

STATE OF CALIFORNIA
STANDARD AGREEMENT
 STD 213 (Rev 06/03)

AGREEMENT NUMBER

16-C0085

REGISTRATION NUMBER

1. This Agreement is entered into between CSUMB, the State Agency and the Contractor named below:

STATE AGENCY'S NAME

Department of Pesticide Regulation, hereinafter referred to as "DPR"

CONTRACTOR'S NAME

University Corporation at Monterey Bay, hereinafter referred to as "CSUMB or Contractor"

2. The term of this Agreement is: January 1, 2017 through June 30, 2019

3. The maximum amount of this Agreement is: \$ 149,982.00

4. The parties agree to comply with the terms and conditions of the following Exhibits, which by this reference are made a part of the Agreement.

Exhibit A – A5: A–Scope of Work; A1–Deliverables; A2–Key Personnel; A3–Authorized Representatives; A4–Preexisting Data; A5–CV/Resumes	13 page(s)
Other Exhibits A (when applicable): A6–Current & Pending Support; A7–Third Party Confidential Information Requirement	1 page(s)
Exhibit B – B–Budget; B1–Budget Justification; B2–Subrecipient Budgets (if applicable); B3– Invoice Elements	4 page(s)
Exhibit C* – University Terms and Conditions	UTC-116

Check mark additional Exhibits below, and attach Exhibits or provide internet link:

- Exhibit D** – Additional Requirements Associated with Funding Sources page(s)
- Exhibit E** – Special Conditions for Security of Confidential Information page(s)
- Exhibit F** – Access to State Facilities and Computing Resources page(s)
- Exhibit G** – If applicable 1 page(s)

Items shown with an Asterisk (*) are hereby incorporated by reference and made part of this agreement as if attached hereto.

These documents can be viewed at <http://www.dgs.ca.gov/ols/Resources/StandardContractLanguage.aspx>.

IN WITNESS WHEREOF, this Agreement has been executed by the parties hereto.

CONTRACTOR

CONTRACTOR'S NAME (if other than an individual, state whether a corporation, partnership, etc.)

University Corporation at Monterey Bay

BY (Authorized Signature)

Cynthia E. Lopez

DATE SIGNED (Do not type)

12/19/16

PRINTED NAME AND TITLE OF PERSON SIGNING

Cynthia E. Lopez

ADDRESS

100 Campus Center, Bldg. 97 Seaside, CA. 93955-8001

STATE OF CALIFORNIA

AGENCY NAME

Department of Pesticide Regulation

BY (Authorized Signature)

Lu Saepanh

DATE SIGNED (Do not type)

12-30-16

PRINTED NAME AND TITLE OF PERSON SIGNING

Lu Saepanh, Fiscal Services and Business Operations Branch Chief

ADDRESS

1001 I Street Sacramento, CA. 95814

California Department of General Services Use Only

Exempt per:
 Delegation Letter 74.6

Exhibit A

Project Summary & Scope of Work

Project Summary/Abstract

Briefly describe the long-term objectives for achieving the stated goals of the project.

California is the leading agricultural state with 13% of the US market (California Department of Food and Agriculture, 2014 Crop Year Report), and this industry is supported by pesticide applications. Woodchip bioreactors are one of the most promising on-farm management practices for mitigation of pesticides, but there is little data in a controlled environment as to conditions that would optimize their functionality. CSUMB has constructed a bioremediation testing facility that currently has 4 four channel bioreactors that can be run in concert to provide a control and triplicate data. The objective is to isolate microbes capable of pesticide bioremediation, and then seed the bioreactors with these strains. Any strains isolated will be shared with others conducting on-site studies of woodchip bioreactors at the discretion of DPR. This could be used to help close the knowledge gap and offer guidelines as to how such bioreactors could be best used in tile drains on farms to reduce environmental impacts.

If Third-Party Confidential Information is to be provided by the State:

- Performance of the Scope of Work is anticipated to involve use of third-party Confidential Information and is subject to the terms of this Agreement; **OR**
- A separate CNDA betCSUMBen the University and third-party is required by the third-party and is incorporated in this Agreement as Exhibit A7.

Scope of Work

Describe the goals and specific objectives of the proposed project and summarize the expected outcomes. If applicable, describe the overall strategy, methodology, and analyses to be used. Include how the data will be collected, analyzed, and interpreted as CSUMBII as any resource sharing plans as appropriate. Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the goals and objectives.

The research objectives are to create a library of freezer stocks of microbes that can bioremediate the main insecticides of concern to DPR and to obtain preliminary data on removal (adsorption, degradation) of these insecticides in woodchip bioreactors inoculated with these cultures. The pesticides CSUMB will target include: 1) organophosphorus insecticides (malathion, chlorpyrifos, dimethoate), 2) a neonicotinoid (imidacloprid), and 3) pyrethroids (bifenthrin, lambda-cyhalothrin, permethrin, cypermethrin).

Task 1: Isolation and Characterization of Biodegrading Microbes

Water and sediment samples will be obtained from sites that DPR has identified as having pesticide contamination and grown via selective enrichment culture. Samples will be incubated in M9 Salts, a minimal growth media, supplemented with the pesticides as the sole carbon and nitrogen source. For those pesticides that do not contain nitrogen, this will be added separately as ammonium nitrate. Liquid cultures will be incubated with several passages to minimize opportunistic growth of microbes feeding on each other. Then cultures will be grown to confluence and spread plated onto minimal agar plates supplemented with the

pesticides. Individual colony forming units will be selected and streaked to axenic culture, and then re-suspended in the liquid cultures to continue selecting for the ability to digest pesticides (microbes may be able to utilize the agar directly). Freezer stocks will be made using glycerol stock solution and stored at -80C until needed. Growth curves with the pesticides at varying concentrations will be generated using turbidity measurements (600 nm scattered light). Immunoassays will be used to confirm the biodegradation of pesticides. (Abraxis, Inc. Warminster, PA)

The isolates with the most optimal growth will be identified by the amplification of the 16 rRNA gene using the primers 27F and 1492R (CSUMBisburg et al. 1991). Products will be screened on an agarose gel prepared with a DNA marker, GelGreen and a molecular marker with a low range plus DNA ladder (EXACTGene). QIAquick PCR purification kits will be used to clean the amplified DNA before sending for sequencing (Mc Lab, San Francisco). Results will be analyzed using BLAST against the 16S Bacterial and Archeal database (<http://blast.ncbi.nlm.nih.gov/Blast.cgi>) DNA using MicroLysis, and amplify and send it to McLabs for 16S sequencing to provide genera identity. Further morphological and biochemical testing will be performed (e.g. Gram staining, oxidase, catalase, anaerobic growth).

Task 2: Testing Biodegradation Ability in Woodchip Bioreactors

Laboratory and small scale experiments examining the potential adsorption and or absorption of aqueous pesticides by the wood chip media will be performed to ensure results obtained from the full scale bioreactors is accurate.

Once preliminary studies in the laboratory have been completed, single-strain and mixed bacterial cultures will be tested for bioremediation efficacy in the full-scale multi-channel wood chip bioreactors that have been dosed with the pesticides. CSUMB will monitor inlet and outlet conditions including pH, dissolved oxygen, conductivity, and temperature, as CSUMBll as perform regular microbial counts to insure the health of the bioreactors.

Fluorometric dye tests will be performed to assess water flow characteristics within the bioreactor channels, and the results of these tests used to verify the hydraulic residence time (HRT) within the reactor channels at specified input flow rates. Input flow rates will be adjusted to better represent conditions found in real world situations to determine the size of reactor required for a given application, as CSUMBll as adjusted to ascertain the optimum HRT for pesticide reduction.

Once CSUMB has established optimum conditions in preliminary experiments those conditions will be repeated and samples will be collected and sent to DPR for lab testing. CSUMB anticipates needing ~\$20K/yr in chemical analysis of pesticide levels by DPR. The microbes found to be efficacious will be used to amend the SeaMist Bioreactor in Castroville for field testing.

Task 3. Reporting and Outreach

CSUMB will provide reports to DPR on our progress at the end of each fiscal year, and the end of the granting cycle. CSUMB will also provide access to the laboratories and bioreactor facility as needed for site visits by DPR staff and/or any of their collaborators. CSUMB will present our data at a suitable meeting venue in the last year of the grant, and prepare a manuscript for publication on our findings.

Potential Problems and Alternate Strategies

Potential problems include difficulty in finding strains of bacteria capable of pesticide bioremediation. CSUMB plans to seek them from locations known to contain the pesticides of concern, which should provide selective pressure on their existence. Maintaining healthy cultures of the microbes could be an issue, as microbes do not live in isolation, but rather in synergistic consortia. CSUMB will mitigate this potential problem by intentionally seeding the bioreactors with mixed bacterial cultures containing all of the strains CSUMB finds that are capable of survival on the particular pesticide. Another potential problem is that microbes prefer to colonize a solid surface (such as the woodchips). This makes them more efficacious at remediating pollutants that have a low solubility (high Kow). CSUMB may encounter less success at the bioremediation of imidacloprid because of this. In anticipation of this potential failure, CSUMB has recruited a graduate student with other funding who is exploring the potential of using nickel to trap the pesticide, much like one does with proteins that have been tagged with histidine. This may be successful as both imidacloprid and histone have an imidazole ring that binds to nickel in the proper oxidation state.

CSUMB will also likely encounter an inability to assess the pesticide concentrations rapidly and frequently enough to accurately determine bioremediate rates. An alternate strategy to chemical testing by DPR in Sacramento is to perform ELISAs in house, as mentioned above for lab work (Abraxis, Inc. Warminster, PA). This will allow us to only send in samples to DPR for accurate testing once CSUMB are rather confident of the anticipated results from this alternative testing method.

Timeline

	2017			2018			2019	
	Jan-April	May-Aug	Sept-Dec	Jan-April	May-Aug	Sept-Dec	Jan-April	May-June
Task 1	x	x	x	x				
Task 2		x	x	x	x	x		
Task 3		x			x		x	x

Exhibit A1

SCHEDULE OF DELIVERABLES

List all items that will be delivered to the State under the proposed Scope of Work. Include all reports, including draft reports for State review, and any other deliverables, if requested by the State and agreed to by the Parties.

Deliverable*	Description	Due Date
End of fiscal year report	Report to DPR on the status following the first funding cycle, to include update on status of microbial enrichment work.	07/01/17
Microbial library	Freezer stocks or fresh culture/stabs of microbes found via pesticide enrichment culture to digest the pesticides of concern. 16S genus data will be provided.	Exact date depends on the success, but anticipate by 01/01/18
End of year report	Report to DPR on the status following the 2nd year funding cycle, to include microbial enrichment, and preliminary bioreactor work	7/1/18
Final report	Report to DPR on all findings.	7/1/19
The following Deliverables are subject to paragraph 18. Copyrights, Section B of Exhibit C		

** If use of any Deliverable is restricted or is anticipated to contain Preexisting Data or copyrightable works with any restricted use, it will be clearly identified in Exhibit A4, Use of Preexisting Data, Copyrighted Works and Deliverables. For deliverables entered in this first section, copyright shall remain with the University with a license to the State in accordance with Exhibit C, Paragraph 18.A.*

*** Deliverables entered below this line provide copyright to the State agency with a license to the University in accordance with Exhibit C, Paragraph 18.B.*

Exhibit A2

KEY PERSONNEL

List Key Personnel as defined in the Agreement starting with the PI, by last name, first name followed by Co-PIs. Then list all other Key Personnel in alphabetical order by last name. For each individual listed include his/her name, institutional affiliation, and role on the proposed project. Use additional consecutively numbered pages as necessary.

Last Name, First Name	Institutional Affiliation	Role on Project
PI:		
<i>Haffa, Arlene</i>	<i>Associate Professor School of Natural Sciences California State University, Monterey Bay Seaside, CA 93955</i>	<i>Haffa will maintain the project schedule and track progress towards project milestones. Haffa will also be responsible for project reporting, as well as tracking the project budget. Haffa will maintain the project schedule and track progress towards project milestones. She is responsible for overseeing the biological aspects of the project including the preparation and sterilization of culture media, and the growing the bacteria used in this study and mentor and support the students working on these aspects of the project. She will also help to analyze the data, write any associated manuscripts, and provide microbes or information to DPR as requested.</i>
Co-PI(s) – if applicable:		
Other Key Personnel (if applicable):		
<i>Silveus, John</i>	<i>Lecturer School of Natural Sciences California State University, Monterey Bay Seaside, CA 93955</i>	<i>Mr. Silveus is an instructor of Biological and Environmental Science in the School of Natural Sciences at California State University, Monterey Bay. He is the primary designer of the four channel bioreactor and other enhancements. Mr. Silveus has extensive experience in bioremediation, water quality monitoring, and hydrology, and will oversee and mentor students working on this aspect of the project. He will help with statistical analysis, manuscript preparation, the final report, and outreach.</i>

Exhibit A3

AUTHORIZED REPRESENTATIVES AND NOTICES

The following individuals are the authorized representatives for the State and the University under this Agreement. Any official Notices issued under the terms of this Agreement shall be addressed to the Authorized Official identified below, unless otherwise identified in the Agreement.

Changes in the University Principal Investigator are subject to the Key Personnel section of this Agreement. Changes in other contact information may be made by notification, in writing, between the parties.

State Agency Contacts	University Contacts
<p>Agency Name: Department of Pesticide Regulation</p> <p>Contract Project Manager (Technical)</p> <p>Name: Xin Deng Sr. Environmental Scientist (Specialist)</p> <p>Address: Department of Pesticide Regulation 1001 I Street, MS 3-B Sacramento, CA. 95814</p> <p>Telephone: 916-445-2506 Fax: 916-324-4088 Email: xin.deng@cdpr.ca.gov</p>	<p>University Name: University Corporation at Monterey Bay</p> <p>Principal Investigator</p> <p>Name: Arlene Haffa Associate Professor</p> <p>Address: California State University, Monterey Bay 100 Campus Center Seaside, CA 93955-8001</p> <p>Telephone: 831-582-4695 Fax: 831-582-4122 Email: ahaffa@csumb.edu</p>
<p>Authorized Official (contract officer)</p> <p>Name: Lu Saepanh Fiscal Services and Business Operations Branch Chief</p> <p>Address: Department of Pesticide Regulation 1001 I Street, MS 4-A Sacramento, CA 95814</p> <p>Send notices to (if different):</p> <p>Name: Xin Deng Sr. Environmental Scientist (Specialist)</p> <p>Address: Department of Pesticide Regulation 1001 I Street, MS 3-B Sacramento, CA. 95814</p> <p>Telephone: 916-445-2506 Fax: 916-324-4088 Email: xin.deng@cdpr.ca.gov</p>	<p>Authorized Official</p> <p>Name: Cynthia E. Lopez Director, Sponsored Programs Office</p> <p>Address: California State University, Monterey Bay 100 Campus Center, Bldg. 97 Seaside, CA 93955-8001</p> <p>Telephone: 831-582-3089 Fax: 831-582-3305 Email: clopez@csumb.edu</p> <p>Send notices to (if different):</p> <p>Name: <Name> <Title></p> <p>Address: <Department> <Address> <City,State,Zip></p> <p>Telephone: <Telephone#> Fax: <Fax#, if available> Email: <EmailAddress></p>

<p><i>Administrative Contact</i></p> <p>Name: Terry Harrison Contract Analyst</p> <p>Address: Department of Pesticide Regulation Business Services Office 1001 I Street, MS-4A Sacramento, CA 95814</p> <p>Telephone: (916) 445-2511 Fax: (916) 445-6845 Email: Terry.Harrison@cdpr.ca.gov</p>	<p><i>Administrative Contact</i></p> <p>Name: Christine Limesand Sponsored Programs Office</p> <p>Address: California State University, Monterey Bay 100 Campus Center, Bldg. 97 Seaside, CA 93955-8001</p> <p>Telephone: 831-582-3551 Fax: 831-582-3305 Email: climesand@csumb.edu</p>
<p><i>Financial Contact/Accounting</i></p> <p>Name: Accounts Payable</p> <p>Address: Department of Pesticide Regulation 1001 I Street, MS-4A P.O Box 4015 Sacramento, CA 95812-4015</p>	<p><i>Authorized Financial Contact/Invoicing</i></p> <p>Name: Robynne Morando Post Award Specialist</p> <p>Address: University Corporation at Monterey Bay 100 Campus Center Seaside, CA 93955-8001</p> <p>Telephone: 831-582-4647 Fax: 831-582-4716 Email: rmorando@csumb.edu</p>

Exhibit A4

USE OF PREEXISTING DATA, COPYRIGHTED WORKS AND DELIVERABLES

If the either Party will be using any third-party or pre-existing data or copyrighted works that have restrictions on use, then list all such data or copyrighted works and the nature of the restriction below. If no third-party or pre-existing data or copyrighted works will be used, check "none" in this section.

A. State: Preexisting Data and/or copyrighted works to be provided to the University from the State or a third party for use in the performance in the Scope of Work.

None or List:

Owner (State Agency or 3 rd Party)	Type of Data or copyrighted work (Restricted or Unrestricted)	Description	If Restricted, nature of restriction:

B. University: Use of Preexisting Data or copyrighted works included in Deliverables identified in Exhibit A1.

None or List:

Owner (University or 3 rd Party)	Type of Data or copyrighted work (Restricted or Unrestricted)	Description	If Restricted, nature of restriction:

C. Anticipated restrictions on use of Project Data.

If the University PI anticipates that any of the Project Data generated during the performance of the Scope of Work will have a restriction on use (such as subject identifying information in a data set) then list all such anticipated restrictions below. If there are no restrictions anticipated in the Project Data, then check "none" in this section.

None or List:

Owner (University or 3 rd Party)	Description	Nature of Restriction:

Exhibit A5

CURRICULUM VITAE (CV) / RÉSUMÉS / BIOSKETCH

Attach CV/Résumé/Biosketch for Key Personnel listed in Exhibit A2.

Arlene Lucille Maki Haffa, MS, PhD

School of Natural Sciences
California State University Monterey Bay
Seaside, CA 93955-8001

Education and Training

- B.S. Molecular Biology, University of WI-Madison, with Honors 1986 *Lipoprotein Profiles and Turnover Rates of LDL & HDL in Canines Before and After DHEA Treatment*, Advisors Alan Attie, PhD and E. Gregory MacECSUMBn, VMD (deceased)
- M.S. Veterinary Science, Univ. of WI-Madison 1990 *Hypocholesterolemic Effects of DHEA in the Rhesus Monkey*, Advisor, E. Gregory MacECSUMBn, VMD (deceased)
- Ph.D. Molecular and Cellular Biology Program, Department of Chemistry and Biochemistry, Arizona State University, Tempe, AZ 2002 *Energetics and Mechanism in Primary Electron Transfer of Bacterial Reaction Centers*, Advisor, Neal Woodbury, PhD

Research and Professional Experience

- 2015-present Associate Professor, S, CSU Monterey Bay, Seaside, CA
- 2011-2015 Assistant Professor, Div. of Sci. & Envi.Policy, CSU Monterey Bay, Seaside, CA
- 2007-2011 Assistant Professor, Biochemistry, UW-Oshkosh Dept. of Chemistry, Oshkosh, WI
- 2005-2008 Adjunct Instructor, Life Sciences, Monterey Peninsula College, Monterey, CA
- 2003-2007 Postdoctoral Fellow, MBARI, Moss Landing, CA
- 2003 Faculty Research Assoc., Dept. of Chem. & Biochem., AZ State University, Tempe, AZ
- 1998-2002 Grad. Rsrch Asst, TA, Dept of Chem & Biochem, AZ State University, Tempe, AZ
- 1995-97 Assoc Rsrch Sp, Nutr. Aspects of Osteo., Aging, & Immunol., Univ WI Sch of Med
- 1991-1995 Assoc. Rsrch Spec., Cancer & Obesity, UW School of Vet. Medicine, Madison, WI
- 1989-1991 Group Home Manager, Volunteers of America, Deerfield, WI
- 1987-1989 Graduate Rsrch. Asst., Lipid Met. & Obesity, UW-School of Vet. Med., Madison, WI
- 1986-1987 Analytical Chemist, Water Quality, DNR State of MD, EPA Lab, Annapolis, MD

Collaborators

Sharon Anderson, Renata Brillinger, Michael Cahn, William Horvath, Lee Johnson, Stefanie Kortman, Pamela Krone-Davis, Nate Jue, Forrest Melton, Timothy Miles, Joji Muramoto, Kirk Post, Carol Shennan, John Silveus, Aparna Sreenivasan, Erin Stanfield, Abby Taylor-Silva

Selected Professional Activities

Senate F13- ; SEP Curriculum Comm Co-chair, CSUMB F13-14, Chair 15- ; SMART Coll. Curr. Comm. Chair, F14, EPPC member 2014-, Chair F15- ; CSU CSUPERB, Faculty Consensus Group, F11- ; Chair Board of Directors of the Monterey County Chapter of the ACLU of Northern CA S14-15, Co-Chair Women in Sci. Advisory Board, University of Wisconsin System, 2009-11. Grant Reviewer: CDFA, NASA, NSF,

COAST, CSUPERB ; RevieCSUMBr: J. Physical Chemistry, Photosynth. Research, Journal of Environmental Chemistry.

Awards and Honors

Monterey Co. Adult Volunteer of the Year, 2005; Postdoctoral Fellowship, NSF/MBARI 2003-7; ASU Engaged Scholar 2003; ASU-Mol. & Cell. Bio. Student of the Year 2002; Regent's Acad. Scholarship, ASU 2001-2; Excellence in Teaching Award, Dept. of Chemistry, ASU 2000; Grad. Acad. Scholarship, ASU 1999-2000; IGERT Grad. Research Training Fellowship (Energy Transduction Mech.) NSF 1998-2002; Grad. College Diversity Assistantship, ASU 1998-99

Current Grants:

Quantifying N₂O Emissions under Different On-farm Irrigation & Nutrient Management BMPs that Reduce Groundwater NO₃⁻ Loading & Applied H₂O, \$270,000, CDFA FREP, PI A.Haffa, CoPI K.Post, 07/15-06/18.

Quantifying how BMPs for On-farm Irrigation Impact Subsequent Nitrogen Pathways, \$136,412, CSU ARI, PD F. Melton, Co-PD A. Haffa, 05/01/15-06/30/17.

Improving Student Success in Agriculturally-related Sciences with Academic Support & Career Mentoring, \$290,000, USDA NIFA 2014-38422-22085 PD Haffa CoPD Anderson, 9/14-8/17.

Teaching Experience

Biochemistry, BIO 310 and CHEM 310, Fall 2014-present, CSUMB

Integrated Physical Sciences, PHYS 121, Fall 2105 CSUMB

Course and Test-based Capstone, BIO 492, Spring 2013, CSUMB

Special Topics in Biology: Microbiology Research, BIO 495 (Group Capstone) F12-present

Health Science Service Learning, BIO 378S, Fall 2012-present, CSUMB

Microbiology, 320/L Lecture and Laboratory, Fall 2011-present, CSUMB

Biology Education Service Learning, BIO 378S, Spring 2012 CSUMB

Bioethics: A Case-based Course, Bio 300, Fall 2011, Spring 2012 CSUMB

Ethics, Science, and Environmental Policy, ENV5 212, Fall 2011, CSUMB

General, Organic and Biochemistry, CHEM 102 Lecture and 4 Laboratories, Spring 2009 -and Fall 2009,

Lecture and 2 Laboratories, Spring 2010, Univ. of WI Oshkosh (UWO)

Senior Seminar, Spring 2009, Fall 2009, Spring 2010, UWO

Applied Pharmacology Chemistry 360 Service Learning Trip to Central America, Spring 2010 (Nicaragua) and Spring 2011 (Nicaragua and Honduras), UWO

Interdisciplinary Studies 272, Cultural Connections, Spring 2009, Fall 2009, Spring 2010, UWO

Interdisciplinary Studies 175-1st Year Honor's Seminar Fall 2008, Spring 2010 and 2011, UWO

Chemistry 303/304 Biochemistry 1, Lec/Lab, F 2007, 2008, & 2010, Lec Sp 2008 & 2011, UWO

Organic Chemistry II 335 Laboratory, Spring 2008, UWO

General Chemistry II 106 Laboratory & Discussion, Spring 2008, UWO

Human Anatomy & Physiology, Lecture & Lab., Summer. 2007, Lab 2005-7, Healthy Living, 2005-2007, MPC

Advisor, Graduate Students, AMWS Program, CSUMB:

Emily Beck (PSM 2014 *Beneficial Reuse of Sediment Elkhorn Slough Tidal CSUMBland Project*)

Amber Schat (PSM 2014; *Arana Gulch Watershed Assessment and Stormwater Program*)

Gabriel Muro (AY 15/16), Steve Flores, Shawnte Greenway and Alana Kleven (PSM in prog.).

Advisor, Undergraduate Researchers & Capstone Projects (past 5 years):

N. Ballard, J. Brown, L. Caliera, A. Carpenter, A. Contreras, E. Dirck, J. Dunn, J. Flavin, W. Garibay, E.

Gonzales, T. Grove, C. Irwin, S. Martin, J. Martinez, N. McCarthy, C. McThorn, K. Moody, A. Moreno

(awarded NSF Grad. Research Fellowship), B. Munoz, T. Munoz, V. Nunez, N. Oliver, R. Perez, A. Picazo, A.

Preece, I. Quintanilla Salinas, O. Quintantar Gomez, G. Rolden, V. Romero, A. Reinhart, J. Ruminski, E. Sahami, A. Shabazian, M. Toovey, J. Vivar, A. Walling, N. CSUMBaverling, A. Stephenson-CSUMBnn

Recent Relevant Publications

- G. Muro and A. Haffa, *Monitoring of Soil Moisture Dynamics Via Ground Penetrating Radar*, AGU Fall 2016 Conference Proceedings, Abstract #83268, San Francisco, December 2015.
- A. Moreno* and A. Haffa, *The Impact of Fish & the Global Commercial Marine Harvest on the Ocean Iron Cycle*, (2014) PLoS ONE 9(9): e107690. doi:10.1371/journal.pone.0107690

John Michael Silveus, M.S.
322 White Court, Marina CA 93933
Home: (831) 338-9742, JSilveus@csumb.edu

Education

California State University Monterey Bay, Master's in Applied Watershed Science, December 2013
University of California Santa Cruz, BS Marine Biology, August 2007
Cabrillo College, Aptos CA, September 2003 to June 2005
San Jose State University, San Jose CA, September 2002 to June 2003
Cabrillo College, AA Degree in Liberal Arts and Sciences, June 2002

Experience

Instructor, CSUMB Science and Environmental Policy Division, August 2013 to Current

- Ecology, Evolution, and Biodiversity Laboratory (BIO 240L), Environmental Biology Lecture and Lab (BIO 230/L), and Intro to Environmental Science (ENVS 201/L).
- Mentor: Undergraduate Research Opportunities Center Scholars (2) & Researchers (5).

Laboratory Manager, CSUMB Geology and Hydrology Lab, January 2012 to August 2015

- Discharge measurements, suspended & bedload sediment and water quality sampling, topographic surveying using total stations, auto levels, GPS, & RTK GPS units, maintenance of lab & field equipment, and installation of hydrologic equipment.
- Preparation of final scientific reports to stakeholders and funding agencies.
- Training of personnel in lab and field standard operating procedures, reporting protocols, and writing of technical scientific reports.

Research Assistant, CSUMB Geology and Hydrology Lab, January 2012 to January 2013

- Discharge measurements, suspended & bedload sediment and water quality sampling, and topographic surveying using total stations, auto levels, GPS, and RTK GPS units.
- Preparation of scientific reports to stakeholders and funding agencies regarding progress and completion of laboratory projects.

Contractor, City of Watsonville Public Works Department, January 2012 to January 2013

- Construction & implementation of a field lab at Pinto Lake to study possible on-site mitigation of effluent contaminated with toxins from harmful cyanobacterial blooms.
- Techniques included use of a settling tank with alum injection, slow sand filtration, granular activated carbon, ozonation, and filtration through polymorphic resin beads.

Laboratory Technician, Cabrillo College, October 2007 to October 2012

Ecology, Field Ecology, General Biology, Cellular & Molecular Biology, Botany, General Chemistry, Inorganic Chem, Organic Chem, Marine Bio, Microbiology, Anatomy Physiology

Instructional Assistant (TA) for Cabrillo College Biology Field Classes

Ecology, Natural History of California, General Biology, Ecological Field Methods

Student Assistant IV, National Marine Fisheries Service (NMFS), SouthCSUMBst Fisheries Science Center (SWFSC), Fisheries Ecology Division, Santa Cruz CA June 2005 to September 2007

Coho Captive Broodstock Program husbandry of Captive broodstock fish:

Maintenance of saltwater & freshwater systems, Spawning, Cryo-preservation of milt for future spawning, Data collection and analysis, Experimental Design

Wild Fish Experience:

Design and construction of life history experiments, Seining, Trapping, Bottom trawling for population assessments, Electro-fishing, Stream captures, Fin clipping, PIT tagging

TA for Wildlands Studies Program Big Sur Project, September 2010 and 2011

Stream Survey, Coastal Otter population survey, Ecological methods, Ecological theory

Student Assistant III, Cabrillo College Biology Department February 2003 to June 2005

Preparation of media, Preparation of student labs. Equipment repair, Sanitation and sterilization of labs and equipment.

Supplemental Instructor, Cellular and Molecular Biology, Cabrillo College 9/2004 to 6/2005

- Tutor/TA for Cellular and Molecular Biology students through the ACCESS Program

Technical Reports

Smith D., Bassett R., Holloway R., Silveus J., Chow K., Luna L., Hession S., Perkins P., Watson F., Largay, B., and Olson, A. 2016. Sediment Trapping Function of an Unmanaged Fluvial CSUMBland: Carneros Creek, Monterey County. Watershed Institute, CSUMB, Pub. No. WI-2016-02, 69 pp.

Chow, K, Luna, L, Smith D, and Silveus, J. 2015. Hollister Hills SVRA Trail Erosion Surveys: Summer 2015. Watershed Institute, CA State Monterey Bay, Pub. No. WI-2015-04, 32 pp.

Silveus, J, Teaby A, and Smith D. 2014. Hollister Hills SVRA Trail Erosion Surveys: Spring 2014. The Watershed Institute, California State Monterey Bay, Publication No. WI-2014-09, 20 pp.

Smith D, Goodmansen, A, Silveus, J. 2014. Hollister Hills SVRA Sediment Budget: Water year 2012-2013. Watershed Institute, CA State Monterey Bay, Publication No. WI-2014-01, 17 pp.

Teaby A, Silveus, J, and Smith D. 2013. Hollister Hills SVRA Trail Erosion Surveys: Spring 2013. Watershed Institute, CA State Monterey Bay, Publication No. WI-2013-07, 32 pp.

Teaby A, Silveus, J, Smith D. 2013. Hollister Hills SVRA Sediment Basin Volumes: Water year 2012-2013. Watershed Institute, CA State Monterey Bay, Publication No. WI-2014-12, 27 pp.

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Exhibit A6

CURRENT & PENDING SUPPORT (Will be incorporated, if applicable.)

University will provide current & pending support information for Key Personnel identified in Exhibit A2 at time of proposal and upon request from State agency. The "Proposed Project" is this application that is submitted to the State. Add pages as needed.

PI: Arlene Haffa					
Status (currently active or pending approval)	Award # (if available)	Source (name of the sponsor)	Project Title	Start Date	End Date
Proposed Project	16-C0085	CA Dept of Pesticide Reg.	Isolating and Characterizing Microbial Bioremediators of Pesticides and Quantifying Bioremediation Rates in Multichannel Wood Chip Bioreactors	01/01/2017	06/30/2019
CURRENT	2014-38422-22085	US Dept of Agriculture	Improving Student Success in Agriculture-Related Sciences	9/1/2014	8/31/2018
CURRENT	15-0356-SA	CA Dept Food and Ag/FREP	Quantifying N2O Emissions	07/01/2015	06/30/2018
CURRENT	15-07-001	CSU Agricultural Research Initiative	Quantifying Benefits of On-Farm BMPs for Irrigation & Nutrient Management	05/01/2015	06/30/2017
PENDING		CA Dept Food and Ag/SCBGP	Improving Anaerobic Soil Disinfestation for Soilborne Disease Control in CA Strawberries	10/01/2016	03/31/2019

Key Personnel: John Silveus					
Status	Award #	Source	Project Title	Start Date	End Date
Proposed Project	16-C0085	CA Dept of Pesticide Reg.	Isolating and Characterizing Microbial Bioremediators of Pesticides and Quantifying Bioremediation Rates in Multichannel Wood Chip Bioreactors	1/1/17	6/30/19
CURRENT		CSU Faculty Support Grant	CSUMB Bioreactor Infrastructure and Field Sampling Expansion: Further Inclusion in Research from School of Natural Science Students and Addition of Real World Data Collection	6/1/16	6/15/17
CURRENT					
PENDING					

NAME OF INDIVIDUAL					
Status	Award #	Source	Project Title	Start Date	End Date
Proposed Project					
PENDING					

NAME OF INDIVIDUAL					
Status	Award #	Source	Project Title	Start Date	End Date
Proposed Project					
PENDING					

Exhibit B
Budget Estimate for Project Period

BUDGET CATEGORY	From: To:	1/1/2017 6/30/2017 Year 1	7/1/2017 6/30/2018 Year 2	7/1/2018 6/30/2009 Year 3	Year 4	Year 5
PERSONNEL: <i>Salary and fringe benefits.</i>		\$19,218	\$43,989	\$30,019	\$0	\$0
TRAVEL		\$0	\$0	\$1,500	\$0	\$0
MATERIALS & SUPPLIES		\$8,000	\$8,060	\$8,900	\$0	\$0
EQUIPMENT		\$0	\$0	\$0	\$0	\$0
CONSULTANT COSTS		\$0	\$0	\$0	\$0	\$0
SUBCONTRACTS		\$0	\$0	\$0	\$0	\$0
OTHER DIRECT COSTS (ODC)	<i>Subject to IDC Calc</i>					
Tuition	<i>N</i>	\$0	\$0	\$0	\$0	\$0
Vehicle usage	<i>Y</i>	\$100	\$100	\$100	\$0	\$0
ODC #3	<i>Y</i>	\$0	\$0	\$0	\$0	\$0
ODC #4	<i>Y</i>	\$0	\$0	\$0	\$0	\$0
ODC #5	<i>Y</i>	\$0	\$0	\$0	\$0	\$0
ODC #6	<i>Y</i>	\$0	\$0	\$0	\$0	\$0
TOTAL DIRECT COSTS		\$27,318	\$52,149	\$40,519	\$0	\$0
Indirect (F&A) Costs						
<i>On-Campus</i>	<i>F&A Base MTDC</i>	\$27,318	\$52,149	\$40,519	\$0	\$0
Indirect (F&A) Costs	<i>25.00%</i>	\$6,830	\$13,036	\$10,130	\$0	\$0
TOTAL ESTIMATED COSTS PER YEAR		\$34,148	\$65,185	\$50,649	\$0	\$0
TOTAL ESTIMATED COSTS FOR PROPOSED PROJECT PERIOD						\$149,982

JUSTIFICATION. See Exhibit B1 - Follow the SUPAM budget justification instructions.

Funds Reversion Dates

06/29/2020 06/30/2021 06/30/2012

Project Period Budget Flexibility (lesser of % or Amount

Prior approval required for budget changes betCSUMBen approved cost categories above the thresholds identified.

% 10.00 Or Amount \$10,000

Exhibit B1

Budget Justification

The Budget Justification will include the following items in this format.

Personnel

Name. Starting with the Principal Investigator list the names of all known personnel who will be involved on the project for each year of the proposed project period. Include all collaborating investigators, individuals in training, technical and support staff or include as "to be determined" (TBD).

Role on Project. For all personnel by name, position, function, and a percentage level of effort (as appropriate), including "to-be-determined" positions.

Arlene Haffa, PhD, Principal Investigator, is an Associate Professor at CSUMB. Haffa will maintain the project schedule and track progress towards project milestones. Haffa will also be responsible for project reporting, as CSUMB tracking the project budget. Haffa will maintain the project schedule and track progress towards project milestones. She is responsible for overseeing the biological aspects of the project including the preparation and sterilization of culture media, and the growing the bacteria used in this study, and mentoring and supporting the students working on these aspects of the project. She will also help to analyze the data, write any associated manuscripts, and provide microbes or information to DPR as requested.

John Silveus, MS, Key Personnel. Mr. Silveus is an instructor of Biological and Environmental Science in the School of Natural Sciences at California State University, Monterey Bay. He is the primary designer of the four channel bioreactor and other enhancements. Mr. Silveus has extensive experience in bioremediation, water quality monitoring, and hydrology, and will oversee and mentor students working on this aspect of the project. He will help with statistical analysis, manuscript preparation, the final report, and outreach.

TBD, Undergraduate Students. Students will assist in the laboratory upkeep (media preparation, dishwashing, inventory), as CSUMB as with growth assays, and data entry. They will also help to support the work on the bioreactor site by taking meta-data measurements, maintenance and upkeep, pump monitoring, etc.

Graduate Student. A graduate student will be recruited to assist with a literature review and data analysis, writing, as CSUMB as to help serve as a near-peer mentor to the undergraduate student. The 400 hours have been chosen to match the Professional Science Master's Program requirements.

Fringe Benefits.

In accordance with University policy, explain the costs included in the budgeted fringe benefit percentages used, which could include tuition/fee remission for qualifying personnel to the extent that such costs are provided for by University policy, to estimate the fringe benefit expenses on Exhibit B.

University Corporation at Monterey Bay charges each employee's actual benefit costs. The benefits of this project are estimated using the average of non-benefitted employees (9.1%) which includes FICA, Workers Compensation, SUI, and Medicare. \$8,322 is requested for fringe benefits.

Travel

Itemize all travel requests separately by trip and justify in Exhibit B1, in accordance with University travel guidelines. Provide the purpose, destination, travelers (name or position/role), and duration of each trip. Include detail on airfare, lodging and mileage expenses, if applicable. Should the application include a request for travel outside of the state of California, justify the need for those out-of-state trips separately and completely.

Funds of \$1,400 are requested to fund ground transportation, lodging, food, and registration costs for 2 in-state conferences for Haffa and Silveus to present the results. This will be in year 3, and the exact location is TBD.

Materials and Supplies

Itemize materials supplies in separate categories. Include a complete justification of the project's need for these items. Theft sensitive equipment (under \$5,000) must be justified and tracked separately in accordance with State Contracting Manual Section 7.29.

CSUMB are requesting a total of \$16,935 in materials and supplies. This includes supplies necessary to growth microbial cultures (e.g. media reagents, petri dishes), ELISAs to measure pesticides in house, consumables and minor repair parts (e.g. pipette tips, tubing, pumps), DNA isolation and visualization reagents (agarose gel, dye), shipping to send DNA samples for genetic sequencing of the 16S rRNA gene. CSUMB are also requesting \$3,000 to purchase a spectrophotometer that is necessary to collect microbial growth kinetic data during the enrichment culture, microbial isolation phase of the work. This is the only lacking equipment to successfully carry out this research.

Equipment

List each item of equipment (greater than or equal to \$5,000 with a useful life of more than one year) with amount requested separately and justify each.

N/A

Consultant Costs

Consultants are individuals/organizations who provide expert advisory or other services for brief or limited periods and do not provide a percentage of effort to the project or program. Consultants are not involved in the scientific or technical direction of the project as a whole. Provide the names and organizational affiliations of all consultants. Describe the services to be performed, and include the number of days of anticipated consultation, the expected rate of compensation, travel, per diem, and other related costs.

N/A

Subawardee (Consortium/Subrecipient) Costs

Each participating consortium organization must submit a separate detailed budget for every year in the project period in Exhibit B2 Subcontracts. Include a complete justification for the need for any subawardee listed in the application.

N/A

Other Direct Costs

Itemize any other expenses by category and cost. Specifically justify costs that may typically be treated as indirect costs. For example, if insurance, telecommunication, or IT costs are charged as a direct expense, explain reason and methodology.

N/A

Rent

If the scope of work will be performed in an off-campus facility rented from a third party for a specific project or projects, then rent may be charged as a direct expense to the award.

N/A

Indirect (F&A) Costs

Indirect costs are calculated in accordance with the University budgeted indirect cost rate in Exhibit B.

\$30,277 is being requested as Indirect (F&A) Costs, calculated at 25% of the total direct costs. This is the agreed upon rate included in the AB20 Implementing MOU betCSUMB the Department of General Services, the University of California and the California State University.

Exhibit B3

Invoice and Detailed Transaction Ledger Elements

In accordance with Section 14 – Payment and Invoicing, the invoice, summary report and/or transaction/payroll ledger shall be certified by the University's Financial Contact and the PI.

Summary Invoice – includes either on the invoice or in a separate summary document – by approved budget category (Exhibit B) – expenditures for the invoice period, approved budget, cumulative expenditures and budget balance available¹

- Personnel
- Equipment
- Travel
- Subawardee – Consultants
- Subawardee – Subcontract/Subrecipients
- Materials & Supplies
- Other Direct Costs
 - TOTAL DIRECT COSTS (if available from system)
- Indirect Costs
 - TOTAL

Detailed transaction ledger and/or payroll ledger for the invoice period ²

- Univ Fund OR Agency Award # (to connect to invoice summary)
- Invoice/Report Period (matching invoice summary)
- GL Account/Object Code
- Doc Type (or subledger reference)
- Transaction Reference#
- Transaction Description, Vendor and/or Employee Name
- Transaction Posting Date
- Time Worked
- Transaction Amount

¹ If this information is not on the invoice or summary attachment, it may be included in a detailed transaction ledger.

² For salaries and wages, these elements are anticipated to be included in the detailed transaction ledger. If all elements are not contained in the transaction ledger, then a separate payroll ledger may be provided with the required elements.

Exhibit G

Negotiated Alternate UTC Terms (if applicable)

*While every effort has been made to keep the UTC as universal in its application as possible, there may be unique projects where a given term in the UTC may be inappropriate or inadequate. AB20 allows for those terms to be changed, but only through the mutual agreement and negotiation of the State agency and the University campus. If a given term in the UTC is to be changed, the change should **not** be noted in Exhibit C, but rather noted separately in Exhibit G.*

1. Harassment Free Workplace

The Department of Pesticide Regulation (DPR) is committed to providing a safe, secure environment, free from sexual misconduct. It is policy of the Department that employees have the right to work in an environment that is free from all forms of discrimination, including sexual harassment. This policy specifically speaks to freedom from a sexually harassing act that results in the creation of an intimidating, hostile or offensive work environment or that otherwise interferes with an individual's employment or work performance. As a Contractor with DPR, you and your staff are expected to comply with a standard of conduct that is respectful and courteous to DPR employees and all other persons contacted during the performance of this Agreement. Sexual harassment is unacceptable, will not be tolerated; and may be cause for prohibiting some or all of the Contractor's staff from performing work under this Agreement.