

# ***Leveraging Research for Food and Agriculture Policy: Lessons Learned from the University of California***





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The Global Food Initiative  
Research to Policy Subcommittee

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**Berkeley Food Institute**  
Cultivating Diversity, Justice, Resilience & Health

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## INTRODUCTION

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Research from public universities is a vital resource to help policymakers understand and address complex social problems and develop innovative policy solutions. Good research is helpful – if not essential – in dealing with challenges in food and agriculture systems, at the local, national and global levels. As food systems intersect with some of the most urgent environmental, economic, social, and cultural issues of our time, multidisciplinary knowledge and solid scientific information are particularly critical to develop effective public responses.

The University of California began as a land-grant college in 1868, with a mission to develop and share practical knowledge in service to the public. The tradition of researchers engaging with policy has continued to the present day, as shown by the research projects highlighted in this report and many more like them. More than ever, UC research is called on to inform and guide policymaking and public decision-making.

At the same time, there is far greater potential for policymakers to apply UC research when developing food and agriculture policies. Likewise, there are myriad opportunities for university researchers to engage with policy processes and respond to policy needs, to share their findings with policymakers and government entities, and to translate their research more effectively for these users. Solid research in itself is important for advancing knowledge in food and agriculture, but through its application to policy it can reach an even wider audience.

The case studies in this report are diverse examples highlighting ways that research at the University of California has been used to inform or affect policies in food and agriculture. They provide just a few recent illustrations – among hundreds of experiences over many years – in which UC researchers have contributed to public policy. These cases were identified and compiled as part of a project of the UC Global Food Initiative, undertaken by the Subcommittee on Leveraging Research for Policy. These are brief summaries intended to clarify points from research projects that pertain to the policy process and lessons, and not to provide comprehensive scientific information or results.

The researchers included in these cases have often taken years or decades to arrive at approaches that are participatory and meaningful for policymakers and/or practitioners. Their hard-won results provide lessons for others attempting to broaden the reach of their research results.

It can be difficult to translate research results into everyday conversation, much less into pressing policy issues of the day. The complexity and nuance that make academic research so valuable can sometimes make it challenging to apply to policy and practice. Yet, these case studies show that researchers who effectively interact with policy issues and public sector stakeholders can achieve successful outcomes: when research informs policy change, it serves the public good. Moreover, many involved in such cases have found professional and personal gratification through their public service.

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## INTRODUCTION

While a diversity of disciplines, strategies, and outcomes are represented, a few common themes that emerged from these case studies. These lessons also constitute useful guidelines for researchers interested in leveraging and using their research to inform policymaking.

**Collaboration with stakeholders is crucial from the start.** Relationships with decision-makers, communities and colleagues in other disciplines are key. Involving nonprofit organizations and government agencies at the beginning of projects can lead to the formation of research questions and methods more likely to be useful to those with the capacity to institute change. (For example, see “Sweet Success,” page 14.) Academics can identify groups with shared goals – or propose projects that bring groups together to solve multiple problems (For example, see “Brownfield to Food Forest,” page 25).

**Flexibility and timing matter.** Timing is crucial in policy change. The legislative calendar matters – as do disasters, unexpected consumer fads, and even the weather. Being responsive to urgent timeframes can be intimidating to researchers used to working deliberately. However, research does not always need to be brand-new to make an impact. (For example, see “Drought Research Proves Evergreen,” page 10).

**Outside groups can help amplify the message.** Think tanks, research institutes, and well-respected nonprofit organizations can be helpful publicists for research. They may have capacity to bring attention to potential applications of the work and stay on top of changing political conditions. (For example, see “Fueling the Future” page 39). If research is clearly explained, it is more likely to be seen and understood by interested parties who will do the legwork for researchers at opportune moments.

**Policy has multiple points of entry.** Policy needs research expertise not at any one point in the process, but at multiple points and for multiple usages. For example, UC research is often requested by lawmakers engaged in active bill-writing, but has also been valuable throughout the regulatory process and when conducting program evaluation.

**Cross-disciplinary work is well-suited to food and agriculture.** Collaboration among diverse academic researchers can have multiple benefits in research projects, especially when addressing complex food and agriculture issues. Collaboration across disciplines is not always easy, but experiences show that it pays off. The broadened perspective, scope, and relevance of interdisciplinary study is particularly applicable to the complex world of policy change. (For example, see “Cross-Disciplinary Insights on the Health of Farmworkers,” page 33.)

**Guidelines for government relations help make parameters clear.** Researchers rarely want to jeopardize their claim to objectivity by involving themselves in hot-button issues. In addition, their department or university may have rules limiting policy involvement. Researchers and policymakers alike need to know and understand the rules and guidelines for their positions; the rules for academics may be less restrictive than some suspect. The University of California has a public service mission that UC researchers are uniquely equipped to serve. (For example, see “Gene Flow Research Informs Transgenic Crop Regulation,” page 12.)

**Strategic partnerships can cost more, but expand results exponentially.** Funding and time limitations can be challenging when addressing policy processes, especially for researchers who involve community members in their projects. At the same time, partnering strategically can ensure that policy applications are “baked in” to the research. (For example, see “Investigating – and Curbing – Labor Law Violations in Chinatown Restaurants,” see page 34.)

Finally, these case studies illustrate the public benefits of research for policymaking and the continued importance to develop research-based solutions for the critical food and agriculture issues of our time.

# ACKNOWLEDGEMENTS

This report and collection of case studies was produced by the Berkeley Food Institute and the UC Global Food Initiative (GFI) Policy Subcommittee, with invaluable contributions by colleagues from several UC campuses. Miranda Everitt, UC GFI student fellow, and a Masters of Public Policy student affiliated with the Berkeley Food Institute (BFI) at UC Berkeley, compiled and wrote the majority of the cases. Nina F. Ichikawa, BFI Policy Director, with L. Ann Thrupp, BFI Executive Director and co-lead for the Subcommittee, provided oversight and guidance for the project. Student assistant Pallavi Sherikar assisted with graphic design and writing.

GFI Subcommittee co-leaders and team members Josette Lewis from UC Davis, Laura Schmidt from UC San Francisco, Clare Gupta from UC Davis/UC Division of Agriculture and Natural Resources, and Laurie True and Harry Snyder from UC Berkeley also provided important input, ideas, and cases. We sincerely thank all contributors and collaborators who were involved.

The Global Food Initiative Policy Subcommittee welcomes additional cases and examples to add to this collection. Please see the UCGFI website at <http://universityofcalifornia.edu/global-food-initiative> for more information.

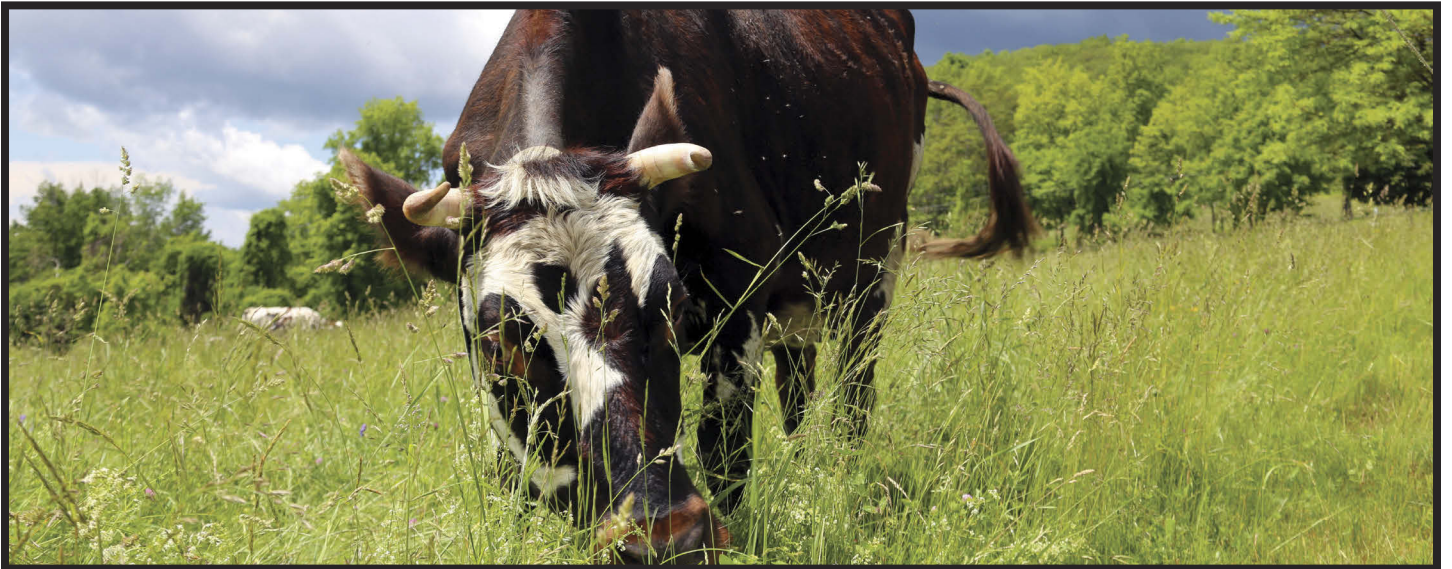
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# AGRICULTURE





# Little Bug, Big Problem: Researchers Work to Stay Ahead of Citrus-killing Bacteria

## OVERVIEW

California citrus is a \$2 billion industry and about 60% of Southern California residences have at least one citrus tree, according to the California Department of Food and Agriculture. But one bug has the potential to both decimate the commercial citrus industry and alter the landscape of California by eliminating citrus from residential properties. Asian citrus psyllid (ACP) is a vector of a devastating bacterial disease of citrus called Huanglongbing (HLB). There is no cure for the disease and it threatens to kill both commercial citrus and residential citrus.



The Citrus Pest and Disease Prevention Program (CPDPP), funded by citrus growers, is conducting a statewide ACP/HLB detection program. Additionally, citrus growers are treating their acreage and providing funding for the California Department of Food and Agriculture to treat residential citrus located near commercial citrus whenever psyllids are found. In urban areas that are difficult to treat with pesticides, a small parasitic wasp called *Tamarixia* is being released to help control the psyllids. Integrated Pest Management (IPM) – the integration of biological and chemical methods of control – of citrus pests including the psyllid, is studied by Dr. Elizabeth Grafton-Cardwell, IPM Specialist and Research Entomologist at UC Riverside and director of the Lindcove Research and Extension Center in Exeter, California.

## THE RESEARCH

Dr. Grafton-Cardwell and her colleagues Matt Daugherty, a specialist and research entomologist at UC Riverside, Karen Jetter, an economist in the Ag Issues Center in Davis, and Robert Johnson, a programmer with the IGIS lab at the Kearney Research and Extension Center, are complementing the citrus industry statewide efforts. They are using their expertise in ACP management strategies and spatial mapping to provide recommendations and provide cost assessments of treatments for both homeowners and growers. This information is integrated with, informs, and supports statewide CDFA regulatory efforts and citrus industry efforts to

Through this project, UC ANR has enhanced collaborations between CDFA, CPDPP, UC and legislators to provide a more effective psyllid and HLB management program.

manage the pest and disease. Through this project, UC ANR has enhanced collaborations between CDFA, CPDPP, UC and legislators to provide a more effective psyllid and HLB management program.

Additionally, the team has begun the development of a market model for California citrus industries to estimate the economic effects of the spread of the disease for both eradication and area-wide treatment programs.

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UC Division of Agriculture  
and Natural Resources





## Little Bug, Big Problem: Researchers Work to Stay Ahead of Citrus-killing Bacteria

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### THE POLICY IMPACT

A more informed general public and citrus industry will lead to a reduction in Asian citrus psyllid populations and slowing of their spread throughout the state. This in turn will slow the rate of spread of the bacterium that causes HLB and buy time for local and national researchers to develop a cure for the disease. This project will assist in protecting California's \$2 billion citrus industry and millions of residential citrus trees from the severe losses that Florida has already experienced.

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### LESSONS LEARNED

Communicating the scope of the problem and recommending solutions to the public is not easy when the problem is urgent but research is ongoing. "Quarantine and management tactics are always a moving target," says Grafton-Cardwell. "Different psyllid and disease situations and management strategies are occurring in different parts of the state, which makes consistent messaging difficult."



To stay on top of that challenge, Grafton-Cardwell stays involved in committees and task forces, such as the CDFA Science Advisory Panel and the Citrus Pest and Disease Prevention Program, both of which decide policies and procedures for their respective audiences. This increases dissemination of research results and allows the team at Riverside, Davis, and at Dr. Grafton-Cardwell's center to continue to shape policy to combat this disease.

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# Reduce Pollution with Proper Fertilizer Timing

## OVERVIEW

Applying nitrogen and phosphorus with irrigation water is a common practice to help plants grow productively – in the Imperial Valley and around the world. But if the fertilizers are applied incorrectly, some of the nutrients end up in drains rather than in the food. And that is not just a waste of resources. Nitrogen and phosphorus are the two main nutrients that cause massive fish kills in the Salton Sea, a shallow, saline lake in California’s Imperial and Coachella valleys. The nutrients lead to what are called eutrophic conditions, or high algal biomass and low dissolved oxygen concentrations.

Current and proposed federal water quality standards for California require growers to improve the quality of drainage waters. To achieve both federal and state water quality objectives, growers will have to reduce the amount of phosphorus that reaches the drains and the Salton Sea.

## THE RESEARCH

Irrigation management is one way to make an impact. Proper irrigation management practices reduce fertilizer and sediment loads in surface runoff water. UC Cooperative Extension Imperial County advisors evaluated various alfalfa and lettuce irrigation and fertilizer application practices on two irrigation systems: border irrigation (1.5 percent slope and 0 percent runoff) and free-draining graded furrows (1.5 percent slope and normal runoff). By comparing various water flow rates and the timing of fertilizer applications, they were able to develop recommendations on the most efficient and effective ways to meet the new water quality standards and conserve water.

## THE POLICY IMPACT

Growers are adopting the UCCE advisors’ recommendations, called Best Management Techniques, or BMTs. This is improving fertilizer use efficiency and reducing the load of nutrients in the Salton Sea watershed. Their educational materials also are used to implement plans to meet the Total Maximum Daily Load regulations. Irrigation management is a key factor in controlling the concentration and load of phosphorus in runoff water. Reducing the rate of surface runoff during and after phosphorus application events could reduce phosphorus load in surface waters by as much as 75 percent compared to standard irrigation practices. The researchers’ BMTs were included in the Regional Water Quality Control Board (Region 7) silt/sediment Total Maximum Daily Load standards.

Growers are adopting the UCCE advisors’ recommendations, called Best Management Techniques or BMTs. This is improving fertilizer use efficiency and reducing the load of nutrients in the Salton Sea watershed.

## LESSONS LEARNED

ANR is unique in that we work with stakeholders to bring practical, science-based tools and solutions to help growers address challenges at the local level. Most of our research is developed first at ANR Research and Extension Centers and then we work with growers to test practices on their fields. UC Cooperative Extension Advisors are serving their local communities and helping the agriculture industry to California in feed the world.

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## Drought Research Proves Evergreen

### OVERVIEW

You do not need to open a newspaper these days to know that California is the midst of a historic drought – it’s front-page news. The challenge of allocating the existing water supply to agriculture and a growing urban population during a historic drought is the subject of much debate in the state. With many powerful interests at odds over a basic element of life, research from UC Berkeley’s Dr. David Zilberman is applying economic models and a look at recent history to potential solutions.

### THE RESEARCH

In a 2011 paper, Dr. Zilberman chronicled responses to the last major drought in California. Agriculture uses the majority of California’s water, and his paper showed that conservation, fallowing less-productive land, and using groundwater were important responses to drought. He credits early work on this to the creation of an electronic water trading market in California, which reduced the impact of the 1991-92 drought. Overall, his work seems hopeful – he argues that the agriculture industry can be responsive to major shocks.

Dr. Zilberman compiles policy-relevant research in an online digest, the Agriculture and Resource Economics Update, which is widely read by regulators at state and national levels. A recent article in that publication quantified the impact of the UC Cooperative Extension’s work on drip irrigation in monetary terms.

### THE POLICY IMPACT

Dr. Zilberman work on the drought is frequently cited by stakeholders in public comments, in commission reports, and in studies on agriculture and environmental protection. His research on drip irrigation has helped increase its adoption among farmers and influenced state policymaking to incentivize this method of water conservation.

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Dr. Zilberman has also worked directly on pest control regulations with the Environmental Protection Agency and the US Department of Agriculture, on ecosystem services with the USDA, and United Nations Food and Agriculture Organization, and on biofuels with the EPA and USDA.

### LESSONS LEARNED

Dr. Zilberman argues that to have an impact on policy debates, sometimes you do not need new research. If researchers learn of a policy conflict – like how to conserve water in California – they can use their existing research and explain it to new audiences. This also helps to build expertise in the media and in policy circles, since many policy fights are perennial.

“A lot of professors are married to methodology rather than stories,” Dr. Zilberman said. “But when you think about projecting policy impact, simple theory is the most useful tool you have.”

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# Measuring and Appreciating the Contributions of Wild Pollinators

## OVERVIEW

Honeybee colonies around the world are disappearing at rapid rates, while native habitat for other pollinators is shrinking to make room for intensive agriculture and development. This has cascading implications for the more than 75 percent of the world’s crops pollinated by insects. Yet the benefits of pollinator habitat have often seemed invisible to policymakers, and the problem is not yet well studied, making it difficult to develop a response. In California, some farmers depend on vulnerable, trucked-in honeybees to support large tracts of single crops.

“Ecosystem services” is a step toward defining the problem and potential solutions. It’s the name for the broad array of benefits, direct and indirect, provided by nature to humans. Researchers like Professor Claire Kremen at UC Berkeley’s Department of Environmental Science, Policy, and Management are working to understand how ecosystems deliver benefits like drinking water, pollination, and flood control to human populations.

## THE RESEARCH

Dr. Kremen has worked with farmers to plant hedgerows of flowering plants, shrubs and grasses that attract diverse pollinators to their crops. From Davis to the Capay Valley, she is finding that providing diverse habitat brings back a wide array of pollinators. Relying less – or not at all – on trucked-in pollinators provides a more sustainable food system, one that uses less fossil fuel and is more resilient to ever more-common climate shocks.

## THE POLICY IMPACT

Now Dr. Kremen’s research is going global. Working with the Food and Agriculture Organization (FAO) of the United Nations, Dr. Kremen and Goldman School of Public Policy student Terra Rose identified existing programs and policies that support pollination throughout the world.

The goal of the document was to be accessible to policymakers and scientists alike, outlining practical methods to support pollinator habitat. The final report covered six thematic areas from developing pollinator-friendly pesticide policy to tapping into knowledge of indigenous communities.

Traditionally, agricultural and environmental policies are developed in isolation – if they are made consciously at all. In developed and developing nations alike, some forethought and examples of policies and practices that work can make all the difference. Rose and Kremen’s work for the FAO puts feasibility at the fore, offering an array of solutions not dependent on huge budget outlays.

Rose and Kremen’s work for the FAO puts feasibility at the fore, offering an array of solutions not dependent on huge budget outlays.

## LESSONS LEARNED

Part of the value that the team added was simply translational. Researchers can not only provide expertise, but also show how urgently solutions are needed. “Professionals who understand science are really necessary and can serve a useful function as translators or mediators between scientists and elected officials,” Rose says.

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# Gene Flow Research Informs Transgenic Crop Regulation

## OVERVIEW

When genetically engineered (transgenic) crops emerged in the 1980s, regulators discussed the possibility that natural cross-pollination could deliver the transgenes to wild/weedy populations, with unintended consequences. But extant relevant data were few and often hard to find. Some theorized that crop-to-wild gene flow would be exceedingly rare or yield sterile hybrids; others believed such hybridization would likely result in the evolution of new or hardier weeds.

## THE RESEARCH

Dr. Norman Ellstrand and colleagues at UC Riverside took up the question, conducting field-based experiments and descriptive studies combined with molecular genetic analysis. At the same time, Dr. Ellstrand did a relentless hunt of the literature for evidence of problems in wild populations. Research on several crop/wild pairs (like corn and teosinte) revealed that crop-to-wild gene flow can occur at surprisingly high rates and over surprisingly long distances. Resulting hybrids were generally just as fit as their parents.

As the Riverside research spawned scientific papers, other scientists worldwide began to conduct similar research. In 2003 Ellstrand published a book reviewing his work and that of others on crop-to-wild gene flow, almost entirely on research that did not involve transgenes. Its key findings: (1) 22 of 25 of the world's most important crops are known to mate with wild/weedy relatives somewhere in the world; (2) when hybridization occurs, it most frequently has little consequence; but (3) in several cases, some of the world's worst weeds have evolved as a consequence of crop-wild hybridization (e.g., weedy rice, weed beet); and (4) (in a handful of cases) crop-to-wild gene flow has radically increased extinction risk in wild populations (actual extinction in the case of wild coconut). If some hybridization and occasional negative consequences occurred for traditionally bred crops, GMOs should be no different, except that, because GMOs are regulated, regulators might be able to anticipate and prevent problems.

## THE POLICY IMPACT

Dr. Ellstrand's research and book are widely cited in policy publications, including National Research Council studies. He has participated in NGO policymaking, for example, through a Gates Foundation-funded workshop in Mombasa, Kenya, on transgenic virus-resistant cassava. Since 2009, he has responded to 30 media requests for information or interviews on the topic from *Al Jazeera English* to the *New York Times* to the *CBS Evening News*. Most important, crop gene flow is now almost always considered in regulatory decisions regarding transgenic plants.

Crop gene flow is now almost always considered in regulatory decisions regarding transgenic plants.

## LESSONS LEARNED

Colleagues warned Ellstrand not to get involved in this potentially controversial topic. "Some told me not to try to conduct science to inform policy because 'they never listen to scientists.' But after some character-building mistakes, I learned to let the science lead," he says. "In the end, I believe that I influenced policy because I tried – as much as possible – to prevent my attitude from interfering with the facts."

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# EDUCATION





# Sweet Success: Changing Food Environments for California Pre-Schoolers

## OVERVIEW

On any given day in the US, 84 percent of pre-school-aged children drink sugary drinks, for the equivalent of 11 percent of their total energy intake. With nearly one in four of these young children overweight or obese, it is clear that too many children are entering school at an unhealthy weight and with unhealthy dietary habits.

## THE RESEARCH AND POLICY IMPACT

In 2008, Dr. Lorrene Ritchie conducted a study in collaboration with California Food Policy Advocates and the Samuels Center for Public Health Research and Evaluation. They surveyed a random sample of licensed providers across the state and found a substantial need for improvement in the beverages being served to young children in licensed childcare. One of their recommendations was that California needed beverage standards for young children in licensed childcare.

The Healthy Beverages in Childcare Law (AB 2084) was signed into law in 2010. This law currently stands as among the most comprehensive of any state laws on childcare beverages. It specifies that: (1) drinking water be available to children at all times, including at meals and snacks; (2) only 1 percent or nonfat unflavored milk be served to children ages 2 and older; (3) no more than 1 daily serving (in age-appropriate portion size) of 100 percent juice be served; and 4) no beverages be served containing added natural or artificial sweeteners.

The Healthy Beverages in Childcare Law (AB 2084) was signed into law in 2010. This law currently stands as among the most comprehensive of any state laws on childcare beverages.

## MORE RESEARCH...AND MORE IMPACT

In 2012, Dr. Ritchie and her team conducted another survey of childcare providers to identify whether the new law was working. They found that beverage options in childcare improved in all four areas – however, only 60 percent of providers reported knowing about the law and only one quarter were fully compliant. Presented with these results, stakeholders suggested better nutrition education for providers, parents, and children.

A year later, Foundations for the Healthy Nutrition in Child Care AB 290 became law. It will require newly licensed childcare providers receive one hour of training on child nutrition starting in 2016. Previously, no training in nutrition had been required. In 2014, Dr. Ritchie served on the AB 290 Workgroup convened by California’s Emergency Medical Services Authority to develop the new nutrition curriculum standards for childcare licensing.

## LESSONS LEARNED

One of the challenges advocates face is having data to support their requests for legislation. “Being armed with good data from a credible source was instrumental in the policy impacts that we achieved in childcare nutrition,” says Dr. Ritchie.

Also impactful were several rounds of policy meetings with decision makers so that they could develop policy and practice recommendations around research findings and make requests for the kinds of data they would like to see to ensure their programs are working.

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UC Division of Agriculture  
and Natural Resources



# Bringing Integrated Pest Management to California Public Schools

## OVERVIEW

The Healthy Schools Act mandated “least-toxic” pest management methods at pesticide use in California public schools. A great first step – but how do schools with limited time and money become pesticide and pest management experts? Since the bill’s enactment in 2001, both UC Cooperative Extension (UCCE) and the California Department of Pesticide Regulation (DPR) have been working with school districts in California to provide information about integrated pest management (IPM) inside buildings and for outdoor areas on school grounds.

The strategies employed in an outdoor IPM program include modifying horticultural practices, such as adjusting mowing heights and managing irrigation appropriately. These practices can reduce the amount of pesticides used on school grounds to help schools to provide a safer and healthier environment for students, teachers, and staff.

## THE RESEARCH

DPR has coordinated numerous workshops for school districts covering general landscape and building IPM topics. However, attendees requested more detailed training about turf IPM for special areas like playgrounds and sports fields. DPR called on the experts at UCCE to help.

Working closely with DPR, UCCE advisors and specialists conducted hands-on training for school landscape staff throughout California. At each workshop, school staff were provided UCCE resources to assist them in implementing IPM at their schools. Trainers helped the participants interpret the results of their soil tests, discussed identification and management of weeds and other pests, and conducted irrigation evaluations. Participants got their hands dirty at school fields: measuring irrigation output, sampling soil, and identifying weeds.

## THE POLICY IMPACT

Seventy-five public school staff members across the state went back to their districts equipped to use fewer pesticides than before. The trainees recognized that many turf problems could be ameliorated through appropriate turf culture such as managing irrigation, mowing, and fertilization rather than the use of pesticides. Additionally, by demonstrating how to evaluate and improve irrigation systems, the trainees also learned about the impact of appropriately managing water to avoid runoff and improve water quality. The program was such a success that over the past two years, it has expanded to include four additional sites (Chico, Vista, Santa Maria, and Fremont), with continued DPR partnership.

Seventy-five public school staff members across the state went back to their districts equipped to use fewer pesticides than before.

## LESSONS LEARNED

Participants said they appreciated the applied aspects of the training, especially when discussing solutions outside on the fields. “We also engaged school facility managers to show the participants what they have done to manage turf pests and improve their irrigation systems,” said Cheryl Wilen, the UCCE integrated pest management advisor and endemic and invasive pests and diseases strategic initiative leader. “This combination of academic expertise and real-world, peer-to-peer experiences made it easier for the participants to understand how they can improve their program.”

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UC Division of Agriculture  
and Natural Resources





# Making Good Choices Stick: School-Based Programs to Learn About Healthy, Local Food

## OVERVIEW

Child obesity threatens to affect the health of millions of people as they grow up. But humans enjoy sugar, salt, and fat – so simply offering healthy food options is not enough to motivate children to make healthy choices. At the same time, imposing restrictions rather than encouraging children to make their own healthy choices can have long-term negative implications.

## THE RESEARCH

As part of the Shaping Healthy Choices Program (SHCP), a UC Davis and UC Cooperative Extension team experimented with school-based programs for healthy, local food options.

They started with nutrition education, events, and promotion, including healthy cooking activities that linked agriculture, food preparation, and nutrition. These programs helped children become familiar with and connected to the variety of food choices they truly have. To ensure that healthy fruits and vegetables were available, the team provided technical support for school gardens, support for increased fresh produce in the school cafeteria, and local grower and distributor connections to encourage regional sourcing. Family and community partners bought in, working to establish school wellness policies.



## THE POLICY IMPACT

Preliminary analyses showed that children classified as overweight or obese dropped from 56 percent to 38 percent during the one year SHCP was implemented in Sacramento County.

The school-based nutrition education program resulted in fewer overweight and obese children than a comparison group. Preliminary analyses showed that children classified as overweight or obese dropped from 56 percent to 38 percent during the one year SHCP was implemented in Sacramento County. The success of the SHCP in promoting health and preventing obesity enabled participating schools to sustain lasting improvements for the school community.

## LESSONS LEARNED

Collaboration with a wide array of stakeholders proved key, and it began with shared goals. Despite a time crunch, the researchers and their allies were able to implement a program that has seeded fruitful relationships.

“One of the most likely reasons that the Shaping Healthy Choices Program produced such impressive results was the collaboration among many sectors of the school environment,” says Dr. Sheri Zidenberg-Cherr, a UC Cooperative Extension nutrition science specialist in the Department of Nutrition at UC Davis. “That’s teachers, administrators, school nutrition program staff, families, farmers, food distributors, and local business owners. The key to success was that university and school partners shared a common goal, and worked together to create a realistic, coordinated educational program given real-life time constraints.”

*Featured Researcher: Sheri Zidenberg-Cherr, PhD  
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UC Division of Agriculture  
and Natural Resources



# What's for Lunch? Making Healthy School Meals a Win-Win

## OVERVIEW

What comes to mind when you think of school lunch? Many might recall foam trays of Salisbury steak and mushy peas. But you'd hear another story from someone who went to school in the 1990s: chips, soda, pizza, French fries, and snack bars.

Fueled by tight budgets and limited resources, schools had found that profits could be obtained by selling “competitive foods.” Vendors not included in the federally funded and regulated National School Lunch Program could sell à la carte and snacks and beverages. Schools became a profitable market for companies, and students were a captive audience.

During this shift, obesity rates skyrocketed. Advocates and policymakers turned their attention to limiting soda, candies, and chips in elementary and middle schools, but a law passed in response to this situation languished as an unfunded mandate.

## THE RESEARCH

The California Department of Education called in researchers at the Atkins Center for Weight and Health at UC Berkeley to examine the financial implications of selling sodas, candies, and chips at schools. The findings from the study surprised everyone. When schools quit selling these snack foods and beverages, students were more likely to eat subsidized school meals, bringing more federal funding into the state. Most schools studied made more money by not selling foods and beverages that competed with school meals. And of course, school meals were more nutritious than competitive foods.

## THE POLICY IMPACT

As a result of the work by advocates armed with data from this study, California became the first state in the nation to pass legislation to limit these kinds of unhealthy foods and beverages sold in K-12 schools. One by one, districts and states across the nation followed suit, until many, if not most states and school districts had some limitation on competitive foods sold to students. Studies of the Body Mass Index (BMI) of California students indicated a reduction in obesity after the policy change. The Center partnered with a variety of groups to disseminate information on best practices for schools wanting to limit junk food and improve the health of their meal programs.

These studies have not only contributed to positive changes in school foods in California, but across the country as well. The 2010 Healthy, Hunger-Free Kids Act directed the USDA to update nutrition standards for schools nationwide. Beginning this school year, students nationwide may only have “smart snacks” that meet nutrition standards in cafeterias, vending machines, and through fundraisers.

As a result of the work by advocates armed with data from this study, California became the first state in the nation to pass legislation to limit these kinds of unhealthy foods and beverages sold in K-12 schools.

## LESSONS LEARNED

The Berkeley researchers were able to obtain data that addressed the barrier to implementation of a law to improve the nutritional quality of school food. With data showing that the proposed competitive food regulations were budget-neutral or even positive, school officials, advocates, policymakers, and a Republican governor championed the first large-scale legislation of its kind in the country.

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# Tackling Campus Vending Machines to Promote Healthy Eating

## OVERVIEW

Policymakers are increasingly looking to the food environment for ways to improve population health. For example, the Affordable Care Act requires “point-of-purchase intervention” – requiring prominent food purveyors to post nutritional information up front. While considerable research has focused on restaurants, little is known regarding the effectiveness and financial impacts of vending machine interventions.

In collaboration with UCLA’s Housing and Hospitality Services, members of UCLA’s Healthy Campus Initiative (HCI) planned, implemented, and evaluated a pilot vending machine program aimed to encourage customers to choose healthier items over conventional items without compromising the financial viability of the machines.

## THE RESEARCH

After evidence-based nutritional criteria were used to identify healthier items, researchers chose a representative sample of vending machines. These were converted so a cohesive group of healthier items were at eye level and branded with HCI stickers. A control group of conventional machines were left as they were. Prices were adjusted campus-wide to incentivize the sale of healthier items and discourage the sale of popular but unhealthy ones.

The evaluation of sales data demonstrated that the pilot machines sold around seven times the number of healthier items compared to the control machines, and that these same machines did not lose revenue or profit compared with the year before. The majority of consumers, surveyed after their purchases, said they did not have a particular item in mind when they approached the machine. These consumers were much more likely to end up choosing a healthier item when they purchased from a pilot machine than a conventional one.

## THE POLICY IMPACT

This research is now being used to inform the vending operations across the UC system. The study has been particularly effective due to the strong partnership between researchers, clinicians, and Housing and Hospitality Services staff throughout the project. This partnership enabled making meaningful but sustainable changes, such as matching evidence-based nutritional guidelines with a first-hand understanding of what sells.

The applicability of the results to practitioners and policy makers, coupled with the rigor of data collection and analysis, has been instrumental in bridging research to practice. Results are being submitted for publication to inform policy more broadly.

This research is now being used to inform the vending operations across the UC system.

## CONTINUING WORK

This project is slated for publishing and more detailed information will be available after the study is published.

*Featured: UCLA Healthy Campus Initiative  
healthy.ucla.edu*



# **ENVIRONMENT & NATURAL RESOURCES**





# Working Dirt: Community Based Participatory Research on Lead, Gardens, and Place

## OVERVIEW

Green infrastructure, including gardens, is at the center of the conversation about a transition to sustainable cities. Urban gardens provide a local source of nutritious food and can help to strengthen community ties. However, there are tradeoffs to gardening in the city, including potential exposure to soil pollutants, such as lead which may have come from paint and gas. Lead in soil is a lesser-known source of human lead exposure than lead-based paint, but contaminated soil can also adversely affect humans, especially children, if accidentally inhaled or ingested. Lead paint was banned for homes in 1978. Older neighborhoods, with the highest soil lead levels, are often the same neighborhoods with limited access to fresh fruits and vegetables.

## THE RESEARCH

University of California Agriculture and Natural Resources has funded a collaborative transdisciplinary research program that includes ecologists and social scientists at UC Davis who work in partnership with local non-profit organizations in Sacramento who are working to support healthy, sustainable, and equitable communities by installing raised-bed gardens to improve access to local foods and build community cohesion and empowerment.

The ecologists have tested soil lead at more than 75 yards in three older, low-income neighborhoods in north and south Sacramento using handheld X-ray fluorescence. Now they are expanding to include all of the City of Sacramento and are actively seeking additional partnerships with regulatory, health, and family service organizations and agencies. The team's social scientists have conducted resident surveys and interviews and facilitated activities that allow residents to tell their stories of place, contamination, and gardening. The researchers and residents are collaboratively evaluating the tradeoffs between ecosystem services such as food provisioning and soil lead exposure.

## THE POLICY IMPACT

UC Davis researchers are able to provide to residents soil lead data within 10 days, which is used to determine where to place gardens and manage lead hazards in other areas of the yard. Researchers also deliver residents detailed maps of their property in person so that they can answer any questions and provide a list of low-cost strategies to mitigate high levels of lead.

Data collected on yards will be used to make predictions at the scale of the city, helping to identify the role that landscape plays in the distribution of lead.

Data collected on yards will be used to make predictions at the scale of the city, helping to identify the role that landscape plays in the distribution of lead. Community-based research on lead, gardens, and place has strengthened relationships between UC Davis researchers, local non-profits, and community gardeners, together identifying ecosystem services that the community values and would like to manage for advancing the ultimate goal of healthy urban gardening.

## LESSONS LEARNED

This project is still in process. It remains to be seen whether the team's work will translate to large-scale policy change. However, by including residents each step of the way, they can be sure that the data will be in the hands of those who have the most to gain immediately from the knowledge.

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UC Division of Agriculture  
and Natural Resources



# Creating a “Global Gold Standard” to Assess Environmental Impacts of Livestock

## OVERVIEW

A growing global population is increasingly demanding eggs, meat, and dairy products. This creates the potential for a massive expansion of the food system’s carbon footprint – a problem difficult to measure, let alone solve.

“You can only mitigate what you can measure,” says Frank Mitloehner, a professor and air quality specialist in UC Davis’ Department of Animal Science. “You need to know what your farm’s current environmental impact is before you can alter your practices to lessen that impact. Secondly, you need to be able to quantify how effective the different mitigating methods are.”

## THE RESEARCH

On April 23, 2015, after three years of international collaboration and study, the United Nations Food and Agriculture Organization (FAO) released new findings and guidelines to help producers of livestock, poultry and animal feed calculate and assess their environmental impacts. Dr. Mitloehner chaired the first year of this effort through FAO’s Livestock Environmental Assessment and Performance Partnership (LEAP).

As the first LEAP chair, Mitloehner led a widely diverse group in establishing science-based methods to quantify livestock’s carbon footprint, create a database of greenhouse-gas emission factors for animal feed, and develop a methodology to measure other environmental pressures. The new guidelines are now publicly available at the LEAP web site.

## THE POLICY IMPACT

Dr. Mitloehner’s research quantifying the impact of livestock production on greenhouse gases and air quality, as well his breadth of international experience, well positioned him to lead the first phase of this global effort. As LEAP transitions to another add-on project– this time developing guidelines for assessing other livestock impacts including water and nutrient use – Mitloehner looks forward to continued global collaborations. Partners who have recognized and adopted the principles set out in the agreement include the International Feed Industry Federation, the International Egg Commission, International Dairy Federation, multiple NGOs and six FAO member countries.

For now, he and his team are proud of their work equipping multiple producers and industries to quantify their impacts. They have also begun a blueprint for assessing and developing mitigating technologies to guide future carbon concerns.

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## LESSONS LEARNED

No research project ends with the published paper.

No research project ends with the published paper. When working in international collaborations, relationships are built that can be tapped for future efforts related to livestock, the environment and the global demand for food.

### Featured Researchers:

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UC Division of Agriculture and Natural Resources



## Soil Matters to Improve Agriculture and Address Climate Change

### OVERVIEW

“There’s a quote I like: “The only thing that stands between civilization and starvation is a thin veneer of soil,”” says Dr. Ronald Amundson, professor at UC Berkeley’s Department of Environmental Science, Policy, and Management. “And that’s true. The layer of soil around the earth is about a yard thick. The rates of erosion are fast – but not fast enough that people perceive how fast that veneer is disappearing.”

It’s the job of scientists, he argues, to document these changes, project their effects, and inspire policymakers to act to ensure that our soil – the very base of a habitable planet – doesn’t disappear. To that end, Dr. Amundson is now connecting a decade of his research describing natural and “domesticated” soils and the ways in which soil management will impact our carbon footprint to the problems of agricultural sustainability and global climate change.

### THE RESEARCH

In his work, Dr. Amundson has explored the connection between soil diversity and biodiversity. As vast tracts of land have been repurposed for agricultural or urban uses, disturbances in soil have changed the relationships among plants and animals depending on the dirt.

Twelve years on, Dr. Amundson says he is starting to feel more comfortable as a researcher interacting with policy debates. He’s now focused on bringing clarity to the nebulous term “sustainability.” In the physical sciences, sustainability has a clear definition: inputs must equal outputs. Soil that is stripped of its nutrients and life – some of which we may not have yet discovered – could end up producing less and less food as our population grows. Yet policies that clearly define and support sustainable soil can arrest, and maybe someday reverse, that trend.

### THE POLICY IMPACT

The United Nations Food and Agriculture Organization is marking 2015 as International Year of Soils. Amundson is a member of the US National Soil Science Committee, which is organizing a one-day workshop convening soil scientists, Congressional staff, and non-governmental organizations with an impact on policymaking to illuminate these issues. They are taking the broad view of what soil science means for natural security and global prosperity.

“We are finally making the direct statement that none of this science – the importance of soil in climate and food systems – is going to matter at the end of the century without policy change.”

The United Nations Food and Agriculture Organization is marking 2015 as International Year of Soils.

### LESSONS LEARNED

Dr. Amundson acknowledges that scientists have more work to do to make policy-relevant research available to policymakers. “If it’s a mile distance to reach out to policymakers, we often reach about 100 yards,” he said. “Scientists have to step into that world.”

Our plates – and our planet – may depend on it.

*Featured Researcher: Ronald Amundson, PhD  
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## Cleaner Water Through Collaboration and Research

### OVERVIEW

Nitrates are common chemicals used in agriculture that can easily contaminate groundwater that rural communities depend on to drink and water their crops. In response, the California legislature directed the state Water Resources Control Board to prepare a report on the scope, sources, impacts, and future of the potential problem, and to identify policy and management responses. In 2010, the Water Board turned to expertise at UC Davis to conduct an independent \$1.7 million study in two particularly vulnerable pilot regions, the Tulare Lake Basin and Salinas Valley.

These regions include four of the top five counties in the U.S. for agricultural production, almost 40 percent of California's irrigated cropland, and over half of the state's animal farming industry. One in ten people living in California's most productive agricultural areas were found to be at risk of exposure to harmful levels of nitrate in drinking water, including some of the poorest communities in California.

### THE RESEARCH

"Cleaning up nitrate in groundwater is a complex problem with no single solution," said Jay Lund, director of the UC Davis Center for Watershed Sciences and co-author of the report. Indeed, the research involved an interdisciplinary team of researchers, spanning hydrology, engineering, soil science, economics, and informatics. Preparation for the report to the Water Resources Control Board spanned 20 months.

"California groundwater quality is a significant concern to the Water Boards, and this comprehensive report presents current science and potential solutions on how to deal with this chronic and longstanding issue," said State Water Board executive director Thomas Howard.

### THE POLICY IMPACT

The state Water Board's report to the legislature cited UC Davis findings and recommendations as foundational for agencies ranging from the Departments of Food and Agriculture, Public Health, and Water Resources, to county and regional water boards.

The state Water Board's report to the legislature cited UC Davis findings and recommendations as foundational for agencies ranging from the Departments of Food and Agriculture, Public Health, and Water Resources, to county and regional water boards.

The governor's administration formed several high-level policy and technical advisory committees to follow up on the study recommendations, including significant interaction between study participants and the advisory committees. State and regional agencies continue to explore regulatory measures to address the scope of the issues and solutions outlined in the UC Davis report.

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#### *Featured Researchers:*

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*Center for Watershed Sciences*



## Cleaner Water Through Collaboration and Research

*Continued from Previous Page*

### LESSONS LEARNED

Engaging in policy requires extensive outreach and communication, with numerous public presentations, uncommon of a typical academic project. It also requires a team effort. The UC Davis Center for Watershed Sciences, in close collaboration with UC Division of Agriculture and Natural Resources, UC Davis News Service, UC Davis College of Agricultural and Environmental Sciences, and the State Water Board, had extensive and frequent outreach presentations, meetings, and briefings throughout the course of the study, an intensive briefing series in preparation of the study release, and outreach, consultation, and follow-up meetings for over a year following the study release. This included scientific and technical meetings and a wide range of stakeholder meetings– briefings with the governor’s administration at the secretarial level, with state agency personnel, with major statewide stakeholder representatives, and in the local basins, including major local agricultural stakeholder groups. Advance notice and engagement of stakeholders is important so that they do not feel blindsided. Industry organizations are critical stakeholders.

Advance notice and engagement of stakeholders is important so that they do not feel blindsided. Industry organizations are critical stakeholders.

The issues were inherently complex and challenging – finding the balance between agriculture, environment, economic and community concerns – but the study definitively changed the substance of discussions on safe drinking water in rural communities toward the science – despite political indecision on how to respond.

The study demonstrated that UC Davis and the UC system have all the components needed for such a major interdisciplinary science and policy project.

#### *Featured Researchers:*

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# Climate Smart Agriculture: Linking Research and Local Policy to Global Policy

## OVERVIEW

Agriculture is among the economic sectors that will be most impacted by climate change, while at the same time, also a contributor to greenhouse gas (GHG) emissions. Adapting to temperature and precipitation changes from climate change, while also reducing agriculture GHG emissions, is necessary for a climate smart agriculture strategy. Research at UC Davis is informing the role of agriculture in California's pioneering climate policy and contributing to the Global Alliance for Climate Smart Agriculture.

## THE RESEARCH AND POLICY IMPACT

California is positioned as a leader in climate change policy and UC Davis research is informing state agencies' in strategic planning and policy development on the agriculture dimensions of climate change mitigation and adaptation. For the California Energy Commission, UC Davis faculty and staff authored the 2012 White Papers on Vulnerability and Adoption to Climate Change in California Agriculture, and California's case study on Adaptation Strategies for Agricultural Sustainability. For the California Air Resources Board, Dept. of Water resources and CalRecycle, UC Davis researchers conducted intensive research to validate GHG emission factors and annual emission budget estimates for a variety of crops.

California's signature climate policy, AB32, created cap and trade regulations for greenhouse gas emissions. To examine how AB32 can incentivize reductions of emissions from agriculture, Dr. William Horwath, UC Davis faculty member, authored the Assessment of Baseline Nitrous Oxide Emissions in California Cropping Systems for The Air Resources Board of California's Environmental Protection Agency. UC Davis researchers provided key inputs to the agriculture section of the Climate Change Scoping Plan for implementation of AB32. While AB32 focuses on mitigation policy, a pending bill, SB367, provides financial incentives for agricultural investment in adaptation practices that will simultaneously reduce emissions and sequester carbon. Research and engagement with policy makers by UC Davis faculty Dr. Louise Jackson has informed the scope of the practices outlined in this bill, including ways that farmland preservation contributes to both mitigation and adaptation to climate change.

UC Davis researchers provided key inputs to the agriculture section of the Climate Change Scoping Plan for implementation of AB32.

## FROM LOCAL TO GLOBAL

UC Davis is also a founding member of the Global Alliance for Climate Smart Agriculture, an international coalition of governments, universities, industry, and non-governmental organizations amongst whose aims include integrating climate-smart agriculture into policy, strategies and planning. The Global Alliance arose in part to fill a gap in the international policy dialog on climate change, as agriculture is not currently addressed under the United Nations Framework Convention on Climate Change (UNFCCC). Leading up to the creation of this alliance, UC Davis hosted the second global conference on climate smart agriculture research and in March of this year, was a partner in the third conference held in Montpellier, France. Through these and the Global Alliance, UC Davis research seeks to inform and foster coherence between climate and agricultural policies. To that end, notably, among the recommendations from the third global conference is the statement that "The profile of agriculture within UNFCCC negotiations must be raised, recognizing that food and nutritional security will be severely affected by climate change. Financing instruments for climate change and for agriculture should be bridged."

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### Featured Researchers:

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## Climate Smart Agriculture: Linking Research and Local Policy to Global Policy

*Continued from Previous Page*

### LESSONS LEARNED

Improving the evidence base for projections of climate impacts on agriculture is essential for increasing awareness and action within the agricultural sector. Frequent interaction and dedicated cooperation with many types of organizations and agencies provided data, ideas and feedback.

Solutions that provide mitigation of greenhouse gas emissions and adaptation to uncertain climate are complex, as well as controversial. An interdisciplinary team of scientists was essential for examining tradeoffs. Support and empowerment of state and local institutions are fundamentally important for agricultural sustainability. Researchers must distill their findings to clear messages that practitioners, policymakers and stakeholders can adjust to local situations and positive economic outcomes. Presentations, hearings, roundtables, and discussions must continue long after the research project ends, if it is to effectively inform and innovate policies to promote the strategic development of climate smart agriculture.

Presentations, hearings, roundtables, and discussions must continue long after the research project ends, if it is to effectively inform and innovate policies to promote the strategic development of climate smart agriculture.

#### *Featured Researchers:*

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# Brownfield to Food Forest: Collaboration on Growing Grounds

## OVERVIEW

Southeastern San Diego is a lower income area that is also considered a food desert. It also has more than 800 vacant lots – many of them are perceived to be “brownfields,” or places where fear of contamination keeps them vacant. Where many would see problems, the Global Action Research Center and UC San Diego researchers saw potential.

One 20,000-square-foot parcel, now known as the Ocean View Growing Grounds (OVGG), is a proving ground for new local and federal policies aimed at putting urban land to edible use. New ordinances have allowed city dwellers to keep goats, chickens, and bees and fast-tracked approval for farmers markets. Meanwhile, Environmental Protection Agency funding is supporting soil testing and brownfield remediation.

## THE RESEARCH

OVGG’s first two years built a foundation: creating a network of over 160 residents, forming a community-led Garden Management Team, and developing a garden plan. To date, the completed work has included building a tool shed, raised beds, a composting system, establishing two food forests, and holding several workshops on topics related to growing and eating healthy foods.

The UCSD Superfund Research Center also began a plant-testing ground on the site. Sampling from the two food forests and nearby backyard gardens is measuring any heavy metal accumulation in the plants and trees people are growing for food. Their EPA-funded research found some elevated toxicants levels in some of the samples. By compiling existing policy and research, UCSD will be presenting the results to the community along with strategies to reduce risk with safe gardening practices and soil amendments.

## THE POLICY IMPACT

The City of San Diego sees the project as a model for interim use of a vacant lot leveraging EPA Brownfield Assessment Grants – but their work has the potential to reach much farther. The research team wants the city to get behind Assembly Bill 551. This bill allows some cities to adopt urban agriculture incentive zones, providing tax incentives for landowners to lease their land to communities establishing community gardens.

The City of San Diego sees the project as a model for interim use of a vacant lot leveraging EPA Brownfield Assessment Grants – but their work has the potential to reach much farther.

## LESSONS LEARNED

Significant policy impact requires joining science and technology with the practical knowledge of the community, merging theory and practice. This cannot be done solo. To begin the work, the team had to build “authentic demand” – building democratic, constituent organizations that could act as a legitimate community voice. Southeastern San Diego is one of the most culturally diverse parts of San Diego. The neighborhood of OVGG is 77 percent Latino and 13 percent African American, and consists of approximately 500 single-family homes with a few apartment complexes and light industry scattered throughout. The researchers, NGOs and government officials knew they had to build lasting, authentic participation by local residents and give them a voice in policymaking.

*Featured Researcher: Keith Pezzoli, PhD*  
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# PUBLIC HEALTH





## Youth Help Each Other to Make the Switch to Water

### OVERVIEW

One third of California children are classified as overweight or obese. Children who are overweight have an increased risk of developing chronic diseases such as diabetes, which has a lasting impact on the quality of life for those affected.



The University of California Cooperative Extension has made health a priority, identifying 12 major risk factors for weight gain. One major contributor is consumption of added sugar, most often consumed in sugar-sweetened beverages. The average American consumes about 22 teaspoons of sugar a day, and more than 30 percent of calories from added sugars are from sweetened beverages.

### THE RESEARCH

But how do you persuade kids to give up liquid candy? The Solano County Department of Health contacted 4-H, a national program administered in California by UC Cooperative Extension, to partner on a youth advocacy project to address this issue. 4-H youth members were trained on nutrition and community advocacy.

The 10 middle and high school 4-H'ers created a plan with both educational and policy components, including a sample healthy drink policy that said "water is the best option for hydration" and "water must be provided as an option at all club meetings."

### THE POLICY IMPACT

As a result of this youth-led advocacy effort, two 4-H clubs in Solano County passed new healthy beverage policies. These 107 4-H members must now have access to water at meetings, providing a sugar- and calorie-free option. Through the partnerships built by 4-H staffers and young people, this work was shared with the 4-H Statewide Healthy Living Leadership Team, and a similar statewide policy has been adopted. 4-H is committed to the health of its youth, and continued application of the latest research to the program benefits all members.

These 107 4-H members must now have access to water at meetings, providing a sugar- and calorie-free option.

### LESSONS LEARNED

"Working with teens as advocates for change is very rewarding, but also very time consuming," says Marcel Horowitz, Healthy Youth, Families, and Communities Advisor. "Researchers and educators often forget that this is an educational opportunity for the teens (and the adults), not just an extender model to get more done.

"As such, it requires a significant amount of coordination so that skills can be taught, partnerships forged, and ideas generated. In the end however, everyone gains a sense of meaningfulness, accomplishment, and personal responsibility which will continue to impact the world positively."

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UC Division of Agriculture  
and Natural Resources



# Research Outside the Bubble: Evaluating Soda Tax Impacts on Obesity

## OVERVIEW

Today you can get a large soda for less than a dollar – but these fizzy drinks aren’t cheap. These sugary sources of empty calories are singlehandedly contributing to rapidly rising health care costs and lowered quality of life for millions of Americans suffering from diabetes, heart disease, and even gout. These costs are shared among all of us, through health insurance premiums or taxes that pay for Medicare and Medicaid.

Research – and common sense – shows that environmental factors are stronger than will power alone. By adding a surcharge to the cost of sugary drinks, governments hope to recover some of the social costs of empty calories. Dr. Kris Madsen at the UC Berkeley School of Public Health is working to evaluate whether this strategy also reduces consumption, providing health benefits farther upstream.

## THE RESEARCH

The City of Berkeley passed a soda tax in November 2014, becoming one of the first cities in the US to try discouraging consumption this way. Dr. Madsen is now working to measure the impact of the change, especially in low-income communities, through periodic surveys. She is comparing results to those in nearby Oakland and San Francisco to see whether consumers drink less soda, switch to untaxed but still unhealthy substitutes like Frappuccinos, or just pay the higher prices.

## THE POLICY IMPACT

“The most important things that really influence behavior are environmental issues: what’s available, what’s affordable, and what’s tasty,” Dr. Madsen says. “If what is tasty costs more than what is a little less tasty, we can shift what people consume. We are fighting a losing battle if the tastiest thing is the cheapest thing.”

Implementation is the start of a new battle. Writing law, of course, quickly gets complex. What counts as a sugary drink? Who will end up paying the tax in the end? Will it even work to reduce consumption? Evaluating the impact of Berkeley’s soda tax will help advocates write laws and ballot measures that are effective in improving public health.

## LESSONS LEARNED

Dr. Madsen says that ensuring a policy is replicable is key to its success. Getting feedback from consumers, advocacy groups, and policymakers makes the policy “product” – a model soda tax, for example – more likely to be used. Public health advocates need to understand the evaluation data so that they can bring solid information to decision-makers.

And while Berkeley is still alone in its soda tax experiment, many other cities have tried or are about to. Dr. Madsen believes that even previous failed attempts have been worth the effort. “I believe everything moves the needle,” Dr. Madsen said. “Even if you aren’t successful by one definition, you can take the conversation to the next level by trying something big.”

“I believe everything moves the needle,” Dr. Madsen said. “Even if you aren’t successful by one definition, you can take the conversation to the next level by trying something big.”

*Featured Researcher: Kris Madsen, MD, MDH  
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# Closing Health Disparities Through Local Sugary Drink Legislation

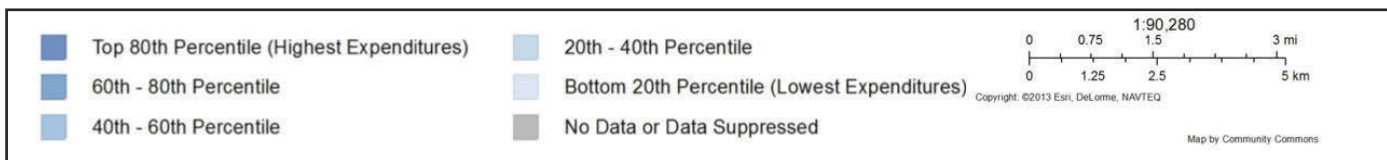
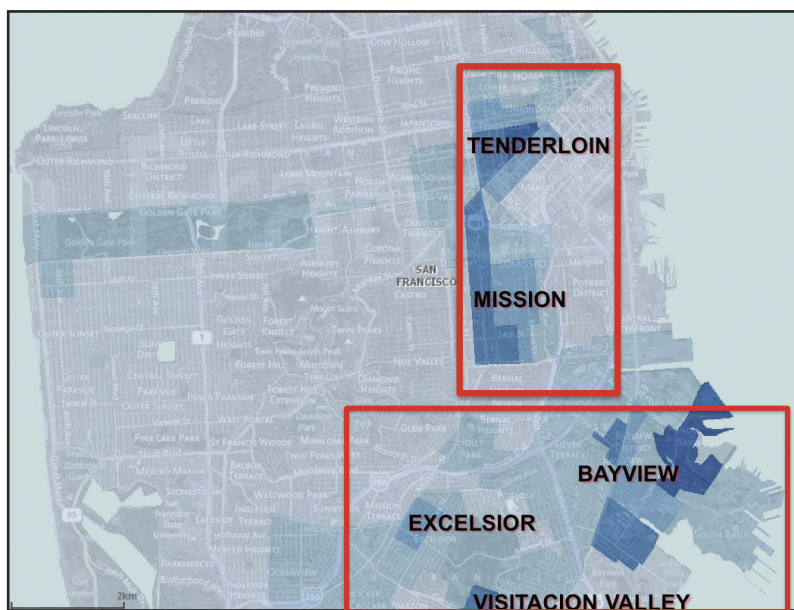
## OVERVIEW

San Francisco is a relatively healthy city – and one of tremendous disparities. African Americans and Latinos, particularly those of low income, have disproportionately high rates of obesity-related illnesses such as “adult onset” diabetes. The disease is now at epidemic proportions in children. UC San Francisco doctors, whose wards in the 1990s were filled with AIDS patients, today work wards filled with diabetics suffering blindness and limb amputations. Concerned policymakers on the San Francisco Board of Supervisors turned to UCSF faculty and staff for answers to curbing this epidemic. The science showed that measures to reduce sugary beverage consumption through taxation and product labeling were their best options.

UCSF faculty and staff worked closely with members of the San Francisco Board of Supervisors for three years to craft legislation to change the city’s health statistics. Measure E, on the November 2014 ballot, proposed to tax sugary beverage distributors at two pennies per ounce. Measure E faced a multi-million dollar counter-campaign by the American Beverage Association, which represents sugary beverage (e.g., soda and sports drink) manufacturers. While 56 percent of San Franciscans endorsed Measure E, it required a 65 percent supermajority, and thus failed to become law.

## THE RESEARCH

UCSF’s Clinical and Translational Sciences Institute spent those years building partnerships between researchers, the local health department, community health advocates, and local policymakers to translate science into evidence-based and locally relevant policy and education approaches. To tap the pulse of San Francisco’s diverse communities, UCSF researchers held focus groups to gather perspectives from communities of African Americans, Latinos, and Asian/Pacific Islanders in the city.



*Continues on Next Page*

### Featured Researchers:

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# Closing Health Disparities Through Local Sugary Drink Legislation

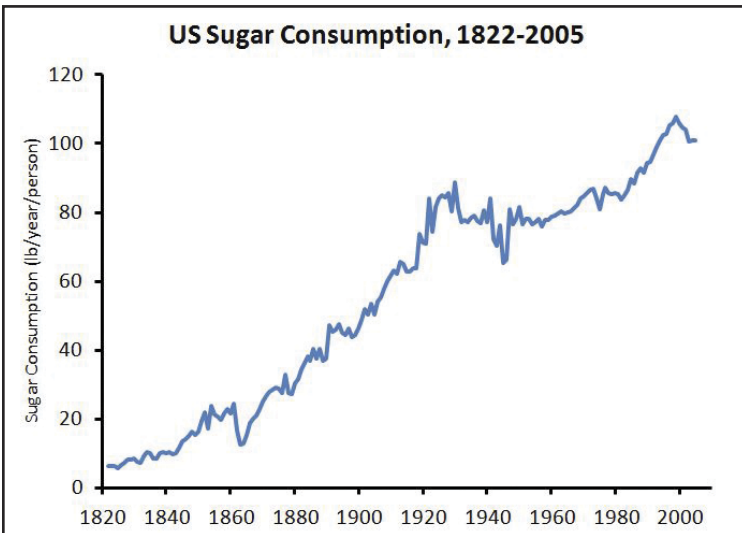
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## THE POLICY IMPACT

Building on the momentum of Measure E, seven months later, the San Francisco Board of Supervisors unanimously passed legislation that, for the first time in America, will place warning labels on sugary beverage advertising within city limits. The Board also passed provisions that ban such advertisements on public property and prohibit the use of city funds to purchase sugary beverages. Focus group studies revealed that low-income communities of color lacked access to safe sources of tap water, as well as the reality that bottled water often costs more than sugary beverages at the checkout stand. Thus, raising prices or restricting sugary beverages would not, on its own, solve the problem for these communities. City officials have responded with an initiative to fund the installation of more than two-dozen water bottle filling stations, to promote access to safe, clean tap water for everyone.

Building on the momentum of Measure E, seven months later, the San Francisco Board of Supervisors unanimously passed legislation that, for the first time in America, will place warning labels on sugary beverage advertising within city limits.

## LESSONS LEARNED



Even locally supported, evidence-based policies that address critical health needs can fall prey to the vagaries of the political process. But policymakers who collaborate with scientists and are cognizant of community needs can work within these confines to make progress all the same.

UC researchers played a key role in bringing forward insights gained from research with the most affected, low-income communities of color. Some of these studies were conducted “on the fly,” as the policymaking process unfolded in real time. The evidence these studies provided about the need for improved water access provided critical information for decision makers that allowed them to hone their policy choices to maximize public health impacts.

Dr. Guyenet: <http://wholehealthsource.blogspot.com/2012/02/by-2606-us-diet-will-be-100-percent.html>

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UC San Francisco



# Leading By Example: UCSF Removes Sugary Drinks from Campus

## OVERVIEW

July 1, 2015, is the beginning of the end. On that day, UC San Francisco will phase out sugar-sweetened beverage (SSB) sales in all of its cafeterias, vending machines, hospital food services, and retail locations. They're calling it the Healthy Beverage Initiative. SSBs include sodas, sports drinks, energy drinks, sweetened teas and coffees, and fruit drinks that are not 100% juice. The phase-out will be complete across all UCSF venues by November 1, 2015. At this time, the only drinks available for purchase at any UCSF campus or hospital location will be zero-calorie beverages and non-sweetened drinks with nutritional value, such as milk and 100% juice. UCSF has been a leader in research revealing the links between sugar consumption and rising rates of diabetes, heart disease, and liver disease, as well as in the translation of these vital research findings through our policy and public education initiatives. Now, they are leading by example.

## THE RESEARCH

The research data about the harmful effects of sugar were the main selling points that supported the rationale behind the importance of the policy. "SugarScience" graphics, posters and information went up across campus to prepare for the change, and an expert panel discussion was held with the SugarScience research team at a wellness event for the UCSF community. The campus Wellness Director partnered with researcher Dr. Laura Schmidt at the School of Medicine, working with all levels of the university and its constituencies to get buy-in: student groups, employee groups, food services, individual vendors, the academic senate, and top leadership at the Medical Center and Chancellors' Office.

## THE POLICY IMPACT

UCSF will be the first academic medical center in the country to eliminate sales of SSBs in all of its hospitals as well as its university sites. Following UCSF's lead, the San Francisco Department of Public Health and San Francisco General Hospital will be rolling out similar changes, and the San Francisco Hospital Council has moved to promote the same across all hospitals within city limits. To connect the policy change back to research, UCSF is hoping to conduct an evaluation of the health impacts of the Healthy Beverage Initiative using a quasi-experimental design and a cohort of UCSF employees.

Following UCSF's lead, the San Francisco Department of Public Health and San Francisco General Hospital will be rolling out similar changes.

## LESSONS LEARNED

One of the biggest challenges was protecting and nurturing relationships with all parties, from students and employees to vendors and leadership. Retail vendors were rightly concerned about financial impacts. University of Michigan's 2013 healthy beverage policy led to decreases in sales at vending machines and retail. Due to concerns about similar financial impacts, UCSF asked all vendors to voluntarily adopt the policy, rather than writing it into their leases. Subsequently, all vendors agreed to voluntarily comply and participate. An alternative (non-SSB) drink products list was compiled to assist the vendors with suggested replacement items.

Using the most appropriate language was another challenge the team took seriously. This work is ongoing – framing the change as a positive has helped counter concern. To this end, the team has avoided terms like "soda ban" or "sugar ban," and refers faculty, staff, students, and the media to the "Healthy Beverage Initiative" instead. Researchers – and the public – are watching this experiment eagerly to assess its impacts.

### Featured Researchers:

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UC San Francisco

# LABOR & JOBS







## Cross-Disciplinary Insights on the Health of Farmworkers

### OVERVIEW

As popular authors and journalists continue to uncover the interconnectedness of the world's resource-intensive, nutrient-deprived food system, it is now common to see organic berries and apples at mainstream grocery stores. However, even organic berries come at a steep price for farmworkers, who labor with few legal protections under extreme conditions. Dr. Seth Holmes explored this first-hand as part of his anthropology dissertation at Berkeley, travelling across the US-Mexico border on foot and working alongside indigenous migrant Mexican farmworkers. This led to the 2013 publication of his multiple award-winning book, *Fresh Fruit, Broken Bodies*, bringing attention to the global – and individual – impacts of our current food system.

### THE RESEARCH

Dr. Holmes did five years of participant-observation, living in farm labor camps, picking berries, and traveling the West Coast for work alongside Oaxacan immigrants. During this time, he saw how structural racism, immigration policy and market forces conspire to sicken the people who help put life-giving food on our tables. Crippling back and knee pain, depression, and drug use as self-medication are among the ailments migrant farmworkers experience at disproportionate rates. At the same time, federal and state laws prohibit public health care spending on undocumented workers and those who move from state to state. While many Americans choose to put healthy fruits and vegetables in their own bodies, they seldom consider the harsh conditions farmworkers face.

### THE POLICY IMPACT

While *Fresh Fruit, Broken Bodies* doesn't have the p-values associated with quantitative scientific studies, evidence-based stories like those he gathered can change the way politicians and voters think. Dr. Holmes' research has been featured in nationwide media including *The New York Times*, *Civil Eats*, and NPR. It's part of an expanded conversation connecting food and health advocates to those working to change labor and immigration laws.

The California Institute for Rural Studies (CIRS) sent a copy of the book and a related policy brief to 535 Congressional representatives, 50 governors, the President, Vice President, First Lady, and the secretaries of Health and Human Services of California and Washington States.

The California Institute for Rural Studies (CIRS) sent a copy of the book and a related policy brief to 535 Congressional representatives, 50 governors, the President, Vice President, First Lady, and the secretaries of Health and Human Services of California and Washington States. They hope that the book will inspire the Environmental Protection Agency (EPA) to update its Worker Protection Standard for the first time in 9 years to strengthen accountability for farming operations. As part of that effort, Dr. Holmes was invited to speak to the EPA in May 2014 and to Congress in April 2015.

### LESSONS LEARNED

Large grant funding is a challenge in the US in work like his, Dr. Holmes says. He hopes this work opens the door for further research that makes the most of the tools of multiple disciplines. "I've learned so much about the intersections of social inequalities and health from my colleagues in public health," Dr. Holmes says. "And my anthropology colleagues think deeply and theoretically about many levels of what is going on in the world and what they mean. This work requires both."

*Featured Researcher: Seth Holmes, PhD*  
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# Investigating – and Curbing – Labor Law Violations in Chinatown Restaurants

## OVERVIEW

In 2007, researchers from UC Berkeley’s School of Public Health and its Labor Occupational Health Program teamed up with the San Francisco Department of Health, the Chinese Progressive Association (CPA), and other academic researchers from UCSF to study threats to worker health in the Chinatown district of San Francisco. The team used a community-based participatory research approach to involve workers themselves in designing questions, fielding the survey, training other workers and, eventually, advocating for policy change. Today, thousands of those workers are better protected by improved and rigorously enforced labor standards.

## THE RESEARCH

Conversations with workers revealed that their biggest health concern was violation of labor laws regarding minimum wages, also known as wage theft. Sub-minimum wages, lack of paid sick time (mandated by city law), and long hours documented by the research contribute to poverty and poor health outcomes for workers. In 2010, the Chinese Progressive Association released the results of the study as a report called “Check, Please!” “The data were explosive,” said Dr. Meredith Minkler, the study’s principal investigator and now professor emerita at the School of Public Health. The report revealed that half of workers reported being paid less than minimum wage, and two thirds were not paid overtime. Meanwhile, over 40 percent worked more than 40 hours per week. The research findings were also published in the *American Journal of Public Health* in 2014. These local findings echoed national studies, which found that millions of workers are not getting the wages and benefits they are entitled to by law – especially those in fast-growing, low-wage industries such as restaurants.

## THE POLICY IMPACT

Backed by these findings, the CPA and an alliance of other low-wage workers proposed the Wage Theft Prevention Ordinance for the city. It and a second ordinance creating a dedicated task force to execute it were passed in 2011. The Department of Public Health is also now empowered to deny restaurant permits if employers lack workers’ compensation coverage. Importantly, the work has also launched successful efforts to reclaim lost wages. For example, in 2014, popular dim sum restaurant Yank Sing reached a \$4 million settlement with workers for back pay and benefits as a result of long-term violations of labor law.

Importantly, the work has also launched successful efforts to reclaim lost wages.

## LESSONS LEARNED

Researchers from the School of Public Health comment that the reward structures of traditional research and grant-making are not a perfect fit with community-based participatory research. Involving more stakeholders made the study and its impact stronger, but it required attention to partnering and process. The academics involved worked to make clear the purpose and language of research methods and human subjects review, and to show up for community events, continuing the working relationship long after the formal study ended. Their participatory research is now a model taught in public health classrooms.

“If you involve partners from the very beginning with a strong sense that their work will make change, you can harness an incredible amount of power and energy,” said Dr. Charlotte Chang. She worked on the study, evaluating the partnership model, and is now a researcher at UC Berkeley’s Labor Occupational Health Program. “We are so proud of this work.”

*Featured Researcher: Meredith Minkler, DrPH  
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# Questioning a Social Expectation: Tipped Minimum Wages and the Food Economy

## OVERVIEW

While inequality grows in the United States, seven of the 10 lowest-paying jobs in America are in the food industry. UC Berkeley's Food Labor Research Center Director and Co-founder and Co-director of Restaurant Opportunities Center, Saru Jayaraman, wants to change that statistic. She has been employing academic tools, analyzing government data, and surveying workers to uncover whether the food economy is sustainable. Her research has helped persuade policymakers in states from Minnesota to New York to introduce bills ending the subminimum wage for tipped employees (who make as little as \$2.13 per hour in many states).

## THE RESEARCH

While the debate over the federal \$7.25 minimum wage is well known among those who follow politics, many people are surprised to learn that legally, tipped workers can earn just \$2.13 per hour from their employer. The \$5.00 per hour difference is supposed to be made up by customers' tips. It's then no surprise that workers who depend on tips are more than twice as likely to fall below the poverty line.

The report "Recipe for Success" busted the myth that paying tipped restaurant employees a higher base salary would kill jobs by examining growth in the seven states that require restaurants to pay their workers at least the regular minimum wage – before tips. Most recently, "The Glass Floor: Sexual Harassment in the Restaurant Industry," a report produced with the help of UC Berkeley student researchers, began a national conversation about how the tipped minimum wage can lead workers to be more likely to tolerate harassment from customers and employers.

## THE POLICY IMPACT

While Congress is now unlikely to raise the minimum wage for all Americans, 20 states and many more cities have raised their minimum wage above the federal \$7.25. Early in 2014, President Barack Obama signed an executive order raising the minimum wage for federal contractors to \$10.10 per hour.

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Public debate around the tipped minimum wage has shifted from a conversation about the impact on industry to essential fairness, with changes pending in Massachusetts, Michigan, Pennsylvania, and more.

## LESSONS LEARNED

Jayaraman said that collaboration with advocates and organizations "close to the ground" is key to successful policy change through research. While academics have an interest in rigorous pursuit of the truth, these groups will keep the real-world application central to the work as well.

"It took women coming forward about the tipped minimum wage for researchers to realize it wasn't just about poverty," Jayaraman says. "The movement now realizes this isn't about economics but about gender equity, and that has won a lot of support."

*Featured Researcher: Saru Jayaraman, JD  
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# PLANNING





# Give a Community a Guide to Garden Regulations, and They'll Eat for a Lifetime

## OVERVIEW

Lecturer, landscape architect, and beekeeper Patricia Algara teaches a course called Designing for Difference at the UC Berkeley College of Environmental Design, where she shares her expertise on designing a host of urban green spaces for users of many different backgrounds. Her students begin by learning the differences between urban spaces— including urban farms, community gardens, school gardens, and other green spaces – who they serve, what resources are needed to keep them going, and what challenges a designer might face in building one. The final assignment is a Post Occupancy Evaluation, examining how the public is actually using a space.

But Algara is not just teaching what she knows – she is creating custom tool kits for communities seeking to build their own green spaces, often without the top-down help of planners or policymakers. Crucially, design is only the first step. The process of creating shared green spaces that are safe, sustainable, and accessible is far from a footnote.

## THE RESEARCH

In 2010, the city of El Monte won a grant to engage the largely Latino and disproportionately poor community in discussions about “urban greening.” Algara’s firm BASE Landscape Architecture engaged city staff, non-profits, schools, and the community, seeking input on concerns, needs, and potential strategies for action to make the community greener and healthier. Their final report includes guides to starting community gardens and farmers markets, and suggests changes to city policies such as planting edibles in public spaces. A UC Berkeley student helped make the report come alive with maps and graphics.

## THE POLICY IMPACT

Her work in El Monte is targeted beyond just policymakers: the team is ensuring that the material is actionable for regular citizens, too. To begin a conversation about the green spaces they’d like to see with the mostly Spanish-speaking community members, her team distributed coloring books to local kids.

Most parents in the community already had connections to the land, with backgrounds as farmers in their home countries. These experiences gave parents a shared vocabulary of the issues and a sense of real expertise on an issue that might otherwise be intimidating. A community group has already emerged with the goal of starting a farmers market and is looking to the report for advice on how to proceed.

These experiences gave parents a shared vocabulary of the issues and a sense of real expertise on an issue that might otherwise be intimidating.

## LESSONS LEARNED

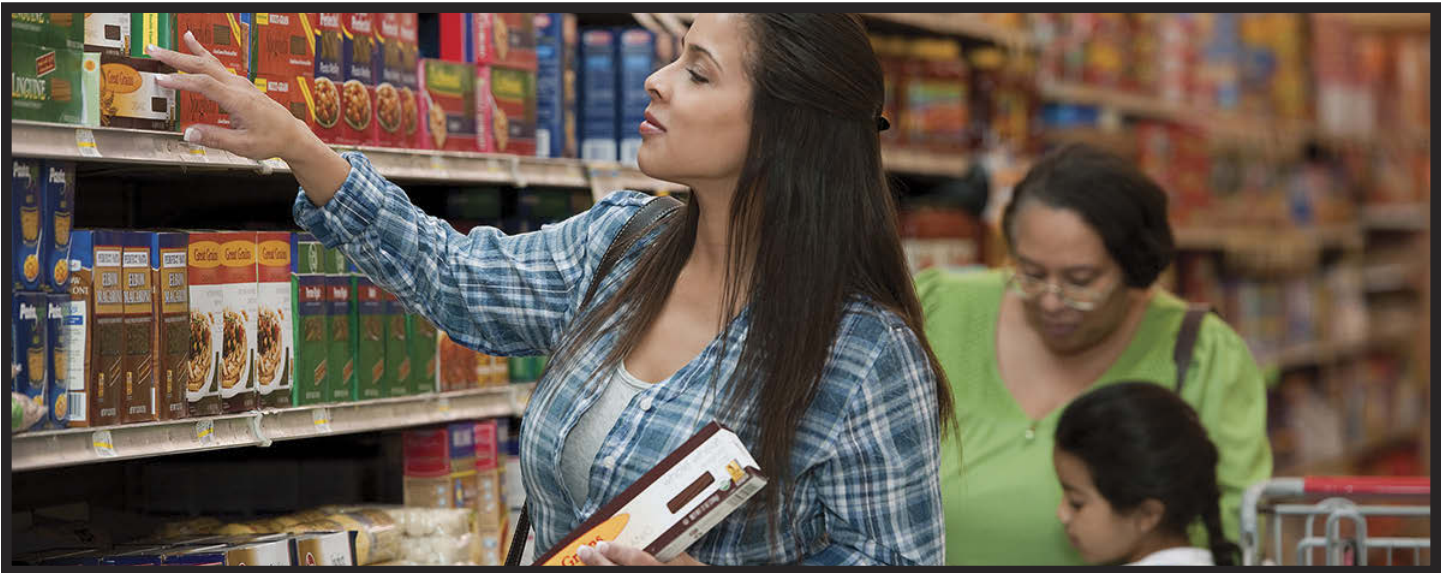
Algara believes that her report will do more than sit on a shelf. She believes that her most important role is navigating the red tape and complexity of planning – showing others that there’s no reason to get discouraged by “the system.”

“A lot of times, planners and city officials speak ‘designer mumbo jumbo’ without even noticing it,” Algara said. “Being able to translate that ordinance not just from English to Spanish, but from regulator-speak to plain language is key as well.”

*Featured Researcher: Patricia Algara, MLA  
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# **SOCIAL SERVICES**







## Fueling the Future: Long-term Economic and Health Benefits of SNAP

### OVERVIEW

The Supplemental Nutrition Assistance Program (SNAP), formerly known as food stamps, is the largest anti-hunger program in America, with 46 million low-income people receiving modest sums they can use to purchase food. During the Great Recession, the program grew, as it was designed to – leading to calls for an overhaul.

In part because it is available to so many Americans, SNAP is difficult to evaluate. It is designed so that there is no “control group” of people who would be eligible but not receive the help, and there is little variation between states (or over time) to compare. Dr. Hilary Hoynes, a professor at the Goldman School of Public Policy at UC Berkeley, has stepped in to add information to the debate.



### THE RESEARCH

While reading about the history of the Food Stamp Program (SNAP’s precursor), Dr. Hoynes discovered that it was rolled out over 15 years in 3,000 counties more or less randomly. This gave her the opportunity to compare a world in which SNAP didn’t exist, and one where it did, isolating the difference the program made.

She and her coauthors had heard about the “fetal origins hypothesis” from epidemiologists: Studies of formerly prosperous, suddenly famine-stricken areas had shown that a pregnant mother’s nutrition could affect her child’s health outcomes for a lifetime. If a fetus is exposed to poor nutrition or too-few calories, its metabolism develops adapted to be very efficient. When normalcy returns, the metabolism doesn’t reset, leading to hypertension, high blood pressure, and diabetes.

She theorized that the expansion of the safety net would have the opposite effect, even in less-extreme scenarios. And in fact, it did. The more years of childhood spent “exposed” to the Food Stamp Program, the better lifelong health outcomes people in her study experienced.

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*Continues on Next Page*

*Featured Researcher: Hilary Hoynes, PhD  
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## Fueling the Future: Long-term Economic and Health Benefits of SNAP

*Continued from Previous Page*

### THE POLICY IMPACT

These findings greatly expanded the scope of the dollars-and-cents cost-benefit analysis of this crucial social program. The Center on Budget and Policy Priorities, a major social policy think tank in Washington D.C., has cited Hoynes' research in its widely read policy briefs and in Congressional testimony. Her research on SNAP and other safety-net programs has been featured in pieces in *The New York Times'* Economix blog and its opinion page, *Washington Post's* Wonkblog and *Salon*. She met with President Barack Obama and a small group of researchers in March 2015 to discuss the importance of the safety net.

If you're interested in health and nutrition and wellbeing, this program touches the most people. We've got to know what it does.

On the importance of SNAP research, Hoynes says, "I think SNAP is the most important program for low-income Americans. If you're interested in health and nutrition and wellbeing, this program touches the most people. We've got to know what it does."

### LESSONS LEARNED

In her estimation, it took Dr. Hoynes about 15 years to start really talking to people involved in policymaking about her research. "Most academics get into the work for the science, not the policy," she said. And there are few traditional incentives for academics to talk to people outside academia.

Her advice is to find a nongovernmental organization that understands your work, knows that it's high quality, and can help you share it. For Hoynes, the Center for Budget and Policy Priorities was that valued partner. Additionally, in 2014 the California Endowment funded Dr. Hoynes to convene a meeting of SNAP policy experts from across the country to share research and develop solutions.

Her advice is to find a nongovernmental organization that understands your work, knows that it's high quality, and can help you share it.

*Featured Researcher: Hilary Hoynes, PhD  
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UC Berkeley



# Making California Produce Available to Low-Income Women, Infants, and Children

## OVERVIEW

Despite the documented health benefits of increasing fruit and vegetable consumption – especially reduced risk of heart disease and Type 2 diabetes – less than 50 percent of California children eat five or more servings of fruit and vegetables daily. Low-income populations in particular face many barriers to consuming fruit and vegetables, such as price and availability. Even a program intended to provide nutrition, the federal Special Supplemental Nutrition Program for Women, Infants and Children (WIC), allowed only one vegetable purchase before 2009: carrots.

To overcome these barriers, WIC changed its policy in October 2009 and began distributing cash vouchers to low-income women and children to purchase fruit and vegetables. But would small stores be able to adapt business practices to provide culturally appropriate, fresh produce?

## THE RESEARCH

“There was so little data on how the WIC packages were working,” says Dr. Lucia Kaiser, a nutrition specialist with the Cooperative Extension. In 2011, a team of University of California Cooperative Extension (UCCE) educators received a three-year specialty crop block grant from the California Department of Food and Agriculture (CDFA) to research ways to improve WIC participants’ access to locally produced specialty crops, including cantaloupe, grapes, strawberries, and bell peppers.

The UCCE nutrition educators surveyed WIC participants in Alameda, Tulare, and Riverside counties and learned that there was in fact a demand for high-quality, fresh produce. Farm advisors and specialists explored the feasibility of connecting small farmers to WIC vendors. Also, visits to WIC stores were made to assess improvements needed to prepare storeowners to handle these new products.

## THE POLICY IMPACT

The WIC clientele survey led to the development of produce handling and nutrition fact sheets for 16 seasonal crops. Testing showed that WIC participants learned new information about preparation, storage, nutritional value, serving, and selection of produce from the fact sheets. Extension educators identified some handling problems at the WIC stores and then hosted three training sessions on produce handling for 30 WIC store employees in Alameda, Tulare, and Riverside/Coachella Valley were carried out.

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## LESSONS LEARNED

Making the most of their data meant extra work, but the payoff means better policies. Data disaggregation was a priority of the UCCE team. “Sometimes the data comes in and it’s very aggregated and hard to tell if some groups are doing better than others, or what the preferences are of different groups so you can take that into account in the policy to promote better outcomes among all groups,” Kaiser says. “We sampled different communities, not just urban and rural populations, but also different ethnic groups. We want our policies to reduce disparities among different economic levels and ethnic groups. It is important to examine how well different groups are doing as a result of a policy change.”

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UC Division of Agriculture  
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