, healthy, productive environment*
- *science literacy and youth development programs* (ANR, 2009, p. 2).

*By 2025, California will face many complex challenges related to increases in global and domestic populations and changes in climate and land use patterns. To thrive and prosper, Californians must have solutions to a wide range of existing and new challenges* (ANR, 2009, pp. 1-2 Executive Summary).

To address some of these challenges, ANR developed the [\*Strategic Vision 2025\*](#)<sup>1</sup> to identify and meet the statewide scientific, technological, social, and economic demands facing California. As an initial implementation strategy, ANR identified five (of nine) Strategic Initiatives within the Division to achieve maximum results. The five Initiatives are:

- Water Quality, Quantity and Security
- Endemic and Invasive Pests and Diseases
- Healthy Families and Communities
- Sustainable Food Systems
- Sustainable Natural Ecosystems

ANR will invest in research, education and outreach projects that meet the goals of its mission by conducting an internal competitive grants program aimed to support high priority issues, encourage collaboration among ANR representatives and key players from throughout the state, support short-term high-impact projects, continue to strengthen the research-extension continuum, yield policy relevant outcomes, and achieve significant statewide economic, environmental and social impacts in California.

## **II. Criteria**

The criteria to be considered in reviewing proposals for funding include, although not limited to:

- *Alignment with strategic initiatives*
  - To what extent does the proposal address one or more of the initiative priorities that are articulated in this RFP?
- *Technical merit*
  - Is the science sound?
  - Are the design and methods adequate and appropriate?
  - Are extension/outreach/engagement plans well thought out?
- *Relevance to California and likelihood of impact*
  - How important are the issues being addressed in light of California needs, issues, and concerns?
  - Will the project produce a product—such as a policy brief or paper—or lead to recommendations that have relevance to California decision makers in the near-term?
  - Will it support science-based decision making and delivery of useful findings to inform policy and outreach efforts?

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<sup>1</sup> *Strategic Vision 2025*. <http://ucanr.org/sites/anrstaff/files/1006.pdf>

- *Feasibility*
  - Does the project team have the expertise and capacity to contribute to the success of the project?
  - Is the project doable?
  - Can the work produce results/outcomes over the duration of the project?
- *Collaboration and integration*
  - Does the proposed project build connections that strengthen the research and extension continuum within and across the strategic initiatives?
  - Does the project leverage additional funding or foster collaborations with key stakeholders?

### **III. Eligibility**

- Proposals must be submitted by someone that holds an academic appointment in ANR with Principal Investigator status (such as CE Advisors, CE Specialists or AES Faculty).
- Strategic Initiative leaders *may not* apply as PIs or Co-PIs of a proposal, but they are eligible to contribute to projects as collaborators. Strategic Initiative leaders *may not* receive funds directly from this grants program.
- Strategic Initiative panel members *are* eligible to apply as PIs and/or Co-PIs on proposals, but will not be involved in review of their own proposals.
- We encourage non-ANR UC academics to collaborate on project proposals.

### **IV. Award Types**

ANR is accepting proposals for two types of award mechanisms:

***Long-term projects*** (3-5 years) may request up to a maximum of \$600,000 USD for the entire duration of the project (up to five years).

***Short-term projects*** (1-2 years) may request up to a maximum of \$50,000 USD for the entire duration of the project (up to two years).

*Funding of an award is contingent upon the successful completion and submission of yearly progress reports; which are subject to a rigorous review. Short-term projects are not eligible for funding beyond the two year term.*

*Please note that the award types have changed from the previous year. Both long and short-term projects are required to include research and extension.*

### **V. Timeline and Process**

- a. Competitive grants **call released Tuesday, January 17, 2012.**
- b. Applicants must **submit a Letter of Intent (LOI) no later than Friday, February 17, 2012** (*Submission and approval of an LOI is required to submit a full proposal to this RFP. The LOI is reviewed by the appropriate strategic initiative panel(s) to determine applicability to initiative goals.*)
- c. Once the LOI is approved, applicants will be notified of their eligibility to submit a full proposal by **Monday, March 5, 2012.**
- d. Full proposals are due by **Friday, April 13, 2012.**

e. Strategic Initiative (SI) leaders will forward proposals for **technical review (April-June) and meet in June-July** to determine a list of proposals to recommend for Program Council's review and consideration.

f. Program Council (PC) will evaluate and discuss the proposals and make funding recommendations to the Executive Working Group (EWG) (**July, 2012**).

g. **Awards are expected to be announced by VP Allen-Diaz in August-September, 2012.**

## **VI. Solicited Targeted Areas**

Proposals must clearly apply to at least one of the five strategic initiatives. Cross-disciplinary or cross-initiative collaborations are strongly encouraged. Specific topics eligible for funding are described under each initiative heading below. For more details on possible research questions, consult the full drafts of the strategic initiative plans, available at: [http://ucanr.org/sites/anrstaff/Strategic\\_Initiatives/](http://ucanr.org/sites/anrstaff/Strategic_Initiatives/) or click on the headers of the strategic initiatives listed below.

### **Initiative to Improve Water Quality, Quantity and Security**

#### ***Water Use Efficiency and Conservation***

The availability of traditionally relied-upon sources of water is expected to decrease. For example, California will have to reduce its use of Colorado River water by 0.8 million acre-feet, a reduction of about 20 percent. In many areas of the state, current levels of groundwater use are not sustainable. Long periods of droughts have the potential to severely decrease reserves, and climate change is expected to reduce the Sierra Nevada snowpack. These factors, coupled with the aging of the infrastructure for water delivery (such as the 1,100 miles of levees on the Sacramento–San Joaquin Delta), will require a coordinated effort at the federal, state, regional, and local levels to meet water demand.

Area of Research and Extension:

- Research, development and delivery of innovative scientific techniques, products, and processes to conserve water through increased water use efficiency.

#### ***Water Quality, Degradation and Protection***

California's water systems (both surface and ground) face increased pressure from organic and inorganic contaminants. Nonpoint water pollution is of particular concern. This degradation of water quality threatens ecosystems and water supply resources, limits beneficial uses and requires expensive treatment solutions. Prevention of degradation is generally more cost effective than treatment.

Area of Research and Extension:

- Develop and encourage the adoption of management practices that demonstrably (through monitoring or other methods) prevent degradation of watersheds and surface and groundwater resources caused by pesticides, salinity, animal waste, nutrients, sediment, pathogens and emerging contaminants.

#### ***Use of Degraded Water Resources and Water Reuse***

Few new supplies of water are expected in California. As demand increases and supplies become less reliable, existing water supplies could be supplemented by the development of new or alternative methods

that safely use degraded water or capture and reuse lesser-quality urban, agricultural and environmental return flows.

Area of Research and Extension:

- Development and encouragement of beneficial use of degraded water sources (e.g., saline water, contaminated ground and surface waters, direct reuse of urban and agricultural return flows) and treated wastewater to produce and maintain agricultural crops and landscapes.

### ***Effective Water Policy***

Water is the life blood of California's economy. As such, water supply and quality for agricultural, urban and environmental systems are critical issues facing the state. Short- and long-term climate trends are predicted to exacerbate the problems associated with water availability. Competition for water will intensify among agricultural, urban and environmental users. Water transfers among these interest groups will play an increasing role in water resource management, especially during periods of drought. In addition, water-quality degradation will become more important as a major public issue. Legal and regulatory decisions will have significant impacts on water use and quality among all sectors.

Interdisciplinary teams are needed to assess and promote policies and actions that address these issues.

Area of Research and Extension:

- Assisting in the development of flexible and effective water policies and strategies using UC's econometric, statistical, systems modeling, GIS, hydrological and policy expertise.

### ***Science Policy and Educational Strategies***

Understanding how to analyze and communicate water management strategies is important for implementation. As part of any communication strategy, we must assess not only who to involve but also how to best work with a variety of stakeholder interest groups. Activities may involve evaluation, facilitation and education.

Area of Research and Extension:

- Science-based research and educational approaches to address the above water issues in partnership with others, including agricultural and urban interests, environmental groups and regulatory entities.

## **Endemic and Invasive Pests and Diseases Initiative**

### ***Exclusion of Pests and Pathogens***

The first step in controlling the damage of any pest or disease, be it arthropods, vertebrates, weeds, or pathogens, is to exclude it from entering a new region. Exclusion includes diagnostics, detection and interception. Eradication of pests and diseases may be feasible if an early detection system is in place. Lack of early detection may result in expensive pest and disease management costs in the long-term, disruption in commerce and industry prosperity, and human and animal health impacts if diseases are involved.

Areas of Research and Extension:

- Risk assessment
- Best practices that reduce risk of invasion
- Development of early detection tools
- Improved diagnostic methodology including sampling strategies
- Response plans for invasive organisms

***Emerging and Re-emerging Problems with Pests and Diseases***

Pests and/or diseases need to be addressed in order to protect animal health, plant health, public health, food security, food safety, and the environment. Often, pests and diseases are problems because they lack natural control agents, creating devastating problems as they spread. Endemic pests and diseases can also develop into more serious problems because of external factors such as changes in climate or management practices.

Areas of Research and Extension:

- Biology/genetics/management of pests and diseases to improve control programs
- Epidemiology and control programs for vectored diseases
- Prediction—Modeling and analytical tools for outbreak analysis
- Development of active surveillance plans and risk assessments for pests and diseases
- Operational plans for intervention and rapid response
- First detector training and new technologies to enhance outreach to stakeholders

***Integrated Management***

When pests and/or diseases become established in California, integrated management tactics are needed to reduce their impact on agriculture, natural resources, communities, and human health.

Areas of Research and Extension:

- Integrated management of pests/diseases (cultural control, chemical control, chemical therapy, mechanical control, biological control and others)
- Tactics for prevention of disease (vaccines)
- Effective, sustainable pest management programs that minimize environmental impacts
- Resistance management
- Modeling and/or field studies to determine benefit of various mitigation strategies

## Healthy Families and Communities Initiative

### ***Promoting Healthy Behaviors for Childhood Obesity Prevention***

Intervention models grounded in a socio-ecological approach to obesity prevention are deemed to be most effective. Programs that utilize a comprehensive programmatic approach integrating nutrition, health and local agriculture should be developed and evaluated for individual, family, school and community systems. This approach recognizes that health-related behaviors are influenced by a number of different factors, including education and supportive programs and policies in the key settings in which children make decisions about eating and physical activity—school, afterschool programs, and the home.

Approaches should be built upon existing research and programs in California communities which include participatory inclusion of key stakeholders. The research will identify promising practices and lessons learned to inform nutrition, youth, health, and school administrative professionals and state and community decision makers.

Area of Research and Extension:

- Does a multifaceted, multi-level, school-centered environmental intervention targeting culturally diverse children promote healthful dietary and activity habits, reduce obesity and support more regional agriculture? What kinds, how, why?

### ***Youth Science Literacy***

Adapt/design effective non-formal science programs (e.g., science camps, after school programs) for youth that include workshops to train science educators. Outcome assessments will compare achievement and attitudes before and after participation of these non-formal science programs and measure possible differences between those who participate in the programs and those who do not.

In youth science literacy, adapting and or designing professional development programs for science educators (paid staff, volunteers, pre-service teachers, and in-service teachers) using methods and strategies drawn from the literature and measuring the impacts on participants' understanding and use of effective pedagogy, science content knowledge, and attitudes toward science is critical.

Areas of Research and Extension:

- What are the impacts of participation in community-based (non-formal) youth development programs on the science knowledge, science process skills, and attitudes toward science among K-12 youth?
- What are the impacts of professional development in science on the pedagogical and content knowledge and skills of non-formal, pre-service, and in-service science educators?

### ***Promoting Positive Youth Development***

Examine comparative case study research on the effectiveness of 4-H and other youth development programs and the impact on positive youth development. Research conducted using a sample of California communities reflecting the state's diversity and building on and synthesizing a growing body of research, including that by ANR academic staff and workgroups and by other researchers is deemed to be effective.

Positive youth development is defined as *a process that prepares young people to meet the challenges of adolescence and adulthood through a coordinated, progressive series of activities and experiences, which help them to become socially, morally, emotionally, physically, and cognitively competent. It addresses*

*the broader developmental needs of youth, in contrast to deficit-based models, which focus solely on youth problems* (National Collaboration for Youth Members, 1998). Thus, the goal is to assess whether and how existing programs promote positive youth development, and in turn, to improve important outcomes for participating youth, families, youth-serving organizations, and communities.

Area of Research and Extension:

- How can the 4-H YD Program and other youth development programs best promote positive youth development with demonstrated impacts on individuals, families and communities?

### **Sustainable Food Systems Initiative**

#### ***Tools to improve the relative competitiveness and productivity of California agriculture today and with projected climate changes***

The continued competitiveness of California agriculture, and mitigation of the impacts of climate change, will depend upon the development of new technologies and the use of the best ecological management practices to optimize food production per unit of inputs. Advances are needed in production practices (producers, processors and marketers) to increase the competitive ability of California livestock and plant food producers at all scales. These advances may include improvements in the quality and value of food products, development of value-added agricultural products, technologies to improve production efficiency and resource use efficiency (water, feed, nutrients, soil, fuel, labor) while addressing pest and disease management and ecological concerns, identification of new crops or animal production systems suited to natural resource limits, and techniques to produce new germplasm or varieties for plant or animal agriculture better-adapted to current and projected situations in California agriculture.

Meeting the range of expectations and potential for products and production practices in local, state, national and international markets are important strategies for California's producers as they strive to remain competitive. How will we meet the global demand for food produced in a healthy and robust California system, including demands for various qualities, costs, production locations and production methods? How will California producers achieve balance between various market demands segments to sustain the future viability of California agriculture? What are the new threats and opportunities that would benefit from UC involvement?

Areas of Research and Extension:

- Development of new crops, animals, and forest species that will thrive in California as the climate changes. This may include innovations in genetics, genomics, biotechnology, and/or traditional breeding approaches. It may also include approaches to grow existing crops in new areas in response to climate change (this could involve new production systems; soil, water and nutrient management; etc).
- Farm, forest and rangeland products to support development of biofuels, medicines and other value-added markets that increase the value of agriculture.
- New and existing crops that enhance nutrition and reduce chronic diseases and address specific health conditions.
- Genetically improved crops to increase yields, introduce novel traits, and adapt plants to water-limited conditions and climate change.

- Science-based information and marketing strategies to enhance the competitiveness of California's agricultural producers and products, and that support California's role as an agricultural producer in local, national and global markets.
- Develop crop management systems or production techniques to improve nitrogen-use efficiency and minimize nitrate contamination of groundwater while sustaining profitable crop yields.

### ***Food safety***

Food safety issues can include both plant and animals systems. Contamination of animal production systems, plant commodities, public health implications, and quality and profitability of cropping and livestock systems are important concerns. There is a decided lack of information on the epidemiology, ecology, and biology of food borne pathogens (such as Shiga toxin-producing *E. coli* (STEC) and *Salmonella* spp.). In addition, while pesticides, fertilizers, and other agricultural chemicals remain an important component of integrated pest management programs, there are opportunities to improve the economic and environmental sustainability of plant agricultural systems through more judicious use of agrichemicals, through the development and use of safer yet effective pesticides, or by exploring novel means of controlling pests that do not rely on pesticides. ANR can also generate information to improve and support regulatory decisions that will positively impact California growers, while increasing food safety to the consumer.

Areas of Research and Extension:

- Developing strategies for food producers and processors to prevent and detect food borne contamination; evaluation of technologies to minimize contamination as food moves from the farm through the processor, handler and to the end consumer.
- Developing systems to allow for rapid and cost-effective trace-back of contaminated products to their source and trace-forward of those products to their markets in order to remove them from possible consumption.

### **Sustainable Natural Ecosystems**

#### ***Balancing multiple ecosystem services and biotic diversity in California's working landscapes:***

Wildland, rangeland, urban, and agricultural land managers face increasing pressure to develop management practices that maximize crop/forage yield and quality while conserving native species, increasing soil storage of carbon and water, and minimizing adverse effects like weeds, soil degradation, flooding, and nutrient leaching. Managing ecosystems for multiple goals involves careful evaluation of tradeoffs, thresholds, and feedbacks associated with multiple ecosystem processes.

Areas of Research and Extension:

- How do environment and management interact to control individual ecosystem services and diversity (including patch- to landscape-level, as well as short-term to long-term) options?
- What are the impacts of any given management practice on multiple services (and how does that depend on site conditions and annual variation in weather)?
- How can the tradeoffs in managing for multiple services be valued and understood, and how do these tradeoffs vary by site (including soils), region, and spatial and temporal scale?

- How do adjacent land uses affect the provision of individual and multiple ecosystem services?
- How does the potential for change in ecosystem services change through interactions among climate change, land use change, changes in soil processes, N deposition, and invasion of exotic species?

***The shifting spatial structure of California’s natural resources under environmental change:*** New conceptual approaches to measuring, understanding, and managing of natural resources are needed because fragmentation of the landscape will change the distribution and abundance of organisms. Resources such as water shift spatially and are used (or lost) differently, and ecological mechanisms resulting from management strategies change.

Areas of Research and Extension:

- An overview of the current status and knowledge, known and postulated trends, and currently projected outcomes in land-change science.
- Utilization and development of existing historical data sets to better provide the context for long-term patterns in land use.
- Development of a clearer framework to evaluate and analyze impacts of fragmentation across scales (local, county, and region), dynamics (temporal dimensions), processes, drivers and systems (working landscapes, wildlands, crop/animal agriculture, and urban communities).

***Tools for Land change science:*** One aspect of land change science is observation, monitoring and prediction of patterns. There is a range of tools that can be used in support of land change science: understanding change, understanding consequences, predicting futures, and educating decision-makers. There are also a number of tools currently available for citizen science monitoring that could be used by Cooperative Extension to broaden the existing network of monitors.

Areas of Research and Extension:

- Develop and demonstrate the use of tools for life cycle analysis of key ecosystem services from natural ecosystems.
- Determine the educational uses and limitations for land change science tools; what are the strengths, weaknesses, and adaptability; are the better information sources available from UC, ANR, or externally?

***Promote the understanding and importance of ecosystem services provided by California’s working landscapes:*** The continued novelty of ecosystem services to the general public warrants a step-wise approach beginning with clientele engagement, education outreach, and building the foundations for better ecological understanding of these services. The education component works towards communicating the purpose and mechanics of using ecosystem services to policy makers and communicating policy makers’ perspectives of ecosystem services to researchers.

Areas of Research and Extension:

- Proposals for communications useful for policy makers and/or general audiences; including better education outreach media, an increased understanding by policy makers and the public of

ecosystem services, and the engagement of policy makers in the development of future ecosystem services research.

- Proposals for communications explicitly linking ecosystem processes to land use decision-making based on environmental economics principles.

## **Reference**

ANR, UC. (2009). *Strategic Vision 2025*. HYPERLINK: <http://ucanr.org/sites/anrstaff/files/1006.pdf>

**University of California**  
**Division of Agriculture and Natural Resources (ANR)**  
**Letter of Intent Submission Instructions**

*January 2012*

Submission and approval of an LOI is required to submit a full proposal to this RFP. The deadline for submitting an LOI is **Friday, February 17<sup>th</sup>**. Once the LOI is approved, applicants will be notified of their eligibility to submit a full proposal by **Monday, March 5<sup>th</sup>**. The deadline for submitting a full proposal is **Friday, April 13, 2012**.

**Required elements for the LOI**

- **Name of Principal Investigator (PI) and affiliation** (UCCE County Office *or* Campus and Department)
- **Name of Co-PI and affiliation** (if applicable)
- **Title** of proposed project
- **Strategic Initiative (SI)**: describe the target area(s) the proposed work will focus on and **choose up to two** strategic initiatives with which your proposal best fits.
- **Award Type**: please state which award type you are soliciting (*long-term or short-term*)
- **Estimated start and end date**: please indicate an estimated start and end date for the entire duration of the project (*projects in this RFP are expected to initiate on September 1, 2012; if your proposed work requires a different critical starting date, provide those dates and a brief explanation*)
- **Estimated Budget**: please indicate the *estimated total budget* for the proposed project and a brief summary explaining the allocation and use of funds over the course of the entire project
- **Project Summary**: please provide a summary that presents an overview of the proposed project. It is not necessary to discuss the specific scientific components; rather the LOI should address how the proposal meets the criteria specified in the RFP. Your summary may be up to one page in length.

To begin your LOI, please log into your ANR Portal and locate the *Universal Review System*. Under *Open Systems*, you can click on *ANR Competitive Grants 2012* to begin your submission. If you have any questions you may contact Vanessa Gomez at (510) 987-0377 or [Vanessa.gomez@ucop.edu](mailto:Vanessa.gomez@ucop.edu).