

**DEPARTMENT OF WATER RESOURCES**

DIVISION OF ENVIRONMENTAL SERVICES  
3251 S STREET  
SACRAMENTO, CA 95816-7017



January 15, 2005

**TO:** Ms. Rebecca Moser  
U.S. Environmental Protection Agency  
Office of Environmental Information  
Office of Information Collection  
1200 Pennsylvania Ave., NW, Mail Code 2823-T  
Washington, DC 20460

**APPLICANT:** California Environmental Protection Agency,  
California Department of Water Resources &  
California Resources Agency

**RE:** **Augmentation OF CEDEN** - Grant Proposal Submittal for 2005 Environmental  
Information Exchange Network Grant Program

Dear Ms. Moser:

The California Environmental Protection Agency, California Resources Agency and the California Department of Water Resources are pleased to submit a request for federal assistance for the *Augmentation of CEDEN*. As per the guidelines listed at <http://www.epa.gov/Network/> for applications over \$100,000, attached is the original document and two full copies including:

- Standard Form (SF) 424, Application for Federal Assistance
- SF-424A, Budget Information for Non-Construction Programs
- SF-424B, Assurances for Non-Construction Programs
- Certification Regarding Lobbying, if the application is for over \$100,000
- EPA Form 4700-4, Pre-Award Compliance Review Report for All Applicants Requesting Federal Financial Assistance
- EPA Form 5700-54, Key Contacts Form
- Work Plan
- Detailed Itemized Budget
- Biographical Sketches for the Project Managers
- Quality Assurance Narrative

Please note the "Copy of Negotiated Indirect Cost Rate Agreement" is not included in this package and in compliance of page 22 of the guidelines, the Department of Water Resources, who will be initial recipient of any funds that may result from this proposal, is currently engaged in obtaining an indirect cost rate in accordance with OMB Circular A-87, "Cost Principles for State, Local, and Indian Tribal Governments". Completion of this process will take place within the required six months. Our budgeted salaries in the "Amount Requested" of our Detailed Budget are inclusive of any indirect charges.

Listed below are the additional items requested in the guidelines for this memo.

DUNS #: 17-121-4307

PROJECT MANAGER: Karl C. Jacobs, Chief  
Interagency Information Services  
CA Department of Water Resources  
3251 S Street  
Sacramento, CA 95816

GRANT CATEGORY: Challenge

AMOUNT REQUESTED: \$748,664

PROJECT PARTNERS: Moss Landing Marine Labs data management and training team participants in the Surface Water Ambient Monitoring Program (SWAMP) and the Sacramento River Watershed Program (SRWP).

COORDINATION IT/IM: Gary Arstein-Kerslake Agency Information Officer, Cal/EPA Chief Technology Officer, CIWMB and John Ellison Agency Information Officer, California Resources Agency are the ranking information managers within their respective agencies and are participants in this proposal. They will provide coordination.

PREFERRED ASSISTANCE VEHICLE: Grant

FORM OF FUNDING: Direct Funding

METHOD OF INCORPORATING: PPG

Per the grant instructions, an additional copy of the full proposal has been sent to Ms. Patricia Eklund, U.S. EPA Region IX Regional Project Officer. We appreciate the opportunity to participate in the Environmental Information Exchange Network Grant program. Please contact me at (916) 227-0435 if you have any questions regarding the attached grant application.

Sincerely,



Karl C. Jacobs  
Program Manager, Interagency Information Section  
California Department of Water Resources

Enclosures  
cc Ms. Patricia Eklund



**BUDGET INFORMATION - Non-Construction Programs**

**SECTION A - BUDGET SUMMARY**

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. CEDEN Augmentation	66-608	\$	\$	\$748,664	\$	\$748,664
2.						0.00
3.						0.00
4.						0.00
5. Totals		\$	0.00 \$	\$748,664	\$	0.00 \$

**SECTION B - BUDGET CATEGORIES**

Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY					Total (5)
	(1)	(2)	(3)	(4)	(5)	
a. Personnel	\$223,125					\$ 223,125
b. Fringe Benefits						\$124
c. Travel	\$124					0.00
d. Equipment	\$3000					\$3,000
e. Supplies	\$42,000					\$42,000
f. Contractual	\$480,415					\$480,415
g. Construction						0.00
h. Other						0.00
i. Total Direct Charges (sum of 6a-6h)	\$748,664		0.00	0.00	0.00	\$748,664
j. Indirect Charges						0.00
k. TOTALS (sum of 6i and 6j)	\$748,664	\$	0.00	0.00	0.00	\$ 748,664

Please note indirect rates are included under Personnel costs and are estimated to be 25%. A formal indirect rate agreement has been submitted.

7. Program Income

\$

\$

\$

\$

\$

0.00

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Standard Form 424A (Rev. 7-97)  
Prescribed by OMB Circular A-102

Previous Edition Usable

**SECTION C - NON-FEDERAL RESOURCES**

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8.				\$ 0.00
9.				\$ 0.00
10.				\$ 0.00
11.				\$ 0.00
12. Total (SUM OF LINES 8-11)				\$ 0.00

**SECTION D - FORECASTED CASH NEEDS**

	Total for 1 <sup>st</sup> Year	1 <sup>st</sup> Quarter	2 <sup>nd</sup> Quarter	3 <sup>rd</sup> Quarter	4 <sup>th</sup> Quarter
13. Federal	\$ 748,664 0.00	\$187,166	\$187,166	\$187,166	\$187,166
14. Non-Federal	0.00				
15. TOTAL (sum of lines 13 and 14)	\$ 748,664 0.00	\$ 187,166 0.00	\$187,166.00	\$187,166 0.00	\$187,166 0.00

**SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT**

(a) Grant Program	FUTURE FUNDING PERIODS (years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16.	\$	\$	\$	\$
17.				
18.				
19.				
20. TOTAL (sum of lines 16-19)	\$	0.00 \$	0.00 \$	0.00 \$

**SECTION F - OTHER BUDGET INFORMATION**

21. Direct Charges:	
22. Indirect Charges:	
23. Remarks:	See Remarks page 1

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**ASSURANCES - NON-CONSTRUCTION PROGRAMS**

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

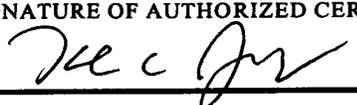
NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
4. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. 4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. 1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), which prohibits discrimination on the

- basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. 6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) 523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. 290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VII of the Civil Rights Act of 1968 (42 U.S.C. 3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.
7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. 1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

<p>9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. 276a to 276a-7), the Copeland Act (40 U.S.C. 276c and 18 U.S.C. 874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-333), regarding labor standards for federally-assisted construction subagreement.</p> <p>10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.</p> <p>11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in flood plains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. 7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).</p>		<p>12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271 et seq.) Related to protecting components or potential components of the national wild and scenic rivers system.</p> <p>13. Will assist the awarding agency in assuring compliance will Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. 469a-1 et seq.).</p> <p>14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.</p> <p>15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. 2131 et seq.) Pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.</p> <p>16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4801 et seq.) Which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.</p> <p>17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."</p> <p>18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.</p>
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SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL 	TITLE Program Manager Interagency Information Section
APPLICANT ORGANIZATION California Department of Water Resources	DATE SUBMITTED 0/14/2005

**CERTIFICATION REGARDING LOBBYING**

**CERTIFICATION FOR CONTRACTS, GRANTS,  
LOANS, AND COOPERATIVE AGREEMENTS**

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, ADisclosure Form to Report Lobbying,@ in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including sub-contracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352 , title 31 U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Karl C. Jacobs Program Manager Interagency Information Section

\_\_\_\_\_  
Typed Name & Title of Authorized Representative

*Karl C. Jacobs*  
\_\_\_\_\_  
Signature of Authorized Representative

*4/14/05*  
\_\_\_\_\_  
Date



Washington, DC 20460  
 Preaward Compliance Review Report for  
 All Applicants Requesting Federal Financial Assistance

FORM Approved  
 OMB No. 2090-0014  
 Expires: 4-30-99

Note: Read Instructions before completing form.

I. A. Applicant (Name, City, State)  California Department of Water Resources	B. Recipient (Name, City, State)  California Department of Water Resources	C. EPA Project No.
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II. Brief description of proposed project, program or activity.

California Environmental Data Exchange Network Augmentation

III. Are any civil rights lawsuits or complaints pending against applicant and/or recipient? If yes, list those complaints and the disposition of each complaint.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IV. Have any civil rights compliance reviews of the applicant and/or recipient been conducted by any Federal agency during the two years prior to this application for activities which would receive EPA assistance? If yes, list those compliance reviews and status of each review.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
V. Is any other Federal financial assistance being applied for or is any other Federal financial assistance being applied to any portion of this project program or activity? If yes, list the other Federal Agency(s), described the associated work and the dollar amount of assistance.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

VI. If entire community under the applicant's jurisdiction is not served under the existing facilities/services, or will not be served under the proposed plan, give reasons why.

VII. Population Characteristics	Number of People
1. A. Population of Entire Service Area	Entire State of CA
B. Minority Population of Entire Service Area	
2. A. Population Currently Being Served	Entire State of CA
B. Minority Population Currently Being Served.	
3. A. Population to be Served by Project, Program or Activity	Entire State of CA
B. Minority Population to be Served by Project, Program or Activity	
4. A. Population to Remain Without Service	Not Applicable
B. Minority Population to Remain With Service	

VIII. Will all new facilities or alterations to existing facilities financed by these funds be designed and constructed to be readily accessible to and usable by handicapped person? If no, explain how a regulatory exception (40 CFR 7.70) applies. Not Applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No
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IX. Give the schedule for future projects, programs or activities (or of future plans), by which services will be provided to all beneficiaries within applicant's jurisdiction. If there is no schedule, explain why.

Services provided apply equally to all citizens of California.

X. I certify that the statements I have made on this form and all attachments thereto are true, accurate and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law.

A. Signature of Authorized Official 	B. Title of Authorized Official Program Manager Information Systems Section	C. Date 1/14/2005
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For the U.S. Environmental Protection Agency

<input type="checkbox"/> Approved	Authorized EPA Official	Date
<input type="checkbox"/> Disapproved		

## BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed for Form Page 2.  
Follow the sample format on preceding page for each person. **DO NOT EXCEED FOUR PAGES.**

NAME		POSITION TITLE	
Kris Lightsey		Software Developer	
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Louisiana State University	B.A.	1982	Psychology
Villanova University	M.Sc.	2000	Computer Science

### A. Positions and Honors.

Member - Upsilon Phi Epsilon (Computer Science Honor Society)  
Member - ACM, National Chapter  
Member - International Sports Science Association  
Member - Mu Sigma Rho (Humanities Honor Society)  
Member - Alpha Epsilon Delta (Health Sciences Honor Society)  
Member - Psi Chi (Psychology Honor Society)

### B. Educational Experience.

Operating system theory, file organization and access, systems administration, client/server and IPC programming, usability research (human computer interaction), data communications, data warehousing, webpage design, XML, HTML, CGI programming, programming languages (Java, Visual Basic, C, C++, Pascal, assembler, Perl, Awk, Unix shell and COBOL), JDBC, ODBC, SQL, Oracle and database design.

### C. Projects and Experience.

Designed and implemented web site for the Bay Delta and Tributaries Database group. This included user interface design, graphics design and editing, client-side programming in JavaScript, server-side programming in PHP and Perl, database interface design and implementation, datamart creation and update, usability and performance testing. Technologies used include Unix (Solaris), Windows 95/98/NT/2000, Perl, Informix, Photoshop, Illustrator, JavaScript, VBA, Visual Basic, Access, hand-coded HTML, Java, SQL and PHP. Responsibilities also include project lifecycle management, development of user requirements, system and functional specifications, and delegation of activities to other developers. Current projects include implementation of GIS-based web data retrieval, customized web applications, SPL design and maintenance, backend data transfer programming, SOAP and XML.

Performed software development for various clients using PHP, SQL, Informix, C, Perl, Java, Visual Basic and JavaScript. Projects involved design, development and maintenance of relational databases (Access, Informix, MySQL), user interfaces, web sites and customized user applications. Operating systems included Solaris, Linux, Ultrix, Windows 95/98/2000. Installed and maintained Apache web servers. Created web pages and web-based applications using HTML, Java, JavaScript, PHP and Perl. Performed support, maintenance and customization of LAN environment. Front end web site development included graphics editing, hand-coding HTML, Adobe Photoshop, Illustrator and Macromedia Flash. Applied results of usability research to design and implementation of projects.

Performed systems administration and systems programming on Sun servers running Solaris 7 and Linux clusters for the University of Pennsylvania. Job also entailed web design and consulting to various departments as well as database design and programming. Technologies used included MySQL, Oracle, Java, Perl, PHP, HTML, DHTML, JavaScript, Solaris, Windows 2000/XP.

Worked as a developer for CareScience doing web development and performance analysis on a large system written primarily in Perl, JavaScript and C, accessing an Oracle data warehouse. The base system was a

combination of Unix and NT servers running Netscape's web server, and ETL tools were provided by Informatica. Other projects included design and development with XML, XSL, XSLT, XPath, JSP, Java servlets, and JavaBeans on Linux systems utilizing Apache and Tomcat servers.

Performed systems administration (Solaris) for Villanova University. This included host security, database conversions (legacy system to Sybase), software and hardware procurement and installation, installation and configuration of Apache webserver, SQL, and PHP. Work involved HTML, Perl, MySQL, and PHP programming.

For the State of California Dept. of Social services, performed systems administration, network administration, router configuration, software installation and configuration and systems analysis on a Unix local and wide area network. Also performed systems support tasks using C, Awk, Perl, Bourne shell and Curses. Designed backup configuration and network printing configuration. Setup connectivity to remote Legitech database and programmed user interface to that system. Created and taught technical training classes for staff. Acted as lead on special projects.

For the State of California Franchise Tax Board, performed mainframe software installation and maintenance of a vendor-supplied teleprocessing monitor called COM-LETE under MVS ESA on an Hitachi mainframe. Wrote and maintained systems programs. Responded to inquiries from help-desk personnel and solved system-related production problems. Performed dump analysis and programmed in assembler and COBOL to solve software and system problems.

**KEY CONTACTS FORM**

**Authorized Representative:** *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name: Karl C. Jacobs  
Title: Program Manager Interagency Information Section  
Complete Address: 3251 "S" St Sacramento CA 95816 RM A-16  
Phone Number: (916) 227-0435

**Payee:** *Individual authorized to accept payments.*

Name: Victor Pacheco  
Title: Branch Chief, Environmental Planning and Information Branch  
Mail Address: 3251 "S" St Sacramento CA 95816 RM A-22  
Phone Number: 227-7529

**Administrative Contact:** *Individual from Sponsored Program Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc.)*

Name: Judi Sabella  
Title: Associate Government Program Analyst  
Mailing Address: 3251 "S" St Sacramento CA 95816 RM B-21  
Phone Number: (916) 227-1312  
FAX Number: (916) 227-7554  
E-Mail Address: [sabella@water.ca.gov](mailto:sabella@water.ca.gov)

**Principal Investigator:** *Individual responsible for the technical completion of the proposed work.*

Name: Karl C. Jacobs  
Title: Program Manager Interagency Information Section  
Complete Address: 3251 "S" St Sacramento CA 95816 RM A-16  
Phone Number: (916) 227-0435  
FAX Number: (916) 227-7554  
E-Mail Address: [kjacob@water.ca.gov](mailto:kjacobs@water.ca.gov)  
Web URL: [bdat.ca.gov](http://bdat.ca.gov)

**2005 CHALLENGE GRANT PROPOSAL APPLICATION  
ENVIRONMENTAL INFORMATION EXCHANGE NETWORK GRANT PROGRAM**

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**PROJECT INFORMATION**

**Project Title:** AUGMENTATION OF CEDEN  
**Fiscal Year/Grant Category:** FY Challenge  
**Total Funds Requested:** \$748,664  
**Applicant:** California Environmental Protection Agency  
California Department of Water Resources, & Resources Agency  
**DUNS Number:** 17-121-4307  
**Contact Persons:** Gary Arstein-Kerslake                      Karl C. Jacobs, Chief,  
Agency Information Officer                      Interagency Information Services  
Cal/EPA    CA Department of Water Resources  
1001 I Street    3251 S St Sacramento  
Sacramento CA 95812    Sacramento CA 95816  
916/341-6147    916/227-0435  
GArstein@ciwmb.ca.gov    KJacobs@water.ca.gov

**Project Partners:** Cal/EPA will provide over all coordination and organization of California's efforts to implement data flows to the Exchange Network

CA DWR will provide technical expertise in database development and network node support

Moss Landing Marine Lab's Data Management Team for the Surface Water Ambient Monitoring Program (SWAMP) will provide SRWP training and network node support.

Sacramento River Watershed Program (SRWP), contractor, will provide training and coordination of watershed groups in data entry.

California Environmental Resources Evaluation System (CERES) will provide services and tools for metadata integration and dissemination.

**IM/IT Roles:** Gary Arstein-Kerslake Agency Information Officer, Cal/EPA Chief Technology Officer, CIWMB and John Ellison Agency Information Officer, California Resources Agency are the ranking information managers within their respective agencies and are participants in this proposal. They will provide coordination.

**Preferred Vehicle:** Grant

**Preferred Funding Form:** Direct Funding

**II. PURPOSE, GOALS, MILESTONES, AND EXPECTED BENEFITS**

The California Department of Water Resources (DWR) Bay Delta and Tributaries Data Management and Sharing System (BDAT) and State Water Resources Control Board -Moss Landing Marine Labs (MLML)-Surface Water Ambient Monitoring Program (SWAMP) propose expansion of the existing distributed environmental data management system (CEDEN – California Environmental Data Exchange Network) that has been successfully implemented within DWR’s collaborative Bay Delta and Tributaries project. The purpose of the CEDEN Augmentation Project is to increase the amount, usefulness and accessibility of data available to scientists, engineers, stakeholders and other interested parties by implementing data expansion into the EPA Exchange Network. The benefits described in this two-year project include the gross improvement in the flow of data and information between the watersheds located in the California Bay-Delta Tributary System and the integrated networks of the Exchange Network and the incorporation of application Decision Support Software (DSS) that turns data into useable information. Consolidation of various and diverse environmental data sets will be furthered within the state, and local management of these data sets will be improved. Operational costs will be minimized by using the existing data management infrastructure of CEDEN and by incorporating existing application software. Linking new watershed data to CEDEN will expand public access via the Cal/EPA Exchange Network Node using the web services specified by the EPA. Increased data exchange with the EPA’s Environmental Information Exchange Network (EIEN) will improve via EPA’s new network protocols when EIEN accesses CEDEN through the Cal/EPA node.

The goals of the CEDEN Augmentation Project are to promote collaboration and interaction among the members of the data exchange community of the Bay-Delta/Tributary region and improve the sharing and dissemination of the existing system statewide. It is imperative that water data and information are accessible to scientists, engineers, decision makers and other interested parties through the Exchange Network. These data currently exist in diverse formats and in different databases that are inconsistent, and in some cases, difficult to access. The CEDEN Project provides planning, implementation and training, and ultimately, improvement and expansion of the existing data exchange network. Environmental data will be more easily and seamlessly stored, integrated, versioned and distributed to data users for analysis, GIS and modeling applications.

Data capture will be enhanced under the direction of Sacramento River Watershed Program (SRWP). Multiple watershed groups currently collect much needed data to support decision-making tools such as modeling, evaluation and review processes. The linking of additional fisheries, water quality and other environmental data types from these watershed groups will accelerate joint analysis of data sets from different parts of the region and help in the development of data for models used by researchers who have not previously worked together. Standardizing these data and making them accessible will help facilitate and/or relate ongoing salmonid studies in the Bay-Delta System with studies conducted elsewhere (e.g., the northwestern United States or Canada). The proposed incorporation of Decision Support Software (DSS) into the network will greatly enhance the analytical and management utility of the network.

An important focus of the CEDEN Project is to develop links between data, mandatory metadata, reports and other information regarding the collection and analysis of data provided to the network. As a partner in the CEDEN Project, California Resources Agency's California Environmental Resources Evaluation System (CERES), the state's leader in managing and providing access to metadata, will provide the tools necessary to make this information available on-line. Use of monitoring data with good documentation aids researchers and decision makers in assessing the interoperability of data sets and how data from certain groups can and can not be used. In addition, literature and other supporting information help researchers understand what has already been accomplished by others, what methodologies are recommended for future efforts, along with a wealth of information regarding the monitoring data that is provided to the network.

**II. OUTLINE OF GOALS, MILESTONES AND BENEFITS**

<b>Goal</b>	<b>Task</b>	<b>Target Date</b>	<b>Expected Benefits</b>
<b>1. Expand data sharing components of CEDEN.</b>	1.1 SWAMP Training of SRWP	Oct 05– Nov 05	General overview of database design and application provided to SRWP participants.
	1.2 On-the-Job Training	Nov 05– Dec 05	Individualized training for laboratory data generators, field data generators, and data users.
	1.3 Development and Production of Training Manual	Jan 06– Mar 06	Documentation and Training Manual will provide trained user types, data generators and data users an easy-to-use support reference.
	1.4 Training of SRWP Regional Coordinator (RC)	Mar 06– May 06	RC will be equipped to organize and train watershed groups.
	1.5 Training of Watershed Groups	May 06– July 06	More efficient participation by groups to enter and share data.
	1.6 Data Entry	Dec 05– Oct 07	Data entry into network.
	1.7 SRWP Website Expansion	Oct 05– Oct 07	SRWP will provide added support to watershed groups.
	1.8 Integrate Data into CEDEN from Watersheds	July 06– Oct 07	Implemented data sharing components for local watershed data management systems. Watershed staff will be trained on how to share data with CEDEN.
	1.9 Technical Support	Oct 05– Oct 07	Service support line item to assist MLML or SRWP with technical modifications of local software systems.
	1.10 Develop	Oct 05–	Technical specifications worksheet

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	Specifications for WWW Data Entry Tools	Mar 06	will be developed based on participants' input and needs.
	1.11 Implement WWW Data Entry Tool	Mar 06- May 06	Completed WWW data entry tools; review and approval of the tools from groups participating in task 1.10.
	1.12 Review XML Laboratory Data Transfer Sheet	Oct 05- Nov 05	Develop methodology for application to CEDEN based on review of work conducted by the New Jersey Information Technology Group.
	1.13 Adaptations to the XML Laboratory Data Transfer Sheet	Oct 05- Dec 05	Linked XML lab transfer templates to local watershed database template.
	1.14 Complete XML Data Transfer Sheet	Dec 06- May 06	Implemented templates with individual labs - existing data transfer systems used by watershed groups will be replaced.
<b>2. Develop and integrate existing decision support (DSS) analysis and display tools to utilize data</b>	2.1 Develop Specifications for Modeling Data Transfer System	Jan 06- Feb 06	Technical specifications worksheet developed based on input from DWR Modeling staff regarding functional specifications for model input data.
	2.2 Implement Specifications for Modeling Data Transfer Tool	Feb 06- May 06	Implement requested specifications in the form of a special report to provide data to DSM II, CALSIM II and Realm; review and approval of tools from task 2.1 Modeling staff .
	2.3 Develop Specifications for GIS Analysis Tool for Coded Wire Tag Information Tool	May 06- June 06	Technical specifications worksheet developed with input from local USFWS reps and IEP Salmonids Project Work Teams.
	2.4 Implement Specifications for GIS Analysis Tool for Coded Wire Tag Information Tool	June 06- July 06	Completed implementation of GIS Analysis tool; review and approval of tools from participants in task 2.3.
<b>3. Provide online metadata documentation CERES FGDIC compliant system. Integrate existing services and tools from the CERES</b>	3.1 Preparation of CERES Tool Integration	Oct 05- Nov 05	Updated/Revised CEDEN architecture that includes CERES elements.
	3.2 Review of CERES Architecture	Nov 05- Jan 06	Documentation of CERES tools and services that will be adapted to and/or modified for application to CEDEN. Document will also identify changes needed to CERES

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			environmental thesaurus to optimize its use and applicability to CEDEN.
	3.3 Planning of Tool Integration	Jan 06-Feb 06	CERES/CEDEN environmental thesaurus tool plan, design, test and deployment plan.
	3.4 Adaptations to CERES	Feb 06-June 06	Revised/updated CERES environmental thesaurus suitable for use with CEDEN.
	3.5 Linking Process	May 06-July 06	Cross-linked CEDEN and CERES web pages.
	3.6 Evaluation of Integration	July 06-Sept 06	Documented evaluation of project with detailed list of needed fixes, changes and enhancements needed to achieve project objectives.
	3.7 Reporting	Oct 05-Sept 06	Progress reports as required.
<b>4. Expand CERES to provide for the capture, preservation and serving of environmental. Include tools and technologies to spatially reference these data and documents.</b>	4.1 Preparation of CERES Expansion	Oct 06-Dec 06	Revised project charter that clearly identifies requirements, expectations, opportunities, constraints, roles and responsibilities.
	4.2 Planning of CERES Expansion	Dec 06-Jan 07	Document identifying user and system requirements.
	4.3 Expansion Design	Jan 07-Feb 07	CEDEN/CERES digital document system design.
	4.4 Expansion Building and Testing	Feb 07-May 07	CEDEN/CERES digital document repository developed and tested (internal).
	4.5 Expansion Deployment	May 07-June 07	CEDEN/CERES digital document repository fully tested (external) and made operational.
	4.6 Expansion Aids	June 07-July 07	CEDEN/CERES help screens in production.
	4.7 Evaluation of Expansion	July 07-Aug 07	Project evaluation with detailed list of fixes, changes and enhancements needed to meet project objectives.
	4.8 Task 4 Reporting	Oct 06-Aug 07	Progress reports as required.
<b>5. CEDEN network maintenance</b>	5.1 Ongoing CEDEN Operation and Maintenance	Oct 05-Nov 06	Continued support for the Network's operation and maintenance costs at BDAT and SWAMP for software licenses, maintenance and 2 years amortization costs for hardware
<b>6. Overview of Project</b>	6.1 Task 1.1 – 1.7		Provide progress reports and

	Oversight		coordination with watersheds and other project leaders.
	6.2 Task 1.8 – 1.14, 2.1-2.4 Oversight		Provide progress reports and coordination with technical staff and other project leaders.

**IV. INTEGRATED PROJECT TEAM PARTICIPATION**

Within California watershed groups are increasing their collection of environmental data. The data types include water quality, fisheries, and habitat inventory and condition assessments. We propose making watershed data collected in the Sacramento River watershed available to the Cal/EPA Exchange Network using the node specified in our 2004 EIEN grant and other technologies already developed by BDAT/CEDEN and specified in the 2004 grant. We will distribute local data management capabilities to the various tributary watershed groups within the Sacramento River watershed. This work would be performed using an Integrated Project Team built from a partnering of MLML (SWAMP), DWR (BDAT), the California Watershed Council (CWC), the SRWP and Cal-EPA.

DWR (BDAT), MLML (SWAMP) and other groups' staffs will work collaboratively with the Sacramento River Watershed Program (SRWP) to establish data management systems within local watersheds. These local systems will be linked to the CEDEN network where these data will be provided through several applications to data users and provided to the Cal/EPA Exchange Network Node using the web services specified by the EPA. Spatially referenced environmental data from California that have not been readily available in the past will be made available for decision-making and public access. The long-term vision ultimately includes data flows to EPA's STORET system and to state and EPA staff working on the 2006 303(d) reporting. Because BDAT and the SWAMP are committed to providing data to many user groups, including Cal/EPA and the US EPA, we will continue to conduct multi-party planning activities to capture and provide access to new developing data flows when the Cal/EPA Exchange Network is ready to accept them.

Before watershed groups can share their data with other agencies and stakeholders, they need to have the tools and training to participate in an integrated data management system. These tools include the ability to capture, store and manage their data, which commonly reside in a relational database. During the early development phases of the BDAT data management system, it was determined that most data providers require that their data be managed locally prior to its release to the public. However, many of the participants do not have an existing relational database management system. The major costs of providing access to CEDEN data sharing system is the development of local data management systems for contributing participants, training on use these systems, and how to implement a quality assurance project plan (QAPP). In most cases, the development and training costs are less for data exchange with contributors that already have a development management system, such as the several dozen local databases that have been successfully implemented and linked to BDAT, at federal, state, county, municipal, university and private sector locations. This data-sharing infrastructure, funded in part using moneys from the 2004 Challenge Grant, has greatly improved the enterprise access to these datasets as networked and at each of the stand-alone entities. The local databases improve the management

and quality of local data for data collectors, which encourages participation in the program and network access to shared data. Large data sharing efforts cannot be successful unless the networked data sharing system is functional and useful at the local database level.

Our proposed strategy to implement this phase of the project is to develop the infrastructure, data management skills and leadership within the SRWP so that they may work directly with tributary watershed within the Sacramento River watershed. The SRWP can respond to problems that may occur during the course of collecting data in the region and can utilize various methods to help coordinate and implement monitoring programs throughout the Sacramento River watershed. Training will include offering small group workshops, providing guidance materials both in hard copy and through the SRWP website, and conducting one-on-one training from field training to data entry protocols. The SRWP will train individual groups in the use the data management tools provided by the BDAT and SWAMP staff and how to correctly collect and properly implement quality assurance/quality control (QA/QC) protocols. These tributary watershed groups will implement a local SWAMP/BDAT compatible MS Access data management system or build a link from their existing system to a local CEDEN node. Each local system (including BDAT and MLML) becomes a functioning component of the shared CEDEN network. As grant funding is provided, each completed or linked local database would be an incremental milestone that can be reviewed by the EPA after these data have been integrated into the Environmental Information Exchange Network. Target local databases have been identified through workshops conducted by the SRWP and discussion with staff from the State Water Resources Control Board, Moss Landing Marine Labs, and the Department of Water Resources.

SWAMP staff located at MLML, are responsible for training groups on how to use the local MS Access databases and how data is to be merged into the CEDEN enterprise network. Due to the complex nature of managing environmental data, several complementary training components are proposed to meet these training needs, including a workshop, individualized training sessions, and a guidance manual. An initial training workshop is proposed to provide a general overview of the database to the SRWP participants and other interested parties. It will serve to familiarize the attendees with database design and application, but will not include actual computer usage by participants. This event will set the stage for individualized training for data form entry from field crews, for required standard formats from laboratories, and for basic data export to the SRWP. Because of the complicated nature of the material to be covered, training can only be accomplished effectively with individualized instruction and hands-on experience. In addition, training manuals will need to be developed for database use and application reference. The objectives for this training are: 1) to elicit a general understanding of the overall data structure and flow, 2) to demonstrate the entry/editing capability of the local database, 3) to outline the analytical requirements for laboratory data and batch uploading, 4) teach basic queries and data retrieval techniques, 5) outline data verification and data validation procedures and 6) to outline migration of local data to the enterprise system. Our intent is to introduce these topics in a general way to the participants during a workshop. The workshop will then pave the way for future individualized training with key data entry people, analytical laboratories and SRWP staff. At the conclusion of the development and training effort it is expected that SWRP will be actively managing environmental data from their local watershed groups using local SWAMP compatible system and providing those high quality data via the CEDEN network to resource managers and the public.

The Cal/EPA is the coordinator of the California CDX node and will continue to organize efforts to provide data to the Exchange Network. This will include environmental data sets being provided by CEDEN as well as other data types collected and managed within the State that are supported by the Network. Data exchange with the EPA's Environmental Information Exchange Network will be accomplished using EPA's new network protocols. CEDEN will be accessed by the Exchange Network via the Cal/EPA node.

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**V. QUALITY ASSURANCE**

Data that are collected under the SWAMP program follow the guidance of the SWAMP QAPP (<http://www.swrcb.ca.gov/swamp/qapp.html>), and more specifically must follow and meet specific Data Quality Objectives (DQO's) as outlined in Appendix C (Data Acceptability Criteria). As with other aspects of the SWAMP QAPP, the intent is to provide for minimum standards and guidelines that all participants should utilize, with strong encouragement to adopt enhanced methodologies that improve upon these minimum standards. The major goal of the SWAMP QAPP is to have representative, comparable, accurate and precise data that can be shared statewide. Disseminating the information contained within the SWAMP QAPP to participating groups and by providing technical assistance in implementation of standard operating procedures related to managing data is a critical component in implementation of the overall data management system. The MLML SWAMP and BDAT teams will provide to SWRP the training needed to implement QA/QC procedures that meet SWAMP DQO's and ensure data comparability and accuracy.

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**VI. PROJECT BUDGET**

			<b>Amount Requested</b>
<b><u>PERSONNEL COSTS</u></b>			
<b><u>Level of Staff-Salaried</u></b>	<b><u># Hours</u></b>	<b><u>Hourly Rate</u></b>	
Program Manager	400	\$63.00	25,200
Web Programmer	737	\$57.00	42,000
Database Programmer	1953	\$57.00	111,300
Staff Benefits @ 25%			44,625
<b>TOTAL PERSONNEL COSTS</b>		<b>\$</b>	<b>223,125</b>
<b><u>OPERATING EXPENSES</u></b>			
<b><u>Travel</u></b>			
Web Programmer (400mi @.34/m)			124
<b><u>Supplies</u></b>			
Workshop Materials			500

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Servers/Storage	30,000
Software	11,500
<b>Equipment</b>	
Laptop	2,000
Projector	1,000
<b>Contractual</b>	
SWAMP Trainer	112,215
Salary \$110,565	
Travel \$ 1,650	
SWAMP Local System Maintenance	40,000
SRWP Regional Coordinator	146,200
Salary \$141,900	
Travel \$ 4,300	
Information Technology Officer	162,000
2616hr @\$61.92/hr	
SRWP Program Coordinator	20,000
<b>TOTAL OPERATING EXPENSES</b>	<b>\$ 525,539</b>
<b>TOTAL AMOUNT REQUESTED</b>	<b>\$ 748,664</b>

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**IV. PROJECT'S RELATIONSHIP TO OTHER EXCHANGE NETWORK ACTIVITIES**

Within California several data analysis tools have been developed to help interpret and model environmental monitoring data collected within the state. To make the benefits of the Exchange Network more apparent we propose adapting existing decision support systems (DSS), to use data directly from the Network and provide summarized information to the public, decision makers, scientists, engineers and other interested parties. The DSS simulation models that are good candidates for this proposal are the Delta Simulation Model II and Realm models developed or in the process of being developed by the California Department of Water Resources.

To further promote the uses of the Exchange network as part of a DSS, we propose developing a web-based GIS application that will allow a user to dynamically query information from the Network. The interface will be developed so that it can be easily configured for many types of analytical comparisons where there is a strong spatial component such as for coded wire salmon and steelhead recovered in the watersheds of Central Valley in California. It could be used for many different metrics, for example, the distribution of high concentrations of mercury in fish tissue that might exceed human health thresholds. This theme is chosen as a proof of concept because there is a strong need for this type of application in the region and this type of analysis the work will have a high public profile.

To help further adapt the system for groups who are not interested in directly managing their data, we propose to develop web based interfaces for direct input of data in a CEDEN node. Another contingency for groups who are not interested in managing data directly (i.e.- citizen monitoring groups) would be to provide a person who would key data into the groups account on a CEDEN node. Groups not interested in managing data directly would still be responsible for data put into the system on their behalf and will have to provide required QA/QC checks before these data are made public.

Currently many of the data providers to the Network receive data from water quality laboratories in a proprietary format including the Surface Water Ambient Monitoring Program (SWAMP). This results in an expensive, cumbersome process in which we must modify the individual client applications to conform to the data input format from these various labs. Furthermore, since the laboratories sometimes change their processes after our initial design, this necessitates a change in the client applications to incorporate the altered input format. We have noted that as part of the Exchange Network grant process, EPA Region 2 working with the New Jersey Information Systems group have implemented a standardized XML reporting template for reporting lab data. We propose piloting this transfer system to improve the data transfers between water quality laboratories and our client databases. Using the system developed in New Jersey, would save substantially in development costs, reduce our maintenance costs, as well as facilitate the rapid addition of new clients and/or water quality laboratories to our distributed network

Finally, to help bridge the gap between raw monitoring data and important metadata and related documentation, we propose using an exiting cataloging system, CERES, to provide the needed information online. The CERES program offers a free, Internet-accessible catalog of environmental data and documents (<http://gis.ca.gov/catalog/>). This service enables organizations to catalog their data and information holdings and make these discoverable to all interested parties. Local groups have the option of using these online tools or developing their own "libraries" and publishing their metadata content in a way that can be harvested by CERES. The CERES environmental thesaurus would be expanded and refined to provide associated keywords for the proper and effective cataloging and rapid discovery of these materials. The main objective will be to enable CEDEN users to retrieve not just the environmental monitoring data they are interested in but all associated documents and related materials including digital photos and maps. CERES can then function as a single integrated portal for the discovery of these materials in California. CERES is built using Federal standards and in turn publishes its metadata catalog content to the Geospatial One Stop Federal metadata catalog for all catalog entries that are geospatially referenced.

CERES and CEDEN promote the use of linked regional data and document repositories or "libraries." Regional data and document holdings are uploaded and shared with the larger environmental community throughout California via CEDEN and CERES. This data network architecture recognizes the distributed nature of environmental data collection and properly places the stewardship of these materials with the source entity. Linking and integrating CEDEN and CERES with EIEN can make these regional collections available to the US EPA and other Federal entities. Cataloging EIEN data via CERES metadata tools will, in turn, make this data corpus searchable and known to the local environmental community in California. The feasibility of further extending and adapting these emerging tools to EIEN will also be investigated.

Detailed Budget

					<b>Amount Requested</b>
<b><u>PERSONNEL COSTS</u></b>					
<b><u>Level of Staff-Salaried</u></b>	<b><u># Hours</u></b>	<b><u>Hourly Rate</u></b>	<b><u>Annual Salary</u></b>	<b><u>%Project Time</u></b>	
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Web Programmer	737	\$57.00	\$65,252	25%	42,000
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Staff Benefits @ 25% (see below)					44,625
<b>TOTAL PERSONNEL COSTS</b>					<b>\$ 223,125</b>
<b><u>OPERATING EXPENSES</u></b>					
<b><u>Travel</u></b>					
Web Programmer (400mi @.34/m)					124
<b><u>Supplies</u></b>					
Workshop Materials (task 1.5)					500
Servers/Storage (tasks 4.4/4.5)					30,000
Software (tasks 1.6/4.4/4.5)					11,500
<b><u>Equipment</u></b>					
Laptop (task 1.5)					2,000
Projector (task 1.5)					1,000
<b><u>Contractual</u></b>					
SWAMP Trainor					112,215
Salary \$110,565					
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Information Technology Officer					162,000
2616hr @\$61.92/hr					
SRWP Program Coordinator					20,000
<b>TOTAL OPERATING EXPENSES</b>					<b>\$ 525,539</b>
<b>TOTAL AMOUNT REQUESTED</b>					<b>\$ 748,664</b>

Please note indirect rates are included in hourly rate and will be provided after our indirect rates have been approved.

Karl C. Jacobs  
3251 S St  
Sacramento, CA 95816  
(916) 803-8901 (Cell) - Work: (916) 227-0435

December 2004

## **Experience:**

*April 2000 to Present*  
*Department of Water Resources*  
*Position: Environmental Specialist IV*

Section Chief for the Interagency Information Systems Services Section. My current task is to provide access to the water quality, biological, hydrologic and topographic data collected by the Interagency Ecological Program, Central Valley Project Improvement Act, Sacramento River Watershed Program, Category III monitoring programs and California Urban Water Association. This effort has led to the implementation of the Bay/Delta and Tributaries relational and time-series databases that can be used directly to obtain the data collected in the estuary, or with various applications to conduct analyses. This job requires extensive coordination between agencies involved with water transport, regulatory agencies and stakeholders. In addition, my current position requires knowledge of the types of data collected in the region and how these data are applied to indicators, knowledge of distributed databases management systems and strong program management skills.

*September 1999 to April 2000*  
*Department of Water Resources*  
*Position: Environmental Program Manager I*

Branch Chief for the Monitoring and Analysis Branch (Acting). Provide managerial; support to the program. Ensure the program is collecting mandated compliance data and meeting its reporting requirements. Coordinate and administer a review of the monitoring program to help ensure the correct constituents are being monitored at locations and frequencies that optimized addressing water quality issues in the Delta. Provide management of special studies.

*September 1999 to Present*  
*Department of Water Resources*  
*Position: Environmental Specialist IV*

Section Chief for the Interagency Information Systems Services Section. My current task is to provide access to the water quality, biological, hydrologic and topographic data collected by the Interagency Ecological Program, Central Valley Project Improvement Act, Sacramento River Watershed Program, Category III monitoring programs and California Urban Water Association. This effort has led to the implementation of the Bay/Delta and Tributaries relational and time-series databases that can be used directly to obtain the data collected in the estuary, or with various applications to conduct analyses. This job requires extensive coordination between agencies involved with water transport, regulatory agencies and stakeholders. In addition, my current position requires knowledge of the types of data collected in the region and how these data are applied to indicators, knowledge of distributed databases management systems and strong program management skills.

*January 1988 to September 1998*  
*Department of Water Resources*  
*Position: Environmental Specialist IV*

Supervisor of the Suisun Marsh Decision 1485 (D-1485) monitoring program. In this capacity I was responsible for coordinating the units' field monitoring activities which included: measurements for salinity, TDS, chloride, and pH in waters supplied to the Suisun Marsh using discrete sampling and a network of continuous monitoring stations. Attempted to determine the effect of the measured water

quality parameters on various biological parameters such as waterfowl populations, vegetation, and endangered species. Identified new monitoring instrumentation for continuous monitoring stations. I also wrote compliance reports and was responsible for data management.

*November 1985 to January 1988*  
*Department of Water Resources*  
*Position: Environmental Specialist I, II and III*

Lead person in the Bay-Delta Decision 1485 (D-1485) monitoring program. As the lead person I coordinated most field activities which included: Monitoring for chlorinated hydrocarbons, pesticides, heavy metals, phytoplankton, benthos, salinity, turbidity, tds, suspended solids, silica, chlorophyll, and pH; implementation the D-1485 Monitoring agreement at the field level; writing the units' work schedule, and coordinating field personnel. My non-field responsibilities included data management of the D-1485 databases both historical and current. This entailed computer programming, data analysis, and creating methods to test data networks. I also wrote compliance reports based on the data collected by the unit for various agencies and participated in studies that tested the effect of pesticides on phytoplankton.

*December 1980 to July 1984*  
*California Department of Food and Agriculture*  
*Position: Environmental Hazards Specialist 1A & 1B*

My duties were derived from the State's requirement to measure pesticide contamination; in the work place, atmosphere, foliage, soil, and aquifers. Conducted literature searches on the toxicology of chemicals and wrote summaries on my findings. I had articles published in professional journals. I was selected by my unit to monitor ethylene di-bromide residues on board a ship during transport of fruit to and upon its arrival in Japan. This program was required by the Japanese and Swedish governments. I have used computers for data analysis. Developed and improved methods for monitoring ethylene di-bromide and other chemicals. I wrote protocols for monitoring pesticides. I was involved in extended field studies, monitoring a number of different pesticides in the environment and in the atmosphere. I did laboratory analysis and some research on analytical methods. I adapted an infrared spectrophotometer and a gas chromatograph so they could be moved from the lab to the location they were needed for on-site analysis.

*November to December 1980*  
*University of California at Riverside*  
*Department of Soil & Environmental Studies*

This was a seasonal laboratory position that provided experience using sophisticated laboratory instrumentation. I analyzed samples taken from Sierra Nevada lakes for acid rain and heavy metals. I also analyzed sludge samples for heavy metal content. The East Bay Municipal Utility District provided these samples. The question to be resolved concerned diffusion of heavy metals into underground aquifers. Among the instruments used was the Perkin-Elmer-Atomic absorption unit.

*February 1980 to November 1980*  
*California Department of Food and Agriculture*

Most of my work involved monitoring the environment for pesticides. Monitored constituents included: 2-4-D, MCPA and DBCP. I worked in the lab determining the toxicity of 2-4-D. I also entered this data into computer files. I developed a level of programming proficiency from formal classroom programming instruction in BASIC.

### **Education:**

BA, Chemistry, University of California San Diego  
MS, Chemistry, California State University Sacramento

**BIOGRAPHICAL SKETCH**

Provide the following information for the key personnel in the order listed for Form Page 2.  
Follow the sample format on preceding page for each person. DO NOT EXCEED FOUR PAGES.

**Comment:** To enter Page Number, select "Unprotect" under Tools, and double-click in footer. Select "Protect" under Tools before closing document.

NAME		POSITION TITLE	
Russell Fairey, M.Sc.		Principal Investigator	
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Texas A & M University Moss Landing Marine Laboratories-SJSU	B.Sc. M.Sc.	1984 1992	Marine Biology Marine Science

**A. Positions and Honors.**

1992 - present Research Scientist, Principal Investigator, Marine Pollution Studies Lab -  
Moss Landing Marine Laboratories, San Jose State University .

**B. Selected peer-reviewed publications (in chronological order).**

Fairey, R., Dunn, R., Roberts, C., Sigala, M., Oliver, J. 2002. Introduced Aquatic Species in California Coastal Waters. Final Report. California State Water Resources Control Board. Sacramento, CA., 52 pp.

Fairey, R., Long, E., Roberts, C., Anderson, B., Phillips, B., Hunt, J., Puckett, H., Wilson, C. 2001. An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. *Environ. Toxic. Chem.* 20(10) 2276-2286.

Fairey, R., Landrau, M.E. 2000. Estimates of mass emissions to the north and central coast regions. Appendix C. California State Water Resources Control Board. 45 pp.

Fairey, R., Roberts, C., Jacobi, M., Lamerdin, S., Clark, R., Downing, J., Long, E., Hunt, J., Anderson, B., Newman, J., Stephenson, M., Wilson, C. 1998. An assessment of sediment toxicity and chemistry in the San Diego Bay Region. *Environ. Toxic. Chem* 17 (8) 1570-1581.

Fairey, R., C. Bretz, S. Lamerdin, J. Hunt, B. Anderson, S. Tudor, C. Wilson, F. LeCaro, M. Stephenson, M. Puckett, and E. Long. 1998. Chemistry, Toxicity, and Benthic Community Conditions in Sediments of the San Diego Bay Region- Addendum Report. California State Water Resources Control Board. Sacramento, CA. 21 pp.

Fairey, R., Taberski, K., Lamerdin, S., Johnson E., Clark, R., Downing, J., Newman, J., Petreas, M. 1997. Organochlorines and other environmental contaminants in muscle tissue of sportfish collected from San Francisco Bay. *Mar. Poll. Bull.* 34 (12) 1058-1071

Fairey, R., C. Bretz, S. Lamerdin, J. Hunt, B. Anderson, S. Tudor, C. Wilson, F. LeCaro, M. Stephenson, M. Puckett, and E. Long. 1996. Chemistry, Toxicity, and Benthic Community Conditions in Sediments of the San Diego Bay Region. California State Water Resources Control Board. Sacramento, CA. 162 pp.

Principal Co-Investigator – Russell Fairey- MLML  
San Francisco Regional Water Quality Control Board. 1995. Contaminant Levels in Fish Tissue from San Francisco Bay. California State Water Resources Control Board. R. Fairey and K. Taberski -eds. 149 pp.

Fairey, W.R., K.S. Johnson, K.H. Coale, W.M. Berelson, T.L. Coley, V.A. Elrod, J.L. Nowicki, C. Chin, H.D. Jams. 1991. Trace metal analysis of sediment pore waters in a transect through the oxygen minimum of the California margin. 1991 Outstanding Student Paper, American Geophysical Union, San Francisco, CA. 042A-06

#### Other Related Publications

Kamer, K. and R. Fairey. 2004. Water Quality in the Callegus Creek and Santa Clara River Watersheds. Under the Surface Water Ambient Monitoring Program- 2000-2001. Los Angeles Water Quality Control Board. Los Angeles, CA 81pp.

Roberts, C., M. Sigala, R. Dunn, R. Fairey and E. landrau. 2002. Data Report for the Investigation of Bioaccumulation of PCBs in San Francisco Bay. San Francisco Bay Regional Water Quality Control Board. Oakland, CA. 45 pp.

Jacobi, M.J., R. Fairey, R.P. Clark, J. Downing. Pilot Study for synoptic water quality monitoring in an urban/agricultural watershed in Central California (in preparation)

Davis, J.A., M.D. May, B.K. Greenfield, R. Fairey, C.A. Roberts, G. Ichikawa, M. Stoelting, J. Becker. Contaminant concentrations in sport fish from San Francisco Bay. (in review: *Mar. Poll. Bull.*)

Hunt, J.W., B.S. Anderson, B.M. Phillips, R.S. Tjeerdema, K.M. Taberski, C.J. Wilson, H.M. Puckett, M. Stephenson, R. Fairey, and J. Oakden. 2001. A large scale categorization of sites in San Francisco Bay, USA, based on the sediment quality triad, toxicity identification evaluations and gradient studies. *Envir. Toxicol. Chem.* 20 (6) 1252-1265

Hunt, J.W., B.S. Anderson, B.M. Phillips, J. Newman, R.S. Tjeerdema, R. Fairey, H.M. Puckett, M. Stephenson, R.W. Smith, C.J. Wilson, and K.M. Taberski. 2001. Evaluation and use of sediment toxicity reference sites for statistical comparison in regional assessments. *Envir. Toxicol. Chem.* 20 (6) 1266-1275.

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Principal Co-Investigator – Russell Fairey- MLML

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Anderson, B., J. Hunt, S. Tudor, J. Newman, R. Tjeerdema, R. Fairey, J. Oakden, Carrie Bretz, C.J. Wilson, F. La Caro, M. Stephenson, M. Puckett, E.R. Long, T. Fleming.

**Principal Co-Investigator – Russell Fairey- MLML**

**Chemistry, Toxicity and Benthic Community Conditions in Sediments of the Southern California Bays and Estuaries.** 1997. California State Water Resources Control Board. Sacramento, CA. 146 pp.

Stephenson, M., Ichikawa, G., Goetzel, J., Paulson, K. Pranger, M., Fairey, R., Lamerdin, S., Tjeerdema, R., Newman, J., Becker, J and Stoetling, M. 1997. Distribution and concentration of selected contaminants in Monterey Bay sediments *in* Southern Monterey Bay Continental Shelf Investigations: Former Fort Ord Restricted Zone. U.S. Department of The Interior, U.S. Geological Survey, Open File Report 97-450

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Sapudar, R., C. Wilson, M. Reid, E. Long, M. Stephenson, M. Puckett, R. Fairey, J. Hunt, B. Anderson, D. Holstad, J. Newman, S. Borosik, H. Smythe. 1994. Sediment Chemistry and Toxicity in the Vicinity of the Los Angeles and Long Beach Harbors. California State Water Resources Control Board. Sacramento, CA.

Johnson, K.S., W.M. Berelson, K.H. Coale, T.L. Coley, V.A. Elrod, W.R. Fairey, H.D. Iams, T.E. Kilgore, J.L. Nowicki. 1992. Manganese Flux from Continental Margin Sediments in a Transect Through the Oxygen Minimum. *Science* 257:1242-1244

**C. Past Research and Grant Support.**

- Principal co-investigator on the following grants from 1992 – 2004.

Title	Funding Agency	Period	Contract Total
Bay Protection and Toxic Cleanup Program	State Water Resources Control Board	1992 - 1998	\$3,000,451
Investigation of PCB Contamination at Canada de la Huerta	AERA Energy	1996 - 1998	\$21,617
United Heckathorne Remediation Investigation	CA Department of Fish and Game	1996 - 1998	\$57,808
Toxicity Identification Evaluations in San Francisco Bay	San Francisco Estuary Institute	1998	\$4,260
Assessment of PCBs in San Leandro Bay	San Francisco Bay Regional Water Quality Control Board	1998	\$16,500
Investigation of Sediment Quality at McGrath Lake	Los Angeles Regional Water Quality Control Board	1998	\$105,328
Inventory of California Emissions	State Water Resources Control Board	1998 - 1999	\$75,902
Assessment of MTBE in California Coastal Waters	Southern California Coastal Water Research Project	1999	\$25,000
Investigation of Metal Contamination at Hugo Neu Proler	Los Angeles Regional Water Quality Control Board	1999	\$35,831
EMAP Western Pilot- 1999	Southern California Coastal Water Research Project	1999 - 2000	\$233,692
Assessment of Stormwater	Southern California Coastal Water Research Project	1999 - 2000	\$105,000
RMP Fish Contaminants	San Francisco Estuary Institute	2000 - 2001	\$129,122
Bioavailability of PCBs	San Francisco Estuary Institute	2000 - 2001	\$130,000
Invasive Species Survey	CA Department of Fish and Game	2000 - 2002	\$671,604
EMAP Western Pilot- 2000	Southern California Coastal Water Research Project	2000 - 2001	\$71,466
Ballast Water Treatment	State Water Resources Control Board	2000 - 2002	\$147,500
ASBS Survey of Central and Northern California	Southern California Coastal Water Research Project	2002 - 2003	\$56,000
EMAP Western Pilot- 2002	Southern California Coastal Water Research Project	20002 - 2003	\$71,466
San Diego Sediment TMDL	University of California, Davis	2003 - 2005	\$154,583
SF Bay Marina Survey	San Francisco Bay Regional Water Quality Control Board	2003 - 2004	\$62,000
Ballast Water Treatment	California State Lands Commission	2003 - 2004	\$68,500
Surface Water Ambient Monitoring Program	CA Department of Fish and Game	2001 - 2005	\$1,388,000
EMAP Western Pilot- 2003 Offshore	Southern California Coastal Water Research Project	20003 - 2004	\$130,327
EMAP Western Pilot- 2003 Morro Bay	Morro Bay National Estuary Program	20003 - 2004	\$52,210
San Diego Sediment TMDL - Phase II	University of California, Davis	2004 - 2005	\$62,000
Comparison of Benthic Field Methods	Southern California Coastal Water Research Project	2004 - 2005	\$87,300
EMAP Western Pilot- 2004	State Water Resources Control Board	2004 - 2005	\$107,912
Surface Water Ambient Monitoring Program	State Water Resources Control Board	2004 - 2007	\$3,302,779
Invasive Species Survey	CA Department of Fish and Game	2004 - 2008	\$2,558,000

## **John Paul Ellison**

### **Position**

Appointed to the position of Agency Technology Officer (ATO) with the California Resources Agency on February 3, 2003. ATO duties included responsibility for oversight of information technology projects within the seven (7) member departments, seventeen (17) commissions, eight (8) conservancies, and nineteen (19) special programs. Also have responsibility for coordination of geographic information systems (GIS) in Agency departments and director of the California Environmental Resources Evaluation System program.

### **Research and Professional Experience**

12/99 -1/03: State Water Resource Control Board  
Assistant Chief (Data Processing Manager III), Office of Information Technology

Accepted the position of Assistant Chief, Office of Information Technology (OIT) with the State Water Resources Control Board (SWRCB) on December 20, 1999. Duties included supervision and management of staff and activities relating to the strategic, project management, IT procurement and operational aspects of SWRCB information management projects and efforts. OIT maintains the Boards' Wide Area Network (WAN) that supports approximately 1,600 staff working in nineteen (19) organizations located at fourteen (14) physical sites across the state. The State Boards' Internet Service Provider, Pacific Bell also provides frame relay circuits (T-1) to each site and a dedicated, high-speed (T1) connection to the Internet for the entire organization. Each RB/Division administers its own local area network (LAN). OIT administers its own LAN and the LAN for the Executive Offices. The Boards use Novell Netware 5.x for network file, print, and directory services. The Boards use Novell GroupWise to provide electronic mail and calendaring.

Served as the project manager and strategist for a major enterprise caliber IT project, the Water Information Network (WIN). WIN will be an integrated system that incorporates the functionality of existing systems to the greatest extent possible with additional enhancements as needed to meet a more comprehensive range of Water Board, Agency and Administration objectives including the deployment of "eGovernment" solutions. The new system will have two components: a program information/reporting system and a Geographic Information System (GIS). The program information/reporting component will include data on core regulatory programs, all known potential and actual discharge sites, water quality, other monitoring programs, electronic self monitoring reports for enhanced enforcement and compliance, and an interface to water rights data. It will also provide tools to improve consistency and efficiency of key processes. The GIS component will provide data analysis and management tools currently not available and data layers that will greatly enhance the efficiency and effectiveness of the Boards' water quality and watershed management efforts. Multi- or cross media analysis and coordination of permitting and enforcement activities will be facilitated by enhancing access to pertinent data via a State Water Board "portal" on the Internet by other Boards, Departments and Offices, Federal and local agencies, and the general public.

7/99 -12/99: California Department of Fish and Game  
Assistant Chief (Data Processing Manager II), Information Technology Branch

Appointed to the position of Assistant Chief for the California Department of Fish and Game's Information Technology Branch in July 1999. In addition to staff supporting the Department's GIS program, also given responsibility to manage and supervise three staff responsible for the

administration, maintenance, and operation of the Department's main enterprise servers. These systems were comprised of minicomputers from Hewlett Packard using the HP-UX operating system, and Intel based microcomputers using Microsoft NT. Expanded duties included involvement in all aspects of Department information technology operations including strategic planning, user needs assessment, operational recovery planning, Year 2000 issues and remediation efforts, business contingency planning, Internet and Intranet operations, help desk and desktop support, and policy formulation.

5/92 - 7/99: California Department of Fish and Game  
Geographic Information Manager (Research Manager II)

Promoted to Geographic Information System (GIS) Manager for the California Department of Fish and Game (Department) in May 1992. Became involved in a wide variety of information technology planning and implementation efforts beyond just GIS. Principal among these duties was the selection, design, implementation and operation of the Department's corporate GIS. Served as project manager for the Feasibility Study Report associated with this large project (e.g., \$8 million over six years). This required negotiation with Department of Finance analysts regarding project costs, benefits, and objectives. GIS implementation required involvement with the development of budget proposals, systems procurement, setup, and deployment, and the establishment and hiring of 17 new staff. GIS project operations involved budget development and management, contracting for services, staff supervision, policy formulation, and preparation of Special Project reports and other status reports. Other duties include technical consulting, and serving as staff to the Department's Information Technology Advisory Committee. The Department's GIS project was awarded a certificate of recognition by the Showcase Solutions Program at the 1995 Government Technology Conference, and was given a High Technology Application Award for Application Integration by Hewlett Packard in 1995. Because of the far-reaching implications of GIS, and opportunities to leverage GIS related infrastructure for other information technology efforts, became involved in an extensive revision of the Department's Information Technology Plan. This effort was closely linked with overall Department strategic planning. Made regular presentations about the Department's GIS, and have participated as a discussion panel member at technical conferences, and a guest lecturer at GIS related classes at University of California, Davis.

7/91 - 4/92: California Department of Fish and Game  
Geographic Information System Supervisor (Research Manager I)

On 31 July 1991, was appointed as the GIS Supervisor for the Natural Heritage Division. Supervise a staff of 5: 1 Research Analyst II (GIS), 1 Associate Programmer Analyst, and 3 Information Systems Technicians. Had chief responsibility for the operation and maintenance of a large (e.g., 10 networked graphic workstations, electrostatic plotter, tape drives, printers, etc.) GIS used to manage a 20,000+ record database on the location and status of California's rare and threatened species and habitats. Information from this system was provided for a fee to private and public sector organizations and agencies. Sales of information products accounted for the generation of about \$200,000 per year in reimbursements. Continued to represent the Department on various committees as noted below.

7/88 - 7/91: California Department of Fish and Game  
Coordinator, Natural Diversity Data Base (Fisheries Management Supervisor)

Effective 18 July 1988, was assigned as Coordinator of the Natural Diversity Data Base Program. In this capacity, supervised a staff of 15; 10 biologists/ecologist and 5 computer technicians in the operation of a GIS to map rare and sensitive species. Also had duties and responsibilities as Project manager for the selection, design and implementation of the program's geographic information system (GIS). Administrative duties included management of a \$881,000 contract with The Nature Conservancy. Chaired a session and gave a paper on the use of GIS in natural area protection and identification at the Natural Areas Conference in October 1990. Represented

the Department on the Computer Mapping Coordination Committee, the Stephen P. Teale GIS Users Group, the AB 1580 Mapping Advisory Committee, and the California State Mapping Advisory Committee.

7/82 - 7/88: California Department of Fish and Game  
Aquatic Ecologist (Associate Fisheries Biologist)  
Information Management Coordinator  
Lead Scientist

As the California Natural Diversity Data Base (CNDDDB) program's Aquatic Ecologist, developed a classification of aquatic communities in California. Used this classification to inventory the location and status of California's rare aquatic communities, rate their overall importance to the State's biological diversity, and formulate recommendations for their protection. Supervised and trained staff to assist in this process. These tasks involved the use of manual and computerized data management systems, including computer graphics.

Was then appointed as the CNDDDB's Information Management Coordinator. This involved the supervision of a staff of 5 and the overall management of the program's microcomputer and word processing systems. Chief assignment was to plan and implement the automation of the Natural Heritage Section. This included the selection and acquisition of a Geographic Information System as well as the design and implementation of an office microcomputer network. Represented the then Nongame-Heritage Program on a committee that selects and approves hardware and software for the Department. Also acted as the Department's representative on the Computer Mapping Coordinating Committee. Retained a number of these responsibilities when assigned as the CNDDDB's Lead Scientist. Chief among these duties was the task of Project Manager for the development of a feasibility study and the subsequent Request for Proposal for the selection, design and implementation of a GIS. As Lead Scientist, had lead responsibility over a staff of 10 biologists and computer technicians.

12/79 - 7/82: California Department of Fish and Game  
District Fisheries Biologist (Fisheries Biologist)

Primary duties in this position included the planning and implementation of fishery management programs and review of environmental documents (CEQA & NEPA) for a region in northern California. Fishery resources involved were warm water game fish, trout, anadromous fish and native, non-game fish. These duties required frequent involvement with county agencies and departments as well as other state and federal agencies.

4/78 - 12/79: California Department of Fish and Game  
Coastal Act Coordinator (Jr. Aquatic Biologist)

Provided review and analysis of planning documents intended to meet Coastal Act objectives and mandates. Specific involvement included review of EIRs, participation with special citizens study groups and committees in an advisory capacity, assessment of environmental sensitivity of natural resource areas and designation of compatible land uses and activities, providing information about fish and wildlife resources to local government planners, review of permit applications and US Army Corps of Engineers Public Notices for projects in the Coastal Zone, and representation of the Department at public meetings.

1/76 - 3/78: VANTUNA Research Group of Occidental College  
Marine Biologist (Research Associate)

Assisted in a project to determine effects of warm water effluent from a power plant on marine fish. Designed and implemented a research program using statistical analysis to survey and compare diets of fish. Continued research dealt with identification of invertebrate prey,



## Project Management Basic Training

### Technical Specialties:

Statistical Sampling Workshop  
Problem Solving with the Instream Flow  
Incremental Methodology

Pesticides Application  
SCUBA Certification  
Understanding Networking Fundamentals

### Honors and Awards

Sustained Superior Accomplishment, 21 January 1992, for the selection, design, implementation and operation of the Department of Fish and Game's first geographic information system.

Supervisory Bonus Award, 14, November 1997, for managing one of the Department's most important information technology project, the Department geographic information system.

### Publications

Ellison, J. P., G. Gaul, I. Oshima, and E. Begley. 1999. A proposal for an Internet based approach to capture and manage spatial data associated with wildlife observations. Proceedings 1999 ESRI International User Conference, July 26-30.

See URL <http://www.esri.com/library/userconf/proc99/proceed/papers/pap339/p339.htm>

Moyle, P. B. and J. P. Ellison. 1991. A conservation-oriented classification system for the inland waters of California. Calif. Fish and Game 77(4):161-180.

Ellison, J. P. 1984. A revised classification of Native Aquatic Communities in California. Calif. Dept. Fish and Game, Planning Branch Adm. Report 84-1. 30 p.

\_\_\_\_\_. 1983. A Classification of Native Aquatic Communities in California. Calif. Dept. Fish and Game, Planning Branch Adm. Report 83-1. 18 p. Ellison, J. P., G. Gaul, I. Oshima, and E. Begley. 1999. A proposal for an Internet based approach to capture and manage spatial data associated with wildlife observations. Proceedings 1999 ESRI International User Conference, July 26-30.

See URL <http://www.esri.com/library/userconf/proc99/proceed/papers/pap339/p339.htm>

Moyle, P. B. and J. P. Ellison. 1991. A conservation-oriented classification system for the inland waters of California. Calif. Fish and Game 77(4):161-180.

Ellison, J. P. 1984. A revised classification of Native Aquatic Communities in California. Calif. Dept. Fish and Game, Planning Branch Adm. Report 84-1. 30 p.

\_\_\_\_\_. 1983. A Classification of Native Aquatic Communities in California. Calif. Dept. Fish and Game, Planning Branch Adm. Report 83-1. 18 p.

\_\_\_\_\_. 1982. Lake Hennessy Catchable Trout Tagging Program, 1980-81. Calif. Dept. Fish and Game, Inland Fish. Adm. Report 82-6. 11 p.

\_\_\_\_\_. 1980. Diets of mountain whitefish, *Prosopium williamsoni* (Girard), and brook trout, *Salvelinus fontinalis* (Mitchill), in the Little Walker River, Mono County, California. Calif. Fish Game, 60(2):96-104.

\_\_\_\_\_, C. Terry and J. S. Stephens, Jr. 1979. Food resource utilization among five species of embiotocids at King Harbor, California, with preliminary estimates of caloric intake. Marine Biol., 52, 161-169.

\_\_\_\_\_ 1979. The use of discriminate analysis in the study of fish food habits. In Fish Food Habits Studies, Proceedings of the 2nd Pacific Northwest Technical Workshop. Oct. 10-13, WSG-WO-79-1, Wash. Sea Grant, 222 p.

\_\_\_\_\_ 1976. Methodology used in stomach content analysis. In Fish Food Habits Studies, Proceedings of the 1st Pacific Northwest Technical Workshop. Oct. 13-15, WSG-WO-77-2, Wash. Sea Grant, 193 p.

Stephens, J. S. and J. P. Ellison 1976. A study of fish food habits as it relates to the biological enrichment of an area. In Fish Food Habits Studies, Proceedings of the 1st Pacific Northwest Technical Workshop. Oct. 13-15, WSG-WO-77-2, Wash. Sea Grant, 193 p.

\_\_\_\_\_ 1982. Lake Hennessy Catchable Trout Tagging Program, 1980-81. Calif. Dept. Fish and Game, Inland Fish. Adm. Report 82-6. 11 p.

\_\_\_\_\_ 1980. Diets of mountain whitefish, Prosopium williamsoni (Girard), and brook trout, Salvelinus fontinalis (Mitchill), in the Little Walker River, Mono County, California. Calif. Fish Game, 60(2):96-104.

\_\_\_\_\_, C. Terry and J. S. Stephens, Jr. 1979. Food resource utilization among five species of embiotocids at King Harbor, California, with preliminary estimates of caloric intake. Marine Biol., 52, 161-169.

\_\_\_\_\_ 1979. The use of discriminate analysis in the study of fish food habits. In Fish Food Habits Studies, Proceedings of the 2nd Pacific Northwest Technical Workshop. Oct. 10-13, WSG-WO-79-1, Wash. Sea Grant, 222 p.

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Stephens, J. S. and J. P. Ellison 1976. A study of fish food habits as it relates to the biological enrichment of an area. In Fish Food Habits Studies, Proceedings of the 1st Pacific Northwest Technical Workshop. Oct. 13-15, WSG-WO-77-2, Wash. Sea Grant, 193 p.

***Kathleen M. Russick, P.E.***

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***Experience  
Summary:***

Eighteen years of experience in water resources and water quality work in the Sacramento area and Santa Clara Valley. Major job responsibilities have included:

- Coordinator for the Sacramento River Watershed Program (SRWP) since May 2003. Facilitating the transition of the SRWP from a partnership between the Sacramento Regional County Sanitation District, Central Valley Regional Board, and EPA into a non-profit organization overseen by a 21-member board of trustees. Helping develop and then implement an organizational structure and a vision that ensures the SRWP is sustainable into the future.
- Sole Proprietor, Russick Environmental Consulting March 2000 - present. Clients: Sacramento River Watershed Program, City of Sacramento, Sacramento Stormwater Management Program (and their member cities and Sacramento County), Sacramento Regional County Sanitation District.
- Assisting the City of Sacramento and the Sacramento Stormwater Program on their Monitoring Program and on pesticide issues.
- Managing the Sacramento County Urban Runoff Organophosphate (OP) Pesticide Toxicity Control Program (a CALFED-funded study of Sacramento urban stormwater).
- Assisting the City of Modesto in the management of their Stormwater Program, stormwater monitoring, program reporting, and NPDES permit negotiations.
- Initiating the Sacramento River Watershed Program's OP Pesticide Focus Group (Mar. 1999 – Mar. 2000).
- Participating on a team managing the Sacramento Stormwater Management Program (June 1997 - Dec. 1998).
- Managing drinking water and stormwater projects for various public agency clients for Brown and Caldwell Consultants (Jan. 1995 – May 1997).
- Managing the Santa Clara Valley Water District's (SCVWD's) watershed management program and internal corrosion control program (Oct. 1990 - Dec. 1994).

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***Education:***

B.S., Civil Engineering, Santa Clara University, 1987  
M.S., Water Resources Engineering, San Jose State University, 1990

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***Registration:***

Professional Civil Engineer No. 49660, California, 1992

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## Quality Assurance Narrative

Data that are collected under the SWAMP program follow the guidance of the SWAMP QAPP (<http://www.swrcb.ca.gov/swamp/qapp.html>), and more specifically must follow and meet specific Data Quality Objectives (DQO's) as outlined in Appendix C (Data Acceptability Criteria). As with other aspects of the SWAMP QAPP, the intent is to provide for minimum standards and guidelines that all participants should utilize, with strong encouragement to adopt enhanced methodologies that improve upon these minimum standards. The major goal of the SWAMP QAPP is to have representative, comparable, accurate and precise data that can be shared statewide. Disseminating the information contained within the SWAMP QAPP to participating groups and by providing technical assistance in implementation of standard operating procedures related to managing data is a critical component in implementation of the overall data management system. Compliance with the SWAMP QAPP, DAO's and data standards will facilitate the crosswalk of CEDEN data to the EDSC standards and transfer of data to the EPA Exchange Network and the interoperability of data from the various watershed groups. Crosswalks will be reviewed by EPA STORET staff for accuracy. The MLML SWAMP and BDAT teams will provide to SRWP the training needed to implement QA/QC procedures that meet SWAMP DQO's and ensure data comparability and accuracy.