California Department of Food and Agriculture
ENVIRONMENTAL FARMING ACT SCIENCE ADVISORY PANEL
INCENTIVES WORKING GROUP

MEETING AGENDA

December 14, 2012
9 AM to 2 PM

1220 N Street
Room 133
California Department of Food and Agriculture
Sacramento, CA 95833
(916) 654-0433

Call in information:
Please call 1-877-238-3859
Participant passcode - 3964856#

Jeff Dlott, PhD, Member and Chair
Mark Nechodom, PhD, Member — Don Cameron, Member
Mike Tollstrup, Member — Ann Thrupp, PhD, Member
Luana Kiger, MSc, Subject Matter Expert
Louise Jackson, PhD, Subject Matter Expert
Amrith Gunasekara, PhD, CDFA Liaison

1.	Introductions (10 minutes)	Jeff Dlott
2.	Qualitative Assessment Model White Paper update Incentives/Pilot Projects White Paper Proposal update (20 minutes)	Amrith Gunasekara
3.	Continue discussion from Nov 8 meeting on Incentives/Pilot Projects (80 minutes)	Jeff Dlott
4.	Ecosystem Services Database Presentation and feedback (40 minutes)	Erica Anderson Jessica Sharkey
5.	Discussion and Public Comments (30 minutes)	All
6.	Next Meeting Date and Adjournment	Jeff Dlott
7.	Working lunch for EFA SAP members (12-2 PM)	Amrith Gunasekara

All meeting facilities are accessible to persons with disabilities. If you require reasonable accommodation as defined by the American with Disabilities Act, or if you have questions regarding this public meeting, please contact Amrith Gunasekara at (916) 654-0433.
More information at: http://cdfa.ca.gov/Meetings.html and http://www.cdfa.ca.gov/EnvironmentalStewardship/Meetings_Presentations.html

Agenda Item 3 (Supplemental Information)

The following information is to provide participants information about presentations given at the November 8, 2012, meeting.

Voluntary Local Program for Tiger Salamander in Alameda County
Marcia Grefsrud – Environmental Scientist, Department of Fish and Game
Leslie Koenig – Biologist, Alameda County RCD
Purpose is to encourage farmers and ranchers engaged in agricultural activities to establish locally designed programs to voluntarily enhance and maintain habitat for endangered and threatened species. This specific program encourages farmers and ranchers to enhance and maintain stock pond habitats for the Alameda Whipsnake and California Tiger Salamander. CDFA has sent a letter of support.

Habitat Restoration and Buffer Strips
Jessa Guisse, MS – **Pollinator Habitat Restoration Specialist, Xerces Society**
Mace Vaughan – Pollinator Program Director, Xerces Society
The diversity and abundance of native bees on a farm, and subsequently their ability to serve as crop pollinators, are strongly influenced by two factors: suitable habitat on the farm and in the surrounding landscape. The basic habitat needs of native pollinators in any location are the same – nesting or egg-laying sites, flowers on which to forage, secure overwintering sites, and a refuge from pesticides. Discussed will the benefit of native buffer strips and efforts of the NRCS and RCDs to support these projects.

Riparian Habitats - Ecosystem Services on Agricultural Lands
Keiller Kyle – Bird conservation Project Manager, Audubon California
Rodd Kelsey, PhD – Director Migratory Bird Conservation Program, Audubon California
Audubon California's Working Lands Program recently established our Working Waterways Initiative, the goal of which is to increase habitat along remnant creeks, agricultural water delivery and tailwater systems across the Central Valley. This initiative grows out of our Landowner Stewardship Program's fifteen years of working with farmers and ranchers to develop habitat on their properties. Revegetating sloughs, canals, and creeks provides important habitat for our target birds, helping recover populations of riparian songbirds in the Central Valley, as well as benefitting farmers through decreased soil loss and increased water quality, weed control and other ecosystem services.

Effects of Native California Grasses on Ecosystem Services
Andrew Rayburn, PhD – Postdoctoral Fellow, UC Davis Dept. of Plant Sciences
The inclusion of native grasses in California's agricultural landscapes may enhance the provision of numerous beneficial ecosystem services related to water, nutrient cycling, diversity, forage, and other factors. This presentation will provide a brief summary of native grass effects on ES (focusing on those most relevant to the panel), and end with a quick summary of our current research on this topic.

Pollination Services and Native Bees (San Joaquin Valley)
Steve Peterson, PhD – Entomologist, AgPollen LLC
Since 2007, AgPollen has provided blue orchard bees for pollination of almonds. Steve has released blue orchard bees on up to 200 acres of almonds and raised bees on wildflowers in a 5-acre screen houses.

Performance-based Conservation Incentives and Water in the Pajaro Valley
Nik Strong-Cvetich – Program Development Manager, Santa Cruz Country RCD
Karen Christensen – Director, Santa Cruz RCD
When it comes to water resources, the Pajaro Valley has no shortage of challenges. Over the last 50 years the aquifer providing water to the ag community, rural citizens and the city of Watsonville has been significantly overdrafted, leading to saltwater intrusion. Additionally, the Pajaro River and other tributaries have been shown to have some of the highest concentrations of nitrate across the state.

In response to these complex issues, RCDSCC and Driscoll's Strawberry Associates Inc, with the support of the Sustainable Conservation, began looking at how incentives can motivate positive change in the condition of the aquifer and watershed. This led the partnership to develop the **Performance-Based Conservation Incentive Pilot,** made possible by a grant from the United States Department of Agriculture's Conservation Innovation Program and CA Department of Agriculture's Specialty Crop Block Grant.

As noted above, the pilot program seeks to improve aquifer and water quality conditions in the Pajaro Valley, by creating a series of standardized metrics to measure water quality and quantity of water used. It also is currently developing a structure of economic and non-economic incentives (e.g. regulatory relief) to motivate grower action, and testing these models on the ground.

This overall approach is unique, uniting private industry, the public and non-profit sectors to use business and policy related incentives to improve environmental conditions. By incentivizing outcomes rather than practices, farmers can find their own strategies to reduce nutrients and improve water quality in ways that are more economically feasible and practical for their own business models.

PILOT PROJECTS TO SUPPORT MARKET-BASED TRADING SYSTEMS

DRAFT DOCUMENT FOR (12/12/2012):
THE CDFA ENVIRONMENTAL FARMING ACT SCIENCE ADVISORY PANEL

Amrith Gunasekara, Ph.D.

INTRODUCTION

The California Department of Food and Agriculture (CDFA) is in the process of establishing pilot projects to obtain quantitative information to support market-based trading systems that will enhance the overall net environmental quality of working lands. CDFA recognizes the many voluntary efforts made by growers and ranches to enhance the environment and the lack of sufficient incentives to further encourage on-farm conservation management practices.

The importance of establishing incentives for growers are described in the California Food and Agriculture code. The Cannella Environmental Farming Act of 1995 states that "many farmers engage in practices that contribute to the well-being of ecosystems, air quality, and wildlife and their habitat" [California Food and Agriculture Code 561 (b)]. The 1995 act also describes requirements for creating a Science Panel and the establishment of a program to "provide incentives to farmers who practices promote the well-being of ecosystems, air quality, and wildlife and their habitat."

The Environmental Farming Act Science Advisory Panel (Science Panel), organized in August 2011 by the Secretary of CDFA, is developing a market-based trading system that will monetarily (and through potentially other means) incentivize growers to improve their overall environmental quality of working lands. However, the Science Panel recognizers there is a lack of basic information to move directly to the implementation stage of a market-based trading system. Therefore, several pilot projects have been proposed.

The goals of the pilot projects are to gather basic information from implemented management practices. The information will be used in the establishment of market-based trading system and show proof-of-concept that market-based trading systems can be effective and sustainable on a long-term basis. This document discusses the pilot projects, including potential sources of funding.

PILOT PROJECTS

Direct investment in large scale agricultural projects to improve the overall net environmental quality of a working landscape is costly and coupled to substantial risk. Pilot projects are designed to understand the practical feasibility, associated costs, and potential risk of the same project on a larger geographic (e.g., regional) scale. Recent research work highlights the importance of pilot projects to understand the success of specific management practices on working landscapes. For example, Evans et al (2012) initiated seven pilot projects from 1995 to 2006 to demonstrate and evaluate alternative channel management strategies that might enhance water quality functions in North Carolina. The results show that nitrogen concentrations and transport were reduced by 20% to 70% with in-stream and constructed storm water wetlands. Pilot projects that have successful quantitative results can be used for larger "scaled-up" projects.

The department and science panel have highlighted three primary subject areas that should be developed into pilot projects first. They are 1. Nitrogen management, 2. Native pollination services, and 3. Riparian habitats. More explanation on each is provided below. Other subject areas will be visited once these pilot projects have been implemented.

1. Nitrogen Management

There have been recent scientific reports and numerous media reports that have highlighted surface and groundwater contamination by nitrates from nitrogen fertilizers used for food production (SBX2 1 report, 2012; Sobata et al., 2009; Warrick et al., 2005). These reports have suggested or identified that much of the contamination stems from agricultural use of synthetic and organic nitrogen fertilizers. Controlling nitrogen on irrigated agricultural lands is critical to limiting the amount of nitrate movement to groundwater systems which are often also used as drinking water sources in many communities (Hearing, 2012). A front end solution to reducing nitrates in groundwater is to have a nitrogen management plan. A nitrogen management plan helps growers balance and understand where their nitrogen is in their agricultural system (e.g., soil, water, or plant). The process helps growers apply nitrogen more effectively to optimize yields and reduce nitrates in water. These nitrogen management plans can also be effectively used to determine how much nitrogen can be potentially traded in a non-point source (e.g., irrigated farm) to point-source (e.g., wastewater treatment plant) nitrogen trading program. This fundamental information is required prior to establishment of any large scale nitrogen market-based trading program.

2. Native pollination services

California agriculture is dependent on pollination services. Many tree crops, such as almonds, require pollinators to establish sufficient, economically viable, yields. Recent declines in California bee populations are of concern (Michels, 2011). Bees are often trucked in from other states such as Florida to provide enough pollinators to ensure crop yields but have numerous issues associated with this process (Longstroth, 2012). Native pollinators and establishment of their habitats on agricultural fields have long-term sustainability benefits including reduced cost from importing in bees from other states.

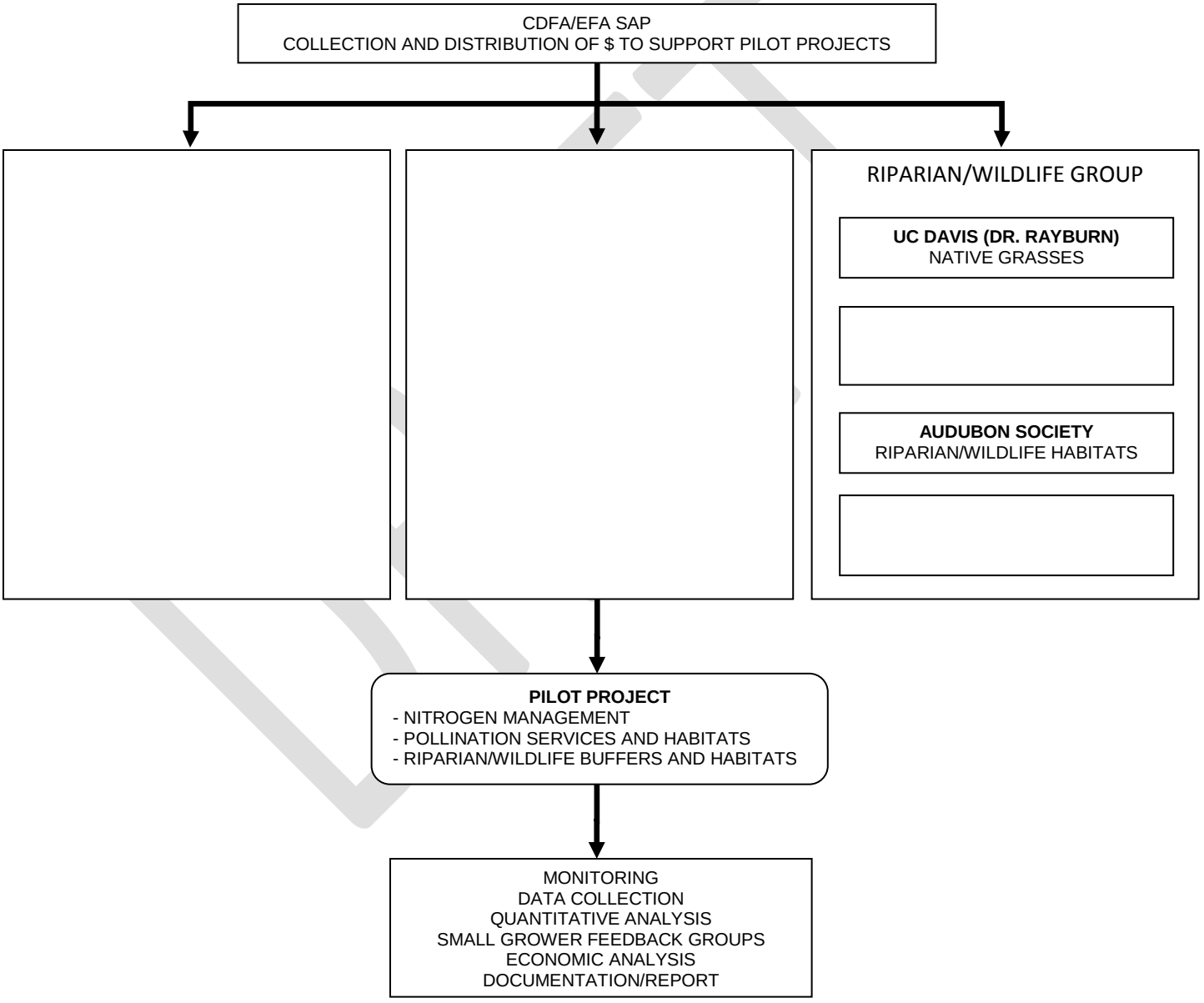
3. Riparian/wildlife habitats (including native plants)

Riparian/wildlife habitats including native grasses have been found to successfully reduce the movement on nitrogen and sediment in surface waters from the irrigation agricultural fields (Smiley et al., 2011; Lovell and Sullivan, 2006). Riparian grasses and intercropping might potentially reduce nitrogen movement beyond the crop root zone as well but more fundamental information is required. Riparian or wildlife habitat zones also offer numerous other benefits including habitats for beneficial insects, habitats for birds, biodiversity services, water cycling, and enhancement of on farm conservation measures (Henningsen and Best, 2005). Pilot projects on agricultural fields will highlight the many benefits of establishing riparian/wildlife habitat zones and also collect some basic quantitative information that can be used to support larger scale projects.

The implementation of these three ecosystem services on agricultural lands, together in combination on a single field, will greatly improve and highlight quantitatively and qualitatively the overall environmental quality of working lands. There are also numerous direct benefits to agriculture as well (e.g., native pollinators). The quantitative data collected will support the establishment of these projects on a larger, potentially regional, scale on California's working lands.

ESTABLISHMENT OF THE PILOT PROJECTS

All pilot projects will be established using experts in each of the three primary subject areas described above. Many of these experts are with nonprofit organizations and UC/CSU education and extension services. Several of these organizations presented their work at the recent EFA SAP public meeting held on November 8, 2012. Presentation materials can be found on the CDFA Environmental Stewardship website; http://www.cdfa.ca.gov/EnvironmentalStewardship/Meetings_Presentations.html. The diagram below shows potential partners that can help establish pilot project on working lands. The diagram also shows how monetary dollars will support the activities of the pilot projects.



FUNDING

The department and EFA SAP are currently seeking funds to establish pilot projects in partnership with groups described in the diagram above. Additional partners will be identified once some initial funds have been encumbered. Growers will also be identified through the Central Valley coalitions once initial funds have been encumbered. Cost sharing will be a priority between the partners and growers and will be built into the structure of establishing the pilot projects. Several funding sources have been identified and departmental activities have been listed below.

- Federal funds – Specialty Crop Block Grant Program – Concept proposal completed and submitted by CDFA on 12/7/12 ($400,000)
- Agricultural associations – TBD (need to distribute document)
- Environmental associations – TBD (need to distribute document)
- NRCS – TBD (need to distribute document)
- State agencies – TBD (need to distribute document)

REFERENCES

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Ecosystem Services on California's Farms and Ranches

A searchable database

Erica Anderson
Jessica Sharkey

Online Search

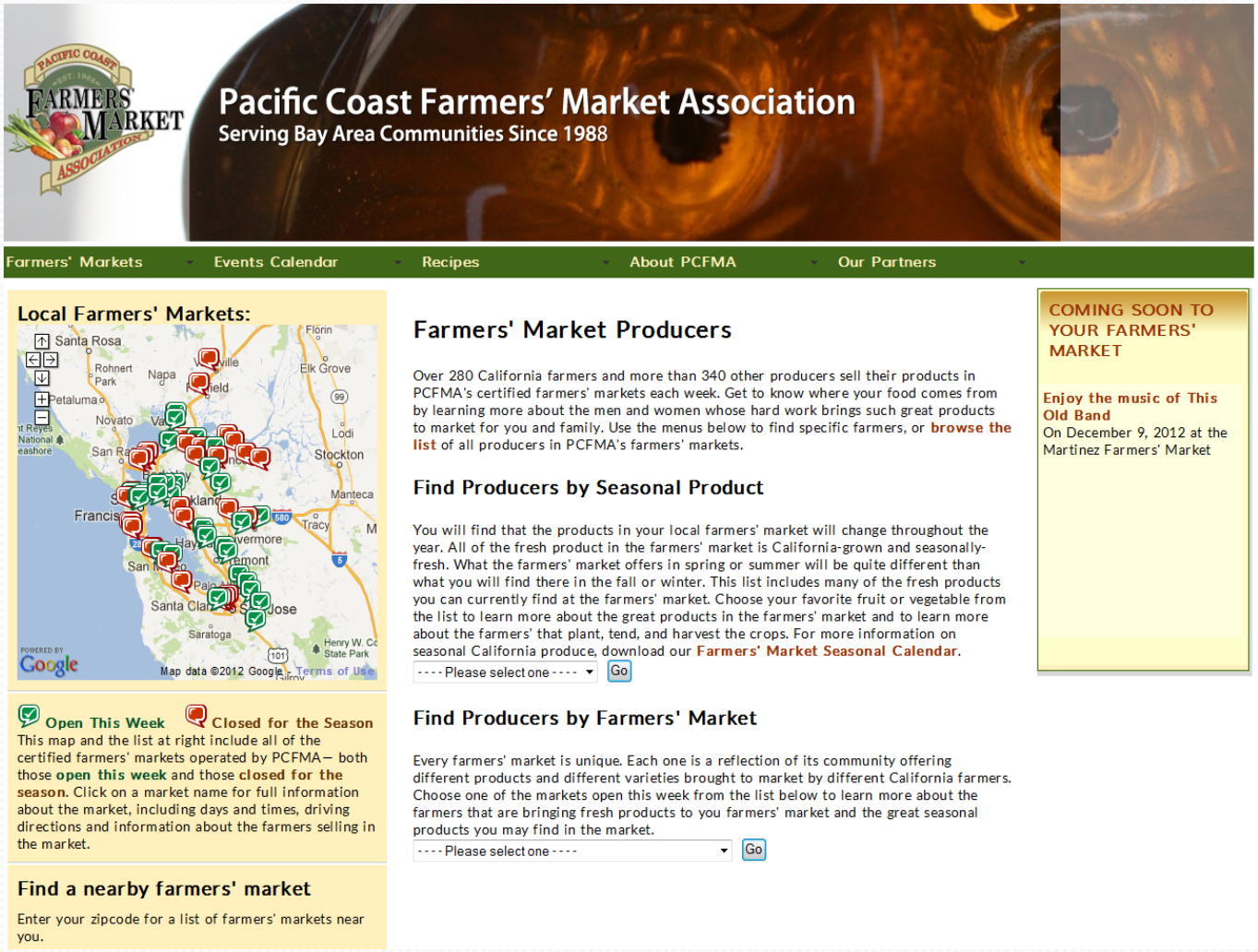
- General search for ecosystem services on farms
- Conservation awards to specific farmers
  - Leopold Conservation Award, Yolo County RCD profiles, NRCS Conservation Showcase
- Other organizations' databases
  - California Ag Water Stewards: http://agwaterstewards.org/index.php/case-studies/list/
- Farmers' markets
  - Monterey Bay: http://montereybayfarmers.org/markets.html
  - Santa Monica: http://www.smgov.net/portals/farmersmarket/vendors.aspx

Duda Farm Fresh Foods

http://www.dudafresh.com/about/sustainability.php#

Pacific Coast Farmers' Market Association:

http://pcfma.com/producers_home.php



CUESA (Center for Urban Education about Sustainable Agriculture): http://www.cuesa.org/list/farm

Format

- Based on California Agricultural Water Stewardship database

List of Water Stewardship Case Studies

Hydrologic Region Select All | Irrigation Method Select All | Crop Type Select All | Stewardship Practices Select All

Search | Showing 42 entries.

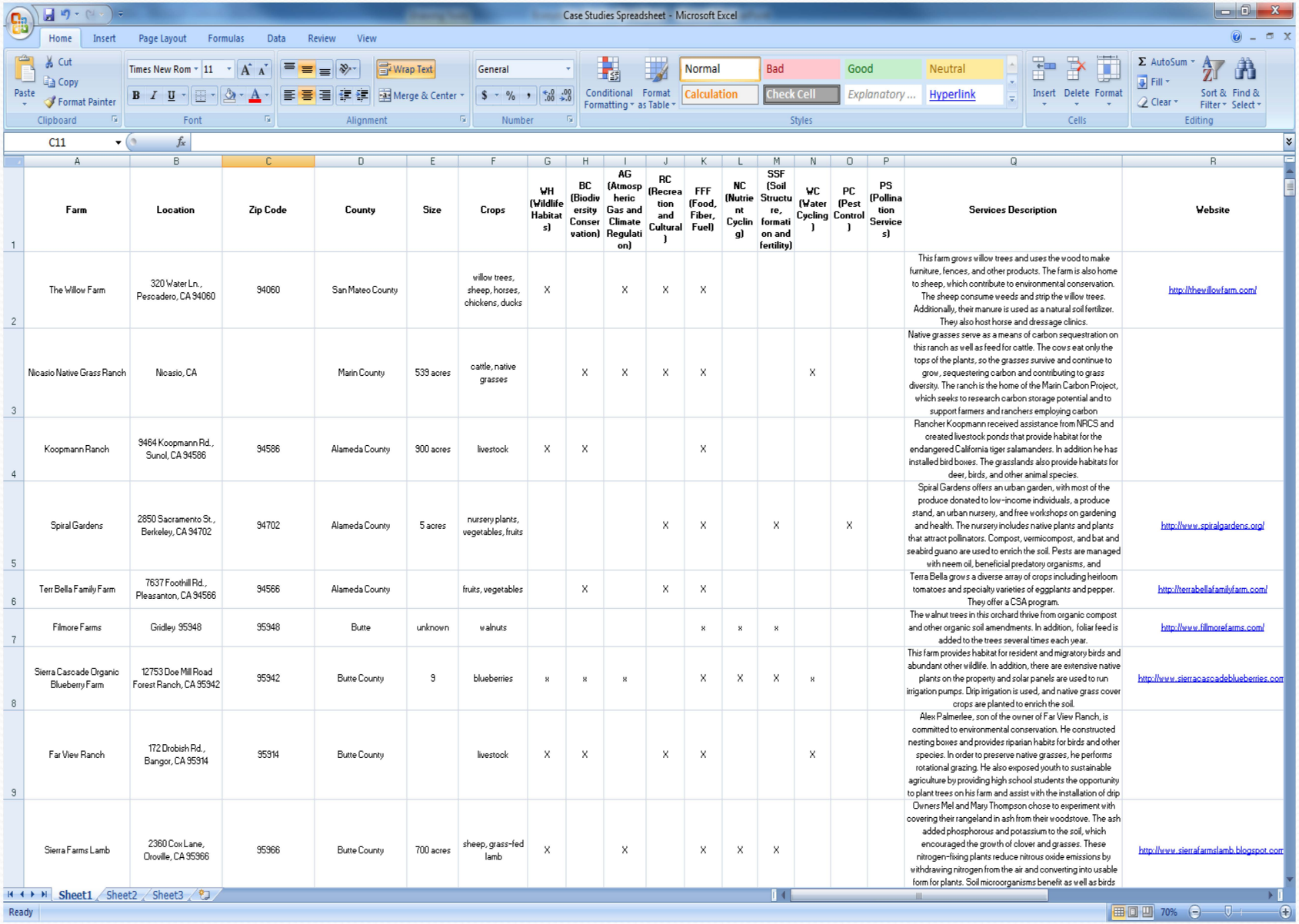
Name	Location	Hydrologic Region	Participants	Production Type	Irrigation Method	Stewardship Practices	Description	Sources
Cover Crop Selection and Management in Orchards and Vineyards	San Joaquin Valley	San Joaquin River		Fruits and Nuts	N/A	Cover Crops	San Joaquin Valley growers have several cover cropping systems from which to choose. The choice and performance of cover crops often depends on site-specific factors, so they should first be tested in a few rows before planting large acreages. The main factors to consider when selecting a particular species or mix are costs vs. benefits, irrigation method, tillage practices, nitrogen needs, frost concerns and harvesting practices (for nut crops). Understanding the basic cover crop types and management strategies can greatly improve the chances for success.	www.sarep.ucdavis.edu/covercrop/res/cover-crop-publications/cover-crop-selection-and-management-in-orchards-and-vineyards
Dairy Water Reuse	Marshall, CA	North Coast	Straus Family Creamery	Livestock and Dairy	N/A	Reuse of Agricultural Wastewater, Water Reuse, Compost, Minimum Tillage/No Till	Straus Family Creamery operates in an area where freshwater is scarce, and so the Creamery has implemented several technologies designed to reduce water use. Wastewater produced by the dairy and creamery is collected for treatment in an anaerobic digester, which also produces enough electricity to power most of the dairy. This video is part of the Water Stewardship video series produced by the Ecological Farming Association. The video describes Strauss Family Creamery's energy production system of methane digestion, which utilizes recycled water, and methane captured from cow manure.	aginnovations.org/agwaterstewards.org/uploads/docs/CaliforniaWaterStewards.pdf agwater.wordpress.com/water-reuse-and-methane-digestion/
Dry Farming and Cover Crops	Rutherford, CA	North Coast	Frog's Leap Vineyard	Fruits and Nuts	N/A	Compost, Cover Crops, Dry Farming	Frog's Leap winery encompasses 250 acres of dry farmed vineyards in Rutherford, CA. The practice of dry farming utilizes stored winter rains to supply moisture throughout the growing season. At the beginning of the season, soil is prepared to encourage infiltration -- compost and cover crops are used to enrich the soil and improve its ability to store moisture. These practices encourage vines to grow deep roots, which aids in the uptake of stored water and also helps guard against pests and diseases that thrive in the top layers.	aginnovations.org/agwaterstewards.org/uploads/docs/FrogsLeapCaseStudy.pdf
Dry Farming Tomatoes and Soil Moisture Management	Davenport, CA	Central Coast	Molino Creek Farming Collective	Fruits and Nuts, Vegetables and Melons	N/A	Dry Farming	This video is part of the Water Stewardship video series produced by the Ecological Farming Association. Molino Creek Farming Collective manages the field's soil moisture prior to planting to save water in raising their crops and increase flavor.	agwater.wordpress.com/dry-farming/
Dry-farming wine grapes	Hopland, CA	North Coast	The Poor Ranch	Fruits and Nuts	N/A	Dry Farming	The Poor Ranch, run by John and Susan Poor in the hills above Hopland in Mendocino County, was homesteaded by the Poor family in 1888, and has expanded to over 1,000 acres. The Poors have 90 acres of wine grapes—80 are organic—including Zinfandel, Petite Syrah, Carignane, and	agwaterstewards.org/index.php/practices/the_poor_ranch_hopland/

http://agwaterstewards.org/index.php/case-studies/list/

CDFA Ecosystem Service database

Search Categories

- Farm/Ranch
- Location
- Size
- Crops
- Ecosystem services provided
- Web access
- Contact info



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Farm	Location	Zip Code	County	Size	Crops	WH (Wildlife Habitats)	BC (Biodiversity Conservation)	AG (Atmospheric Gas and Climate Regulation)	RC (Recreation and Cultural)	FFF (Food, Fiber, Fuel)	NC (Nutrient Cycling)	SSF (Soil Structure, formation and fertility)	WC (Water Cycling)	PC (Pest Control)	PS (Pollination Services)	Services Description	Website
2	The Willow Farm	320 Water Ln., Pescadero, CA 94060	94060	San Mateo County		willow trees, sheep, horses, chickens, ducks	X		X	X	X						This farm grows willow trees and uses the wood to make furniture, fences, and other products. The farm is also home to sheep, which contribute to environmental conservation. The sheep consume weeds and strip the willow trees. Additionally, their manure is used as a natural soil fertilizer. They also host horse and dressage clinics.	http://thewillowfarm.com/
3	Nicasio Native Grass Ranch	Nicasio, CA		Marin County	539 acres	cattle, native grasses		X	X	X	X			X			Native grasses serve as a means of carbon sequestration on this ranch as well as feed for cattle. The cows eat only the tops of the plants, so the grasses survive and continue to grow, sequestering carbon and contributing to grass diversity. The ranch is the home of the Marin Carbon Project, which seeks to research carbon storage potential and to support farmers and ranchers employing carbon	
4	Koopmann Ranch	9464 Koopmann Rd., Sunol, CA 94586	94586	Alameda County	900 acres	livestock	X	X			X						Rancher Koopmann received assistance from NRCS and created livestock ponds that provide habitat for the endangered California tiger salamanders. In addition he has installed bird boxes. The grasslands also provide habitats for deer, birds, and other animal species.	
5	Spiral Gardens	2850 Sacramento St., Berkeley, CA 94702	94702	Alameda County	5 acres	nursery plants, vegetables, fruits				X	X		X		X		Spiral Gardens offers an urban garden, with most of the produce donated to low-income individuals, a produce stand, an urban nursery, and free workshops on gardening and health. The nursery includes native plants and plants that attract pollinators. Compost, vermicompost, and bat and seabird guano are used to enrich the soil. Pests are managed with neem oil, beneficial predatory organisms, and	http://www.spiralgardens.org/
6	Terr Bella Family Farm	7637 Foothill Rd., Pleasanton, CA 94566	94566	Alameda County		fruits, vegetables		X		X	X						Terra Bella grows a diverse array of crops including heirloom tomatoes and specialty varieties of eggplants and pepper. They offer a CSA program.	http://terrabellafamilyfarm.com/
7	Filmore Farms	Gridley 95948	95948	Butte	unknown	walnuts					x	x	x				The walnut trees in this orchard thrive from organic compost and other organic soil amendments. In addition, foliar feed is added to the trees several times each year.	http://www.fillmorefarms.com/
8	Sierra Cascade Organic Blueberry Farm	12753 Doe Mill Road Forest Ranch, CA 95942	95942	Butte County	9	blueberries	x	x	x		X	X	X	x			This farm provides habitat for resident and migratory birds and abundant other wildlife. In addition, there are extensive native plants on the property and solar panels are used to run irrigation pumps. Drip irrigation is used, and native grass cover crops are planted to enrich the soil.	http://www.sierracascadeblueberries.com
9	Far View Ranch	172 Drobish Rd., Bangor, CA 95914	95914	Butte County		livestock	X	X		X	X			X			Alex Palmerlee, son of the owner of Far View Ranch, is committed to environmental conservation. He constructed nesting boxes and provides riparian habits for birds and other species. In order to preserve native grasses, he performs rotational grazing. He also exposed youth to sustainable agriculture by providing high school students the opportunity to plant trees on his farm and assist with the installation of drip	
	Sierra Farms Lamb	2360 Cox Lane, Oroville, CA 95966	95966	Butte County	700 acres	sheep, grass-fed lamb	X		X		X	X	X				Owners Mel and Mary Thompson chose to experiment with covering their rangeland in ash from their woodstove. The ash added phosphorous and potassium to the soil, which encouraged the growth of clover and grasses. These nitrogen-fixing plants reduce nitrous oxide emissions by withdrawing nitrogen from the air and converting into usable form for plants. Soil microorganisms benefit as well as birds	http://www.sierrafarmslamb.blogspot.com

Methodology

- We present our methodology to the Science Panel for evaluation
- Is our method of classification by ecosystem service appropriate?
- Recommendations to improve the user interface?

Methodology: Categorizing by Service

Wildlife H	Biodiv.	Climate R	Recrea.	Food, Fuel	Nutrient	Soil	Water	Pest	Pollinat.	
		X		X	X	X	X	X		Farmer Bill Crepps manages pests by leaving some plants to flower so that they attract beneficial insects. The soil is amended with compost. Bill also plants cover crops, rotates crops, and practices minimum tillage. One orchard is dry farmed.
		X		X			X			Bullseye is keen on preserving the natural surrounding and as a result has adopted water conservation practices. Father-son owners now irrigate 98% of their land with a drip irrigation system that uses recycled water. They also plant cover crops, which retain moisture.
	X		X	X	X	X				Environmental conservation is high among the priorities at Capay Organic. Soil is enhanced through natural compost and cover cropping. Avoidance of nitrogen fertilizers helps to maintain water quality. Additionally, the farm features heirloom and specialty crops, promoting biodiversity. Produce is available through the CSA Farm Fresh to You.
X	X		X	X				X	X	Owners Jeff and Annie Main are committed to sustainable agriculture. They have installed 4 hedgerows that provide wildlife habitats, attracting predatory insects and bees, which serve as the farm's pollinators. Additionally, the Mains engage the community in agriculture, coordinating a farmer's market, providing CSA baskets to community members, and offering their farm as an outdoor classroom for elementary school students and university researchers.

Methodology: Ecosystem Service Definitions

Are you are farmer/rancher that has on-farm/ranch ecosystem services?
Let us know: EcoSysServices@cdfa.ca.gov.

- **WILDLIFE HABITATS (View Image)**
  - **Provide habitats for resident and transient wildlife populations**
- **NUTRIENT CYCLING (View Image)**
  - **Provide nutrient storage and cycling**
- **FOOD, FIBER AND FUEL PRODUCTION (View Image)**
  - **Provide food, fiber, and fuel to sustain a growing global population**
- **RECREATION AND CULTURAL (View Image)**
  - **Provide opportunities for recreational activities**
- **SOIL STRUCTURE, FORMATION AND FERTILITY**
  - **Provide opportunities for enhancing the soil system, promotes organic matter buildup/carbon sequestration, and prevent disturbances**
- **BIODIVERSITY CONSERVATION**
  - **Promote biodiversity**
- **WATER CYCLING**
  - **Maintain soil moisture and regulate water movement/cycling**
- **ATMOSPHERIC GAS/CLIMATE REGULATION**
  - **Regulate atmospheric chemical composition.**
- **PEST CONTROL**
  - **Control pests and weeds by natural enemies and weed seed predators, respectively**
- **POLLINATION SERVICES (View Image)**
  - **Contribute to fruit, nut, and vegetable production**

http://www.cdfa.ca.gov/EnvironmentalStewardship/EcosystemServices.html

Methodology: Example of Classification

- Based off USDA and NRCS Definitions
- Example:

  HEDGEROW: Establishment of dense vegetation in linear design

  - **Wildlife habitat**- Provides food, cover, and a corridor for wildlife
  - **Pollination services**-Enhances pollen, nectar, and nesting habitat
  - **Pest services**- Provides substrate for beneficial insects
  - **Atmosphere**- Increases carbon storage in biomass and soils
  - **Biodiversity**- Living fence, increases diversity of plants and insects

Methodology: Example Definition

USDA **Field Borders**

Conservation Practice Job Sheet ***386***

Natural Resources Conservation Service (NRCS) ***April 1997***

Landowner_____

Definition

A field border is a band or strip of perennial vegetation established on the edge of a cropland field.

Purpose

A field border reduces sheet, rill, and gully erosion at the edge of fields; protects water quality by trapping sediment, chemical and other pollutants; provides a turning area for farm equipment; and provides wildlife habitat.

Where used

- On the outside edges of fields.
- Complementary to a conservation management system.

Requirements for establishing field borders

Field borders should be a minimum of 20 feet wide and should be wide enough to allow turning of farm equipment.

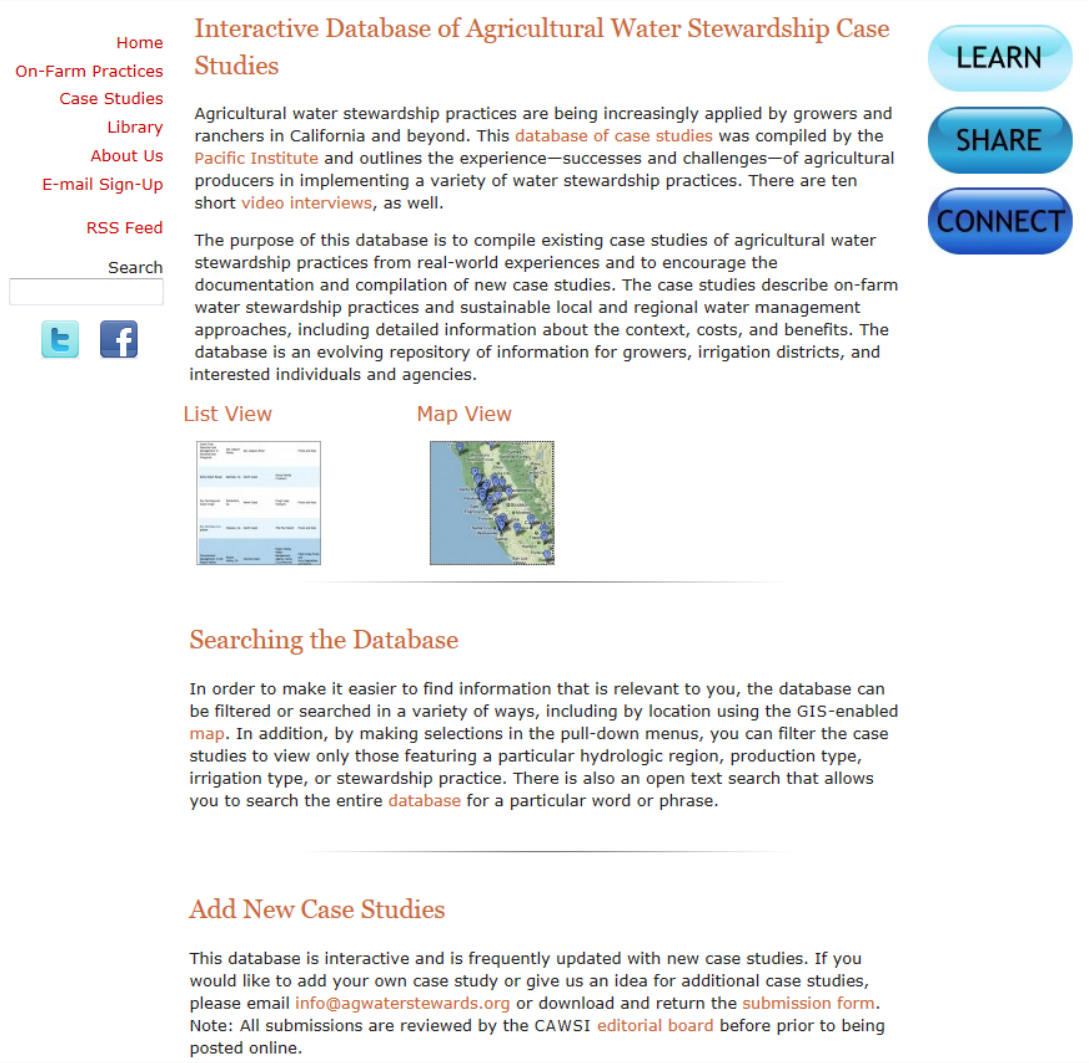
Practices within Ecosystem Service Categories

Wildlife Habitats	Nutrient Cycling	Recreation & Culture	Biodiversity
Field border	Filter strips	Farm tours	Using heirloom varieties
Hedgerows	Salinity/Sodic soil management	CSA memberships	Alley cropping
Alley cropping	Stream improvement/protection	Farm dinners	IPM techniques
Stream restoration	Soil amendments (such as compost and manure, etc.)	Educational opportunities	Habitat restoration for endangered species
	Cover cropping		
	Monitor nutrient levels in soil and irrigation water		

Practices within Ecosystem Service Categories

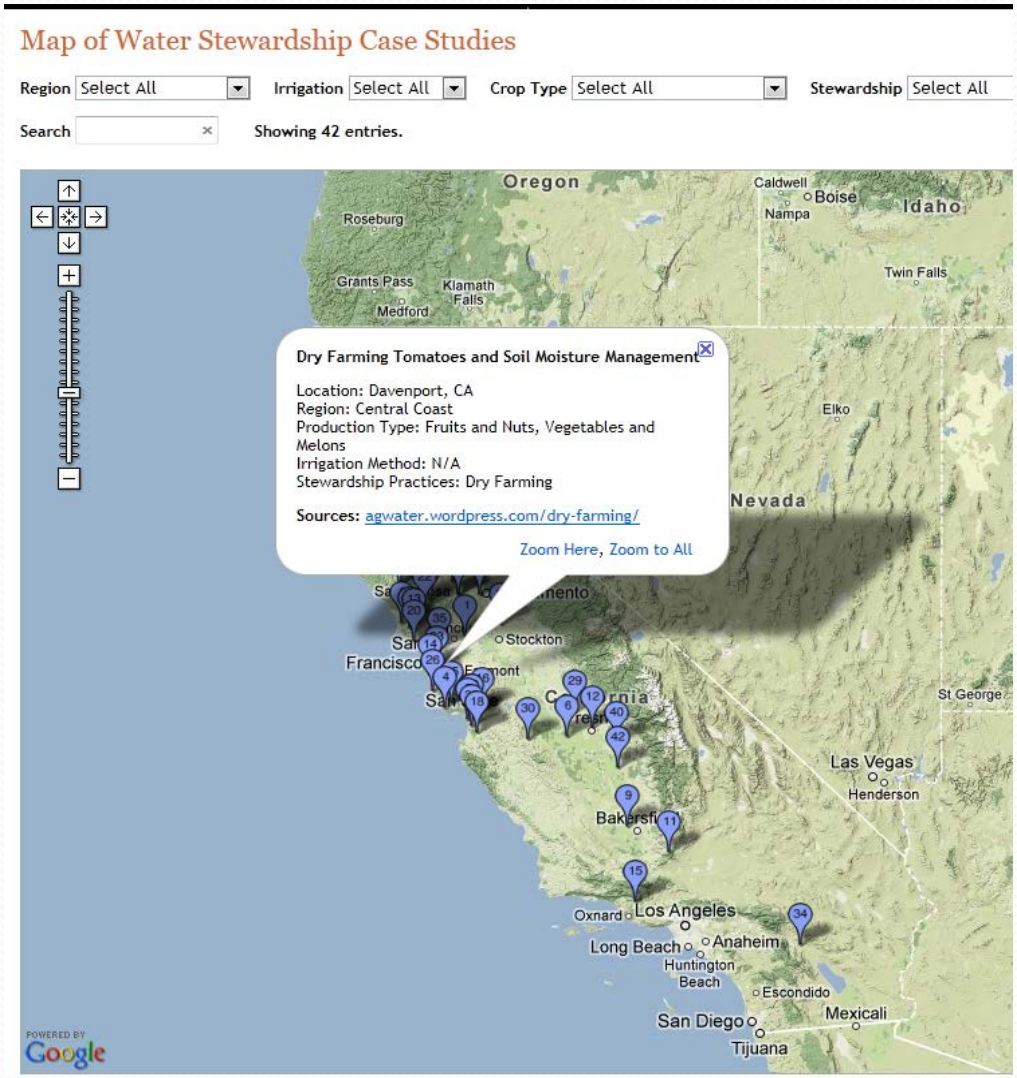
Atmospheric Gas & Climate Regulation	Pest Control	Pollination Services	Soil Structure (partial list)	Water Cycling
Reduced or no-tillage	Bird boxes	Hedgerows	Wind rows	Water conservation
Solar, wind, biogas generation	IPM techniques	Allowing weeds to grow	Erosion control	Drainage water management
Residue management (green mulch)	Beneficial insect habitat	Planting native plants and plants that attract bees/birds	Dust control	Irrigation improvements (drip, micro-sprinklers, etc.)
	Releasing beneficial insects	Habitat improvement/protection	Mulching	Subsurface drainage
	Mulching		Filter Strips	Tail-water return
			Cover cropping	Runoff control
			Adding compost	Alley bropping
			Crop rotation	

Final Product: Searchable database



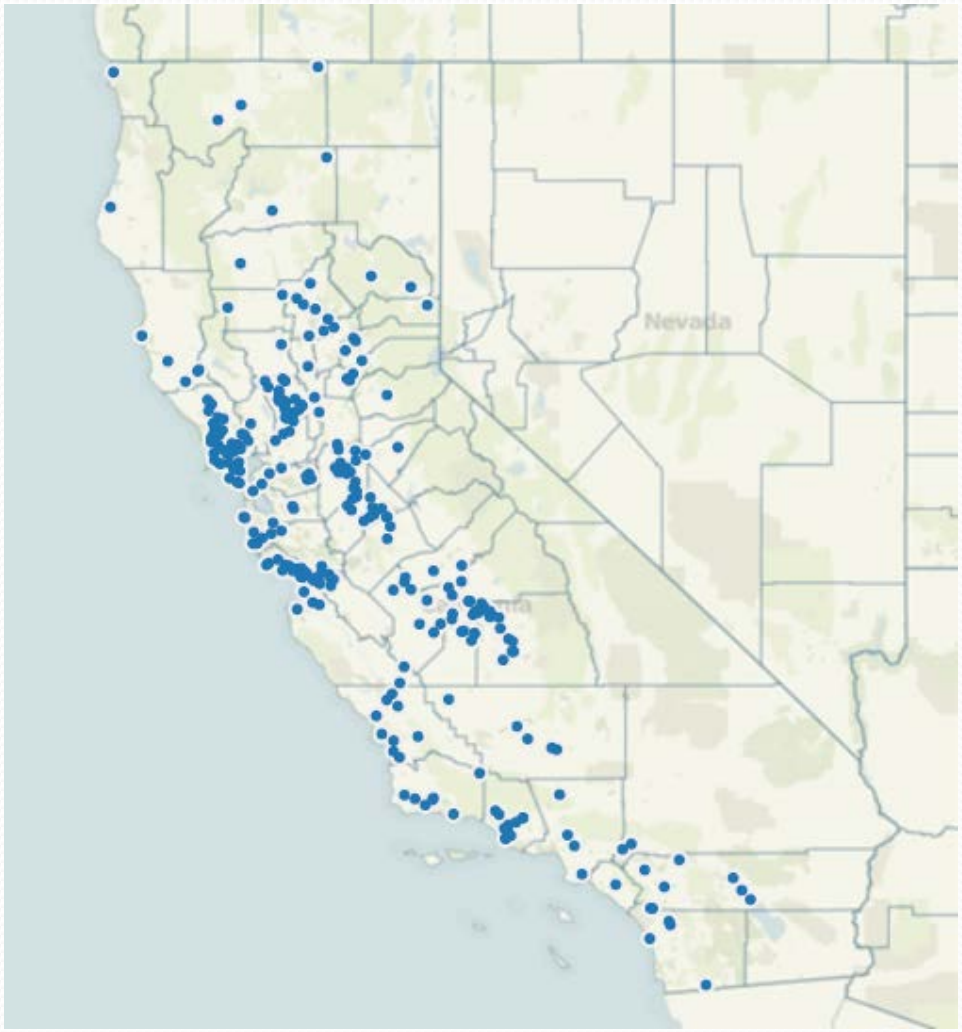
http://agwaterstewards.org/index.php/case-studies/

Map View: Ag Water Steward



http://agwaterstewards.org/index.php/case-studies/map/

Map of Farms in our Database



THANK YOU!

We greatly appreciate your time and feedback.

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