

Thank you for attending this session. I am Jane Schafer-Kramer, a Research Analyst in the California Department of Water Resources. Like many of you here I wear a few different metaphorical hats in my professional life. Today's presentation draws on my experience as the Chair of the GIS Training and Outreach Subcommittee for the Department, which I will refer to interchangeably as DWR or The Department. If I use any acronyms, abbreviations, or terminology that is unclear to any of you, please interrupt me, raise your hand, call the jargon police, or otherwise get my attention so I can stop and clarify. I may bore you, but there is no reason to frustrate you.

GIS stands for...just kidding.

I'd also like to welcome those of you who are visitors to the state of California. It is a beautiful, wonderful, and resourceful state, but our water resources are running low these days. So please don't use more water than you need to!

## **How we do GIS training in our organization**

- Recent GIS history in DWR
- What works for us
- What hasn't worked for us
- Going forward – new ideas

Outline of presentation-

Please feel free to ask questions anytime during this presentation.

## Some Background...

- *Department of Water Resources (DWR), within California's Natural Resources Agency*
- *Mission includes: operating the State Water Project, planning and stewardship of water resources, dam safety, and flood management*
- *3,000+ employees*
- *~ 10% use ArcGIS to some degree:*  
*Civil Engineers, Environmental Scientists, Geologists, Surveyors, and Research Analysts/Specialists*



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The blue stars represent locations of our offices: HQ in Sacramento, 4 Regional Planning Offices, 5 Operations & Maintenance Field Division Offices. We don't have dedicated GIS classifications except for some in the Research category. Some IT folks provide support – infrastructure and license management

## **Some History...**

**Prior to 2008 – No Formal GIS Coordination in DWR**

**2008 - Our CIO takes on executive sponsorship of  
GIS Planning Committee**

**- ArcGIS enterprise licensing acquired**

**- GIS Training Workgroup formed to manage the use of the  
Learning & Service Credits**

Before 2008, there was a loosely organized GIS User Group. Each office managed its own ArcGIS licenses. In 2008, our Chief Information Officer (CIO), who was fairly new to our Department at the time, offered to sponsor us and we started meeting as the GIS Planning Committee. The CIO convinced our executive management to support the procurement of enterprise level licensing of ArcGIS software. DWR was the first department in California state government to get enterprise licensing. This was a huge boost for the GIS users, allowing many more employees access to the software, and it did save us time and money. With the enterprise license came a batch of learning and service credits. It fell to the GIS Planning Committee to figure out how to make use of these credits. We formed a workgroup to focus on this task.

## What's a Learning & Service Credit?

Except for item (e) each Learning and Service Credit may be used for one each of any of the following:

- (a) Two hours of consulting services support, consisting of review of technology strategy, systems design, prototyping, and other general technical consulting services support activities. Any project-related activities requiring a deliverable other than consulting time will be scoped, budgeted, and scheduled through a separate agreement;
- (b) Two hours of Premium Support Services;
- (c) One day at the ESRI Application Development Center;
- (d) One day for one student at an ESRI Training Center in Redlands, California, or at a regional office (Sacramento or Oakland);
- (e) On-site Instructor-led Training (9 credits = 1 day)
- (f) 480 Virtual Campus dollars for Virtual Campus training; or
- (g) Related ESRI travel and per diem expenses as quoted.

All available training courses - including Instructor-led classroom training and Virtual Campus Self-Study training - are listed on the ESRI training website: <http://training.esri.com/gateway/index.cfm>

I don't expect you to be able to read all of this text, but this is copied and pasted from the enterprise license agreement. It describes how the credits can be spent: either for standard prepackaged training classes, or for premium support services. We also learned that one credit can be traded for a registration fee for attendance at the Developer Summit. In the first couple of iterations of our contract with Esri, DWR got 200 credits per year, and unused credits do not expire as long as we stay current on our contract.



But back to the history - With an executive sponsor, we had an opportunity to outline our vision for an enterprise GIS. We discussed and debated throughout 2009, and in 2010 presented our plan to DWR's Governance Board (made up of Division and Office Chiefs facilitated by a Deputy Director.) We knew we could count on some basic support from our IT Group – the Division of Technology Services, but we needed a small group of staff dedicated full-time to the functions of developing standards, coordination, stewardship of enterprise data. I am using the term “enterprise” in the Information Technology sense: one platform that can be used by many groups within the organization, scalable to the extent that's appropriate for the organization as a whole. (describe graphic)

So we presented this vision to the Governance Board.

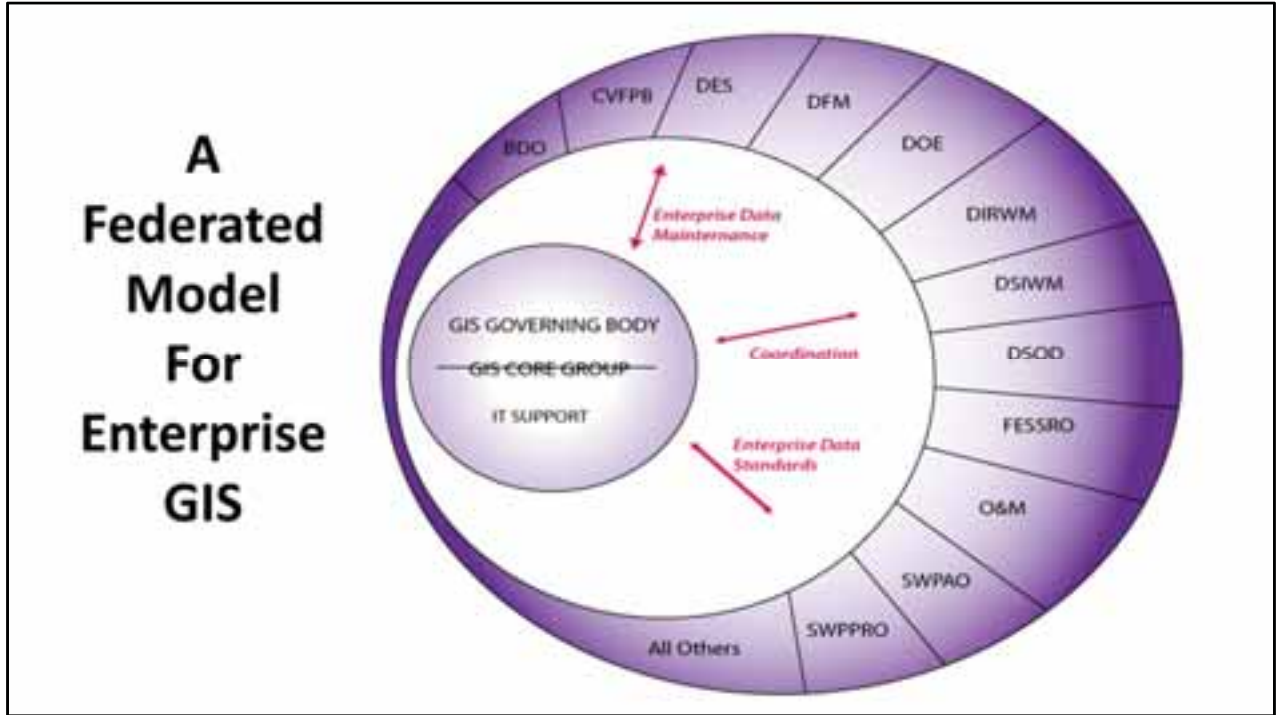




***But Alas...  
No Centralized GIS Group in DWR!***

And Governance Board said “No” to the creation of central GIS group.

But they did agree to charter our Committee with authority to spend a limited amount of work time on establishing data standards, enterprise geodatabase design, and a data stewardship process, as well as manage the learning and service credits and the user conference passes that came with the Esri enterprise license agreement.



We went back to the drawing board and came up with a federated model that radiated out from a GIS governing body that became known as the Enterprise GIS Committee, with support from a small group in the Division of Technology Services. “Federated” is used in the IT sense: an approach to enterprise architecture that allows interoperability and information sharing among semi-autonomous de-centrally organized lines of business. The acronyms and abbreviations in this diagram represent DWR’s various Divisions and Offices (an Office is an entity too small to be a Division.)





Essentially, we now have enterprise GIS as a grassroots volunteer effort. We initially had three other subcommittees but those disbanded for various reasons. The same group of worker bees is doing the bulk of the work among the three active subcommittees. For the remainder of this presentation I will focus on the work of the Training and Outreach Subcommittee.

### ***GIS Training History...***

**2008** - CIO takes on executive sponsorship of GIS Planning Committee

- ArcGIS enterprise licensing acquired

- **GIS Training Workgroup formed to manage the use of the Learning & Service Credits**

**2010** - Enterprise GIS Committee chartered by Governance Board

- **GIS Training & Outreach Subcommittee formed**

In 2010, when our committee received its charter and became the Enterprise GIS Committee, the Training Workgroup became the GIS Training & Outreach Subcommittee. In addition to managing the learning & service credits and the user conference passes, we also were assigned to do some outreach to new and potential GIS users in the Department, and manage an email listserv and web portal for our communications.

## Initial GIS Training Plan for DWR



1. Teach our own DWR Introduction to GIS course to our co-workers.
2. Convert some Esri Learning & Service Credits to Esri Virtual Campus Dollars (a.k.a. Annual User License) for self-study web courses.
3. Split remaining credits among offices, let the GIS users figure out how to spend them

We also came up with a plan for training our workforce to make use of the tools that they now had access to. The plan we developed relied on some in-house training, on using some of the Learning & Service credits to set up a Virtual Campus dollars account (now called the Annual User License) for self-study web courses, and then split the remaining credits among the Divisions and Offices to use as they saw fit. (Esri doesn't use the term Virtual Campus anymore; they call it e-learning. I will continue to use "Virtual Campus" in this presentation.)

## Training Ourselves



*"What is GIS?  
GIS is a system where data can be stored and  
queried with a geographic component..."*

***DWR Environmental Scientist Harry Spanglet develops an  
"Introduction to GIS" 2-day training course for his co-workers***

In discussing how to make the best use of the limited learning & service credits, we decided to use the credits for intermediate and advanced training. We knew that some of us were probably qualified to teach an intro-level class to our co-workers. Fortunately, our of our subcommittee members already had been doing this. We decided to formalize the Introduction to GIS training for the first part of our training plan.

- 1. Formalize In-House Introduction to GIS Training (2-day class)**
  2. Convert some Learning & Service Credits to Virtual Campus Dollars
  3. Split remaining credits among offices, let the GIS users figure out how to spend them
- 
- A. Get Harry's lesson plan approved by DWR Training Office
  - B. Recruit volunteer instructors from various offices
  - C. Train the Trainers (2-day class by DWR Training Office staff)
  - D. Volunteer trainers customize course for their office
  - E. Trainers recruit Training Assistants
  - F. Trainers work with DWR Training Office to schedule and offer class for their office co-workers

DWR's Training Office already had a procedure in place for formalizing in-house training. This procedure involved developing the outline using a template they provided, recruiting instructors who were willing and knowledgeable enough to teach, and who had the support of their management to spend the time it would take. The Training Office presented their Train the Trainers class for us. Some of the trainers tweaked the lesson plan for the Intro to GIS to customize it for the needs of their office, for example, using their own data for the exercises. We encouraged the trainers to recruit some helpers for their class – we found that having 2 or 3 teaching assistants for the class of up to 15 students helps to keep the class moving at a good pace by providing extra help to those who need it. Then the trainers would work with the Training Office to schedule the class, prepare the classroom, and enroll the students. Once completed, the Training Office staff would update the students' training history record.

1. Formalize In-House Introduction to GIS Training (2 days)
2. **Convert some Learning & Service Credits to Virtual Campus Dollars**
3. Split remaining credits among offices, let the GIS users figure out how to spend them



For the second part of our training plan, we took a look at the offerings in Esri's Virtual Campus web-based-self-study courses. I don't know if Esri uses the term Virtual Campus anymore, but I will continue to use that to avoid confusion. Our workgroup decided that Virtual Campus is a really good option for training our workforce. This was a time of tight budgets and travel restrictions, and being able to get training without leaving the workplace seemed to be pretty darn convenient. So, on the assurance from Esri that unused VC dollars would roll over to the next fiscal year, we decided to convert 50 of our L & S credits to 24,000 Virtual campus dollars.



1. Formalize In-House Introduction to GIS Training (2 days)
2. Convert some Learning & Service Credits to Virtual Campus Dollars
3. **Split remaining credits among offices, let the GIS users figure out how to spend them**

*How do we figure this out?*

...

*We need some data about ourselves.*

...

*Let's take a survey!*



So, that first two parts of our training plan weren't too difficult to implement, but part three was new territory for us. We assumed there would be high demand for the Esri live-instructor classroom training, but how many GIS users were there in each of our Divisions and Offices? We needed to collect some actual data to base our decisions on. So we took a survey.

## So we did a survey...and analyzed the results...

12. Rank your preferred method of obtaining GIS training, with 1 being the most preferred.

	1	2	3	4	5	6	7	8
ESRI instructor-led training at ESRI facility (Sacramento, Redlands, or Oakland)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ESRI instructor-led training at DWR Training Center	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DWR instructor-led training at DWR Training Center	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Web-based training through ESRI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Web-based training through another vendor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
College/University class(es)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On-the-job training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning on my own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Rank your preferred method of obtaining GIS training, with 1 being the most preferred.

Training preferences were for ESRI instructor-led training at DWR facilities - web-based ESRI training was also highly ranked. DWR instructor-led training at DWR facilities is another popular choice, but ESRI instructor-led training at an ESRI facility was also given priority. The least-preferred training options are "learning on my own" and "on-the-job training."

The values displayed in this chart are percentages.

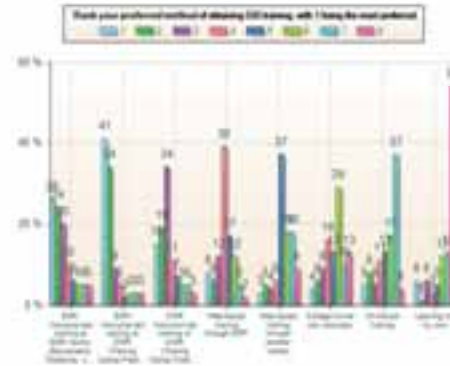


Figure 12. Responses to Question 12. Rank your preferred method of obtaining GIS training, with 1 being the most preferred.

I don't expect you to be able to read this – it's just here for graphic purposes. If anyone would like the survey, contact me. We set up an electronic survey using our Department's Zoomerang account, we tallied up the responses, and

...and developed a distribution of the credits based on responses to the survey.

We did this for fiscal years 2008-09 and 2009-10.

Organization	Credits 08-09	Credits 09-10	Total Credits
Bay-Delta Office	19	8	27
California Energy Resources Scheduling	3	0	3
Delta Field Division	2	1	3
Division of Engineering	21	20	41
Division of Environmental Services	24	7	31
Division of Fiscal Services	0	0	0
Division of Flood Management	33	40	73
Division of Integrated Regional Water Management - HQ	6	13	19
Division of Management Services	3	0	3
Division of Operations and Maintenance - HQ	2	3	5
Division of Safety of Dams	9	1	10
Division of Statewide Integrated Water Management	14	19	33
Division of Toxicology Services	3	3	6
Executive	3	1	4
Flint Hills Environmental Stewardship and Statewide Resources Office	0	7	7
North Central Region Office	10	21	31
Northern Region Office	14	17	31
Office of the Chief Counsel	0	0	0
Oroville Field Division	2	0	2
Public Affairs Office	3	1	4
San Joaquin Field Division	2	3	5
San Luis Field Division	2	2	4
South Central Region Office	13	14	27
Southern Field Division	2	0	2
Southern Region Office	9	10	19
State Water Project Analysis Office	3	2	5
State Water Project Power and Risk Office	3	2	5
	200	200	400

Used them to develop a distribution of the credits. We did this for the first and second years of our contract. I don't expect you to be able to read this either, but it's the breakdown of credits by Division/Office for those that responded to the surveys.

1. Formalize In-House Introduction to GIS Training (2 days)
2. **Convert some Learning & Service Credits to Virtual Campus Dollars**
3. **Split remaining credits among offices, let the GIS users figure out how to spend them**

VC Course Price in \$	VC Course Price in Credits
87	0.18
116	0.24
145	0.30
174	0.36
203	0.42
232	0.48

### **Administering the Virtual Campus Dollars Account:**

One main License Administrator, plus nine designated sub-administrators throughout DWR.

One other thing we had to do was to designate nine Esri Training sub-administrators located around the Department to assist our primary Esri license administrator in keeping track of the credits usage and getting access codes for Virtual Campus training. This took some work – we had to recruit the volunteers and create a credits calculator tool in Excel to help them track the credits.

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We wrote a memo for distribution throughout the Department. It was very detailed. This is just a snippet from that memo. Our federated enterprise GIS model directed us to give the information to the users, and let them decide, along with their management, how best to use their credits. This excerpt details the various ways the credits can be spent.

It's complicated.



*Well, let me tell you how it worked out...*

So that's how we rolled out our first DWR GIS Training Plan. How did it work out?





So – remember we are still grassroots volunteers. We are working hard, but stuff doesn't always work out the way you hope it will.

### **What worked...**

Some Divisions/Offices used all of their credits promptly, thanks to motivated individuals.

Individuals were able to get the classes they needed.

One Regional Office used credits to bring the Esri instructor to their location.

Virtual campus is a good resource, flexible and inexpensive.

Live, in person, instructor-led training is always good.

We got very positive feedback from our users on the Esri training, especially the live, in-person instructor-led training.

## **What didn't work so well...**

Some Divisions/Offices had no emerging leader and/or management support to guide this process; so credits went unused.

Survey and allocation process = *a big hassle*

Virtual Campus (VC) courses require dedicated time and concentration to complete; that doesn't work for everyone (too many distractions.)  
VC not utilized as much as we had hoped.

Unused VC Dollars can rollover to next fiscal year, but Esri charges us 1 Learning & Service credit to do this.



Taking these lessons learned and moving forward...

### **2011 to present – Training & Outreach Subcommittee:**

- Decides which Esri Instructor-Led courses are most needed,
- Schedules a dedicated offering of each class either online or at Esri Training Facility,
- Enrolls students on a first-come, first-served basis.
- **Works with Esri Training Consultant to customize the courses to suit our needs**

**And we still have access to Virtual Campus courses, on demand!**

This is how we have implemented our Esri training over the past four years. We – the subcommittee – decide which instructor-led courses are most needed, based on informal input from co-workers. We schedule the class either online or at an Esri training facility, and then open it up to enrollment on a first-come, first-served basis. If more folks sign up than we have seats for, we know we need to offer that course again in the future. Customizing the training to our needs is something we should have done from the beginning. We have been able to set up a custom class that took the relevant modules from two different courses and save a day by skipping the less-relevant modules. Another time, we had a group of employees in one of our more remote offices that needed an Introduction to ArcGIS training. Since there was no internal trainer nor an appropriate classroom available there, we arranged for an ArcGIS 2 class to be held at the nearest Esri training facility, but we required the participants to complete the Learning ArcGIS Virtual Campus course on their own as a prerequisite, instead of using credits to send them to an ArcGIS 1 class. We have held ArcHydro training twice, and have found the instructor to be very interested in customizing the training to our needs. The lesson and advice I give here is to carefully examine the content of the Esri course being considered, and only pay for what is really needed.

## **Other ideas...**

**For specialized training by an Esri partner, coordinate with the partner and Esri staff to teach a class at an Esri Training facility.**

**To make better use of Virtual Campus account, set aside a day or two for folks to gather in a training lab or conference room and work through courses collectively, supporting each other as needed.**

As an example of the first idea on this slide, we had a group requesting some training on ArcHydro Groundwater, which is a 3<sup>rd</sup> party extension for ArcGIS. The requesting program made arrangements to pay the ArcHydro Groundwater developer to travel from Utah to Sacramento, and teach the course at the Esri training facility. We would not have been able to send our folks out of state for training due to State Government travel restrictions, and since Esri has moved to offering more of their training online, the Esri offices that have training centers that aren't used all that often. Esri staff have been very gracious in accommodating our custom training requests.

This second idea is one we have not tried yet. It's sitting on the table as an option to be used the next time I hear someone complain about how difficult it is to get through a Virtual Campus course at their desk.

Oh, and by the way, six years later we are still using that first batch of 24,000 Virtual Campus dollars.



## Still more ideas...

- Watch for and disseminate information on MOOCs (Massive Open Online Courses) and other free stuff
- Developing in-house training that builds on Virtual Campus courses  
Example: Python in ArcGIS course that uses “Python for Everyone” as a prerequisite
- Optimize conference attendance to justify as training
- DIY (Do It Yourself) conference and “Brown Bag” seminar/webinars

MOOCs aren't for everyone, but they are a good option when travel and training budgets are tight. I learn about these from Directions Magazine newsletters, URISA, LinkedIn groups, etc.

We still would like to develop more in-house training, but that takes dedicated staff hours that have not been available to us lately. The exception is a new Python in ArcGIS course that an employee is developing.

It can be difficult to get management approval and support for attending conferences, but we were able to justify attendance for 20 of us to this conference by framing it as mission-critical training. Prior to coming here, we had a meeting to share ideas on optimizing one's time at the conference.

Starting in 2009 we have celebrated GIS Day by putting on a one-day mini-conference for the GIS users in our Department and more recently extended the invite list to include the sister Departments in our Agency. This year we plan to refocus this mini-conference as a GIS Professional Development Day.

Our subcommittee also encourages users to present one-hour webinars throughout the year, scheduled around lunchtime to show off the cool stuff we are doing with GIS in the

program areas, and to share ideas for workflows and data sources.



And finally, in response to our ongoing struggle to work out a process for effectively utilizing our ArcGIS Server, we formed a Cadre: The ArcGIS Server Cadre came together as a group of tinkerers with the knowledge or wherewithal to build geospatial web applications and create effective services. The Cadre is positioned to explore efficient workflows and best practices for getting GIS on the web and shall share this information with any and all interested parties.

Anyone in DWR who has the need to create a web map on our ArcGIS Server must be a member of the Cadre which meets monthly to informally discuss ways of meeting our geospatial web needs. A couple of our resident experts have created map templates and workflows that work with our IT and ArcGIS infrastructure. The Cadre makes these available to the rest of us.

Some of these ideas will only work for a larger organization, but my advice to anyone in a position of having to coordinate training for their workforce is to only pay for what is really needed. If some part of a prepackaged training course seems to be irrelevant, ask your training provider to help come up with a solution that will work for you. Provide feedback to them at every opportunity. Our time and budgets are all limited. Rather than lamenting that you can't afford all of the training that is presented in someone else's Training Plan, think outside of their box and make it fit into your own boxes.

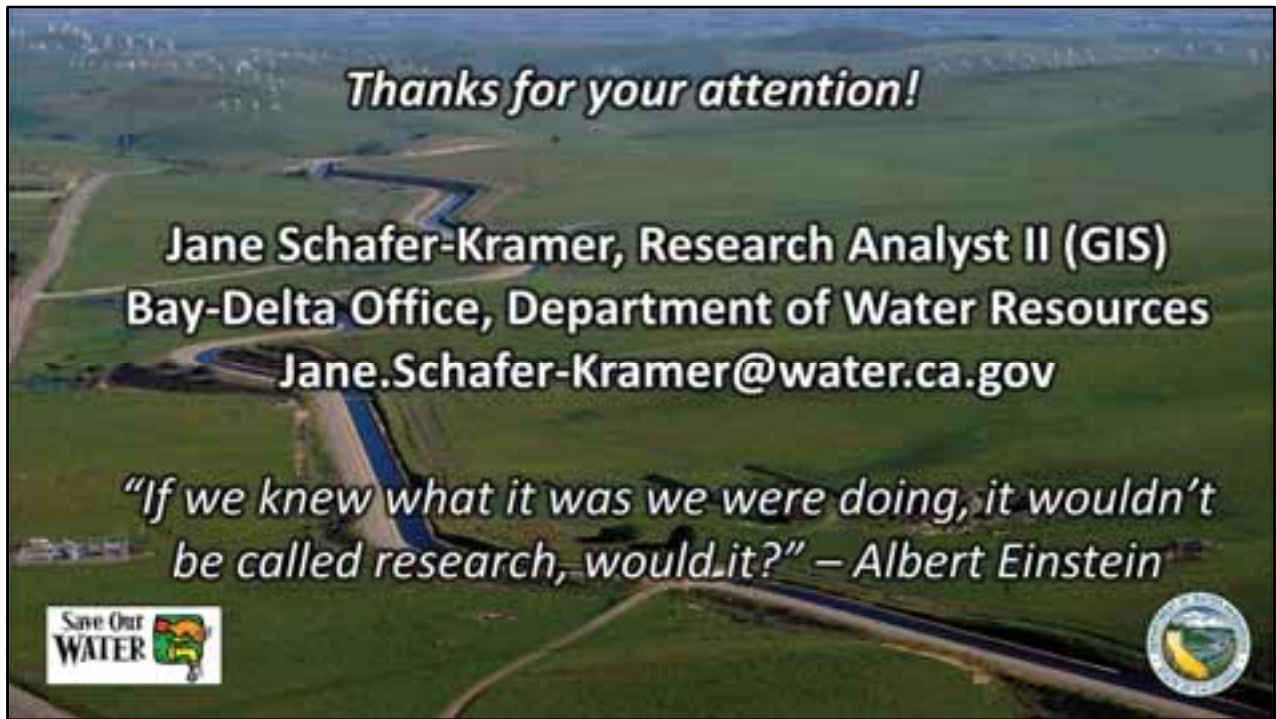
Our DWR GIS web portal:



<https://dwrgis.water.ca.gov/>

[Jane.Schafer-Kramer@water.ca.gov](mailto:Jane.Schafer-Kramer@water.ca.gov)

Our Enterprise GIS Committee uses a portal at this web address for posting working documents. The portal is not really designed or intended for public use but it is accessible over the Internet. Anyone interested is welcome to browse. But please contact me if you have any questions. I realize that our training plan is for a rather large organization, and some of these ideas won't necessarily translate well for smaller organizations, but the point of my presentation today is this: Be creative, think outside that stiff, inflexible box, and customize.



***Thanks for your attention!***

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***"If we knew what it was we were doing, it wouldn't  
be called research, would it?" – Albert Einstein***



And please don't waste water!