

STATE OF CALIFORNIA  
**STANDARD AGREEMENT**  
 STD 213 (Rev 05/18)

|                                     |
|-------------------------------------|
| AGREEMENT NUMBER<br><b>18-C0018</b> |
| REGISTRATION NUMBER                 |

- This Agreement is entered into between the State Agency and the Contractor named below:  

|                     |  |  |  |
|---------------------|--|--|--|
| STATE AGENCY'S NAME | Department of Pesticide Regulation, hereinafter referred to as "State" or "DPR"      |  |  |
| CONTRACTOR'S NAME   | The Regents of the University of California, hereinafter referred to as "University" |  |  |
- The term of this Agreement is: July 1, 2018 through June 30, 2020
- The maximum amount of this Agreement is: \$ 119,997.00
- 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.

|  |            |
|--|------------|
| <b>Exhibit A – A7:</b> A–Scope of Work; A1–Deliverables; A2–Key Personnel; A3–Authorized Representatives; A4–Use of Intellectual Property; A5–Resumes/Biosketch; A6–Current & Pending Support; A7-Third Party Confidential Information (if applicable) | 13 page(s) |
| <b>Exhibit B – B–Budget; B1–Budget Justification; B2– Subawardee Budgets (if applicable); B3– Invoice Elements</b>   | 4 page(s)  |
| <b>Exhibit C* – University Terms and Conditions</b>  | UTC-518    |

- Check mark additional Exhibits below, and attach applicable 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 or Computing Resources page(s)
  - Exhibit G** – Negotiated Alternate UTC Terms 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/ModelContractLanguageUniversities.aspx>

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

| CONTRACTOR  |                           | California Department of General Services Use Only |
|---|---------------------------|--|
| CONTRACTOR'S NAME (if other than an individual, state whether a corporation, partnership, etc.) |                           |  |
| The Regents of the University of California   |                           |  |
| BY (Authorized Signature)   | DATE SIGNED (Do not type) |  |
|              | 7/2/2018                  |  |
| PRINTED NAME AND TITLE OF PERSON SIGNING  |                           |  |
| Grace Liu, Associate Director, Research Administration  |                           |  |
| ADDRESS   |                           |  |
| 1850 Research Park Drive, Suite 300, Davis, CA 95618  |                           |  |
| STATE OF CALIFORNIA   |                           |  |
| AGENCY NAME   |                           |  |
| Department of Pesticide Regulation  |                           |  |
| BY (Authorized Signature)   | DATE SIGNED (Do not type) |  |
|              | 7.11.18                   |  |
| PRINTED NAME AND TITLE OF PERSON SIGNING  |                           |  |
| Anise Severns, Assistant Director   |                           |  |
| ADDRESS   |                           |  |
| 1001 I Street, Sacramento, CA 95814   |                           |  |

Exempt per: Delegation Letter 74.6

## Exhibit A – Scope of Work

### Project Summary & Scope of Work

Contract       Grant

**PI Name:**      Randy Dahlgren

**Project Title:**      Data Driven Evaluation of Pesticide Signal Observed in the Aquatic Environment

### Project Summary/Abstract

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

In this project, we aim to build a database with extensive list of geomorphological and hydrological attributes for any surface water locations and develop a data-driven model that can link the differing behaviors in pesticide signals at various monitoring sites to the large array of the attributes values.

The objectives are to:

- 1) Build a database with extensive list of attributes that may affect the fate and transport of pesticides in the environment. The attributes will be formatted at refined spatial and temporal scales so that the geomorphological and hydrological properties of any surface water monitoring site can be derived from the database.
- 2) Develop a data-driven geospatial model that enables use of the large arrays of attribute data (i.e., pesticide use reporting, hydrological, geomorphological properties) to predict the environmental concentration of pesticides at sites that have not been sampled or are not routinely monitored.

### Scope of Work

#### 1. Background and Goals

California, with many long-term monitoring programs and special studies, is the focus of intensive monitoring to assess pesticide pollution to surface waters. Due to differences in study objectives and practical constraints, the sampling design of those efforts may select sites located anywhere in the hydrological system—from the edge of the field to tributary or main stem sites. Due to the varying pesticide contribution from their corresponding drainage areas, contaminants at the monitoring sites may display different behaviors, such as range of concentration, variation over time, frequency of detection and exceedance over water quality thresholds. In addition, because sites located downstream also integrate the signals from sites located upstream and other unmonitored region, signals at those sites are interrelated. This dependency is difficult to characterize due to variation in the lag-time resulted from off-site transport, hydrologic flow, and degradation. Currently there is no valid approach to distinguish the behavioral differences from the sampling site locations. The common practice is either to treat all sites equal as if there is no behavioral differences and interdependency, or to select a subset of sites, e.g., outlets of separate watersheds with similar characteristics. This common practice does not fully utilize the information contained in the

monitoring data and may fail to discover some key factors that may inform effective mitigation. Utilizing all available data to assess statewide pesticide occurrence and trends thus requires an understanding of the hydrologic conditions and contributing area to any given sampling site. In this project, we aim to build a database with extensive list of geomorphological and hydrological attributes for any surface water locations and develop data-driven model that can link the differing behaviors in pesticide signals at various monitoring sites to the large array of the attributes values.

## 2. Work to Be Performed

### Task 1:

**Conduct literature review.** In the first phase of the project, an extensive literature review will take place to identify attributes that may affect the fate and transport of pesticides in the environment.

### Task 2:

**Build the database.** The second phase will identify databases that contain those attributes and evaluate the temporal/spatial resolution as well as the accuracy of the data. The data will be reconciled / reformatted to refine spatial/temporal scales in order to characterize the condition at any given surface water location.

### Task 3:

**Develop Data-driven model.** The third phase of the project is to develop a geospatial model that can link the large array of attribute data to the observed pesticide signal in the environment and identify key factors that affect the signal. The model will be calibrated at sites with monitoring data and will be used to predict the pesticides signals at sites that are not routinely monitored.

## 3. Deliverables

- 1) A technical memorandum will be prepared summarizing the attributes that may affect the fate and transport of pesticides in the environment. The memorandum will be submitted to DPR's Contract Manager via email on or before September 30, 2018.
- 2) A technical memorandum summarizing the database compilation procedure will be prepared and submitted to DPR's Contract Manager via email on or before March 31, 2019.
- 3) The compiled database will be transferred to DPR's Contract Manager on or before June 30, 2019.
- 4) A technical memorandum summarizing the development of a modeling framework will be prepared and submitted to DPR's Contract Manager via email on or before March 31, 2020.
- 5) Present one seminar to DPR, toward the end of the project, on the database and final model.
- 6) Prepare a final technical report of the study to DPR 6 weeks before completion of the contract.

## 4. State Responsibilities

- 1) DPR will participate, as needed, in Tasks 1 to 3 of the project.
- 2) DPR will review the memorandums (deliverable 1, 2, and 4) and will provide comments within 3 weeks of submission
- 3) DPR will review the final technical report (deliverable 6) and will provide comments within 3 weeks of submission

## Exhibit A1 - Deliverables

### 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.*

If use of any Deliverable is restricted or is anticipated to contain preexisting Intellectual Property with any restricted use, it will be clearly identified in Exhibit A4, Use of Preexisting Intellectual Property.

Unless otherwise directed by the State, the University Principal Investigator shall submit all Deliverables to the State Contract Project Manager, identified in Exhibit A3, Authorized Representatives.

| <b>Deliverable</b>  | <b>Description</b>   | <b>Due Date</b> |
|---|--|-----------------|
| 1   | Literature review, identifying the attributes that may affect the fate and transport of pesticides in the environment. | Sept. 30, 2018  |
| 2   | Build the database, summarizing the database compilation procedure and the transferring the completed database         | June 30, 2019   |
| 3   | Develop the model, elaborating the modeling framework and the selection of the final model                             | March 31, 2020  |
| 4   | Seminar and final report   | May 15, 2020    |
|   |  |                 |
|   |  |                 |
|   |  |                 |
|   |  |                 |
| <b>The following Deliverables are subject to Section 19. Copyrights, paragraph B of Exhibit C</b> |  |                 |
|   |  |                 |
|   |  |                 |
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|   |  |                 |
|   |  |                 |

## Exhibit A2 – Key Personnel

### 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                  |
|---|----------------------------------|----------------------------------|
| <b>PI:</b>                                  |                                  |                                  |
| <i>Dahlgren, Randy</i>                      | <i>UC Davis</i>                  | <i>Principal Investigator</i>    |
| <b>Co-PI(s) – if applicable:</b>            |                                  |                                  |
| <i>Aue, Alexander</i>                       | <i>UC Davis</i>                  | <i>Statistical Consideration</i> |
| <i>Last name, First name</i>                | <i>Institutional affiliation</i> | <i>Role on the project</i>       |
| <b>Other Key Personnel (if applicable):</b> |                                  |                                  |
| <i>Last name, First name</i>                | <i>Institutional affiliation</i> | <i>Role on the project</i>       |
| <i>Last name, First name</i>                | <i>Institutional affiliation</i> | <i>Role on the project</i>       |

## Exhibit A3 – Authorized Representatives

### 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.

| State Agency Contacts   | University Contacts   |
|---|---|
| <p>Agency Name: Department of Pesticide Regulation</p> <p><b><i>Contract Project Manager (Technical)</i></b></p> <p>Name: Dan Wang<br/>           Senior Environmental Scientist</p> <p>Address: Department of Pesticide Regulation<br/>           1001 I Street<br/>           Sacramento, CA 95814</p> <p>Telephone: 916/324-4201<br/>           Fax: 916/324-4088<br/>           Email: dan.wang@cdpr.ca.gov</p>   | <p>University Name: University of California, Davis</p> <p><b><i>Principal Investigator</i></b></p> <p>Name: Dr. Randy Dahlgren<br/>           Professor</p> <p>Address: Department of Land, Air, and Water<br/>           Resources<br/>           3134 Plant and Environmental Science Bldg.<br/>           One Shields Avenue<br/>           Davis, CA 95616</p> <p>Telephone: 530/400-9842<br/>           Fax: 530/752-1552<br/>           Email: radahlgren@ucdavis.edu</p> <p>Designees to certify invoices under Section 14 of Exhibit C on behalf of PI:</p> <ol style="list-style-type: none"> <li>1. &lt;Name&gt;, &lt;Title&gt;, &lt;EmailAddress&gt;</li> <li>2. &lt;Name&gt;, &lt;Title&gt;, &lt;EmailAddress&gt;</li> </ol> |
| <p><b><i>Authorized Official (contract officer)</i></b></p> <p>Name: Anise Severns<br/>           Assistant Director</p> <p>Address: Department of Pesticide Regulation<br/>           1001 I Street, 4<sup>th</sup> Floor<br/>           Sacramento, CA 95814</p> <p>Telephone: 916/650-6957<br/>           Fax: 916/445-4149<br/>           Email: anise.severns@cdpr.ca.gov</p> <p><b><i>Send notices to (if different):</i></b></p> <p>Name: Dan Wang<br/>           Senior Environmental Scientist</p> <p>Address: Department of Pesticide Regulation<br/>           1001 I Street<br/>           Sacramento, CA 95814</p> <p>Telephone: 916/324-4201<br/>           Email: 916/324-4088</p> | <p><b><i>Authorized Official</i></b></p> <p>Name: Grace Liu<br/>           Associate Director</p> <p>Address: Office of Research, Sponsored Programs<br/>           1850 Research Park Drive, Suite 300<br/>           Davis, CA 95618</p> <p>Telephone: 530/754-7700<br/>           Fax: 530/752-0333<br/>           Email: awards@ucdavis.edu</p> <p><b><i>Send notices to (if different):</i></b></p> <p>Name: Victoria Sissac<br/>           Contracts &amp; Grants Analyst</p> <p>Address: Office of Research, Sponsored Programs<br/>           1850 Research Park Drive, Suite 300<br/>           Davis, CA 95618</p> <p>Telephone: 530/754-7700<br/>           Email: vsissac@ucdavis.edu</p>                                     |

|  |   |
|--|---|
| <p><b>Administrative Contact</b></p> <p>Name: Kim Bateman<br/>Contract Analyst</p> <p>Address: Department of Pesticide Regulation<br/>1001 I Street, MS-4A<br/>Sacramento, CA 95814</p> <p>Telephone: 916/445-2512<br/>Fax: 916/445-6845<br/>Email: kim.bateman@cdpr.ca.gov</p>                                  | <p><b>Administrative Contact</b></p> <p>Name: Victoria Sissac<br/>Contracts &amp; Grants Analyst</p> <p>Address: Office of Research, Sponsored Programs<br/>1850 Research Park Drive, Suite 300<br/>Davis, CA 95618</p> <p>Telephone: 530/754-8094<br/>Fax: 530/752-0333<br/>Email: vsissac@ucdavis.edu</p>   |
| <p><b>Financial Contact/Accounting</b></p> <p>Name: Department of Pesticide Regulation<br/>Accounts Payable</p> <p>Address: Department of Pesticide Regulation<br/>Accounts Payable<br/>P.O. Box 4015<br/>Sacramento, CA 95812-4015</p> <p>Telephone: (916) 445-4149<br/>Email: Accounts_Payable@cdpr.ca.gov</p> | <p><b>Authorized Financial Contact/Invoicing</b></p> <p>Name: James Ringo, Contracts and Grants<br/>Accounting<br/>Associate Accounting Officer</p> <p>Address: Contracts &amp; Grants Accounting<br/>1441 Research Park Drive<br/>Davis, CA 95618</p> <p>Telephone: 530/757-8523<br/>Fax: 530/757-8721<br/>Email: <a href="mailto:efa@ucdavis.edu">efa@ucdavis.edu</a></p> <p>Payment Address: Cashier's Office<br/>University of California Davis<br/>P.O. Box 989062<br/>West Sacramento, CA 95798-9062</p> <p>Designees for invoice certification in accordance with<br/>Section 14 of Exhibit C on behalf of the Financial Contact:</p> <ol style="list-style-type: none"><li>1. &lt;Name&gt;, &lt;Title&gt;, &lt;EmailAddress&gt;</li><li>2. &lt;Name&gt;, &lt;Title&gt;, &lt;EmailAddress&gt;</li><li>3. &lt;Name&gt;, &lt;Title&gt;, &lt;EmailAddress&gt;</li></ol> |

## Exhibit A4 – Use of Intellectual Property

### USE OF INTELLECTUAL PROPERTY

*If either Party will be using any third-party or pre-existing intellectual property (including, but not limited to data, copyrighted works, known patents, trademarks, service marks and trade secrets) "IP" with restrictions on use, then list all such IP and the nature of the restriction below. If no third-party or pre-existing IP will be used, check "none" in this section.*

A. State: Preexisting IP 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<br>(Name of State Agency<br>or 3 <sup>rd</sup> Party) | Description | Nature of restriction: |
|---|-------------|------------------------|
|   |             |                        |
|   |             |                        |
|   |             |                        |
|   |             |                        |

B. University: Restrictions in Preexisting IP included in Deliverables identified in Exhibit A1, Deliverables.

None or  List:

| Owner<br>(Name of University or<br>3 <sup>rd</sup> Party) | Description | 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<br>(University or 3 <sup>rd</sup> Party) | Description | Nature of Restriction: |
|--|-------------|------------------------|
|  |             |                        |
|  |             |                        |



## Exhibit A5 - RÉSUMÉ/BIOSKETCH

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### RÉSUMÉ/BIOSKETCH

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#### Randy Alan Dahlgren

Distinguished Professor of Soil Science & Biogeochemistry &  
Russell L. Rustici Endowed Chair in Rangeland Watershed Sciences

Soils and Biogeochemistry Section  
Dept. Land, Air and Water Resources  
University of California  
Davis, CA 95616-8626  
E-mail: radahlgren@ucdavis.edu

**EDUCATION:** 1987 Ph.D., College of Forest Resources,  
University of Washington, Forest Soils  
1984 M.S., College of Forest Resources,  
University of Washington, Forest Soils  
1981 B.S., College of Agriculture,  
North Dakota State University, Soil Science

#### **POSITIONS HELD:**

Distinguished Professor of Soils and Biogeochemistry, University of California-Davis, 7/16 to present  
Russell L. Rustici Endowed Chair in Rangeland Watershed Sciences, 7/09 to present  
Director, Ecosystem Restoration Program - Technical Support Program, 7/11 to present  
Thousands Talents Professor & Research Director, Wenzhou Medical University, China, 3/08 to present  
Guest Professor, Zhejiang University, Hangzhou, China, 5/07 to present  
Professor of Soils and Biogeochemistry, University of California-Davis, 7/97 to 6/16  
Chair, Department of Land, Air and Water Resources, 1/10 to 6/13  
Director, Kearney Foundation of Soil Science: Scaling in Soil Ecosystem mission, 5/06 to 6/12  
Associate Professor of Soil Science, University of California-Davis, 7/94 to 6/97  
Visiting Scientist – Landcare Research and Massey University, Palmerston North, New Zealand 1/96 to 12/96  
Assistant Professor of Soil Science, University of California-Davis, 2/89 to 6/94  
Post-doctoral Research Associate, Dept. of Environmental Engineering, Syracuse University, 9/87 to 12/88  
Research Assistant, College of Forest Resources, University of Washington, 6/81 to 8/87  
Student Trainee, Soil Conservation Service, 1978-1981

#### **Selected Administrative & Professional Activities:**

US National Committee for Soil Sciences (2017 – present)  
USDA National Technical Committee for Hydric Soils (2005-2012)  
Director, TMDL Research/Technical Support Program for Sacramento and San Joaquin Rivers (7/01-6/11)  
Vice-Chair, Soils and Biogeochemistry Program, Dept. Land, Air and Water Resource (7/00 to 6/03)  
Chair, Hydrologic Sciences Graduate Group (7/98 to 6/02)  
Chair, College of Agriculture and Environmental Sciences Executive Committee (7/99 to 6/00)  
Editorial Board – Ecology and Ecological Monographs (2001 to 2016)  
– Soil Science and Plant Nutrition (1999 to 2002 and 2005 to present)  
– Indonesian Journal of Agricultural Science (2016 to present)

- Journal of Integrated Field Sciences (2002 to present)
- Plant and Soil (2005 - 2014)

### **HONORS AND AWARDS**

Japanese Society for the Promotion of Science Fellowship (2000)  
Chancellor's Teaching Fellowship with Jessica Veenstra (2005)  
Fellow, Soil Science Society of America (2006)  
UC Davis Academic Senate Distinguished Teaching Award (2008)  
Russell L. Rustici Endowed Chair in Rangeland Watershed Sciences (2009)  
Soil Science Society of America Journal – Citation for Excellence in Manuscript Review (2010)  
Japanese Society for the Promotion of Science Fellowship (2010)  
UC Davis Prize for Undergraduate Teaching and Scholarly Achievement (2012)  
The Western Extension Directors' Association – Award of Excellence: Rangeland Watershed Program (2012)  
Yandang Friendship Award, Wenzhou, China for significant contribution by foreign expertise (2012)  
Westlake Friendship Award, Zhejiang Province, China for significant contribution by foreign expertise (2013)  
President, UC Davis Quarter Century Club (2014-2015)  
Fellow, UC Davis Agricultural Sustainability Institute (2016)  
Distinguished Alumni – University of Washington, School of Environmental and Forest Sciences (2016)

**RESEACH INTERESTS:** Agricultural, forest, rangeland, wetland, and freshwater aquatic ecosystem biogeochemistry - interactions of hydrologic, geochemical, and biological processes in regulating nutrient cycling and surface and ground water chemistry; genesis and mineralogy in volcanic soils.

### **TEACHING EXPERIENCE:**

|                          |                                 |
|--------------------------|---------------------------------|
| Science and Society 9    | Crisis in the Environment?      |
| Soil Science 10          | Introductory Soil Science       |
| Soil Science 105/205     | Field Studies of Soil Resources |
| ESM/PLB 144              | Trees and Forests               |
| Soil Science 214         | Soil Mineralogy                 |
| Soil Science/Ecology 219 | Ecosystem Biogeochemistry       |

### **HONORARY AND PROFESSIONAL SOCIETIES:**

American Society of Agronomy, Soil Science Society of America, Ecological Society of America, International Society of Soil Science, American Geophysical Union, California Forest Soils Council, Professional Soil Scientist Association of California, Alpha Zeta, Xi Sigma Pi, Gamma Sigma Delta

### **PROFESSIONAL CERTIFICATION:**

Certified Professional Soil Scientist: American Registry of Certified Professionals in Agronomy, Crops and Soils (ARCPACS) (1987 to 2015)  
Professional Soil Scientist Association of California (1989 to present)

## Alexander Aue

### PERSONAL DATA

Professor Phone: +1-530-554-1555  
Department of Statistics Fax: +1-530-752-7099  
University of California, Davis Email: [aaue@ucdavis.edu](mailto:aaue@ucdavis.edu)  
Davis, CA 95616 Web: [www.stat.ucdavis.edu/~alexau](http://www.stat.ucdavis.edu/~alexau)

### EDUCATION

Ph.D., Universität zu Köln, Germany, 2004, Applied Mathematics  
Diplom, Philipps-Universität Marburg, Germany, 2000, Mathematics

### PROFESSIONAL EXPERIENCE

#### Academic Positions

2017–present University of California, Davis Professor  
2013–2016 University of California, Davis Vice Chair for Undergraduate Affairs  
2011–2017 University of California, Davis Associate Professor  
2008–2011 University of California, Davis Assistant Professor  
2006–2007 Clemson University Assistant Professor  
2004–2006 University of Utah Assistant Professor (Lecturer)

#### Visiting Positions

08–09/2016 Visiting Scientist  
Department of Electrical Engineering and Computer Science, University of Michigan  
02–03/2016 Simons Visiting Professor  
Mathematical Research Institute Oberwolfach and Ruhr-Universität Bochum, Germany  
01–02/2014 Visiting Fellow  
Isaac Newton Institute for Mathematical Sciences, University of Cambridge, UK

#### Professional Society Memberships

2000–present Deutsche Mathematiker-Vereinigung  
2005–present Institute of Mathematical Statistics  
2005–present Bernoulli Society for Mathematical Statistics and Probability  
2007–present American Statistical Association  
2008–present The Econometric Society  
2918–present The American Association for the Advancement of Science

#### Honors and Awards

2013 Econometric Theory Multa Scripsit Award  
2016 Elected Fellow of the American Statistical Association  
2016 UC Davis Chancellor's Award for Excellence in Mentoring Undergraduate Research

### UNIVERSITY AND PROFESSIONAL SERVICE

#### Editorial Service

Associate Editor, Journal of Computational and Graphical Statistics, 2012–present  
Associate Editor, Journal of the Royal Statistical Society, Series B, 2013–present  
Associate Editor, Journal of Statistical Planning and Inference, 2014–present  
Associate Editor, Electronic Journal of Statistics, 2016–present  
Associate Editor, Journal of Business and Economic Statistics, 2016–present

#### Other Service to Profession

Ordinary Council Member, Bernoulli Society, 2017–2021.

#### Conference Organisation

Second International Workshop in Sequential Methodologies 2009, Troyes, France,  
Member of the Scientific Program Committee.  
2009 NBER-NSF Time Series Conference, Davis, CA,

Member of the local Organizing Committee.  
UC Davis Statistical Sciences Symposium 2013: Complex and Massive Data, Davis, CA,  
Member of the Organizing Committee.  
2014 German Open Conference on Probability and Statistics (Stochastik-Tage), Ulm, Germany,  
Organizer for Section 12: "Statistics of Stochastic Processes".  
2014 International Indian Statistical Association Conference, Riverside, CA,  
Member of the Organizing Committee.  
European Meeting of Statisticians 2015, Amsterdam, Netherlands,  
Invited Session Organizer.  
Recent Developments in Statistics for Complex Dependent Data, 2015, Loccum, Germany,  
Invited Paper Session Organizer.  
2016 Joint Statistical Meetings, Chicago, IL,  
Program Chair of the IMS Contributed Papers Sessions.  
10th International Conference on Computational and Methodological Statistics, 2017, London, UK,  
Organized Invited Session Organizer.  
11th International Conference on Computational and Methodological Statistics, 2018, Pisa, Italy,  
Member of Scientific Program Committee and Organized Invited Session Organizer.  
European Meeting of Statisticians 2019, Palermo, Italy, Invited Session Organizer.

#### **Grant Reviews**

Panelist National Science Foundation, Division of Mathematical Sciences  
Reviewer Natural Sciences and Engineering Research Council of Canada  
Reviewer Fonds quebecois de la recherche sur la nature et les technologies  
Reviewer National Security Agency  
Reviewer Hong Kong Research Council

#### **Referee**

Annals of Applied Statistics, Annals of Statistics, Annals of the Institute of Statistical Mathematics,  
Applied Stochastic Models in Business and Industry, Austrian Journal of Statistics, Biometrika,  
Bernoulli, Communications in Statistics—Simulation and Computation,  
Communications in Statistics—Theory and Methods, Computational Statistics & Data Analysis,  
Econometric Theory, Econometrica, Economics Bulletin, Extremes,  
IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on Signal Processing,  
Journal of Applied Econometrics, Journal of Business & Economic Statistics,  
Journal of Econometrics, Journal of Financial Econometrics, Journal of Multivariate Analysis,  
Journal of Probability and Statistics, Journal of Statistical Computation and Simulation,  
Journal of Statistical Planning and Inference, Journal of the American Statistical Association,  
Journal of the Royal Statistical Society, Series B, Journal of Time Series Analysis,  
Journal of Time Series Econometrics, Lithuanian Mathematics Journal,  
Mathematics and Computers in Simulation, Probability and Mathematical Statistics,  
Oxford Bulletin of Economics and Statistics, Rocky Mountain Journal of Mathematics,  
Scandinavian Journal of Statistics, Statistica Sinica, Statistical Modelling: An International Journal,  
Sankhya: The Indian Journal of Statistics, Statistics, Statistics & Probability Letters,  
Statistics and Its Interface, Stochastic Processes and Their Applications, Test.

#### **SPONSORED RESEARCH**

[1] Monitoring structural changes in dynamic time series models,  
National Science Foundation DMS-0604670,  
Co-Principal Investigator, \$ 160,002, 2006–2009.  
[2] Monitoring structural changes in dynamic time series models,  
National Science Foundation, DMS-0652420 (Supplemental Funding),  
Co-Principal Investigator, \$ 20,958, 2007–2009.  
[3] Topics in nonlinear and functional time series,  
National Science Foundation DMS-0905400,

Co-Principal Investigator, \$ 250,000, 2009–2012.

[4] Functional linear models and functional time series,  
National Science Foundation DMS-1209226,  
Principal Investigator, \$ 200,000, 2012–2015.

[5] Statistical inference for functional and high-dimensional time series,  
National Science Foundation DMS-1305858,  
Co-Principal Investigator, \$ 200,000, 2013–2016.

[6] Random matrix approach to high-dimensional time series,  
National Science Foundation DMS-1407530,  
Co-Principal Investigator, \$ 330,000, 2014–2017.

[7] Spatial-temporal modeling for the assessment of complex environmental monitoring data,  
California Department of Pesticide Regulation,  
Principal Investigator, \$ 150,000, 2015–2020.

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## Exhibit A6 – Current & Pending Support

### CURRENT & PENDING SUPPORT

*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.*

| <b>PI: Randy Dahlgren</b>                                |                                   |   |  |                   |                 |
|--|-----------------------------------|---|--|-------------------|-----------------|
| <b>Status<br/>(currently active or pending approval)</b> | <b>Award #<br/>(if available)</b> | <b>Source<br/>(name of the sponsor)</b>               | <b>Project Title</b>   | <b>Start Date</b> | <b>End Date</b> |
| Proposed Project   | 18-C0018                          | Department of Pesticide Regulation                    | Data Driven Evaluation of Pesticide Signal Observed in the Aquatic Environment   | 7/1/2018          | 6/30/2018       |
| CURRENT  | E0883002                          | California Department of Fish and Game                | Ecosystem Restoration Program Project Review Office  | 6/01/2013         | 6/30/2018       |
| CURRENT  | N/A                               | United States Bureau of Reclamation                   | Baseline assessment of salmonid rearing habitat and growth in tributaries above Shasta Reservoir                             | 10/01/2016        | 09/30/2019      |
| CURRENT  | N/A                               | California Department of Forestry and Fire Protection | Effects of Forest Stand Density Reduction on Nutrient Cycling and Nutrient Transport at Caspar Creek Experimental Watersheds | 06/01/2017        | 05/31/2020      |
| CURRENT  | N/A                               | California Department of Fish and Game                | Ecosystem Restoration Program Project Review Office  | 07/01/2018        | 06/30/2023      |
| CURRENT  | N/A                               | United States Bureau of Reclamation                   | Investigating the Role of Nutrients (N & P) in Food Resource Dynamics of the Sacramento-San Joaquin Delta                    | 10/01/2017        | 09/30/2020      |
| <b>Alexander Aue</b>                                     |                                   |   |  |                   |                 |
| <b>Status</b>  | <b>Award #</b>                    | <b>Source</b>   | <b>Project Title</b>   | <b>Start Date</b> | <b>End Date</b> |
| Proposed Project   | 18-C0018                          | Department of Pesticide Regulation                    | Data Driven Evaluation of Pesticide Signal Observed in the Aquatic Environment   | 7/1/2018          | 6/30/2020       |
| CURRENT  | 15-C0055                          | California Department of Pesticide Regulation         | Spatial-temporal modeling for the assessment of complex environmental monitoring data  | 10/1/2015         | 3/31/2020       |

## Exhibit B - Budget

### Budget for Project Period

Principal Investigator (Last, First):

Dahlgren, Randy

Exhibit B

| COMPOSITE BUDGET FOR ENTIRE PROPOSED PROJECT PERIOD |                                |                                 |                                 |            |                  |  |
|---|--------------------------------|---------------------------------|---------------------------------|------------|------------------|--|
|   |                                | 07/01/2018                      | to                              | 06/30/2020 |                  |  |
| BUDGET CATEGORY                                     | From:<br>To:                   | 7/1/2018<br>6/30/2019<br>Year 1 | 7/1/2019<br>6/30/2020<br>Year 2 | Year 3     | TOTAL            |  |
| PERSONNEL: <i>Salary and fringe benefits.</i>       |                                | \$24,479                        | \$50,204                        | \$0        | \$74,683         |  |
| TRAVEL  |                                | \$3,000                         | \$3,000                         | \$0        | \$6,000          |  |
| MATERIALS & SUPPLIES                                |                                | \$4,000                         | \$3,525                         | \$0        | \$7,525          |  |
| EQUIPMENT   |                                | \$0                             | \$0                             | \$0        | \$0              |  |
| CONSULTANT  |                                | \$0                             | \$0                             | \$0        | \$0              |  |
| SUBRECIPIENT  |                                | \$0                             | \$0                             | \$0        | \$0              |  |
| OTHER DIRECT COSTS (ODC)                            | <i>Subject to<br/>IDC Calc</i> |                                 |                                 |            |                  |  |
| ODC #1, publishing costs                            | Y                              | \$1,500                         | \$1,500                         | \$0        | \$3,000          |  |
| ODC #2, graduate student tuition                    | N                              | \$0                             | \$5,987                         | \$0        | \$5,987          |  |
| ODC #3  | Y                              | \$0                             | \$0                             | \$0        | \$0              |  |
| ODC #4  | Y                              | \$0                             | \$0                             | \$0        | \$0              |  |
| ODC #5  | Y                              | \$0                             | \$0                             | \$0        | \$0              |  |
| ODC #6  | Y                              | \$0                             | \$0                             | \$0        | \$0              |  |
| <b>TOTAL DIRECT COSTS</b>                           |                                | <b>\$0</b>                      | <b>\$0</b>                      | <b>\$0</b> | <b>\$0</b>       |  |
| Indirect (F&A)<br>Costs                             | <i>F&amp;A Base<br/>MTDC *</i> |                                 |                                 |            |                  |  |
| <i>Rate</i>   |                                | \$32,979                        | \$58,229                        | \$0        | \$91,208         |  |
| 25%   |                                | \$8,245                         | \$14,557                        | \$0        | \$22,802         |  |
| <b>TOTAL COSTS PER YEAR</b>                         |                                | <b>\$41,224</b>                 | <b>\$78,773</b>                 | <b>\$0</b> |                  |  |
| <b>TOTAL COSTS FOR PROPOSED PROJECT PERIOD</b>      |                                |                                 |                                 |            | <b>\$119,997</b> |  |

\* MTDC = Modified Total Direct Cost

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

**Funds Reversion Dates: Unless otherwise specified, fund reversion dates are three years from fiscal year end of year funded**

**Project Period Budget Flexibility (lesser of % or Amount)**

|  |        |          |
|--|--------|----------|
| Prior approval required for budget changes between approved budget 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.

Dr. Randy Dahlgren: PI of the project, who will oversee the project design and implementation and communication with the contract manager.

Dr. Aue, Alexander: Co-PI of the project, who will supervise and develop statistical models and participate to the discussion of the database portion.

Dr. Ruoyu Wang: A postdoc who will work to develop GIS databases and participate to the statistical model development by working with PIs. Dr. Wang will also have the responsibility to communicate and discussion the project findings with the contract manager on a frequent basis. Dr. Wang will provide semi-annual report on the project. GSR 3 will assist Professor Aue for model development in this project. The Junior specialist will provide assistance to Dr. Wang for data collections and data quality assessment.

#### **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.*

The benefits for Dr. Ruoyu Wang and other personnel was based on the university policy to calculate and details see the budget sheet.

#### 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.*

The specified travel cost will be associated with the local travel to communicate with the contract managers and possibly travel to conferences and workshop to present the research results. At this point, there are no specific locations of the conferences identified, travel cost is an estimation.

#### 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.*

The supplies listed in the budget include a high end power computing device with high memory, large hard disk space at year 1. In addition, there will be some computing supplies associate with that.

We envision that we would have publications generated from the research. The publication fee was budgeted for publishing journal articles.

#### 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.*

No equipment is required for this project over \$5,000.

#### 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 budgeted indirect cost rate in Exhibit B.*

Per the agreement between the University of California and the State of California indirect costs have been calculated at the rate of 25.0% Modified Total Direct Cost (MTDC) for the duration of the project.

### **Exhibit B3 – Invoice Elements** **Invoice and Detailed Transaction Ledger Elements**

In accordance with Section 14 of Exhibit C – Payment and Invoicing, the invoice, summary report and/or transaction/payroll ledger shall be certified by the University's Financial Contact and the PI (or their respective designees).

**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 available<sup>1</sup>**

- 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<sup>2</sup>**

- 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

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

<sup>2</sup> 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)

An alternate provision in Exhibit G must clearly identify whether it is replacing, deleting or modifying a provision of Exhibit C. The Order of Precedence incorporated in Exhibit C clearly identifies that the provisions on Exhibit G take precedence over those in Exhibit C.

*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. California Education Code §67327(b) 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.