

**Regular Meeting of the Board of Directors**  
**August 18, 2016**  
**6:30 pm – 8:30 pm**  
**Location: RCD Office**

<b>1. Call to Order</b>
<b>2. Introduction of Guests and Staff</b>
<b>3. Public Comment-</b> The Board will hear comments on items that are not on the agenda. Comments are limited to three minutes per person. The Board cannot take action on an item unless it is an emergency as defined under Government code Sec. 54954.2.
<b>4. Approval of Agenda</b>
<b>5. Consent Agenda</b> 5.1. June 16, 2016 Draft Regular Meeting Minutes 5.2. June 2016 Draft Financial Statements 5.3. July 2016 Draft Financial Statements
<b>6. Discussion Items</b> 6.1. Executive Director Report 6.2. Directors' Reports 6.3. Presentation on Biochar Field Trial in Brussels Sprouts Crops- Brittani Bohlke, RCD Water Resources Specialist and Sara Polgar, RCD Conservation Program Specialist
<b>7. Action Items</b> 7.1. <u>Resolution 2016-4: Approval to Enter Into an Agreement with the Wildlife Conservation Board for a California Stream Flow Enhancement Program Grant for Domestic and Agricultural Water Efficiency Design Program.</u> Board will consider authorizing RCD to receive \$828,357 from the California Wildlife Conservation Board for water efficiency project designs. 7.2. Reschedule September Board of Directors Meeting
<b>8. Adjourn</b>

*Public records that relate to any item on the open session agenda for a regular board meeting are available for public inspection. Those records that are distributed less than 72 hours prior to the meeting are available for public inspection at the same time they are distributed to all members, or a majority of the members of the Board. The Board has designated the San Mateo RCD office, located at the address above, for the purpose of making those public records available for inspection.*

**Minutes of the Regular Meeting of the Board of Directors**  
**August 18, 2016**  
**Location: RCD Office**

Directors present: TJ Glauthier, Jim Reynolds, Barbara Kossy, Neal Kramer

Staff present: RCD – Kellyx Nelson, Adria Arko, Brittani Bohlke, Sara Polgar  
NRCS- Jim Howard

Guests: Kimberly Williams, Dave Olson

**1 Call to Order**

- Meeting called to order at 6:33pm.

**2 Introduction of Guests and Staff**

**3 Public Comment**

- There were no public comments.

**4 Approval of Agenda**

- Item 6.3 was moved up to the top of the discussion items on the agenda.
- Kramer moved approval of the revised agenda, Reynolds seconded, unanimously approved.

**5 Consent Agenda**

5.1 June 16, 2016 Draft Regular Meeting Minutes

5.2 June 2016 Draft Financial Statements

5.3 July 2016 Draft Financial Statements

**6 Discussion Items**

**6.3** Presentation on Biochar Field Trial in Brussels Sprouts Crops- Brittani Bohlke, RCD Water Resources Specialist and Sara Polgar, RCD Conservation Program Specialist

- RCD was awarded and NRCS Conservation Innovation Grant for the field trial. The goal was a field trial to understand how to operationalize biochar in a row crop on our soils, to fully understand costs and benefits from an economic perspective for our farms and weather conditions, and to better understand some of the less well documented potential benefits, e.g. water quality. The scope was revised with increasing focus and more limited scope for the available funds. It was set up as a field trial, not a laboratory study, which has implications in the findings. Used standards and lessons learned from the International Biochar Initiative.
- Technical advisory and project team included NRCS agronomist, soil scientist, UCCE economist, the farmer, NRCS and RCD staff, and others.

- Established demonstration plots at Cabrillo Farms across from the airport in Moss Beach. Farmer Dave Lea was a great and willing partner, contributed a lot to the project.
- Many volunteers, including director Kramer, helped harvest the plots to collect yield data.
- The final report is available on our website. This presentation is a summary (see presentation slides as ATTACHMENT).
- Bohlke, Polgar, Howard and Nelson addressed questions from the Board and guests:
  - There were previous studies on biochar, but none were local. The evidence wasn't conclusive. Effects of biochar explained in the presentation are based on property of biochar.
  - The biochar was applied in about a ½ inch layer. The rate of application was low compared to other trials.
  - The RCD was initially going to test it on other types of operations, but scaled the project down to just this operation.
  - The farmer continued his regular operation at the trial site.
  - Pesticide leaching was not studied, but nitrates were evaluated extensively.
  - Biochar has mostly been studied in degraded soils. Biochar in those degraded soil setting offers nutrient retention and water holding capacity. In the beginning of biochar application, nitrogen can be trapped in growing numbers of microbes. That was why they were advised to add compost to the mix. It bonds with nitrogen. Other studies have shown large improvements in soils, but there have not been any studies before this one studying the effect on local soils.
  - Results were shared the online, with interested individuals, the Department of Conservation, the NRCS, the Agricultural Water Quality Alliance, and others.
  - There was a discussion of other biochar topics that could be studied, e.g. waste management.
  - The RCD does not intend to conduct another research study on biochar. Marin Carbon project and others are studying similar effects from compost application. Howard said there needs to be more research to figure out how biochar works and what the benefits are before making plans for application. This study was focused on our local farmers. This study started answering a lot of questions.
  - Polgar said that she thinks the next steps are for someone to do another study to show the benefit and address barriers. She thinks it could be developed into NRCS conservation standard, but it would be a big undertaking.
  - Howard said that the next study would have to be more aggressive- longer, more money and more control over the variables, which would mean interrupting the farm operation.
  - Nelson said RCD is not pursuing more research right now while we focus our resources on priority projects like water storage. We aren't getting a lot of demand from customers and funders to learn more about biochar. Compost is a significant area of focus regionally and locally.
  - Kramer asked what the farmer thought of the project. Nelson said that we should give him a big thanks for being so generous and accommodating. Nelson said he hasn't asked for more biochar or research. He did it because we asked him, not because he was looking for higher yield, etc.

- Kossy said she would be interested in looking at rangeland and depleted soils. There was discussion about the challenges and benefits.
- Williams asked if the RCD considered partnering with someone else who had already done the trial and error. Nelson and Howard described their work with others who have, including the biochar source in San Rafael, the International Biochar Initiative, and others. There wasn't anyone who had done it for row crops here- that was the new piece we added.

#### 6.1 Executive Director Report (ATTACHMENT)

- There was discussion about scheduling visits to restoration sites for directors during construction.
- RCD (Bohlke) will be a technical advisor to a new dog management committee for County Parks. There are about ten people on the committee.
- The drought relief program is really hopping. Numbers included in the ED report have been reported to Farm Bureau, Food System Alliance, and other partners. All planned projects would be 49 million gallons of water savings, and another 49 million gallons of water storage. RCD is helping growers to change their operations to not take water during low flow times.
- RCD is partnering with UCCE to assess water resources on the coast. It will help people understand current and projected needs for water and hopefully give a better picture of surface and groundwater supply. Much of the San Mateo Coast is unusual because there is no water utility and no irrigation and water is managed in a very diffuse way with individual water rights and permits. There is minimal regional information about water demand and supply. Funding for this first phase is from the County and POST.
- TJ asked about the history project. Nelson said she has been working with Stanford. They have an intern focused entirely on our RCD, paid for by a grant. There is some mildew damage. Our history will be more accessible to us offsite because it will be well managed. Nelson hopes to bring the Stanford partners to present at next CARCD conference and connect them to other RCDs.
- RCD will be at Pescadero Arts and Fun Festival promoting the toilet rebate water conservation program that is a partnership with the County.
- Nelson, Arko, and director Watt have been brainstorming about relationships with multi-generational farming families and began putting together a "Next Generation" advisory committee. The RCD wants to know how we can continue to be relevant to them.
- Nelson and directors brainstormed what to include in the upcoming Board training on reading financials. Kossy said that the financial statements are hard to read. Glauthier said that we need to work on making them less confusing and noted that it is not easy to tell what resources we actually have. Nelson agreed, and says they are going to be working on making the documents more readable.
- Reynolds likes having a summary of the financials in the Executive Director report. Nelson will try to continue doing that but noted that there is often not enough time between when financial come out and when the ED report is written to interpret the financials before noticing meeting, but will try to include something.
- The Board discussed delaying the financials by a month to allow interpretation in the ED report. Glauthier still wants the financial statements to be current and suggested that maybe we could have a commentary on the previous month. He was reviewing what we had when we passed budget, and thinks that all the changes are good. Seems like we are in a good place.

- Nelson said that the financials look very positive but it's really because the Drought Relief program was invoiced after years of working on it, but the RCD still hasn't received that cash.
- Nelson asked Glauthier if he can share what he does each month with the financials to help the other Board members understand them better.
- There was discussion about the need for Board engagement with financials. Nelson said a healthy organization has checks and balances from the Board. It is also the basic legal requirement of the Board to have fiscal oversight of the organization.
- Glauthier said that not everyone needs to be an expert, but everyone on the Board needs to know if we are in solid shape, and to understand the opportunities and challenges, cash flow and understanding if we have enough. The Board will need to work together.
- Kossy says she is interested in stories about late invoices and financial flow, as these are big challenges to the organization.
- Glauthier asked if anyone wants to join him on the Finance Committee.

## 6.2 Directors' Reports

- Kossy will be going to California Invasive Plant Council Symposium in November. And Central Coast Invasive Plant Symposium in San Francisco. Kramer says he is intending to go. Her California Invasive Facebook page is up to 1000 people. She has been thinking about Mexican feathergrass and thinking about managing habitat instead of just removing plants. Has been asking herself the question, "what are you restoring for?" She shared that there is a fungus infecting nurseries- Phytopthera. Kramer said they are establishing best management practices for it. Kossy said that it hasn't been a big issue here in San Mateo County. Nelson said it is a concern when permits require revegetation that risks introduction of pathogens in healthy wild places where natural recruitment would be better. Kramer said he has seen a lot of examples of revegetation projects gone wrong.
- Reynolds announced that the Pescadero Municipal Advisory Committee didn't meet this last month. There is a high interest in the restoration project at Butano Farms. The County is starting work around the bridge. The ED report shows how the RCD is adding value. Years ago people told him that the RCD was irrelevant, but it is a totally different picture now. He is getting good feedback from people. He would like to let District members know about all the projects happening. He thinks attitudes toward the RCD are changing a lot. He is excited about the project on ag water reliability.
- There was discussion about how to spread the news about what the RCD is doing. Nelson said that RCD does press releases, a quarterly newsletter, website, Facebook, tables at some events, and presents at meetings (Board of Supervisors, PMAC, Midcoast Community Council, realtors, Coastside Democrats, various groups, Harbor Commission, City of Half Moon Bay, etc.). She wishes there were funding for a communications staff member. She has historically tried to utilize volunteers but it took so much of her time that it didn't really make sense.
- Glauthier said that the RCD would be making a presentation at the Harbor Commission on September 7<sup>th</sup> and he is planning on attending. He asked about next steps for Harbor District work and how to get funding to address it. He thinks that finding the contamination source would have visible benefits. Nelson told him it was probably good to talk to the Water Quality Committee. Glauthier and Nelson discussed putting a meeting together. Glauthier said he is interested in helping to find funding. Would like to see the signs removed at the beaches. Nelson said that the current scope of work is broader than our last one. This one will put us in a place to move forward.

## 7 Action Items

**7.1** Resolution 2016-4: Approval to Enter Into an Agreement with the Wildlife Conservation Board for a California Stream Flow Enhancement Program Grant for Domestic and Agricultural Water Efficiency Design Program. Board will consider authorizing RCD to receive \$828,357 from the California Wildlife Conservation Board for water efficiency project designs.

- Nelson explained that this grant is for planning and design to look at water efficiency and conservation improvement projects in the Pescadero watershed. The domestic piece is the parks, and agricultural component is audits and designs. Planning and design money is always the hardest to get, so this is exciting. This will get us to a point where we are shovel ready and can apply for implementation funds.
- Reynolds moves to approve, Kossy seconds, unanimous approval of Resolution 2016-4.

**7.2** Reschedule September Board of Directors Meeting

- Nelson cannot attend September 15<sup>th</sup> meeting.
- Board voted unanimously to move the meeting to the 14<sup>th</sup>.

## 8 Adjourn

Meeting adjourned at 8 :31pm

**Balance Sheet**

As of June 30, 2016

Jun 30, 16

**ASSETS****Current Assets****Checking/Savings**

1000 · Checking RCD 8123985

SC Stewardship Restricted Fund

50,400.00

County Bridge Loan Tracking

36,754.00

SVC Recoverable Grant

100,000.00

Kabcenell Recoverable Grant

100,000.00

1000 · Checking RCD 8123985 - Other

124,083.59

**Total 1000 · Checking RCD 8123985**

411,237.59

1004 · Restricted 8121907

68,612.55

1010 · 8144886 SC NETWORK

102,891.96

**Total Checking/Savings**

582,742.10

**Accounts Receivable**

1110 · Contracts Receivable

589,689.38

**Total Accounts Receivable**

589,689.38

**Total Current Assets**

1,172,431.48

**Other Assets**

1600 · Long-Term Receivables

526,675.95

1610 · Security Deposits

1,300.00

1620 · Prepaid Expenses (Liability Insurance)

979.73

**Total Other Assets**

528,955.68

**TOTAL ASSETS****1,701,387.16****LIABILITIES & EQUITY****Liabilities****Current Liabilities****Accounts Payable**

2000 · Accounts Payable

232,415.56

**Total Accounts Payable**

232,415.56

**Other Current Liabilities**

2130 · Compensated absences payable (Sick/Vaca Carryover)

26,389.86

2150 · 2150 County Bridge Loan (Bridge Loan Drought Relief projects Repettos and Memori...

36,754.00

2165 · Recoverable Grants Payable (Two year loan from SVC)

200,000.00

2200 · Deferred Revenue

327,784.75

2250 · Potential Revenue

526,675.95

**Total Other Current Liabilities**

1,117,604.56

**Total Current Liabilities**

1,350,020.12

**Total Liabilities**

1,350,020.12

**Equity**

3900 · Retained Earnings

193,454.67

Net Income

157,912.37

**Total Equity**

351,367.04

**TOTAL LIABILITIES & EQUITY****1,701,387.16**

## San Mateo County Resource Conservation District

07/13/16

## Profit &amp; Loss

Accrual Basis

July 2015 through June 2016

Jul '15 - Jun 16

<b>Ordinary Income/Expense</b>	
<b>Income</b>	
4010 · Contracts/Grants	2,419,577.66
4015 · Fines and Mitigation Funds	4,432.25
4020 · Individual Contributions	18,455.41
4030 · Interest Income	549.42
4100 · Misc. Income	7,921.00
4200 · Property Tax Revenue	66,543.04
4300 · Service Fees	6,562.50
<b>Total Income</b>	<b>2,524,041.28</b>
<b>Gross Profit</b>	<b>2,524,041.28</b>
<b>Expense</b>	
5000 · Personnel	
5010 · Salary	557,288.12
5030 · Salary Tax Expense	50,468.27
5040 · Benefits	29,128.21
<b>Total 5000 · Personnel</b>	<b>636,884.60</b>
6000 · Accounting Services	8,961.21
6020 · Bank Fees	878.33
6070 · Communications	
6075 · Internet	923.04
6080 · Telephone	2,031.72
6070 · Communications - Other	24.70
<b>Total 6070 · Communications</b>	<b>2,979.46</b>
6085 · Computer Service	7,392.97
6090 · Consultant	7,612.85
6200 · Discretionary	4,157.49
6300 · Equipment & Furniture	5,404.32
6400 · Insurance-Liability	3,360.39
6450 · Legal Services	334.50
6500 · Membership, Dues & Subscription	2,491.00
6550 · Mileage	1,174.18
6555 · Personnel Service Fees	3,872.20
6650 · Postage and Delivery	58.32
6700 · Printing and Copying	573.99
6750 · Professional Development	3,057.53
6775 · Project Software	2,115.00
6800 · Public Relations	672.66
6850 · Rent	18,150.00
6900 · Supplies	548.08
6950 · Travel/Accommodations	2,135.14
7500 · Program Expense	1,653,314.69
<b>Total Expense</b>	<b>2,366,128.91</b>
<b>Net Ordinary Income</b>	<b>157,912.37</b>
<b>Net Income</b>	<b>157,912.37</b>

6:19 PM

08/11/16

Accrual Basis

**San Mateo County Resource Conservation District**

**Profit & Loss**

July 2016

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	Jul 16
Ordinary Income/Expense	
Income	
4010 · Contracts/Grants	130,537.63
Total Income	130,537.63
Gross Profit	130,537.63
Expense	
5000 · Personnel	
5010 · Salary	58,100.74
Total 5000 · Personnel	58,100.74
6200 · Discretionary	160.00
6555 · Personnel Service Fees	180.00
6650 · Postage and Delivery	5.29
6700 · Printing and Copying	100.00
6850 · Rent	3,300.00
7500 · Program Expense	24,099.55
Total Expense	85,945.58
Net Ordinary Income	44,592.05
Net Income	<u>44,592.05</u>

## San Mateo County Resource Conservation District

## Balance Sheet

As of July 31, 2016

	Jul 31, 16
<b>ASSETS</b>	
<b>Current Assets</b>	
<b>Checking/Savings</b>	
1000 · Checking RCD 8123985	333,900.53
1004 · Restricted 8121907	68,612.55
1010 · 8144886 SC NETWORK	102,891.96
<b>Total Checking/Savings</b>	505,405.04
<b>Accounts Receivable</b>	
1110 · Contracts Receivable	624,017.06
<b>Total Accounts Receivable</b>	624,017.06
<b>Total Current Assets</b>	1,129,422.10
<b>Other Assets</b>	
1600 · Long-Term Receivables	526,675.95
1610 · Security Deposits	1,300.00
1620 · Prepaid Expenses (Liability Insurance)	7,896.06
<b>Total Other Assets</b>	535,872.01
<b>TOTAL ASSETS</b>	<b><u>1,665,294.11</u></b>
<b>LIABILITIES &amp; EQUITY</b>	
<b>Liabilities</b>	
<b>Current Liabilities</b>	
<b>Accounts Payable</b>	
2000 · Accounts Payable	139,218.76
<b>Total Accounts Payable</b>	139,218.76
<b>Other Current Liabilities</b>	
2100 · Payroll Taxes Payable	13,802.74
2105 · Employee Benefits Payable	2,839.97
2130 · Compensated absences payable (Sick/Vaca Carryover)	26,389.86
2150 · 2150 County Bridge Loan (Bridge Loan Drought Relief projects Repetto...	36,754.00
2165 · Recoverable Grants Payable (Two year loan from SVC)	200,000.00
2200 · Deferred Revenue	327,784.75
2250 · Potential Revenue	526,675.95
<b>Total Other Current Liabilities</b>	1,134,247.27
<b>Total Current Liabilities</b>	1,273,466.03
<b>Total Liabilities</b>	1,273,466.03
<b>Equity</b>	
3900 · Retained Earnings	347,236.03
Net Income	44,592.05
<b>Total Equity</b>	391,828.08
<b>TOTAL LIABILITIES &amp; EQUITY</b>	<b><u>1,665,294.11</u></b>

## **Executive Director Report August 2016**

### Program and Project Updates

#### *Construction Season*

We are going to construction this season (August through October) on more projects than at any other time in our 77 year history. Work these past two months has focused on contracting, outreach to neighbors and community members about the work being done, finalizing permits, and biological monitoring. The projects are to:

- restore riparian habitat in San Gregorio Creek;
- expand a farm pond on lower San Gregorio Creek that will benefit the farmer's water security and protect streamflows;
- repair two rural roads to reduce sedimentation into Pilarcitos Creek;
- restore over 100 acres of the historic floodplain along a mile of Butano Creek;
- repair a reservoir in La Honda to improve water security for the community and reduce demand on the creek in late summer and early fall; and
- replace a water storage tank in Loma Mar resulting in better water security for the community and a reduced demand on the creek in late summer and early fall.

#### *Dog Management Committee*

The San Mateo County Parks Commission has named 10 community members to advise on dog management policies in County parks. Brittani Bohlke, the RCD's Water Resources Specialist who oversees our water quality program, will serve as a technical advisor. In addition to recommending updates to County ordinances and identifying potential dog recreation opportunities, the Committee is expected to outline criteria to be used in identifying parks, places or trails best suited for dog activity and parameters for specific pilot areas where dog management will be allowed and carefully monitored to determine effectiveness. Committee meetings will be open to the public and announced at [smcoparks.org](http://smcoparks.org).

#### *Agricultural Water Resources*

Efforts to ensure water for farms and creeks are in full gear. We estimate 150 acre-feet of water conservation per year (nearly 49 million gallons per year) and 150 acre-feet of water storage (nearly 49 million gallons) will result from our work with the agricultural community from 2012 to the present. The RCD and our partners at the NRCS, Trout Unlimited, and American Rivers:

- completed 6 irrigation efficiency projects, constructed or improved 6 ponds, installed 15 tanks;
- are completing 1 pond, 2 tanks, and 4 irrigation efficiency projects this season; and
- are planning 7 more pond 6 more irrigation efficiency projects.

In total, we have assisted 19 agricultural operations with 16 irrigation efficiency projects, 14 ponds projects, and 17 tanks in different stages of completion.

<b>Watershed</b>	<b>Date</b>	<b>Funders<sup>1</sup></b>	<b>Operation</b>
<b>Water Storage Projects</b>			
<i>Ponds</i>			
Ano Nuevo	2012	NRCS	mixed vegetable
Pescadero	2014	Caltrans	livestock
Pescadero	2014	Caltrans	livestock
Pescadero	2014	Caltrans	livestock
Pescadero	2014	Caltrans	livestock
Pescadero	2014	Caltrans	livestock
San Gregorio	2016	IRWMP, SCC, SVCF	flowers and pumpkins
San Gregorio	2017	IRWMP, SCC	flowers and pumpkins
Pescadero	2017	IRWMP, NRCS	berry, herb, and vegetable
Pescadero	2017	IRWMP	livestock, berries, vegetables, herbs
Pescadero	2017	IRWMP, NRCS	vegetables, hay
Pilarcitos	2018	IRWMP	mixed vegetables and hay
Butano	2019	IRWMP, NRCS	greenhouse
San Gregorio	2019	IRWMP, SCC	mixed vegetable
<i>Tanks</i>			
Tunitas	?	NRCS	livestock
Butano	2014	NRCS	mixed vegetable
Pescadero	2014	NRCS	mixed vegetables
Pescadero	2015	NRCS	orchard
Pescadero	2016	NRCS, IRWMP	orchard
<b>Irrigation Efficiency Projects</b>			
Pescadero	2013	NRCS	herbs
Pescadero	2013	NRCS	mixed vegetables
Pescadero	2014	NFWF, RCD	flowers and vegetables
San Gregorio	2014	FRGP, NRCS, USFWS	flowers and pumpkins
Butano	2014	NRCS	mixed vegetable
Pescadero	2015	IRWMP	confined animal
Pescadero	2016	IRWMP	herbs

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<sup>1</sup> IRWMP- Integrated Regional Water Management Plan via Department of Water Resources

NRCS- USDA Natural Resources Conservation Service

USFWS - US Fish and Wildlife Service

SCC - State Coastal Conservancy

SVCF - Silicon Valley Community Foundation

FRGP- CDFW Fisheries Restoration Grant Program

San Gregorio	2016	IRWMP	mixed vegetables
San Gregorio	2016	IRWMP	mixed vegetable
Butano	2016	IRWMP	mixed vegetable
Pescadero	2017	IRWMP	mixed vegetable and berry
Pescadero	2017	IRWMP, NRCS	livestock, berries, vegetables, herbs
Pescadero	2017	IRWMP, NRCS	vegetables, hay
San Gregorio	2017	SCC, IRWMP	flowers and pumpkins
Pilarcitos	2018	IRWMP	mixed vegetables and hay
San Gregorio	2019	unfunded	mixed vegetable

In addition, the RCD is partnering with UC Cooperative Extension to conduct an assessment of agricultural water reliability. It will determine the current and future need for water as well as the availability of water resources. This type of research will serve as the backbone for projects and permits, and allow a planned, systems-based approach to San Mateo County's agricultural water reliability.

RCD staff is working on Phase One of the project, focusing on understanding whether there is sufficient information to develop a map of baseline agricultural water demand and supply in space and time, and how these two could possibly evolve in the near future. This includes gathering data that are currently available on soils, crop types, evapotranspiration (ET) rates, and irrigation distribution uniformity; producing a geospatial database in GIS; and installing equipment for the collection of new data. This phase is funded by the County and Peninsula Open Space Trust. The second phase, to be completed by UC Cooperative Extension, will fill information gaps with new data collection and analysis.

### *Fish Sampling*

RCD staff assisted the CA Department of Fish and Wildlife in mid-July to capture and measure steelhead trout in Pescadero lagoon to assess the status of the nursery habitat for rearing steelhead.

### Administration, Communication, and Operations

#### *Financial Perspective*

The RCD's current financial health, particularly as seen in the Profit and Loss statement, primarily reflects (1) a long-awaited payment from the Department of Water Resources for expenses incurred in a previous year; and (2) funding agreements with billing rates that more fully recover RCD costs.

#### *History Partnership with Stanford University*

Working with the Stanford historians who are professionally archiving RCD documents, we found a treasure trove of RCD history in our storage unit, including early minutes and financial records as well as documents pertaining to the establishment of the RCD and boundary expansions. Stanford is treating the documents for damage from mildew. Eventually, many of our historical documents will be available online.

# Biochar Field Trial in San Mateo County, California:



*Presented at RCD Board Meeting  
August 18<sup>th</sup> 2016  
by Brittani Bohlke  
& Sara Polgar*



Department of  
Conservation

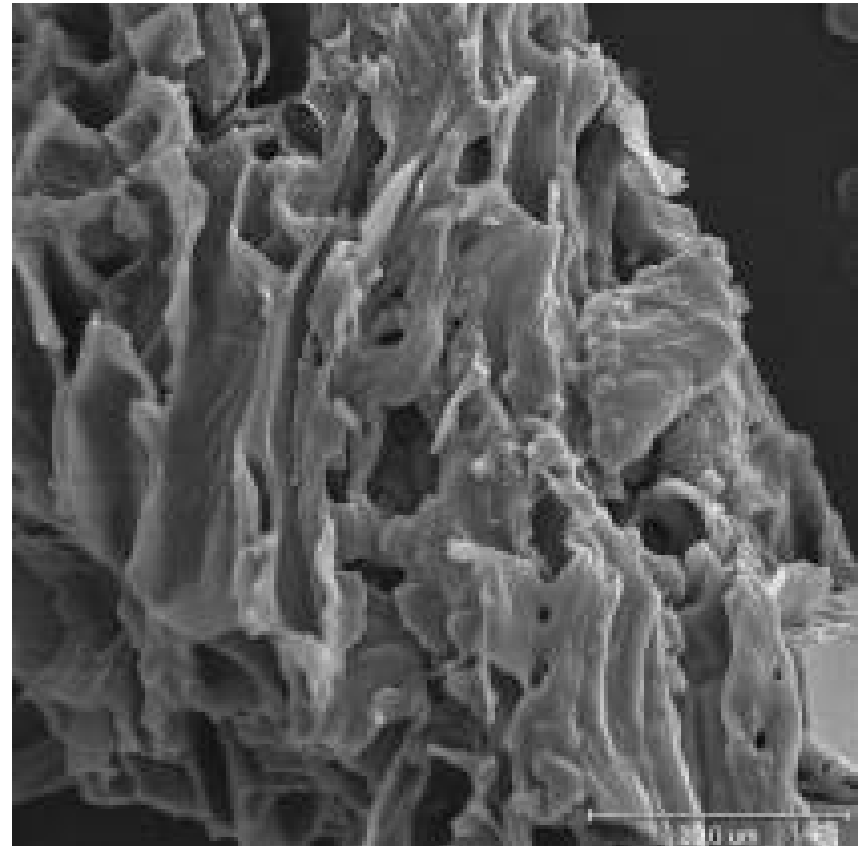
# What is Biochar?

- Ancient soil amendment- charcoal
- Pyrolysis of organic biomass (slow burning in low-oxygen/high temp)



# Properties of Biochar

- Varies depending on parent material-carbon preserved
- Porous, highly ionized particles
- Highly stable in soil
- Slow decay

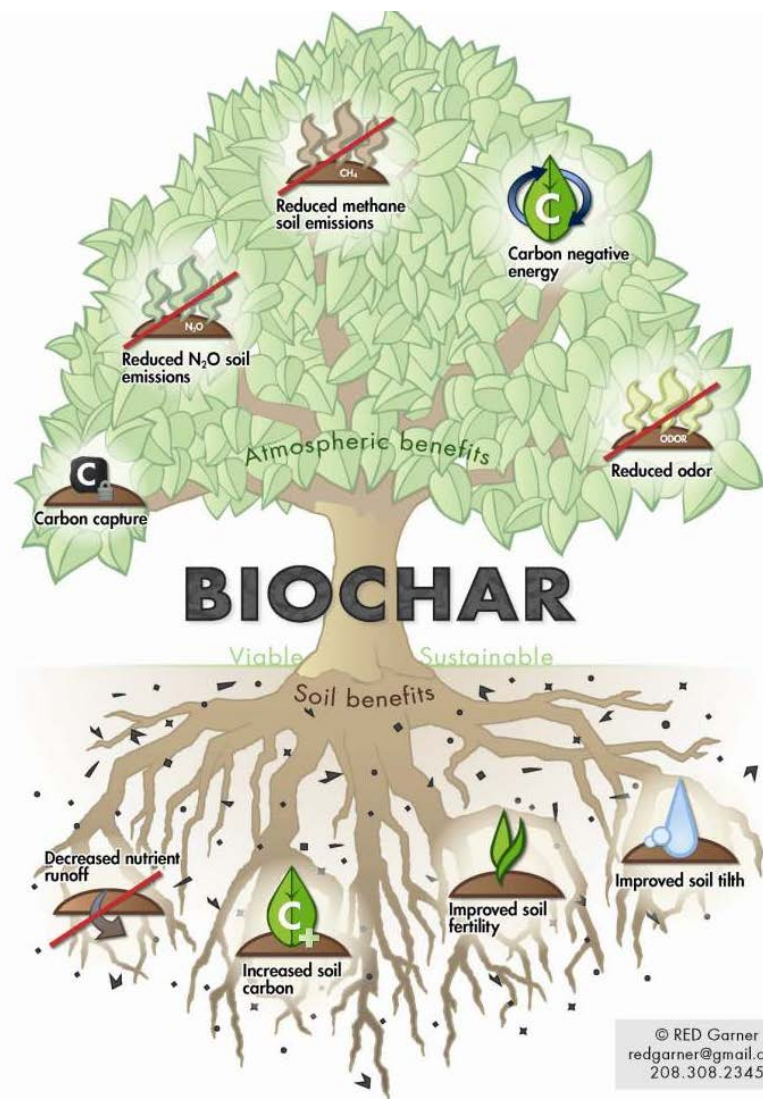


When applied as a soil amendment in  
agricultural operations.....

***Biochar has been shown to improve crop yield,  
soil health, nutrient retention and have  
climate change benefits***

# How?

- Slow release fertilizer
- Increase soil carbon and storage
- Increase water holding capacity
- Decrease nitrous oxide emissions and nitrate leaching
- Diversified microbial assemblages
- Positive feedback loops



# RCD Biochar Field Trial Project

*The purpose of our study was to demonstrate the use of biochar in conventional row crop operation in the local climatic and soil conditions of coastal San Mateo County*



Our goals were to assess:

- Effects of biochar on crop yield, soil health, nutrient retention and carbon sequestration
- Cost/benefit to farmers
- Barriers and opportunities to local biochar use

# Project Tasks

- Field trial
  - Crop yield and soil monitoring
- Cost/benefit analysis
  - Labor, materials, crop yield etc.
- Barriers and opportunities analysis
  - Sources, application methods, feasibility
- Report and distribute results

# Field Trial

- Site Identification
  - Conventional row crop operation (Brussels sprouts) in Half Moon Bay, CA
- Baseline Data
  - On farm practices
  - Soil monitoring
  - Crop yield data

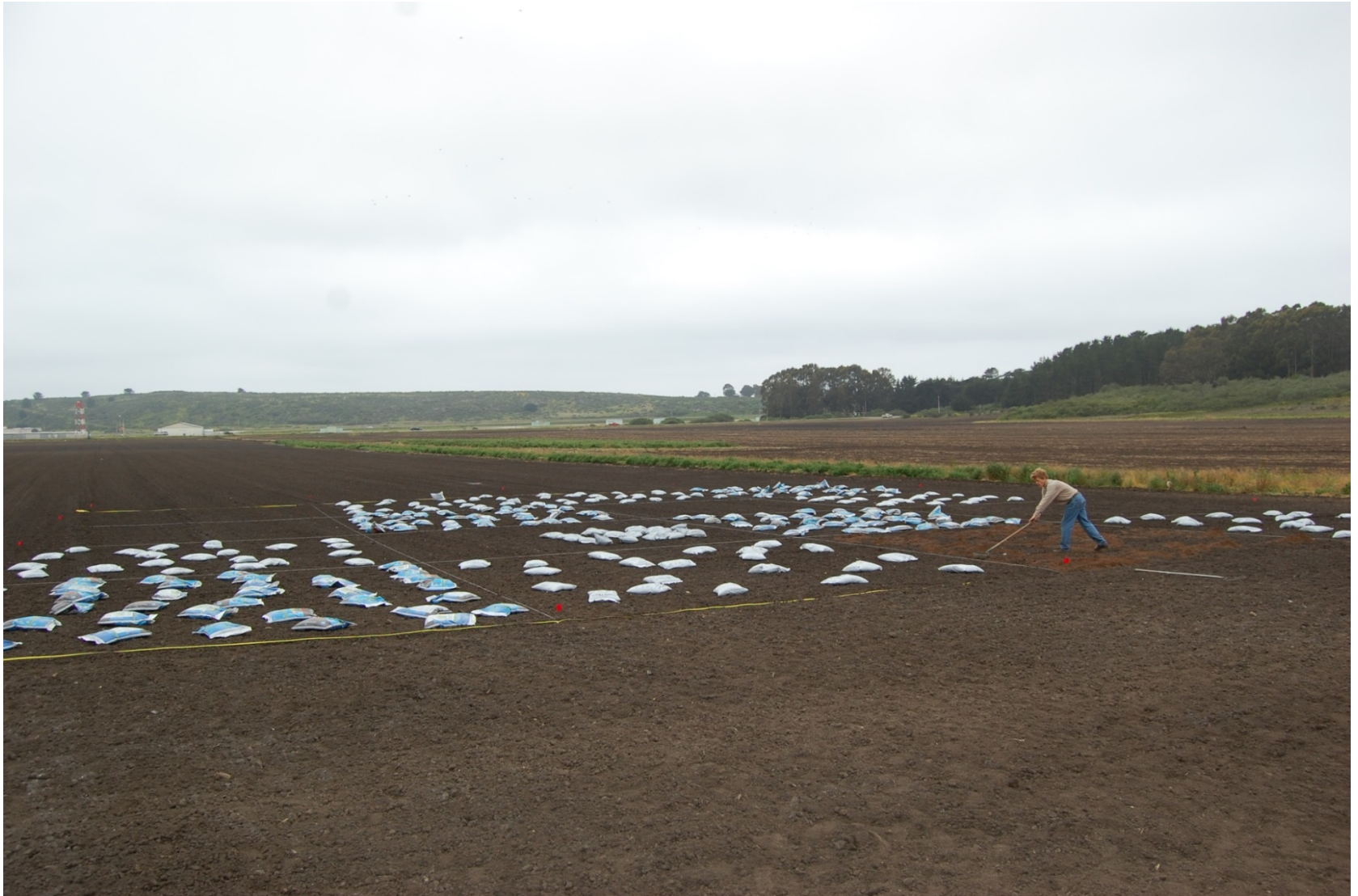


# Field Trial Methods

- A Guide to Conducting Biochar Trials (2009): International Biochar Initiative (IBI)
- Spring 2012-Fall 2014
- Two test plots of 16 square subplots:
  - 4 control, 4 biochar, 4 compost, 4 biochar-compost mix
- One-time application at 10-20 tons/acre with rakes
- Existing farming practices preserved



# Soil Amendment Application



# Field Trial Monitoring

- Crop Yield
  - Weigh Brussels sprouts stalk and fruit in the fall
- Soil
  - Spring and Fall samples
    - Composite nutrient analysis (0-6", 6-12")
    - Nitrate-N analysis (12-24", 24+")
  - Fall samples
    - Bulk density analysis



# Crop Yield Findings

- Biochar-only and biochar-compost mix soil amendments had neutral or negative effects on crop yields
  - Lime application may have masked biochar benefits
  - Biochar likely bound to nutrients initially and decreased nutrient availability during this short-term (3-year) study
- Compost-only treatment had a neutral or positive affect on crop yields
  - Compost may have increased soil organic matter (SOM) particularly in SOM deficient soils



# Soil Health Findings

- Increased soil organic matter (SOM) levels in SOM-depleted soils
  - All soil amendments
- Multi-year, stabilizing effect on bulk density
  - Both biochar soil amendments
- Increased nitrate-N concentrations (slightly) in root zone over the growing season
  - Biochar-compost mix soil amendment
- Increased Boron concentrations (slightly) in Boron-depleted soils
  - Biochar-only soil amendment



# Nitrate Leaching Findings

- Nitrate soil profiles used to draw inferences
- No significant effects of treatments
  - Slight trend: Higher nitrate concentrations in upper vs. lower soil layers (Both biochar soil amendments)
- Biochar-nitrogen dynamics are complex especially within an active farming operation
  - Plowing, tilling, disking, lime application, fumigation, fungicide, fertilizer etc.

# Carbon Sequestration Findings

- Carbon sequestration from soil amendment biomass (tons/acre total soil organic carbon):
  - Biochar: 6.0
  - Compost: 2.3
  - Mix: 8.3
- No conclusive trends to show carbon sequestration benefit
  - Soil monitoring was too short
- Other potential carbon sequestration benefits not quantified:
  - Higher, more diverse microbial activity → Increased carbon storage
  - Slow-release fertilizer → reduced need for fertilizer/GHG production



# Cost-Benefit Analysis

- 2 scenarios of biochar application:
  - 1 ton/acre: Benefit accrues with 1-2% increased crop yields over three years (or >5% in one year)
  - 10 tons/acre: Benefit accrues with 13% increased crop yields over three years (or 37-40%) in one year)
- Cost and inconvenience can be major drawbacks
- Potential benefits from soil health, nutrient retention and climate change should also be considered

# Barriers and Opportunities Analysis



- High cost of material
- Few local suppliers
  - Produce biochar on-site?
- Transport & storage difficulties
- Challenges with application methods and equipment
- Operationalize with NRCS conservation practice standard

# Conclusions and Next Steps

- Biochar use in a conventional agricultural operation in coastal San Mateo County was successfully demonstrated
- Results largely inconclusive besides benefits to soil health
- Potential influencing factors:
  - Extreme weather conditions (heat and drought)
  - Study too short
  - Influence of on-farm practices
- Substantial costs and barriers
- Future studies
  - Rate and timing of application, isolation of variables, longer study



# Questions?



## RESOLUTION 2016-4

### APPROVAL TO ENTER INTO AN AGREEMENT WITH THE CALIFORNIA WILDLIFE CONSERVATION BOARD FOR A STREAM FLOW ENHANCEMENT GRANT FOR PLANNING OF DOMESTIC AND AGRICULTURAL WATER EFFICIENCY PROJECTS

**Whereas** the San Mateo County Resource Conservation District is a Special District organized under Division 9 of the California Public Resources Code with an original petition granted on July 1, 1939;

**Whereas** the San Mateo County Resource Conservation District is defined in Section 3501 of the Government Code as a public agency;

**Whereas** the California Wildlife Conservation Board has encumbered \$828,357 through the Stream Flow Enhancement Program for the San Mateo County Resource Conservation District to design domestic and agricultural water efficiency projects within the Pescadero-Butano watershed; and

**Whereas** the California Wildlife Conservation Board requires a resolution from the governing body of the grant recipient authorizing its designee to sign a financial assistance agreement, and any amendments thereto;

**NOW THEREFORE BE IT RESOLVED** that the San Mateo County Resource Conservation District Board of Directors hereby authorizes its Executive Director to sign an agreement with the California Wildlife Conservation Board for the Domestic and Agricultural Water Efficiency Design Program, grant number WC-1560MM, and any amendments thereto.

**ADOPTED** at a regular meeting of the Board of Directors of the San Mateo County Resource Conservation District on August 18, 2016.

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TJ Glauthier, President

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Date