

# What do citizen and community science mean for cooperative extension?

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# NOTE:

These results and recommendations represent the opinions of the authors, and not official UCANR policy or programming.

# Cooperative Extension

## Background

Land grant universities (Morill Act, 1862)

- Teach practical agriculture, science, military science, and engineering

Cooperative Extension (Smith-Lever Act, 1914)

- Bring research from the land grants out to the user community

## In California

In California, **UC Agriculture and Natural Resources** works across campuses and through county offices.

The logo for the University of California Agriculture and Natural Resources. It features a vertical orange bar on the left, followed by the text "University of California" in a dark blue serif font, and "Agriculture and Natural Resources" in a smaller, dark blue sans-serif font below it.

**University of California**  
Agriculture and Natural Resources

(aka UCANR, aka ANR... 🤔)



UCANR's network of UC researchers and educators bring practical, trusted, science-based answers to Californians.

- **Cooperative Extension Offices**  
 Since 1911, UCCE Advisors have been living in the communities they serve, working hand-in-hand with growers, ranchers, and families. Today, over 200 Advisors based in 57 county offices support research and local initiatives to create healthy communities, vibrant ecosystems, and economic development.
- ▲ **Research and Extension Centers**  
 ANR's nine field stations are located throughout California's diverse agricultural regions and ecosystems. RECs support research projects and public education events to deliver the highest quality science to growers, industry, and land managers.
- ◆ **Affiliated Campuses**  
 Over 120 ANR Specialists and 600 affiliated faculty are based at five UC Campuses: Berkeley, Davis, Riverside, Merced, and Santa Barbara. ANR faculty conduct applied research and teaching programs in agriculture, natural resources, nutritional science, and policy.

**Statewide Programs and Institutes**  
 Throughout California, ANR Statewide Programs and Institutes work on complex, high-priority issues, engaging integrated teams with cross-disciplinary approaches.

**Bridging research and practice statewide.**

- 200 locally based Cooperative Extension advisors and specialists
- 57 local offices throughout CA
- 130 campus-based Cooperative Extension specialists
- 9 Research & Extension Centers
- 6 statewide programs
- 700 academic researchers in 40 depts at 3 colleges & 1 professional school

# QUESTION:

What does the exploding field of **citizen and community science** mean for cooperative extension in California?

# PROJECT: Assessing CCS at UCANR

## Goals

- Assess the status of CCS at ANR.
- Highlight science opportunities.
- Highlight engagement opportunities.
- Provide roadmap for increasing ANR capacity for CCS.

## Approach

- Interviews
- Brief survey
- Web research and word of mouth.

## Outputs

- Report (coming soon!)
- Special Issue of California Agriculture (Fall, 2019)

# Sampling of ANR CCS projects

Clientele  
Driven

- Fishes of the LA River
- Coyote Cacher
- Invasive Shot Hole Borer (MGs)
- Water Quality (MGs, other)
- California Naturalist (various)
- Soil and wildfires
- On-farm demonstration network
- Wolves and livestock
- YPAR -- Biosecurity monitoring with (4H)
- YPAR – nutrition in schools
- YPAR – (4H)
- Rural broadband

Contributory,  
public  
projects

Youth-  
focused,  
community-  
based

# Citizen and Community Science at ANR

## Diverse in many ways

- Youth to retirees, socio-economically diverse
- General public to specialized groups/knowledges/skills
- Tight-knit communities to distributed online networks.
- High-tech and low-tech
- Single event, to ongoing
- Many different uses of the data.
  - Early warning, inform decision-making, improve practices, improve modeling, etc.

# Citizen and Community Science at ANR

## Many different roles for ANR personnel, programs

- Novel projects and platforms
- Becoming a hub for larger, ongoing projects
- Catalyzing and supporting CCS led by others
  - Developing standards, structures, training, etc.
- Creating networks that facilitate citizen science

# GRAY AREAS:

Citizen and community science at ANR blurs definitional boundaries, and fits uneasily into traditional frameworks.

**Table 3. Roles of participants in three idealized modes of citizen and community science.\***

	<b>Contributory</b> projects generally designed by scientists, for which members of the public primarily contribute data.	<b>Collaborative</b> projects, generally designed by scientists, for which members of the public contribute, data but also help to refine project design, analyze data, and/or disseminate findings.	<b>Co-Created</b> designed by scientists and members of the public working together and for which at least some of the public participants are actively involved in most or all aspects of the research process.
Define a question/issue			<b>X</b>
Gather information			<b>X</b>
Develop explanations		<b>X</b>	<b>X</b>
Design data collection methods		<b>X</b>	<b>X</b>
Collect samples	<b>X</b>	<b>X</b>	<b>X</b>
Analyze samples	<b>X</b>	<b>X</b>	<b>X</b>
Analyze data		<b>X</b>	<b>X</b>
Interpret data/conclude			<b>X</b>
Disseminate conclusions			<b>X</b>
Discuss results/inquire further			<b>X</b>

\*Adapted from Bonney et al. (2009) and Shirk et al. (2012).

# How do they participate?

Throughout the process.

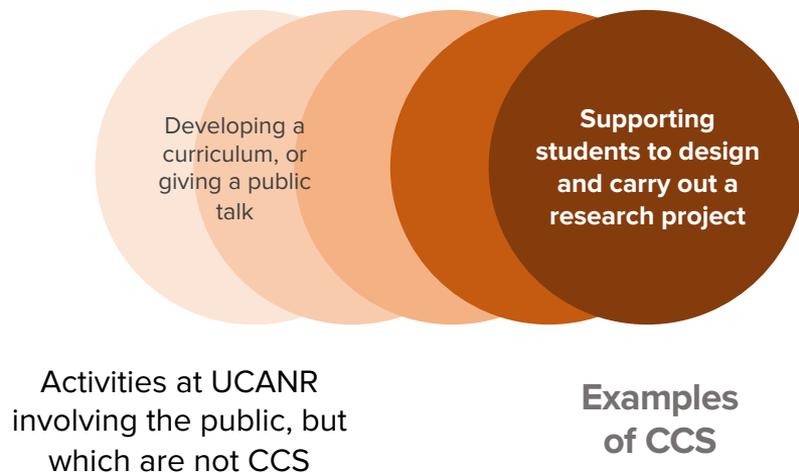
As expected, heavy engagement in data collection AND with early stages of the research process.

This does not always conform to the idea that simplest projects start with data collection.



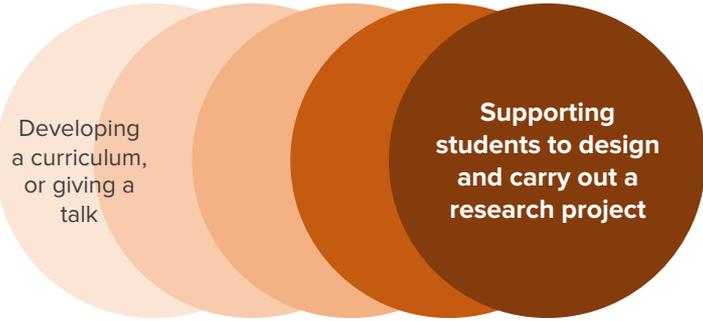
“What kinds of activities have participants been involved in, when collaborating on research?”

## Education and Outreach



There are many projects that move toward citizen and community science, or exist in the gray areas between traditional extension activities and CCS.

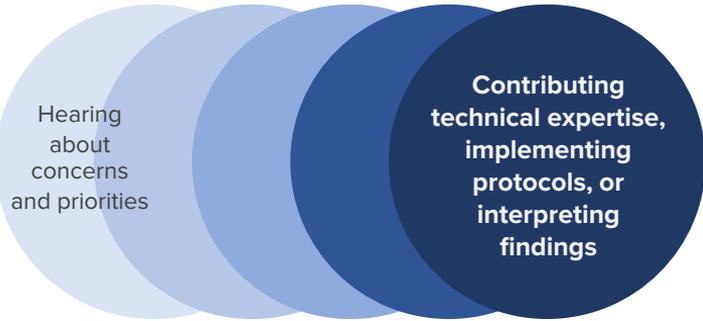
### a. Education and Outreach



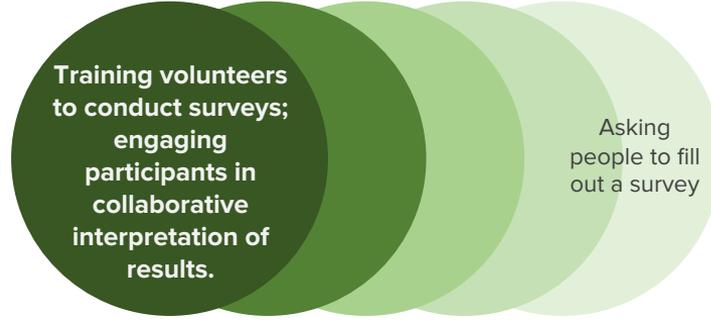
### b. Self-Assessment



## Examples of CCS



### c. Clientele Input



### d. Evaluation and Social Science

Other activities at ANR involving the public, but which are not CCS

Other activities at ANR involving the public, but which are not CCS

### **a. Traditional outreach and CCS**

Science education, outreach, and science communication activities are generally not considered to be CCS unless they involve meaningful participation in scientific research or monitoring beyond *receiving* information resulting from a scientific process.

### **b. Self-assessment and CCS**

Some ANR-developed tools help clientele improve their practices. This sometimes involves growers, ranchers, or other clientele groups collecting data for their own use. In cases where those data are *also* used by researchers to advance scientific knowledge, this resembles CCS, but is a gray area.

### **c. Traditional clientele interactions and CCS**

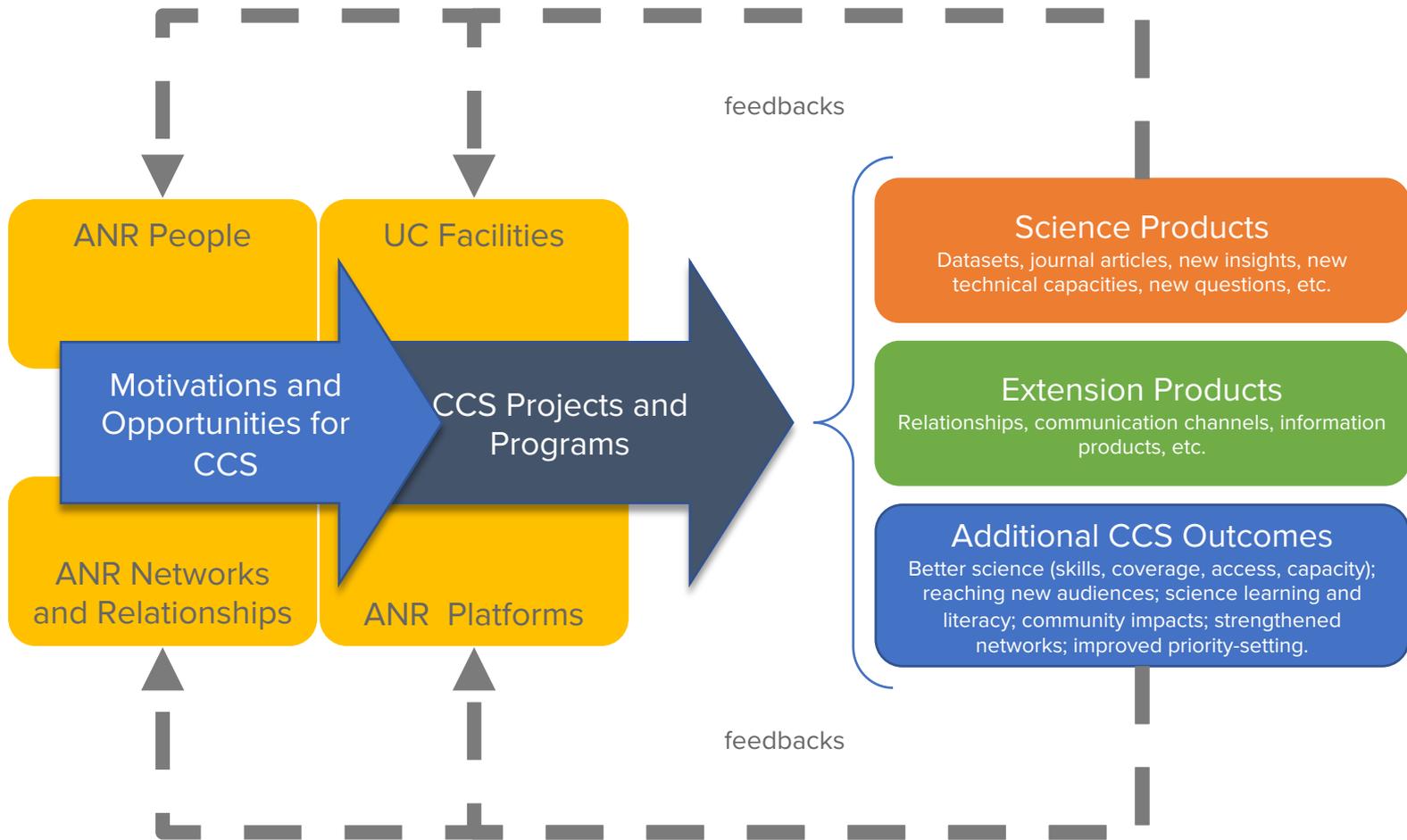
Communication with clientele helps ANR understand and prioritize research needs. This might not seem like meaningful CCS, but in some cases clientele contribute in-depth technical input to research questions and/or design. This does fit a broad definition of CCS, even if participant activities do not include data collection.

### **d. Social science/evaluation and CCS**

It can be helpful to ask, “are the participants in this study social science ‘research subjects’ in a traditional sense, or are they also helping to *conduct* the research in one or more ways?” Typically the former, including activities like filling out a survey, would not be seen as CCS.

# FEEDBACK LOOPS

UCANR has important capacities, values, and history that lay the groundwork for citizen and community science. CCS in turn aligns well with the UCANR mission, and strengthens the institution.



# Take-home points

## Key Strengths

- **Relationships** that cross social boundaries.
- **Networks** of dedicated participants.
- **Organizational culture** is locally-focused, problem-driven

## Challenges

- Connecting researchers to volunteer networks.
- Meeting demand, sustaining interest, and scaling.
- Diversity and inclusion.
- Understanding impact.

# Thanks!

## Acknowledgments:

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## More information:

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# ADDITIONAL SLIDES

Though there was not time for these in the presentation, the following slides present more content from the project – report coming soon!

# Challenges and Needs -- Practical

- Meeting demand: initiating and scaling up requires time and resources, new skillsets
- Sustaining interest, training, supporting and managing volunteers
- Reaching and empowering new communities – especially non-dominant communities.
- Understanding impact on multiple dimensions (knowledge, decision-making, science literacy, environmental/economic outcomes)

# Challenges and Needs – Institutional/Cultural

- Resources to support CCS at ANR (training, guidance, technology)
- Perceived practical divide between research and extension
- Legitimacy and credibility
- Blurry lines between advising and collaborating, between being a research subject and a citizen scientist.

# Looking ahead...

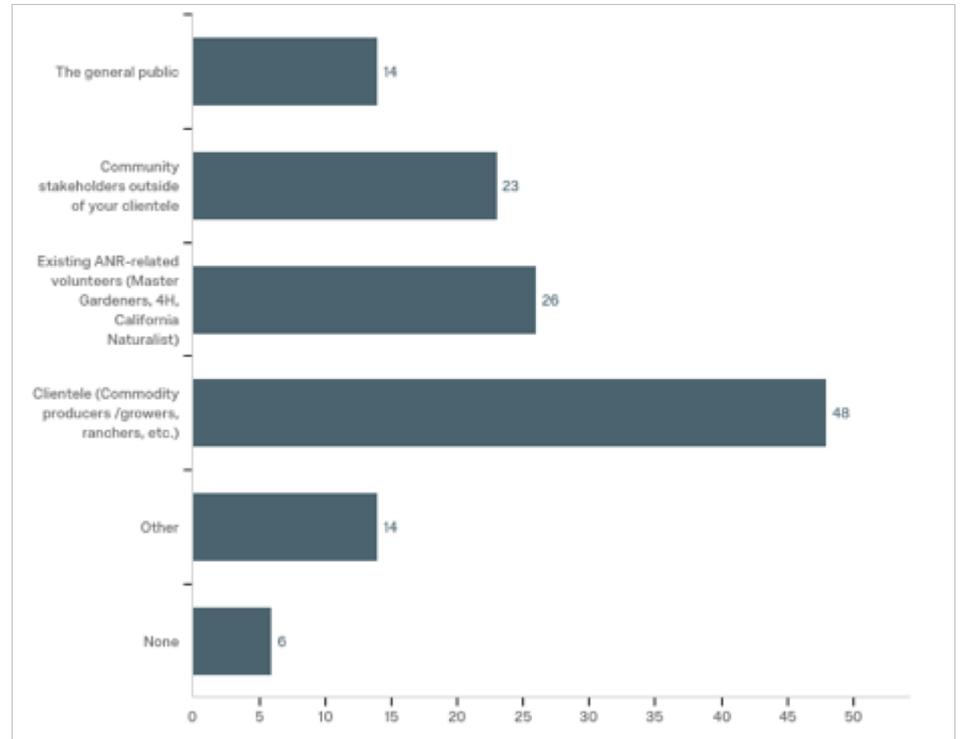
- What kinds of formal recognition could support and expand the reach of ANR citizen and community science?
- What kinds of training, professional development, and capacity could support ANR researchers in doing this kind of work?
- Programs for tapping into networks and other infrastructure.
- Public awareness: Can volunteers find projects? Do participants know how the data are being used?
- What's the role of ANR in providing access, and supporting participation?

# Who Participates?

Aligns with expectations

Does not speak to demographics -- important question

Caveats -- not necessarily representative, and definitions may be inconsistent across respondents



Which groups have participated in your research as collaborators in the scientific process?