



UCDAVIS

**ENVIRONMENTAL HEALTH
SCIENCES CENTER**

**COMMUNITY
RESEARCH
PRIORITIES**

2021-22

Table of Contents

| | | |
|--------------------------|-------|-----------|
| Introduction | _____ | 1 |
| Pesticide Regulation | _____ | 2 |
| Air Quality | _____ | 6 |
| Water Quality & Quantity | _____ | 11 |
| Hazardous Waste Disposal | _____ | 18 |
| Health Equity Data Tools | _____ | 19 |
| Research Methods | _____ | 20 |

Introduction

The [UC Davis Environmental Health Sciences Center](#) works with a dedicated group of non-profit organizations and state agency staff we call our [Community Stakeholder Advisory Committee \(CSTAC\)](#).

The CSTAC works with the EHSC to guide our research priorities, connect researchers with communities experiencing some of the country's worst environmental pollution, and participate as research collaborators.

The following is a compilation of policy-relevant priority areas that our CSTAC organizations and their networks are focused on now, along with examples of opportunities for research that can contribute to these priorities.

Many of these have potential as [EHSC Pilot Program](#) projects, and we encourage applicants to consider these topics for developing their proposals. We also recommend that applicants review the [current NIEHS Strategic Plan](#). Many of the community priorities detailed here relate directly to NIEHS [Theme 2: Promoting Translation - Data to Knowledge to Action](#).

Please connect with the [EHSC's Community Engagement Core](#) to learn more about how you can collaborate with community-based organizations around these topic areas.

Pesticide Regulation

Community Policy Priorities & Research Needs

1

RIGHT-TO-KNOW REGULATIONS

Establish required public notification of pesticide applications near communities, and in particular near sensitive locations within communities (schools, daycares, elder care facilities, etc.).

2

RULEMAKING FOR 1,3-D (TELONE)

Establish a regulatory process for 1,3-dichloropropene that protects environmental and community health.

3

SCHOOL BUFFER ZONES

Establish enforceable, evidence-based pesticide application buffer zones around schools.

4

ALTERNATIVES TO HAZARDOUS PESTICIDES

Ensure that communities and advocacy organizations have adequate information on the known health impacts of proposed alternatives to chlorpyrifos and other hazardous pesticides.

1

Right to Know Regulations

Goal: Establish required public notification of pesticide applications near communities, and in particular near sensitive locations within communities (schools, daycares, elder care facilities, etc.).

Policy context

As part of the state's effort to reduce air pollution in heavily impacted communities, [AB 617](#) established community clean air steering committees in 10 locations across the state, including one in [Shafter](#), charged with developing [Community Emission Reduction Plans \(CERPs\)](#). The [Shafter CERP](#) includes a commitment from DPR to work with the Air District, California Air Resources Board (CARB), and the Kern County Agricultural Commissioner's (CAC) office to explore options for a public pesticide notification system in the Shafter area. Pre-application notifications, known as NOIs (Notices of Intent) are currently reported to county ag commissioners and shared with other farmers.

An EHSC Pilot Project was funded in 2021 to use these NOIs to develop effective, culturally appropriate public notifications of pesticide applications. However, to date the Kern County agricultural commissioner [has not complied](#) with an order from the DPR to make these NOIs public, stating that he believes it is beyond the jurisdiction of AB 617 and [offering alternative, more limited notification options](#), which community advocates believe are insufficient. This issue is ongoing.

There are also efforts at the state level to institute public notifications, with [\\$10 million](#) allocated in the 2021-22 California state budget to develop and implement a statewide [Pesticide Notification Network](#).

Research needs

- Research that builds an evidence-base for notifications base on environmental and public health risk, *including but not limited to restricted materials* (i.e. any substances linked to cancers, harm to pollinators, etc., regardless of regulatory status)
 - There is a particular interest in drift studies, and in studies on the impacts of pesticides not currently restricted in California (some of which are banned in other countries)
- Research on the development of effective, culturally appropriate notification systems and risk mitigation strategies (possible models include CA wildfire notification systems and BeeWhere).
- Providing testimony or written justification of the need for notification of pesticide application for the purpose of scientific research (ex: [EHSC Letter to Governor Newsom on Notification of Intent to Spray Pesticides](#))

2

Rulemaking for 1,3-D

Goal: Establish a regulatory process for 1,3-dichloropropene (Telone) that protects environmental and community health.

Policy context

The Department of Pesticide Regulations is expected to begin working on a process to regulate Telone following a 2018 court judgment to do so and subsequent appeals process. [Californians for Pesticide Reform](#) (CPR) and other advocacy organizations are focused on influencing these regulations to protect the health of workers and nearby communities. OEHHA also recently granted a [CPR petition to establish a Prop 65 Safe Harbor level for 1,3-D](#).

Research needs

- Research on Telone drift (see [DPR investigation of 2018 Telone detections in Shafter](#))
- Research that supports the development of effective, evidence-based pesticide monitoring to protect public health (including but not limited to Telone)

3

School buffer zones

Goal: Establish enforceable, evidence-based pesticide application buffer zones around schools.

Policy context

California established regulations [limiting pesticide applications near schools and daycare facilities](#) during the school day in 2016, which went into effect in 2018. However, advocates are concerned with the efficacy of these regulations due to their limited enforceability (1, 2, 3).

Research needs

- Research on pesticide drift dynamics, pediatric health impacts of pesticide exposure (particularly long-term, cumulative impacts), and the impact of current regulations on pediatric pesticide exposure.
- Research that supports the development of evidence-based, enforceable regulations limiting pesticide applications near sensitive community locations like schools and daycares.

4

Alternatives to hazardous pesticides

Goal: Ensure that communities and advocacy organizations have adequate information on the known health impacts of proposed alternatives to chlorpyrifos and other hazardous pesticides.

Policy context

In response to the 2019 [ban on chlorpyrifos](#) that went into effect in January 2021, the Department of Pesticide Regulation convened an [Alternatives to Chlorpyrifos Work Group](#) in 2019 and released a list of alternative pesticides in a 2020 [Action Plan](#). A [Sustainable Pest Management Work Group](#) was then convened in spring 2021, as a collaborative forum to help identify ways to minimize the use of hazardous pesticides and expand the use of integrated pest management practices.

Californians for Pesticide Reform are monitoring alternatives proposed by these workgroups for pesticides of concern.

Research needs

- Research on any known environmental or health impacts of proposed alternative pesticides
- Research on characteristics of proposed pesticides relevant to their capacity/likelihood to spread beyond their application site

Air Quality

Community Policy Priorities & Research Needs

1

ULTRAFINE PARTICULATE REGULATION

Assess the health risks of ultrafine particulate exposure to support the establishment of an appropriate regulatory framework to protect public health.

2

AIR TOXICS

Increase knowledge of the health impacts of Air Toxics and effective risk mitigation strategies (behavioral and regulatory)

3

AIR QUALITY NOTIFICATIONS

Establish culturally appropriate and timely notices about air quality and recommendations for air quality safety.

4

OIL AND GAS SETBACKS

Establish a regulatory framework for oil and gas production in California that includes setbacks around wells that protect public health.

5

AB 617 COMMUNITY AIR PROTECTION PROGRAM IMPLEMENTATION

Ensure AB 617 implementation is effective and includes meaningful community participation and accountability.

6

QUANTIFYING COMMUNITY HEALTH IMPACTS OF CLIMATE POLICIES

Ensure that climate actions and policies are improving human health.

1

Ultrafine particulate regulation

Goal: Assess the health risks of ultrafine particulate exposure to support the establishment of an appropriate regulatory framework to protect public health.

Policy context

Ultrafine particles are produced in large numbers by combustion activities (including vehicle emissions and wildfire) but are currently unregulated by state and federal mass-based air quality regulations (PM 2.5 and PM 10) due to their extremely small size. An ultrafine particle is defined as having a diameter of less than 100 nanometers (nm). The average size particle from vehicle emissions is 25 nm, which is one million times smaller than a single particle of PM 2.5 dust. These ultrafine particles are undetectable using traditional optical particle counters (like PurpleAir), but are more mobile in the human body than larger particles, and thus may pose a greater risk to human health.

Research needs

- Research to develop and utilize innovative methods to collect and measure ultrafines in the environment
- Research that develops and utilizes innovative methods to assess the health impacts of ultrafines (e.g., using mouse/rat models and other approaches)

2

Air Toxics

Goal: Increase knowledge of the health impacts of Air Toxics and effective risk mitigation strategies (behavioral or regulatory).

Policy context

Air toxics (e.g., perchloroethylene, methylene chloride, dioxin, asbestos, toluene, and metals such as cadmium, mercury, chromium, and lead compounds) are addressed through the Clean Air Act, but are not currently included in the EPA's National Ambient Air Quality Standards (NAAQS), which only apply to six common air pollutants that the EPA refers to as "Criteria Air Pollutants." Some, but not all, Air Toxic emissions are regulated under the EPA's National Emissions Standards for Hazardous Air Pollutants (NESHAP). Both of these lists are subject to periodic revision.

Research needs

- Health studies of the impacts of different Air Toxics individually or in complex mixtures (cumulative impacts)
- Research analyzing the effectiveness of the National Air Toxics Assessment (NATA) and approaches to improving it

3

Air quality notifications

Goal: Establish culturally appropriate and timely notices about air quality and recommendations for air quality safety.

Policy context

There are some existing air quality notification systems (e.g., colored flags indicating air quality and health impact warnings, mobile apps like AirNow and Breezometer, Spare the Air alerts) but little research on how effective these are and how they could be improved.

Research needs

- Research on how much and for how long sensitive populations can be exposed to various criteria and toxic pollutants before experiencing short and/or long-term health consequences.
- New research or analysis of existing research to help inform the development of effective air quality notifications and communications on exposure mitigation strategies.
- Research to develop a culturally and linguistically appropriate notification system for farm workers and other outdoor workers, as they have higher exposure due to the length of time that they spend outdoors.

4

Oil and gas setbacks

Goal: Establish a regulatory framework for oil and gas production in California that includes setbacks around wells that protect public health.

Policy context

California does not currently have setback requirements for oil and gas drilling, unlike most other oil-producing states. Community advocates have been working for years to establish these setbacks, including [AB 345](#), which was introduced in 2019 but died in committee, and most recently [AB 467](#).

Research needs

- Research on the local and regional human health impacts of oil and gas operations in various settings.
- Research on appropriate setback distances to protect human health.

5

AB 617 Community Air Protection Program Implementation

Goal: Ensure AB 617 implementation is effective and includes meaningful community participation and accountability.

Policy context

The AB 617 Community Air Protection Program was passed in 2018 with the purpose of improving air quality in heavily impacted communities in California. It involves community-scale air quality monitoring and the production of air pollution emission reduction plans. The California Air Resources Board manages the program for the state and the regional Air Districts implement it in consultation with Community Stakeholders Committees made up of local residents, organizations, governments, and businesses.

Many CSTAC members are involved with AB 617 implementation and are organizing to ensure quality community engagement and to advocate for improvements to the regulation.

Research needs

- Research on air quality and public health condition improvements associated with AB 617 implementation
- Research on the role of land use as an influence on air quality and environmental health
- Research on the changes in relationships of conflict and collaboration between air quality agencies and community residents and organizations as they pursue improvements in environmental health.
- Research that supports low cost monitoring of black carbon, methane, and ozone.



Quantifying human health impacts of climate policies

Goal: Ensure climate actions & policies are improving human health

Policy context

The state of California has a range of climate change mitigation legislation but few with direct connections to impacts on public health ([California Climate Policy Dashboard](#)).

Research needs

- Applied research of health impacts (benefits and unintended harms) associated with climate actions/policies.
- Research on the impact of various methods of greenhouse gas emissions reduction on adaptation capacity/resilience, equity, and public health.
 - Examples include: [dairy methane digesters](#), urban planning to reduce vehicle miles traveled as promoted by [SB 375](#), and the unintended consequence for communities from the policy of [Reducing Emissions from Deforestation and Degradation \(REDD\)](#).
 - NOTE: There is \$5 million dollars in the 2021 state budget to assess the costs/benefits/efficacy of dairy digester technology. This is the first time such funding has been provided and could provide an opportunity to expand research beyond research commissioned by the agriculture and energy industries.

Water quality and quantity

Community Policy Priorities & Research Needs

1

SB200 SAFE & AFFORDABLE DRINKING WATER FUND IMPLEMENTATION

Ensure that the Fund reaches communities most in need due to water contamination and unaffordability.

2

IMPLEMENTATION OF THE SUSTAINABLE GROUNDWATER MANAGEMENT ACT (SGMA)

Establish effective sustainable groundwater management systems that ensure long-term groundwater quality and quantity.

3

DROUGHT PREPAREDNESS & RESILIENCY

Better coordinate drought preparedness and response, particularly in small, rural, and disadvantaged communities.

4

SANITATION / WASTEWATER MANAGEMENT

Establish a regulatory and funding framework to ensure adequate wastewater and sanitation services in disadvantaged rural communities.

5

PFAS REGULATION AND REMEDIATION

Implement state policies that effectively mandate PFAS remediation of impacted water systems and prevent future contamination.



SB 200 Safe and Affordable Drinking Water Fund Implementation

Goal: Ensure that the Fund reaches communities most in need due to water contamination and unaffordability.

Policy context

In 2019, [SB 200](#) established the [Safe and Affordable Funding for Equity and Resilience \(SAFER\) Program](#), which provides \$130 million per year in funding support for underperforming and at-risk small water systems through the [Safe and Affordable Drinking Water Fund](#). The Fund's [Expenditure Plan](#) is updated annually based on an annual [Drinking Water Needs Assessment](#).

Research needs

- Research identifying higher risk contaminants for small water systems (which could help prioritize funding by the State Water Board)
- Research that identifies water systems at high risk of failure (which could enable the provision of funding to disadvantaged communities before their systems underperform or fail).
- Research that assesses resource allocations under the Fund (whether small districts are accessing funding, and if not, why) and/or the effectiveness of different interventions.

2

Implementation of the Sustainable Groundwater Management Act

Goal: Better coordinate drought preparedness and response, particularly in small, rural, and disadvantaged communities.

Policy context

The Sustainable Groundwater Management Act (SGMA) requires local Groundwater Sustainability Agencies (GSAs) in high- and medium-priority basins to develop and implement Groundwater Sustainability Plans (GSPs) or Alternatives to GSPs, which are submitted to the Department of Water Resources' (DWR) SGMA Portal. SGMA went into effect in 2017 and is in the process of implementation across the state.

Research needs

- Research on the effectiveness, transparency, and community-responsiveness of Groundwater Sustainability Agencies (GSAs).
- Research on the impact of new groundwater management strategies being deployed as part of SGMA implementation.
- Research on the impact of wildfire on surface and groundwater quality (in particular in cases of proposed groundwater recharge using surface water in wildfire impacted regions).
- Research identifying gaps in SGMA that could be addressed by future legislation or regulatory rule-making.
- Research on the effectiveness of GSPs and the GSP assessment/approval process.

3

Drought preparedness and resiliency

Goal: Better coordinate drought preparedness and response, particularly in small, rural, and disadvantaged communities.

Policy context

Current bills related to drought response in California include SB 552 Drought Resilient Communities Act and the national Large Scale Water Recycling and Drought Resiliency Investment Act, co-sponsored by California Senator Alex Padilla.

Research needs

- Research on strategies or technologies to protect water quality during drought conditions.
- Research on methodologies for testing for wells for contamination that require less water throughput. Testing of some active residential wells in disadvantaged communities is currently not possible under drought conditions due to the water requirements for testing running the well dry.
- Research on effective remediation of residential and community wells, including contamination and saltwater intrusion. Research could also look at the cost/benefit of various alternative strategies, including connecting to municipal water services.
- Research on costs/benefits (economic, environmental, public health, climate-related) of alternatives to large-scale desalination projects, like the proposed [Poseidon Plant](#) in Southern California, which many environmental justice organizations are advocating against (1, 2). Alternatives include water recycling, greywater, and rainwater capture.
 - In particular, there is interest in assessing the carbon footprint of desalination projects (including the large scale use of plastic RO membranes) and the economic and health impacts of these types of projects (including on employment and consumer cost of / access to water).
 - There is also interest in research assessing the safety and reliability of desalination under changing climate conditions (i.e. increased risk of algal blooms) and in relation to plant proximity to offshore wells (i.e. increased risk of oil seepage/spills).

4

Sanitation / wastewater management

Goal: Establish a regulatory and funding framework to ensure adequate wastewater and sanitation services in disadvantaged rural communities.

Policy context

Many rural residents in California rely on septic systems for wastewater management, which may be overburdened or inappropriate for the soil conditions. This can result in soil and water contamination, including the contamination of residential wells. The state has the authority to require local municipalities/wastewater providers to provide connections to residents on septic systems, but has done very little to do so. Note that this year's state budget includes \$1.3 billion over 4 years for "drinking water and wastewater infrastructure, with a focus on small and disadvantaged communities"

Research needs

- Research on the impacts of inadequate wastewater service on human and environmental health.
- Research on the implementation of the SAFER program as it pertains to sanitation and wastewater.
- Research that builds on the analysis in the UC Davis report "The Struggle for Water Justice in California's San Joaquin Valley," to include wastewater and sanitation services in an overall analysis of how to provide crucial water infrastructure to rural communities. This original research focused on Disadvantaged Unincorporated Communities (low-income communities outside of cities) because urban areas generally have city-run wastewater systems.
 - Specifically, there is interest in an analysis of the distance between inadequate septic systems and municipal or county wastewater services. This proximity analysis is important as it can identify the possibilities for places with no or inadequate sewage systems to tie in or be consolidated with an existing formal system. This research could also study the costs and any policy/structural barriers associated with connecting rural residents to these services.

5

PFAS regulation and remediation

Goal: Implement state policies that effectively mandate PFAS remediation of impacted water systems and prevent future contamination.

Policy context

Per- and polyfluoroalkyl substances (PFAS) are a family of man-made chemicals that repel oil and water and are used across a range of industries and consumer products -- including food packaging, waterproof clothing and upholstery, and at high concentrations in Class B firefighting foam (used for flammable liquid fires). They are associated with a range of adverse health effects, including immune, reproductive, and developmental impacts and increased risk of testicular and kidney cancer. Other potential sources of PFAS exposure include military bases, airports, landfills, wastewater treatment facilities, and other industrial or manufacturing facilities. A national monitoring survey in 2013-2015 found more detections of PFAS in California drinking water sources than any other state. Remediation of PFAS contamination is technically challenging due to its unique characteristics.

Firefighting foam is of particular concern in California due to its use on military bases, which can be a major source of groundwater contamination (and around which federal/state responsibilities for remediation are complex and unresolved). It is also an area of emerging concern in wildfire zones with an urban interface, where gas stations or other industrial facilities at risk for flammable liquid fires may be impacted. In 2020, California SB 1044 required PFAS chemicals to be phased out of Class B firefighting foam by 2022 for most uses, with waivers available to certain facilities, including oil refineries, through 2032.

The EPA classified PFAS as an “emerging contaminant” in 2016 and established a (non-enforceable and non-regulatory) lifetime health advisory level. The California State Water Resources Control Board Division of Drinking Water (SWRCB-DDW) established notification and response levels for three PFAS chemicals in California, including: perfluorooctanoate (PFOA), perfluorooctanesulfonate (PFOS), and perfluorobutanesulfonate (PFBS). If these are detected at or above the response level, it is recommended that a water source is taken out of service. (1) Environmental justice advocates would like the Office of Environmental Health Hazard Assessment (OEHHA) to develop a public health goal (PHG) for PFAS as a class, allowing the effective regulation of all (approximately 4,700) PFAS chemicals in drinking water.

In September 2021, AB 1200 passed the California Senate requiring disclosure of PFAS used in cookware. The 2021-22 California state budget includes \$4.3 million and 21 permanent positions to the State Water Resources Control Board to oversee cleanup of contaminants including PFAS. Orange County received a \$131 million EPA Water Infrastructure Finance and Innovation Act (WIFIA) Loan in 2021, which will support 35 PFAS treatment systems for 59 impacted wells in the Orange County Water District's service area. These treatment systems are currently under design and are expected to be constructed in the next two years.

5

PFAS regulation and remediation

Goal: Implement state policies that effectively mandate PFAS remediation of impacted water systems and prevent future contamination.

Research needs

- Research is needed on improved methods of testing for the presence of PFAS chemicals, including detection of low concentrations in both environmental and biological samples.
- Research that expands water sampling, in particular in proximity to military bases and airports.
- Research on alternatives to PFAS.
- Research on effective PFAS remediation and mitigation strategies/technologies.
- Research on the use of PFAS-based firefighting foams during urban-interface wildfires and the impact on surface and groundwater quality in impacted communities.
- Research on the health impacts of newer short-chain PFAS chemicals that are being used to replace older long-chain PFAS.

Hazardous Waste Disposal

Community Policy Priorities & Research Needs

Goal

Residents of Kettleman City and other communities impacted by hazardous waste facilities are working to influence California's new permitting framework for hazardous waste disposal. They are focused on issues of setbacks, violations, and community engagement within the permitting process.

Policy context

In 2015, [SB 673](#) required the Department of Toxic Substances Control to address environmental justice concerns on the location and operation of hazardous waste facilities by updating its permitting criteria to include “the vulnerability of, and existing health risks to, nearby populations” and to consider setting minimum setback distances from sensitive locations (schools, homes, hospitals, elder care facilities, etc.). In response, the DTSC released a draft regulatory approach in 2018, which was [updated based on public comment in 2021](#). The DTSC is currently taking comments on changes to these regulations ([through October 29, 2021](#)), which will be incorporated into the draft formal regulatory text that will be submitted to the Office of Administrative Law in 2022.

Research needs

- Research on the adequacy of proposed regulations, including setbacks, to protect public health.

Health Equity Data Visualization Tools

Health equity data visualization tools use indicators of exposure and vulnerability to identify geographic locations where communities are at disproportionate risk of environmental health impacts.

In California, these include [CalEnviroScreen 4.0](#), [Climate Change and Health Vulnerability Indicators for California \(CCHViz\)](#), the [California Healthy Places Index \(HPI\)](#), the [Human Right to Water Portal](#), [EJ Screen](#) (national), and a tool currently in development analyzing toxic facilities by the Department of Toxic Substances Control (see [SB 673 Cumulative Impacts and Community Vulnerability Regulatory Framework](#), 2021).

These tools provide valuable data for environmental justice advocates, policy makers, and regulatory agencies to help ensure that the health of communities at highest risk of harm is protected and prioritized.

Potential research contributions:

CSTAC members are interested in research that utilizes these (or similar) tools or investigates the efficacy/impact of these tools in influencing budgeting, land use, and permitting decisions in ways that improve environmental and public health.

Research Methods

In addition to advising on specific topical priorities, our CSTAC has also advised us on types of research projects that can be most useful for them to use to build evidence-based cases for health-protective policies.

Health risk assessments

The key question the public has around many environmental pollutants is, “Should I be concerned about this?” Comprehensive Human Health Risk Assessment is a multi-step process involving hazard identification, dose-response measurement of effects, exposure assessment, and risk characterization. Risk characterization can inform decision-making to control or otherwise respond to exposures to environmental hazards. The work requires multidisciplinary teams to take on the assessments. Many of the topics listed above could benefit from health risk assessments.

True cost accounting

True Cost accounting is often used in sustainable agriculture to talk about the externalities associated with growing food. Our CSTAC has emphasized the importance of incorporating health economics and the true cost of environmental pollution into research they partner on. They specifically asked the Community Engagement Core to facilitate relationships with more UC Davis health economists.

Regulatory compliance / impact assessment

Following the implementation of environmental regulations, community-based organizations see a great need in knowing whether those regulations are being followed/enforced and whether they are having an impact on environmental quality and ultimately, human health.

Acknowledgements

This document was compiled by the EHSC Community Engagement Core in collaboration with the EHSC's Community Stakeholder Advisory Committee.

Special thanks to all those who generously shared their time and expertise throughout the process. We are thankful to be part of your community.

If you are a researcher interested in collaborating with a community organization on your next project, or a community organization who would like help connecting with an environmental health scientist, the EHSC Community Engagement Core can help.

Links

[UC Davis Environmental Health Sciences Center](#)

[EHSC Community Stakeholder Advisory Committee](#)

[EHSC Pilot Projects Program](#)

[EHSC Community Engagement Core](#)

Contact

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