



SAN JOAQUIN VALLEY



Phase II Summary Report

March 31, 2017



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Purpose of the Greenprint Project

The San Joaquin Valley (SJV) is one of the world's most productive agricultural regions; is a vital link in California's complex water delivery and transportation systems; provides important habitat to protect biodiversity; and is a center for oil and solar energy production. The region has a unique set of assets and challenges related to its agricultural land, growing population centers, biodiversity, energy production, and water availability.

The San Joaquin Valley Greenprint project grew out of the San Joaquin Valley Blueprint, an effort launched in 2005 by the Valley's Metropolitan Planning Organizations (MPOs), which are also the region's Regional Transportation Planning Agencies (RTPAs), to provide a vision for urban growth in the eight Valley counties. The Blueprint focused on urban challenges, particularly the relationship of land use to transportation, and developed a set of smart growth principles that should minimize development impacts on the non-urban lands of the Valley. The Blueprint revealed the need for better regional mapping of the Valley's non-urban areas to assist land use and resource management decisions. The SJV Greenprint complements the Blueprint process and fills in gaps in data concerning the Valley's expansive rural spaces and the resources therein.

The SJV Greenprint is primarily a collection of maps, assembled as a comprehensive, interactive database that catalogs current conditions and trends related to the region's resources. The maps and data collected for the SJV Greenprint are publicly available through the San Joaquin Valley Data Basin Gateway (<http://sjvp.databasin.org>). The SJV Gateway allows users to explore and organize data and information; create custom visualizations, drawings, and analyses; use collaborative tools in groups; publish datasets, maps, and galleries; and develop decision-support and custom tools. The map collection provides dozens of maps that document the Valley's water, agricultural, biological, and energy features. The collection demonstrates how these resources are interrelated across political boundaries and how they are changing under the influence of population growth, changing land use practices, resource limitations, and changing climate.

The maps and data collected for the SJV Greenprint are publicly available through the San Joaquin Valley Data Basin Gateway (<http://sjvp.databasin.org>).

As both a data resource and a participatory process, the SJV Greenprint is intended to foster regional cooperation on plans, programs, and strategies that promote resource sustainability. Many local planning agencies and organizations do not have the staff or resources to dedicate to researching, analyzing, and addressing local and regional resource management challenges. The SJV Greenprint is intended to assist local agencies/organizations and their decision-makers, making available a wide range of current public data on regional resources, compiled in a single repository with interactive mapping capability. This data can inform planning decisions at the county and city levels and can be used as a basis for communication about resources that span multiple jurisdictions, thereby reducing conflicts and improving outcomes.

The SJV Greenprint is intended to assist local agencies/organizations and their decision-makers, making available a wide range of current public data on regional resources, compiled in a single repository with interactive mapping capability.

Report Organization

This Report is organized into three main sections and three appendices:

- » **Section I: Background and Overview.** This section provides an overview of the San Joaquin Valley Greenprint and summarizes the outcomes of Phases I and II of the Greenprint.
- » **Section II: Resource Challenges in the Valley.** This section provides an overview of existing resource challenges in the San Joaquin Valley within the topics of water, agriculture, biodiversity, and energy.
- » **Section III: San Joaquin Valley Gateway.** This section of the Report describes the data platform – the San Joaquin Valley Gateway – and lays out the tools and functions users can expect to find on the platform.
- » **Section IV: SJV Greenprint Demonstration Projects.** This section of the Report describes the three Demonstration Projects, which are projects that showcase the use of SJV Greenprint data to address resource management issues.
- » **Appendix A: SJV Gateway User Guide.** This appendix contains a User Guide that provides step-by-step instructions for using the Gateway.
- » **Appendix B: Phase I Data Layers.** This appendix contains the list of datasets curated during Phase I of the Greenprint, which can be found on the SJV Gateway.

Phase I of the SJV Greenprint

Phase I of the Greenprint involved the compilation of data and a summary report on existing conditions and trends in the Valley.

Data Collection

Phase I of the Greenprint focused on identifying and mapping Valley resources for the eight counties that comprise the San Joaquin Valley, including Kern, Tulare, Kings, Fresno, Madera, Merced, Stanislaus, and San Joaquin Counties. The University of California at Davis Information Center for the Environment (ICE) led the efforts to collect, analyze, and map pertinent datasets, with permissions from various sources such as State and Federal agencies, local jurisdictions, and policy and regulatory programs.

The compiled information includes over 100 datasets related to agriculture, biodiversity, energy, and water resources, as well as supplemental datasets including land use planning, transportation, soils, and land cover. Appendix B includes a full list of the datasets.

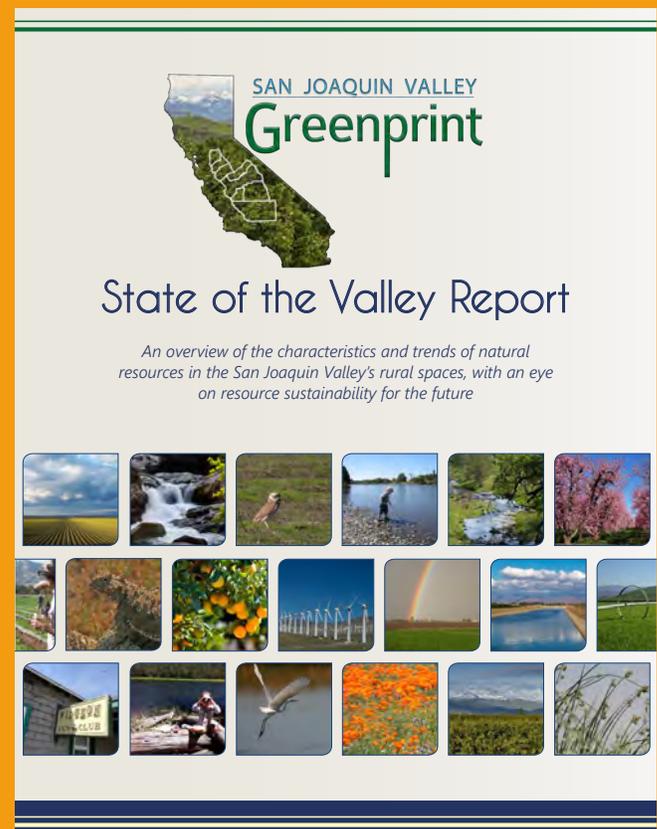
The catalog aimed to be a comprehensive, regional map collection that informs policy and land use planning challenges, such as resource management, flood and drought mitigation and resilience, managing biodiversity and wildlife habitats, and identifying strategic sites for energy facilities.

The main purpose of these data is to Valley decision-makers and stakeholders make informed decisions around regional resource management. Part of Phase II efforts consisted of moving the datasets to the San Joaquin Valley Gateway (SJV Gateway), hosted by Databasin, which is described in detail in Section III of this Report.

State of the Valley Report

The State of the Valley Report, prepared during Phase I, outlines the existing conditions and trends related to natural resources in the San Joaquin Valley, based on interpretation and analysis of the collection of maps and data collected in Phase I. The issues are grouped into four main categories: Water, Agriculture, Biodiversity, and Energy. The State of the Valley Report concludes that the Valley faces significant challenges with few easy solutions, but that despite these challenges, there are many opportunities for a coordinated approach to economic growth and resource management. The Report stresses that the overall purpose of the San Joaquin Valley Greenprint is to provide a tool that can help inform projects, plans, and partnerships, as well as policies that can simultaneously accommodate regional growth and enhance quality of life.

The State of the Valley Report can be found on the SJV Gateway at: <http://sjvp.databasin.org>.



Overview of Phase II of the SJV Greenprint

Phase II of the SJV Greenprint was intended to build on and extend the work in Phase I by demonstrating the real world utility of this information. The Demonstration Projects, described in Section IV, serve as case studies for the use of Greenprint data. A second objective of Phase II was to find an appropriate platform for these curated resources, specifically a host that could provide a user-friendly interface as well as the capacity to update and maintain the data. The San Joaquin Valley Gateway, hosted by Data Basin, was identified as the best platform. The Gateway is described in more detail in Section III. A third objective of Phase II was to shed light on key questions and insights into various resource management challenges in the Valley through outreach to experts, regional councils of government, and county planning directors. This outreach process helped to clarify why the SJV Gateway is an important resource management tool, calling attention to the additional work necessary to ensure that the Gateway remains an important asset to local long-range planning efforts.

San Joaquin Valley Gateway

The SJV Greenprint and its interactive mapping portal (SJV Gateway) provide access to information and tools to help inform interconnected resource decisions in the San Joaquin Valley. Phase II of the SJV Greenprint involved transferring data collected by UC Davis ICE to the Gateway. The San Joaquin Valley Gateway now contains a large collection of publicly-funded maps and data that portray the Valley's water, agricultural, energy, and biological resources. As a comprehensive collection of data on natural and developed resources in the Valley's rural lands, the SJV Gateway gives planners, resource managers, and decision-makers, as well as the public, the ability to layer various resource values on top of one another to evaluate development and conservation decisions through a regional lens. With these tools, any resident or stakeholder can investigate the complexity of planning decisions and contribute to the environmental and economic viability of the San Joaquin Valley.

This Report includes a User Guide (Appendix A) for the SJV Gateway that is tailored to users who are specifically interested in creating and sharing data and maps related to land use and resource management decisions in the San Joaquin Valley. For a more detailed discussion on the San Joaquin Valley Gateway, see Section III of this Report.

San Joaquin Valley Gateway

Sign Up Sign In Support

Search by keyword or location

powered by DATA BASIN

Get Started Explore Create My Workspace

What is the San Joaquin Valley Gateway?

What can I do?

How do I start exploring?

The San Joaquin Valley Gateway provides a regional tool to help planners and resource managers develop and implement integrated multiple-benefit solutions for long-term environmental and economic sustainability. The Gateway also showcases programs and projects that have used this information resource to address resource conflicts in the

Get started quickly with the San Joaquin Valley Gateway

Least Conflict Solar

The San Joaquin Valley Gateway can be accessed at:
<https://sjvp.databasin.org>

Demonstration Projects

The majority of the grant funding for Phase II of the Greenprint went toward funding three Demonstration Projects intended to show how data can be used to support decision making around resource management. Fresno COG released a request for proposals from interested agencies and organizations to conduct Demonstration Projects that use the data assembled by the SJV Greenprint in the SJV Gateway with other sources to help local, regional, State, and Federal agencies and organizations address the Valley's resource management issues, opportunities, and conflicts. Three Demonstration Projects were chosen to address a current issue or opportunity by analyzing and mapping characteristics of the land and its associated resources that will inform choices about their management and the consequences of those choices. The project topics focus on different topics related to land use and water management in the San Joaquin Valley. These projects demonstrated how the SJV Gateway and associated data can be used to address resource management challenges. Section IV of this Report provides an overview of the three Demonstration Projects, the purpose of the projects, the data used, preliminary findings, challenges and limitations in working with the data, and lessons learned.

Stakeholder Outreach

The following summary outlines the process of collecting input from Valley experts.

One key component of Phase II was to collect feedback from experts, local governments, and the regional councils of government concerning the types of data that would be useful for answering resource management questions in the San Joaquin Valley. The Project Team conducted three main outreach efforts to engage Valley planners and stakeholders in a conversation about their concerns on resource management.

Expert Panelist Input

In the first outreach effort, the Project Team proposed to form Expert panels, whereby Expert Panelists were asked for input on identifying the key resource questions to help guide discussion on how to address resource management challenges in the San Joaquin Valley. Over 30 experts on agriculture, biodiversity, energy, water, and economics were

contacted for input. The Expert Panelists were provided an initial list of key questions related to resource protection and management for review and input. In their review, the Expert Panelists were asked to give input on 1) whether these questions addressed the most critical issues facing Valley agriculture, biodiversity, water, and energy, in addition to the economics associated with these topics; 2) whether there were other questions that should be answered related to resource protection and management; and 3) if there were other questions that could be asked to frame issues in a meaningful way to convey the importance of the sustainable use of Valley resources.

A total of 12 Expert Panelists contributed their input, providing a valuable snapshot into the concerns of Valley stakeholders. Most of the input concerned water, covering topics such as water availability, recharge zones, water delivery costs, water rights, and irrigation practices. The energy topic also generated many responses and comments from the Expert Panelists, who touched on issues such as regional energy partnerships; the nexus between water and energy, specifically concerning the energy-intensive nature of groundwater management plans; the incorporation of energy-efficient models and technological advances in industrial, commercial, and agricultural sectors; siting considerations for solar and wind energy facilities; environmental concerns over the use of fracking; and policy efforts to implement clean energy practices.

Additionally, several responses addressed the interplay between multiple topics – water and energy; agriculture, energy production, and biodiversity; climate change and water; agriculture and biodiversity – which speaks to the complexity and interconnectivity of these issues that stakeholders face in their work. Other topics that did not fall within the topic areas, but were raised in the responses, include balancing urbanization/growth/sprawl with agricultural preservation and biological conservation efforts, and a greater emphasis on how climate change could affect all of these areas, as well as concerns over climate-change-induced migration and its effects on the housing market in the Valley.

County and Regional Perspectives

In the second outreach effort, the Project Team reached out to councils of government, regional planning agencies, and county planning directors to get input on a broad range of topics to help identify key resource issues and creative approaches to address these challenges facing the Valley. The input helped to develop evaluation criteria for the Demonstration Projects.

The Project Team sent out a questionnaire to planning directors from the eight counties and directors of the eight regional planning agencies and received responses from the Fresno Council of Governments (FCOG), Madera County Transportation Commission (MCTC), Stanislaus Council of Governments (StanCOG), Tulare County Association of Governments (TCAG), and Madera County. The questionnaire asked the following nine questions:

1. *What are the most important non-urban resources in the Valley whose health and productivity need to be sustained into the future? Can you put the answer into more specific context for your county or area of the Valley?*
2. *What are the major non-urban land use issues related to agriculture, water, energy, conservation, or open space which are of concern in your county or region?*
3. *What key resource issues and associated planning challenges does your agency need to address?*
4. *Does your county have the tools/resources to map where the best locations for groundwater recharge are in your county or region?*
5. *Does your county have the tools/resources to map where the best locations are for agricultural production in your county or region?*
6. *Does your county have the tools/resources to map where the most important locations are for the conservation of native, rare and endangered species and ecosystems? This would include important corridors and connectivity factors. Which of these locations has the least conflict with other land and water uses?*
7. *Does your county have the tools/resources to map where the best (least conflict) locations are for utility scale wind energy and solar facilities? Can you identify which of these locations has the least conflict with other land and water uses?*
8. *What additional information and/or tools would help you address these near-term and longer-term planning challenges?*
9. *Does your county have the tools and information resources to map probable changes in climate, and the effects this might have on agriculture, natural resources, water, and energy in your region?*

Overall, the main resource concerns in the Valley are related to agriculture preservation, open space, water supply, air quality, the impact of the drought, and balancing conservation with growth. Although the agencies felt they generally had the tools and in-house capacity to conduct analyses necessary for resource management (except climate change), they expressed a need for up-to-date, accurate open-space GIS data – particularly regarding the impact of the drought on Valley resources. These resources are exactly what the SVJ Gateway aims to provide to local and regional planning efforts.

Informational Interviews with County Planning Directors

To build on the insight collected during the second outreach effort, the Project Team contacted additional county planning directors through e-mails and phone calls. This third outreach effort aimed to develop a deeper understanding of the capacity of local jurisdictions to address resource challenges and to discuss the potential role of the Gateway in helping them address these issues.

According to these informational interviews, county planners consider the SJV Gateway an excellent new resource for their land use planning efforts. As county planners are often responsible for helping to balance competing needs of city growth, county economic development, and resource preservation, the Gateway would provide a comprehensive resource GIS database that they can use to gather existing conditions information about a planning area or project site, compare and analyze resource impacts of various alternatives, and develop appropriate policies, programs, mitigation measures, or conditions of approval. The SJV Gateway database expands the county planners' knowledge and understanding of the resources under their jurisdiction, which leads to better resource-based policies and more effective decision-making.

There are, however, two key concerns county planners have about the SJV Gateway: database maintenance and public awareness. A concern expressed by all those involved with the SJV Greenprint Project is the assurance that the database will remain current and be updated regularly. Without a robust maintenance effort, some of the spatial data could become stale. Planners need to know they can rely on the SJV Gateway as a reliable, comprehensive data source. Second, there was strong interest expressed about informing and educating San Joaquin Valley planners, particularly county planners, about the existence and use of the SJV Gateway. Many planners are unaware of the SJV Gateway, and it was felt that a comprehensive outreach and education program could result in widespread use of the site, leading to increased support for regular upkeep.



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Resource Challenges in the Valley



Continuing the work of the SJV Greenprint can make important contributions to the health and well-being of the San Joaquin Valley. The Valley faces many critical resource challenges that can only be addressed through the continuing efforts of residents and businesses; local, regional, State, and Federal agencies; and NGOs and CBOs. Additionally, public and policy-maker education is an important and critical component in ensuring long-term environmental and economic sustainability in the Central Valley for all resource topics. While there is much work underway already, the SJV Greenprint and Gateway can make an important contribution to these efforts.

This section provides a general overview of existing resource challenges in the San Joaquin Valley within the topics of water, agriculture, biodiversity, and energy. It provides broad context of the issues and calls out key questions, distilled from the combination of the questions developed by the Management Committee in Phase II for outreach to Expert Panelists, in addition to the comments and questions provided by Expert Panelists. These questions serve to:

1. highlight where the work still needs to be done in the Valley to fully understand the challenges, how to manage limited resources, and where cross-sectional efforts could be improved (e.g., the effect of climate change on any and all of the topical focus areas; the economic ramifications of resource management decisions); and
2. showcase the types of questions users can begin to answer through combining and analyzing the data hosted in the SJV Gateway.

The discussion and questions together frame these issues by highlighting what is currently known about the state of resources in the Valley, the types of questions that still need to be answered, but could be addressed by using the tools available in the SVJ Gateway.

Agriculture

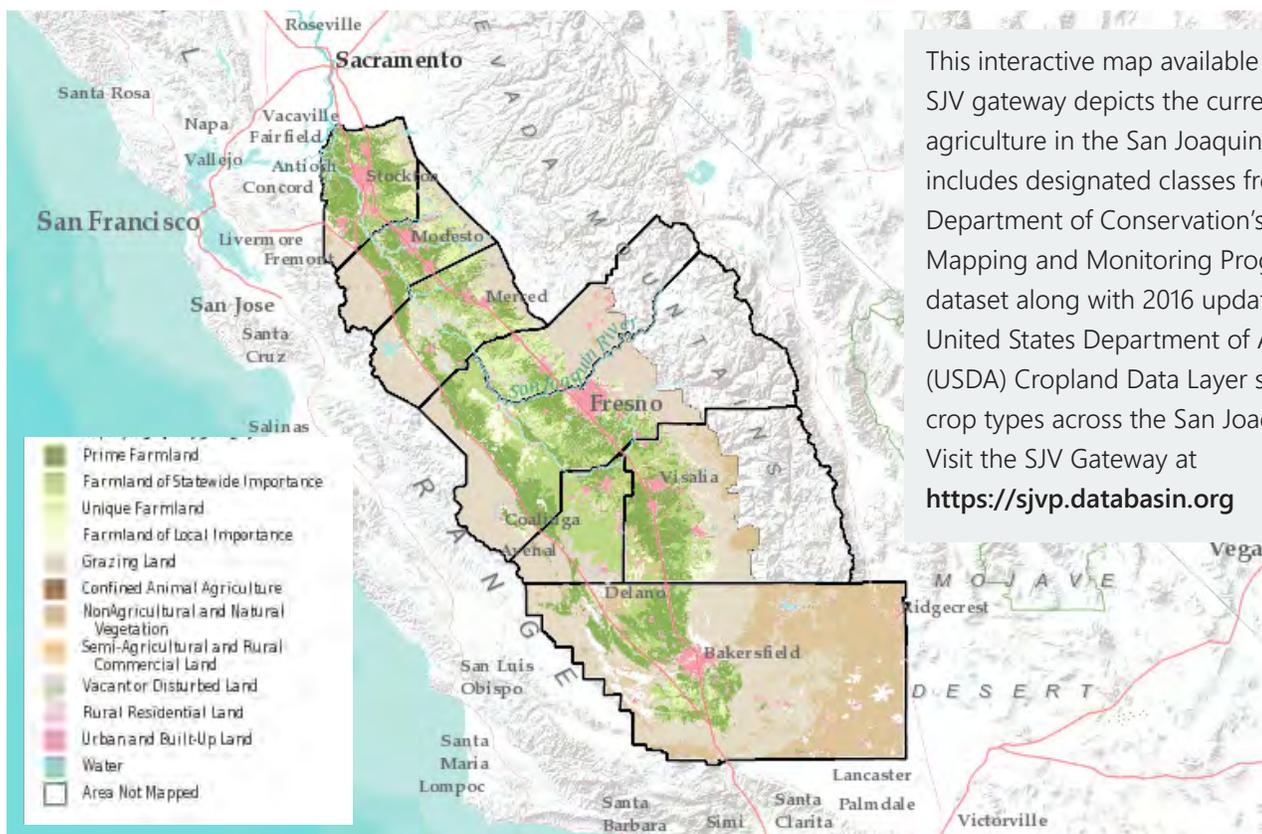
The San Joaquin Valley is an agricultural powerhouse with seven out of the eight counties among the top ten in U.S. agricultural market value. The remarkable productivity of the region is a result of superior soils, plentiful sun, and cool winters with limited frost danger. These are rare factors that exist in select regions around the world.

Losses to farmable land and uncertainty in water availability, however, challenge the Valley's overall productivity. As long as cities and urban areas in the Valley continue to expand outward, agricultural land preservation will remain a key challenge. While the SJV Blueprint and SB 375 Sustainable Communities Strategies have introduced new approaches to increasing the capacity of existing urban areas, outward expansion of development remains essential to the accommodation of population and economic growth. As a result, productive agricultural land continues to be converted to urban uses. The SJV Greenprint can contribute to a better understanding of the implications of agricultural land conversion and the viable options to minimize that conversion.

The San Joaquin Valley Greenprint and its interactive mapping portal (the SJV Gateway) can be used to help answer the following important questions when making land use decisions that could impact farmland:

- » What areas are important to the region's agricultural economy because of soils?
- » Is this area a groundwater recharge area that can serve as both cropland and groundwater recharge?
- » Does the project overlap with an area producing a high value crop? How widespread is that crop?
- » Does the action being considered make an appropriate trade in providing regional benefits for the conversion of agricultural land?
- » Where are existing agricultural lands most and least likely to remain viable for commercial agricultural production in the future?
- » What are the direct impacts of drought on the San Joaquin Valley's regional economy through its influences on agricultural productivity?

Agriculture in the San Joaquin Valley



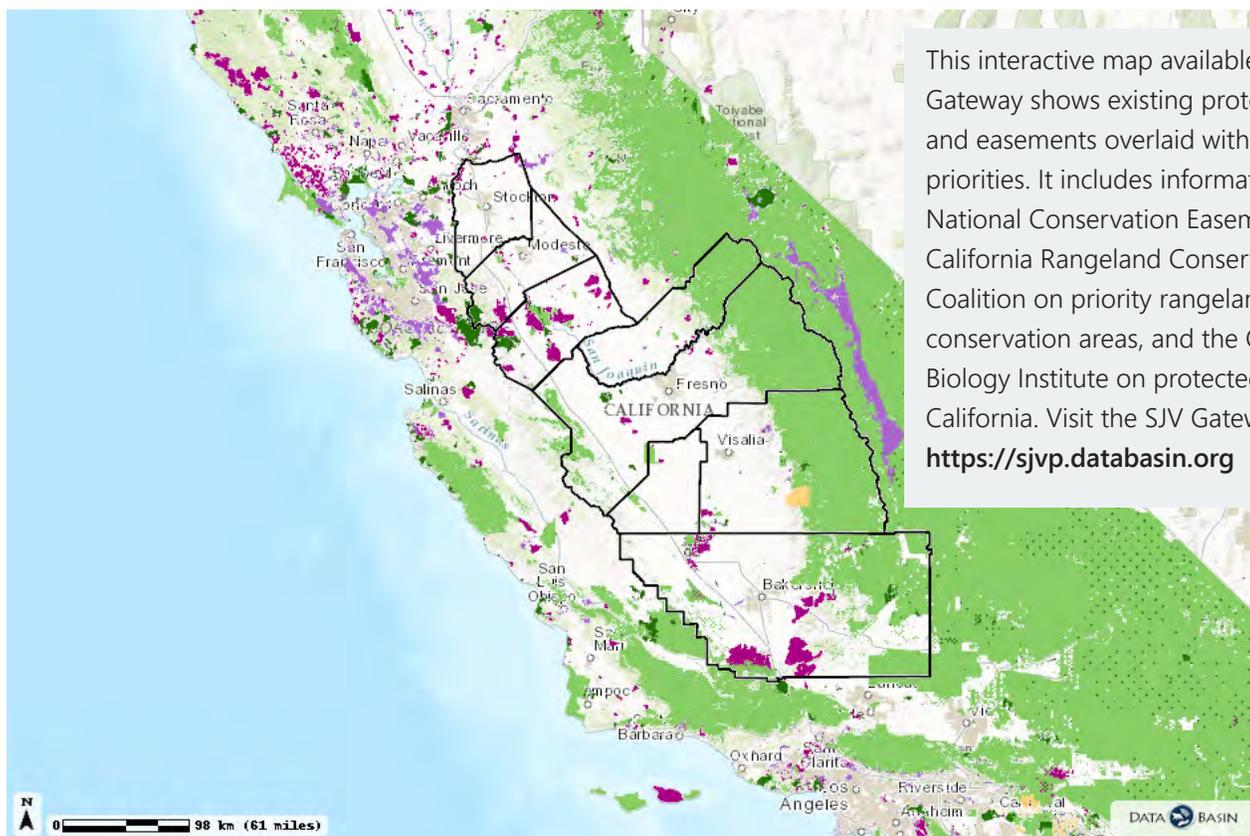
Biodiversity

Plants, wildlife, and other organisms are integral ecosystem components, acting together with non-living factors such as water and climate. Regions with higher numbers of species (also called higher levels of biodiversity) support greater natural plant productivity, and are more resilient to natural habitat disruptions like wildfire, as well as manmade disruptions to landscape, and potentially, climate change. This biodiversity also supports the health and sustainability of “ecosystem services” upon which humans and other species depend, including purification of air and water, flood and drought protection, decomposition of wastes, soil renewal, pollination of crops, pest control, and more.

Due to the extensive conversion of natural habitats, particularly on the valley floor, there is a need to conserve what remains to support biodiversity and ecosystem processes. As planners and resource managers make land use and conservation prioritization decisions, the regional perspective provided by the SJV Greenprint and the interactive mapping portal (the SJV Gateway) can help inform questions such as:

- » What groundwater recharge zones can also provide high value wildlife habitat?
- » Where can riparian restoration efforts be combined with wildlife corridors and other needs?
- » Where can we restore biodiversity and connect wildlife habitats, while also achieving other land use benefits like riverside parks for recreation?
- » Can we identify areas for urban and energy development that also minimize impacts to wildlife and ecosystem processes?
- » Where are high-priority habitats for rare species that proposed development projects can avoid or mitigate?
- » Where can agricultural practices also provide wildlife habitat benefits?
- » What agricultural lands have relatively low value that might be retired and used for habitat restoration?
- » Where can flood management modifications positively contribute to habitat availability?

San Joaquin Valley Protected Lands Network Map



This interactive map available on the SJV Gateway shows existing protected areas and easements overlaid with range land priorities. It includes information from the National Conservation Easement Database, California Rangeland Conservation Coalition on priority rangeland conservation areas, and the Conservation Biology Institute on protected areas in California. Visit the SJV Gateway at <https://sjvp.databasin.org>

Energy

The San Joaquin Valley is a center for both energy production and transmission in California. The Valley's largest contribution to the State's power system comes from more than 80 conventional oil/gas power plants that generate more than 7,500 megawatts. The southern end of the Valley is a major petroleum-producing region, accounting for 6 percent of the nation's oil production. Wind farms are in the northern and southern ends of the Valley and are the region's second largest producer of electricity. Other energy sources in the Valley include hydropower, solar electricity facilities, and biomass.

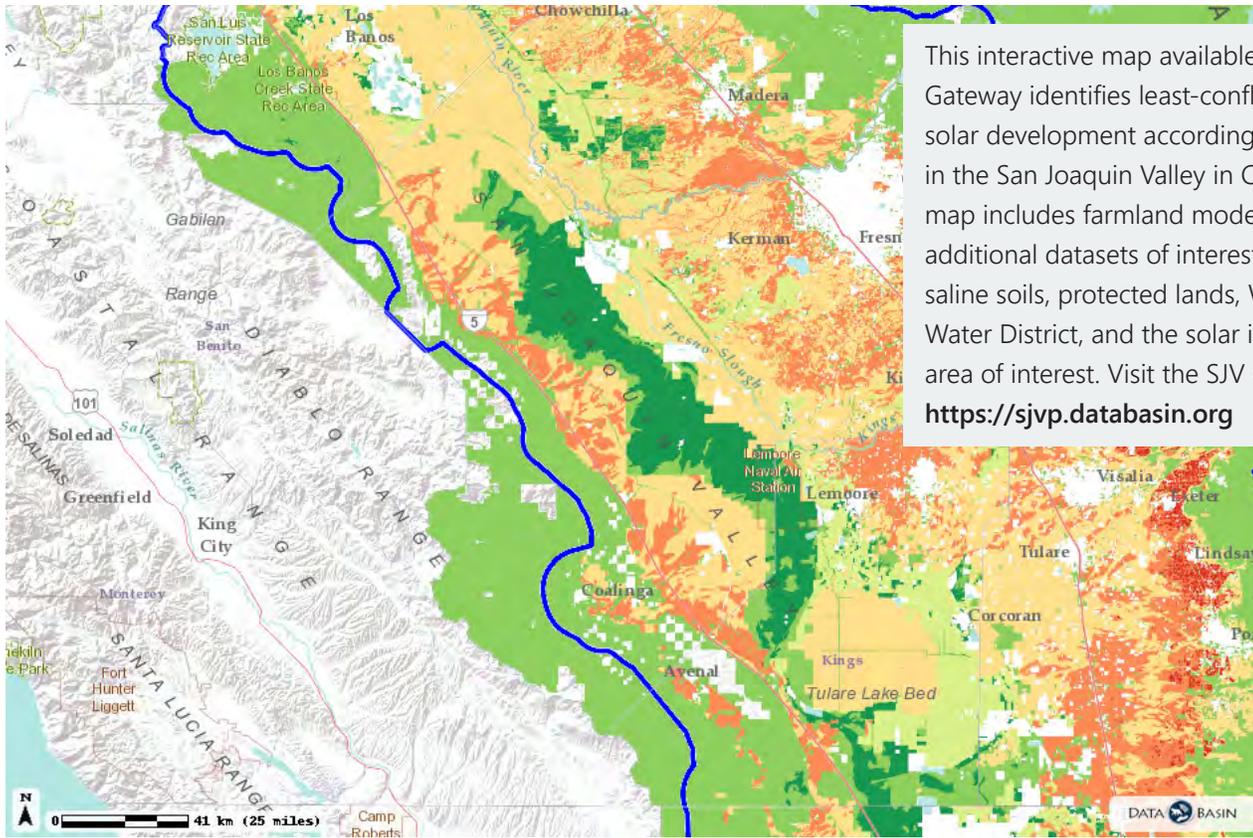
Many of the state's major electrical transmission lines pass through the San Joaquin Valley as they connect Northern and Southern California. The California Energy Commission and its collaborators, both public and private, identified regions around the state with the right climate conditions to generate renewable energy resources and the ability to transmit that energy to the state's power grid. Many of these lie within the Valley's eight counties.

The development of energy production facilities poses many challenges, and with careful consideration, opportunities as well. In the regional context of the Valley's planning and resource management decisions, the following are some questions that the SJV Greenprint and the interactive mapping portal (the SJV Gateway) can help answer:

- » What areas in the eight San Joaquin Valley counties are the most suited to solar energy production, and what other resource trade-offs are made by selecting a location?
- » What areas are most suited to wind energy generation? And what other effects may that development have?
- » Where are existing fossil fuel operations located? If operations expand, what conflicts may arise with other resources?
- » What is the impact of climate change on hydro-electric production?

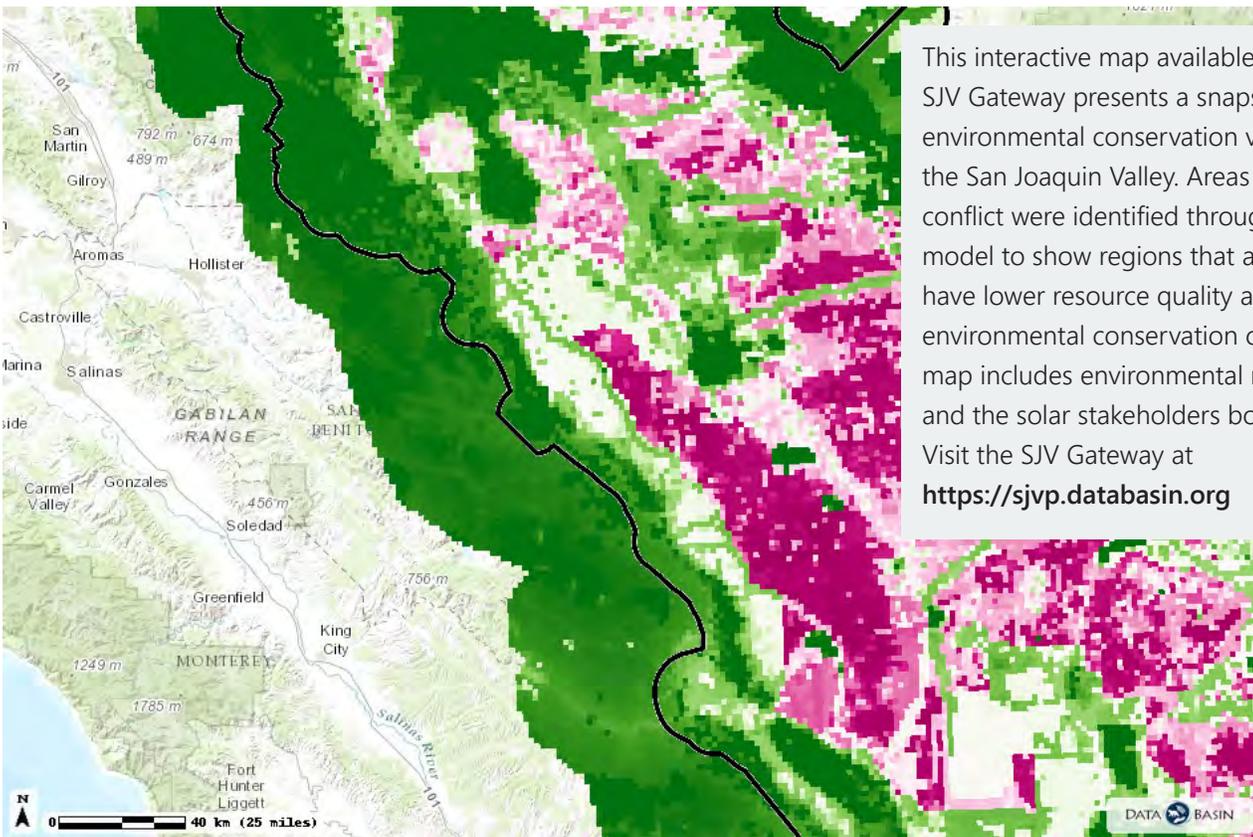


San Joaquin Valley Least Conflict Solar – Farmland Map



This interactive map available on the SJV Gateway identifies least-conflict lands for solar development according to farmland in the San Joaquin Valley in California. The map includes farmland model results and additional datasets of interest, including saline soils, protected lands, Westlands Water District, and the solar industry focal area of interest. Visit the SJV Gateway at <https://sjvp.databasin.org>

San Joaquin Valley Least Conflict Solar – Environment Map



This interactive map available on the SJV Gateway presents a snapshot of environmental conservation value within the San Joaquin Valley. Areas of least conflict were identified through this model to show regions that are likely to have lower resource quality and lower environmental conservation conflicts. This map includes environmental model results and the solar stakeholders boundary. Visit the SJV Gateway at <https://sjvp.databasin.org>

3

San Joaquin Valley Gateway



What is the San Joaquin Valley Gateway?

The San Joaquin Valley Gateway (SJV Gateway) is a web-based, interactive mapping platform that provides spatial data to support collaborative planning in the San Joaquin Valley. The SJV Gateway is housed within Data Basin, which is a web-based mapping and analysis platform that provides open access to thousands of scientifically-grounded, biological, physical, and socio-economic datasets.

“Gateways” are sites powered by Data Basin and curated by members of various interest groups. They showcase spatial information for a particular geography, topic, project, or organization. Gateways include a subset of the data available on Data Basin.

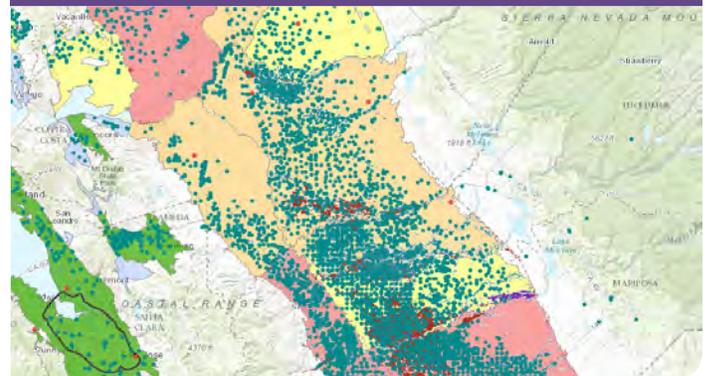
The SJV Gateway contains interactive maps and data on agriculture, water, energy, and biodiversity for the eight San Joaquin Valley counties – Kern, Tulare, Kings, Fresno, Madera, Merced, Stanislaus, and San Joaquin Counties. The SJV Gateway is intended to support a variety of different stakeholders, including decision-makers, planners, natural resource managers, advocates, students, and members of the public. There is no cost to use the Gateway. Users can also sign up for a free Data Basin membership that will allow them to create and participate in working groups where they can visualize, draw, comment, and discuss relevant topics or geographies. The Gateway allows various users that are often siloed from one another to collaborate on resource management challenges in the Valley. The Gateway gives users the ability to view, download, and upload data; view and create maps; and collaborate on special projects.

The Role of the San Joaquin Valley Gateway in Greenprint Phase II

The University of California at Davis Information Center for the Environment (ICE) led the effort to collect, analyze, and map the data for the San Joaquin Valley Greenprint in Phase I of this project. The ICE team obtained the information from a wide variety of sources including State and Federal agencies, local jurisdictions, policy and regulations programs, and private and/or NGO collections. All the data have been uploaded and organized by theme on the SJV Gateway website. Moving forward, the Gateway will be used to showcase the demonstration projects and future datasets and models created to help inform planning decisions within the San Joaquin Valley region.

The San Joaquin Valley Gateway
can be accessed at:

<https://sjvp.databasin.org>



How can the San Joaquin Valley Gateway support you and your agency/organization?

The SJV Gateway is a repository of water, agricultural, energy, and biological resource maps and data that can inform land use and resource management decisions in the Valley. It is a tool for Valley planners and decision-makers; local, State, and Federal resource managers; consultants; non-governmental organizations; and the public to view and create maps and view, analyze, or download data.

View, Download, and Upload Data

The SJV Gateway offers its users a rich library of data and information about the San Joaquin Valley that is reliable, accurate, and current. The Gateway allows anyone to view a broad range of maps and data pertaining to topics such as agriculture, water resources, energy, biological resource, land use planning, transportation, soils, and land cover for areas throughout the Valley. Users do not need an account to view data. All data is easily accessible through an online mapping interface on the SJV Gateway site.

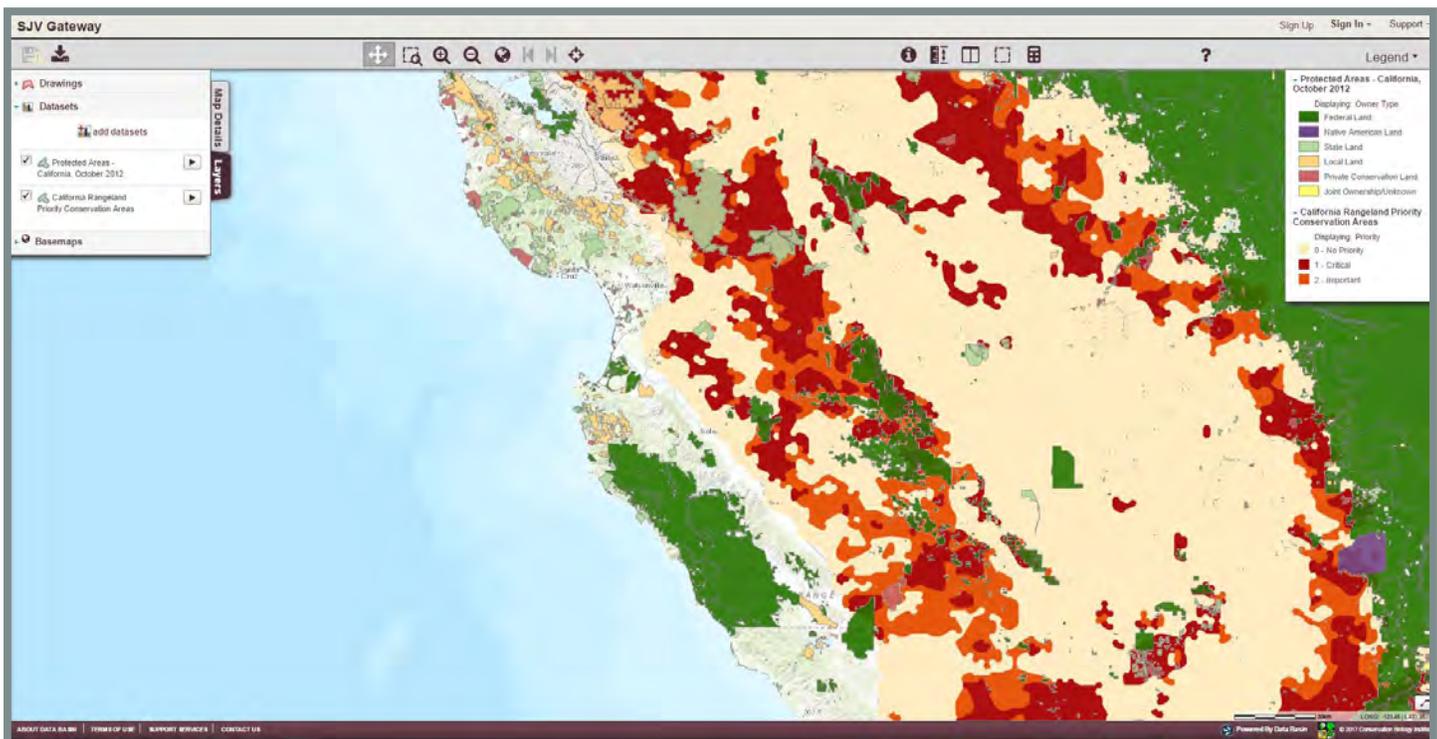
If users prefer to view and analyze the data in their own Geographic Information System, users can download datasets simply by signing up for a free Data Basin account. The data can then be downloaded and used to create maps in a user's own Geographic Information System.

In addition, if your agency or organization has datasets that it would like to share with the public, the SJV Gateway is a great tool for hosting that information. Data Basin members can upload new datasets to the Gateway.

Create Maps

If your agency or organization does not have access to ArcGIS or other mapping tools, the SJV Gateway allows its users to create custom maps using the online mapping interface. For example, if an agency or organization is interested in groundwater in Kern County, they can create a map using the data layers on the Gateway. The mapping interface allows users to create new maps, upload relevant data layers, set the geographic extent of the map, and customize colors, symbols, shading, and other map features.

If you are making a presentation or want to include your map in a report, you can export your map to PDF, PowerPoint, or a set of PNG files. As a member of Data Basin, you can download the map to your desktop and it will be compatible with ArcGIS.



For more information on how to use the SJV Gateway, please visit the site at <https://sjvp.databasin.org> and read the User Guide in Appendix A of this Report.

Gateway User Guide

Please see Appendix A for the SJV Gateway User Guide. It will take you step-by-step through the basic features of the SJV Gateway, including how to search for relevant content, create groups to facilitate collaboration on specific topics, manage and personalize workspace areas, and import datasets.

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Introduction

To show how the information collected for the SJV Greenprint could be used to inform regional planning decisions, the Fresno Council of Governments sought out Demonstration Projects to help local, State, and Federal agencies and organizations address the Valley's resource management issues, conflicts, and opportunities. Three projects, covering topics ranging from the relationship between land use and water to sustainable groundwater in the San Joaquin Valley, address a current issue or opportunity by analyzing and mapping characteristics of the land and its associated resources that will inform choices about their management and the consequences of those choices. The Demonstration Projects were encouraged to use data sourced from the San Joaquin Valley Gateway. The final product will be uploaded to the SJV Gateway upon completion for future SJV Gateway users and visitors to reference. Demonstration Projects will result in implementation tools and/or mechanisms for use by local governments. These tools will provide decision-makers with improved information to better address the current and future needs of the San Joaquin Valley's eight counties.

The three demonstration projects include:

- » *Watershed Enhancement Strategies for Groundwater Sustainability*, by Sequoia Riverlands Trust
- » *Exploring the Land-Water Intersection in the San Joaquin Valley*, by American Farmland Trust and Conservation Biology Institute
- » *Groundwater Recharge Assessment Tool (GRAT)*, by Sustainable Conservation and Earth Genome

The Demonstration Project summaries below include:

- » A description of the Demonstration Project;
- » How the project uses the data from the SJV Gateway;
- » Preliminary findings; and
- » Data limitations and challenges.

The Demonstration Projects are still underway as of the writing of this Report, and final results are not yet available. The summaries below describe the work completed as of the end of March 2017. Final results, including maps and data sources used, will be posted on the San Joaquin Valley Gateway at: <https://sjvp.databasin.org>.

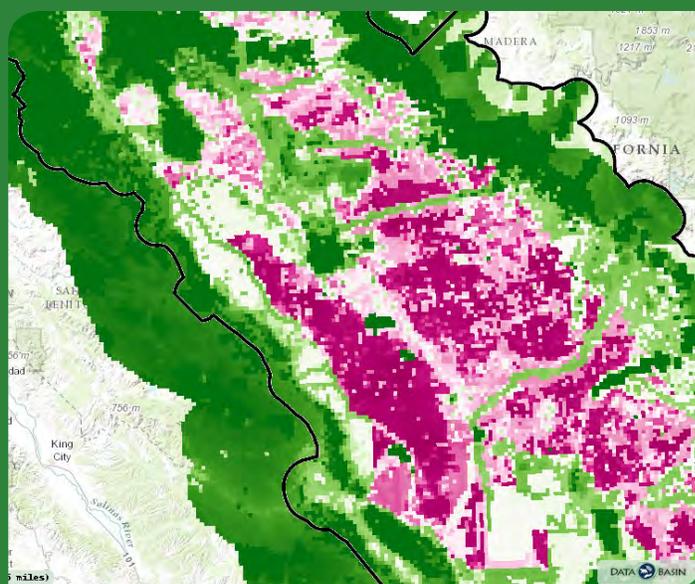
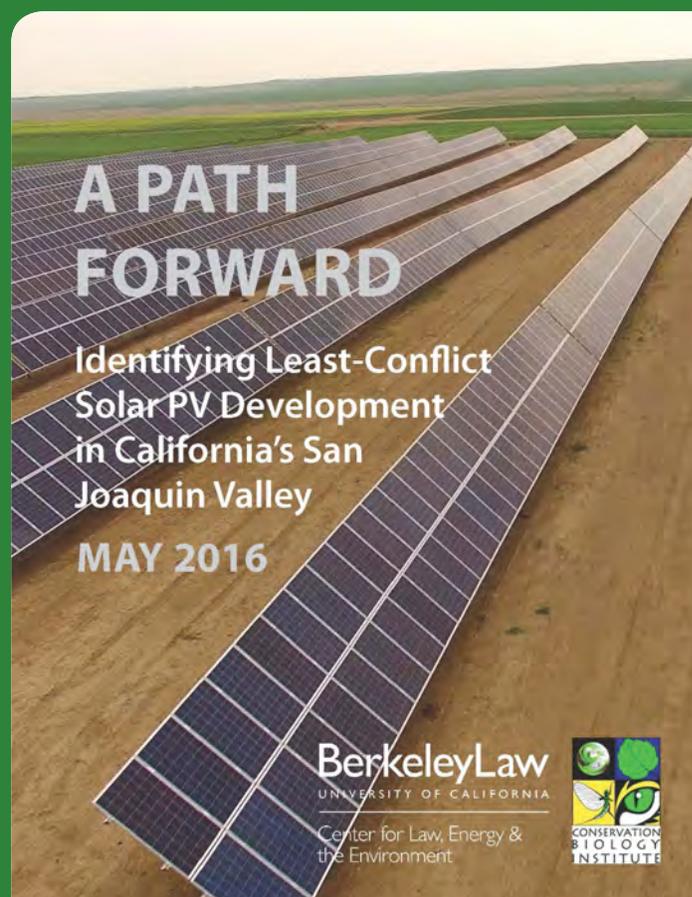
Case Study: Least-Conflict Solar

The Least-Conflict Lands project was a precursor to the Greenprint Demonstration Projects. Initiated and managed by the Strategic Growth Council, this effort used the SJV Data Basin Gateway to map and analyze different resources in the Valley compared to the best locations for future large-scale solar projects. The SGC then convened agricultural, biological, and energy stakeholder groups to review the materials and come to agreement on areas of “least conflict” for siting future solar projects. The project identified 470,000 acres of least-conflict land for PV solar development, which amounted to roughly 5 percent of the 9.5 million acres of the total area studied.

As part of a separate effort, the California County Planning Directors Association prepared a Model Solar Energy Facility Siting Ordinance (<http://www.ccpda.org/solar>) for use by local governments. The goal of this project was to assist Counties in providing streamlined regulations for the installation of solar energy facilities, while protecting important farmland and sensitive habitats.

While prepared separately, when combined, these two efforts provide an example of how to use the geographic information in the SJV Gateway to map and analyze resource information, engage key stakeholder groups, and create an implementation strategy to use the mapped data at the local level.

The SJV Gateway was originally created to support the Least-Conflict Lands project and was later expanded to include the SJV Greenprint project.



¹ Thorne, J.H., Roth, N.E., Boynton, R.M., and Woodard, N. 2014. *The San Joaquin Valley Greenprint State of the Valley Report*. Retrieved from <http://www.fresnocog.org/san-joaquin-valley-greenprint-program>.

² Cal. Water Code § 10720 et seq. SGMA calls for local jurisdictions, water agencies and other stakeholders to form Groundwater Sustainability Agencies (GSAs), which are responsible for preparing Groundwater Sustainability Plans (GSPs) for their basins or subbasins. In the San Joaquin Valley, GSAs must be formed by June 30, 2017, GSPs must be prepared by January 31, 2020, and the time horizon for achieving sustainability is 20 years.

Watershed Enhancement Strategies for Groundwater Sustainability

Sequoia Riverlands Trust

I. Purpose

The State of the Valley Report identifies water as “one of the central management challenges of the San Joaquin Valley,” and emphasizes that “[b]oth surface water and water pumped from underground aquifers are critical to the region’s farming, ranching, urban users, industry, and natural ecosystems.”¹ Implementation of the Sustainable Groundwater Management Act (SGMA) is just beginning,² but the overall dialogue about water sustainability has focused more on technological solutions for enhancing storage than on ways to improve the natural ability of watersheds to absorb, store, and gradually release water in forms useful to people and the land. Sequoia Riverlands Trust (SRT) seeks to remedy this imbalance by exploring and creating tools to implement land-based approaches to support natural groundwater recharge and improved watershed function.

II. Project Description

SRT’s project involves mapping, planning, and policy research to identify water management strategies in the Kaweah and Tule Watersheds, including areas covered by the Mid-Kaweah and Lower Tule Groundwater Sustainability Agencies (GSAs). In keeping with the goal of exploring land-based strategies, it is built around three themes:

- » Soil enhancement and water resources;
- » Flood threats and opportunities; and
- » Mineral and water resources;

The mapping and planning portion of the project is designed to explore the scope and spatial distribution of land-based opportunities by:

1. Mapping natural resources and land uses in the region as they relate to the three themes.

2. Creating a well-documented gallery on Data Basin and developing an interactive, web-based tool that stakeholders can use to identify priority areas for watershed conservation and enhancement.
3. Identifying key elements, partners, and potential funding sources for a collaborative project that will enhance natural watershed function and groundwater sustainability. The groundwater policy portion of the project is designed to support these goals by offering a set of policies and practices for GSAs to incorporate into the region’s first Groundwater Sustainability Plans (GSPs). While this project is focused on specific watersheds, SRT anticipates that its methods and policy recommendations will be exportable to other parts of the region. In addition, ongoing coordination with American Farmland Trust and Sustainable Conservation is helping to ensure that SRT’s work will complement the other two Greenprint Demonstration Projects, and vice versa.

III. Data and Preliminary Findings

A. Mapping and Planning

In addition to input from land managers, water agencies, and other stakeholders, the mapping and planning portion of the project has incorporated several geospatial data sources. These include, but are not limited to, the following:

- » Map layers depicting natural water features, such as rivers, streams, and groundwater basins
- » Map layers depicting water infrastructure, such as retention basins, canals, and ditches
- » Map layers depicting mine sites and mineral resource zones
- » Spatial data on groundwater banking potential, including Soil Agricultural Groundwater Banking Index values³
- » Federal Emergency Management Agency layers representing 100-year and 500-year flood zones

³ See U.C. Davis. 2017. *Soil Agricultural Groundwater Banking Index*. Retrieved from <https://casoilresource.lawr.ucdavis.edu/sagbi/>.

Figure 1: Draft Water and Mineral Resources Map

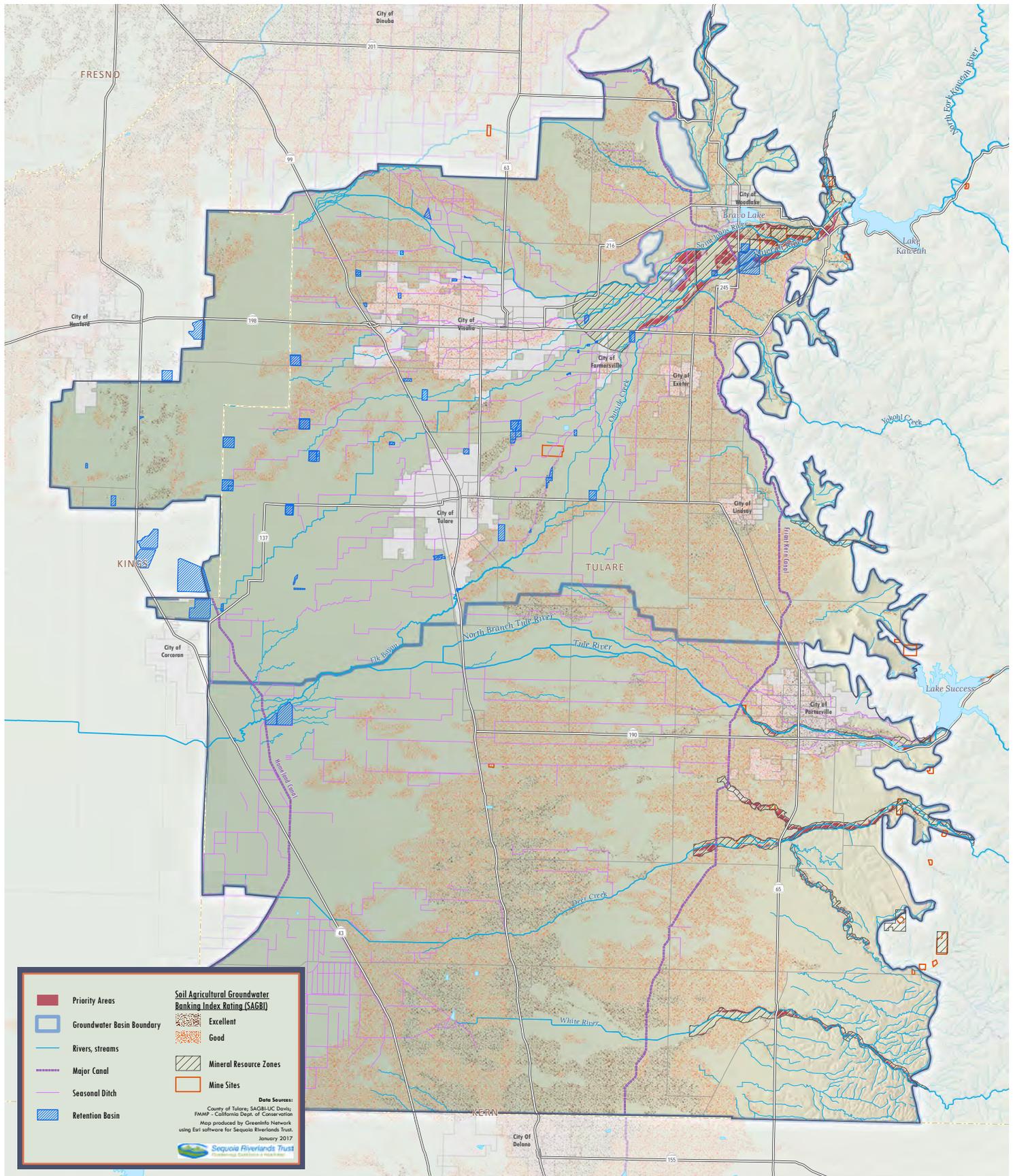


Figure 2: Draft Floodwater Threats and Opportunities Map

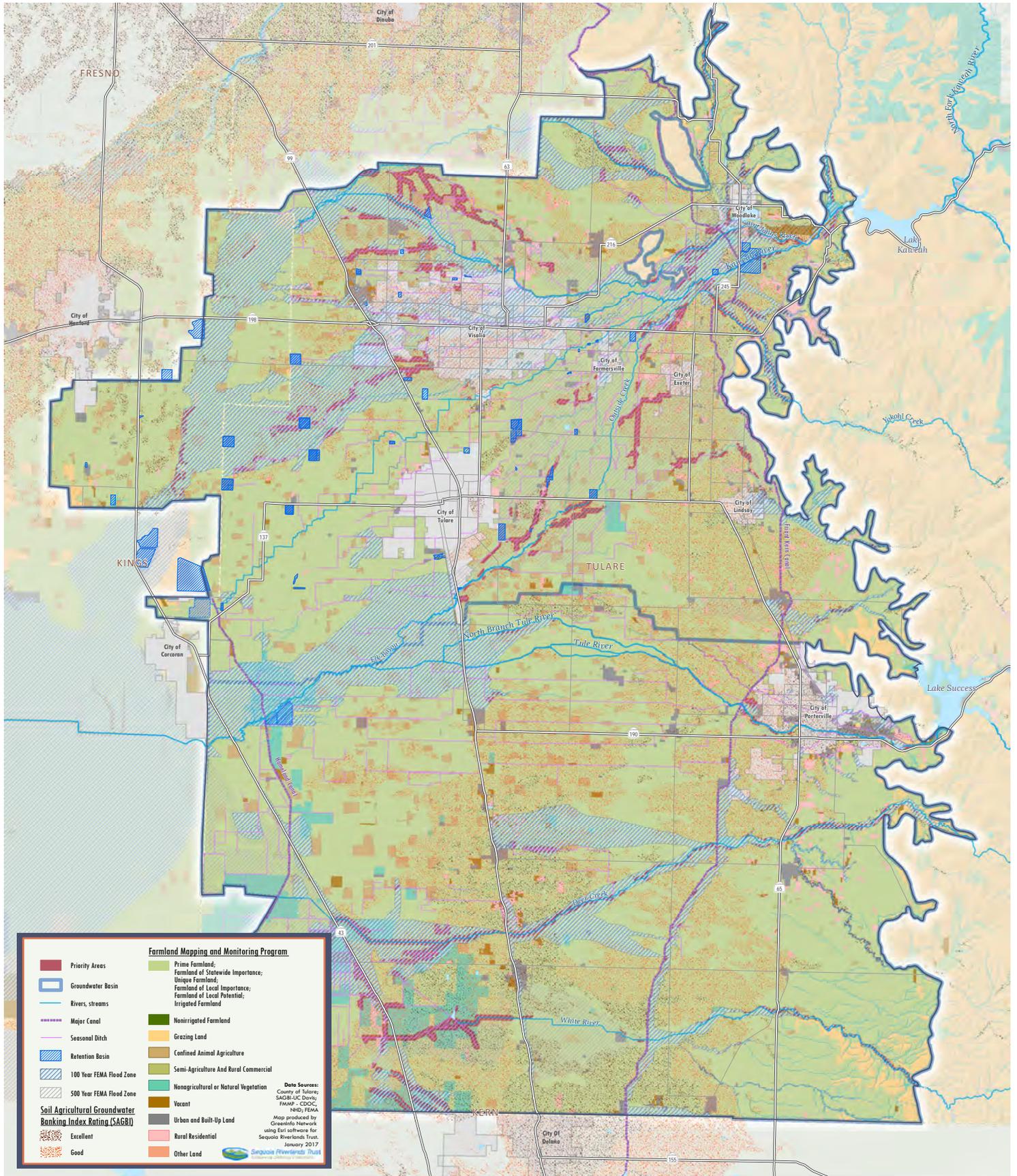
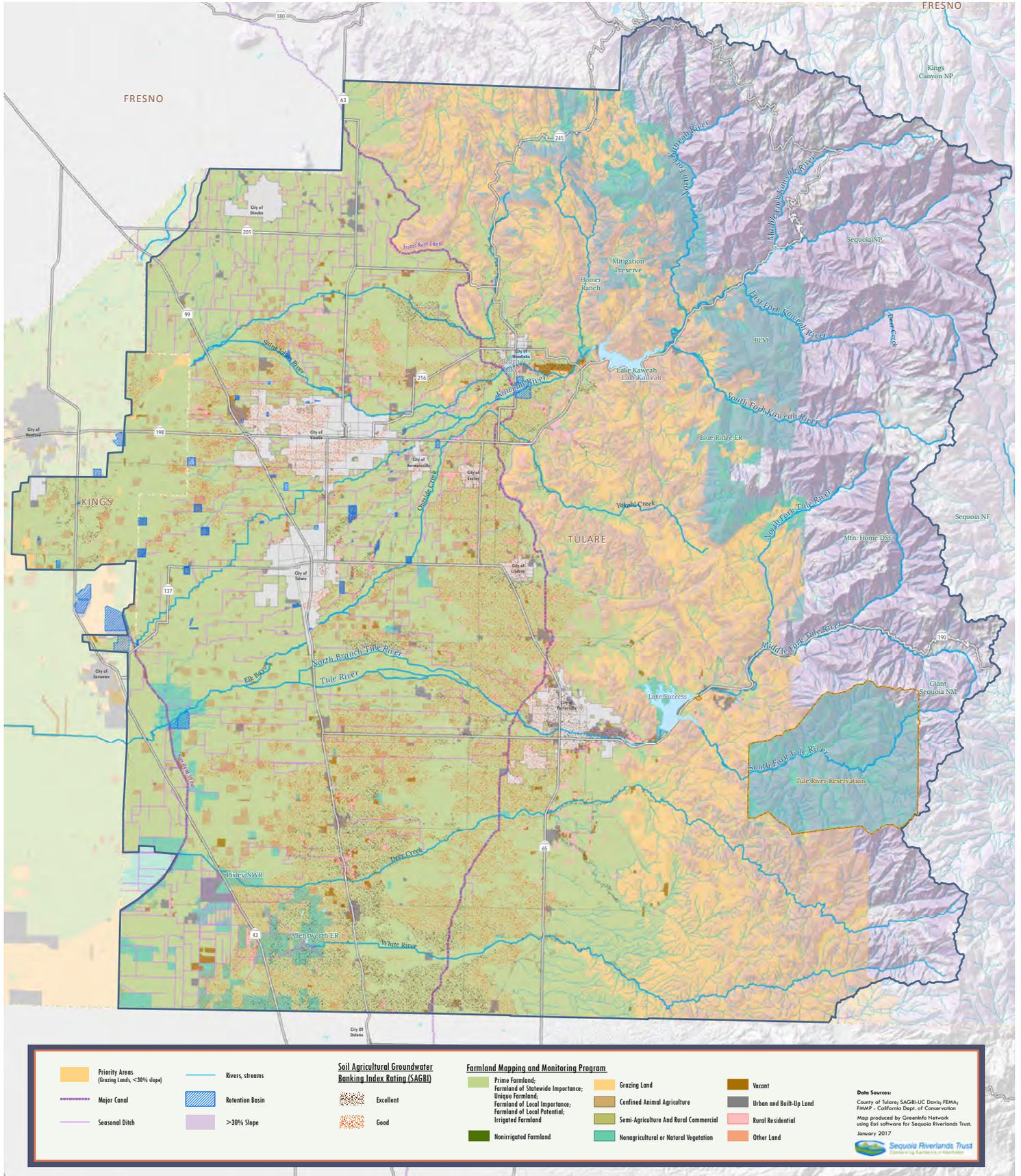


Figure 3: Draft Soil Enhancement and Water Resources Map



- » Land use and soil quality data from the Farmland Mapping and Monitoring Program (FMMP), including but not limited to, prime farmland and other State-designated categories of important farmland, grazing land, and developed areas
- » Data on elevation gradients (slope)

With the help of GreenInfo Network, SRT is using this data to develop three maps, each examining a hypothesis about land-based opportunities to enhance watershed function. Each hypothesis is drawn from a core theme of the project. One map examines opportunities involving soil (Figure 1), another focuses on threats and opportunities related to flood management (Figure 2), and a third enhancement explores the potential for improved watershed function in the context of mineral resources (Figure 3).

Using these maps, SRT and GreenInfo are designing a web-based “reporting tool” that enables users to identify high-priority areas for enhancing watershed effectiveness and groundwater sustainability. Results will be organized around the three themes, and will include relevant attributes of any given area (either a “pin drop” point or a custom polygon) within the Kaweah and Tule Watersheds. SRT will then apply the tool and other GIS analyses to a subset of the Kaweah River corridor to illustrate their utility for identifying areas of greatest opportunity and conceptualizing potential projects.

This will culminate in a concept for a collaborative, on-the-ground project that will demonstrate application of multiple land-based strategies for a variety of benefits, including but not limited to, enhanced watershed function, groundwater recharge, downstream flood abatement, riparian habitat, soil health, and livestock forage production. Based on the results so far, the most promising opportunity may be SRT’s “carbon farm pilot” at Kaweah Oaks Preserve. This pilot project would incorporate several management practices that

enhance soil carbon, moisture retention and groundwater recharge, along with a plan for partially restoring the natural hydrology of the Preserve via floodwater runoff.

B. Groundwater Policy

The groundwater policy portion of the project is ongoing, and continues to benefit from SRT’s involvement in the Mid-Kaweah, Greater Kaweah, and Lower Tule GSAs. Beyond stakeholder input, other data sources include, but are not limited to, the following:

- » The Department of Water Resources (DWR) recently-released Best Management Practices for the Sustainable Management of Groundwater;⁴
- » Research on the relationship between soil management practices and groundwater recharge potential;⁵
- » Best management practices relating to flood protection and groundwater recharge;⁶ and
- » California regulations and other guidance on best practices for mine reclamation;⁷

SRT is developing recommended policies and practices for GSPs and does not yet have preliminary results from this portion of their work. They anticipate that their recommendations will be organized around the three central themes of the project, and will support land-based opportunities to improve watershed function and groundwater sustainability.

⁴ DWR. 2016. *Best Management Practices for the Sustainable Management of Groundwater*. Retrieved from <http://www.water.ca.gov/groundwater/sgm/bmps.cfm>.

⁵ See, e.g., Smith, C.W. 2015. *Effects of Implementation of Soil Health Management Practices on Infiltration, Saturated Hydraulic Conductivity (Ksat), and Runoff*. Retrieved from https://www.nrcs.usda.gov/wps/PA_NRCSCconsumption/download?cid=nrcseprd1289235&ext=pdf.

⁶ See, e.g., RMC Water and Environment. 2015. *Creating an Opportunity: Groundwater Recharge through Winter Flooding of Agricultural Land in the San Joaquin Valley*. Retrieved from [http://waterfoundation.net/wp-content/uploads/2015/09/Creating%20an%20Opportunity%20On%20Farm%20Recharge%20Final%20Full%20Report%20\(00306327xA1C15\).pdf](http://waterfoundation.net/wp-content/uploads/2015/09/Creating%20an%20Opportunity%20On%20Farm%20Recharge%20Final%20Full%20Report%20(00306327xA1C15).pdf).

⁷ See, e.g., 14 Cal. Code Regs. § 3710 (setting performance standards for mine reclamations affecting streams, including both surface and groundwater protection).



IV. Challenges and Data Limitations

The challenges and data limitations SRT has encountered so far include the following:

1. Determining the best data for depicting and evaluating areas most suitable for groundwater recharge;
2. Determining the best data to represent existing land uses;
3. Depicting and evaluating current conditions in riparian corridors, such as degree of alteration and status of riparian vegetation, in more nuanced ways than just mapping existing land uses; and
4. Gathering substantive input on possible GSP provisions when some GSAs in the region are still working out committee membership, boundaries, and other administrative concerns.

None of these difficulties has proven insurmountable. As the maps above illustrate, SRT has been able to identify land-based opportunities to improve watershed function relating to each of the three core themes of the project. In addition, SRT's ongoing research on groundwater policy has benefited from stakeholder input, as well as DWR guidance, existing regulations, and other useful sources.

⁸ SRT used FMMP data for the theme maps because the Tulare County land use layer would make the maps too cluttered. FMMP data has some gaps in depicting actual land conditions relevant to their water-enhancement strategies (e.g., crops suitable for on-farm floodwater layoff), and the Final Report will have more detail on how these gaps are addressed.

Exploring the Land-Water Intersection in the San Joaquin Valley

American Farmland Trust and Conservation Biology Institute

I. Purpose

Both land and water resources are critical to agriculture in the San Joaquin Valley and other Mediterranean climates in California. These resources are under pressure from a variety of factors that have the potential to significantly affect the food production capacity of a region essential to the food security of the state, nation, and the world. The most significant challenges include water supply, climate change, soil impairment, urban development, and environmental factors such as in-stream water needs.

II. Project Description

American Farmland Trust (AFT) has partnered with the Conservation Biology Institute (CBI), creator of Data Basin, to undertake a spatial analysis to determine where agricultural land and water resources are most at risk because of these challenges in the context of the relative quality or value of those resources from an agricultural production standpoint.

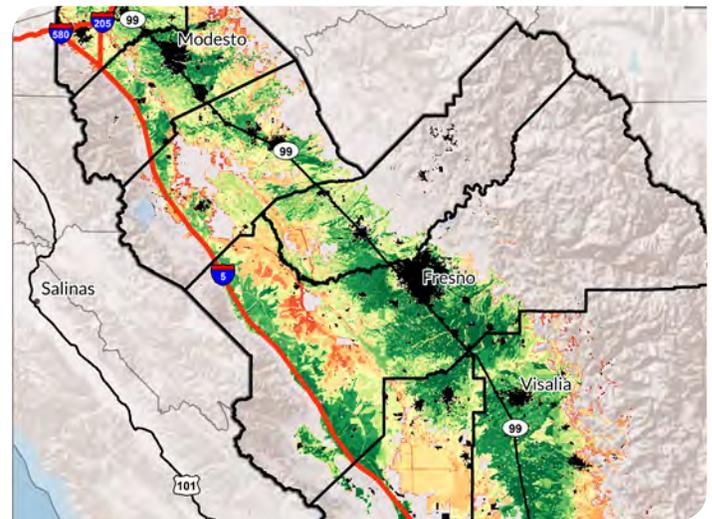
This project will build on the successful effort led by CBI to identify areas where large-scale solar energy projects sited in the Valley would pose the least conflict with agriculture and the environment. As with the solar project, spatial analysis will occur at a broad Valleywide level, but with a finer grained analysis of at least two counties. Several scenarios, representing different assumptions about physical and policy trends, will be done to further enrich our understanding of the prospects of Valley agriculture. Input from technical experts and regional stakeholders will be sought throughout the process to help determine how to rank resource risks and values, and to help formulate future scenarios. AFT and CBI are actively recruiting stakeholders from the Valley to participate in the process through in-person meetings and online webinars.

The goal of the project is to encourage and inform a purposeful regional conversation about strategies that will be needed to meet land and water resource management challenges and assure a productive and prosperous future for San Joaquin Valley agriculture.

III. Data and Preliminary Findings

The preliminary findings that American Farmland Trust has discovered are described below.

- » **Data Collection.** CBI has assembled about 200 data sets that describe the relative values of, and stresses on, land and water resources in the Valley. These have been incorporated into the San Joaquin Valley Gateway mapping tool being used by the Greenprint. AFT is in the process of vetting these data sets with key experts to determine which are most appropriate to use in the logic model.
- » **Logic Model Development.** A logic model is a framework for assembling data sets in a way that describes the resources under study. CBI has developed a preliminary logic model that, at present, has four components: land assets, land limitations, water supply reliability, and urban development pressure. Each component combines several data sets that will eventually be weighted based on expert and public opinions about their significance as descriptors of the resource base.



Preliminary example showing the relative land asset values of agricultural land based on soil capabilities and limitations, citrus microclimate, and capacity for groundwater recharge.

- » **Development of Alternative Scenarios.** One of the significant features of the San Joaquin Valley Gateway mapping system is analysis of its ability to evaluate alternative scenarios representing different assumptions about future trends and policy choices. An example of the former would be availability of water under various climate change assumptions. The latter could include decisions made about water deliveries to agriculture. At present, AFT intends to evaluate several scenarios representing two extreme sets of assumptions and representing midrange assumptions about the stresses on land and water resources. Like the logic model, specific scenarios to be evaluated by the model will be determined based on expert and public opinion.
- » **Public Outreach.** The intention of the project is to represent broad public opinion about desirable outcomes for the Valley's land and water resources, and to compare those desires with actual likely outcomes. To tap into public opinion, AFT has already held one series of in-person public workshops in Modesto, Fresno, and Bakersfield, and has convened a Valleywide webinar workshop at which a preliminary version of the logic model and several maps of land assets and impairments were presented. About 40 stakeholders participated in these events. In March 2017, AFT will convene at least one additional webinar to reveal the final logic model and additional maps. A portal to the land-water intersection project, including a recording of the first webinar and preliminary maps, is on the San Joaquin Valley Gateway.

IV. Challenges and Data Limitations

The project has not yet progressed to the point where AFT and CBI have identified any clear findings or lessons learned. Data limitations (one of which is cost) and other technical challenges are always present in projects of this kind, and AFT is addressing them as they arise.

Groundwater Recharge Assessment Tool (GRAT)

Sustainable Conservation and Earth Genome

I. Purpose

Long-term groundwater overdraft and five years of drought in the San Joaquin Valley (SJV) are threatening the reliability of drinking water for communities and irrigation water for crop production. Additionally, the California Sustainable Groundwater Management Act (SGMA) requires newly forming Groundwater Sustainability Agencies (GSAs) to develop plans by 2020 to manage groundwater supplies to ensure long-term sustainable yields and avoid undesirable results. There is growing interest, across many stakeholders, to move groundwater basins toward balance by accelerating groundwater recharge when recharge water is available. However, there is a lack of easily accessible information about the optimal locations and methods to capture available flows for groundwater replenishment.

II. Project Description

The Groundwater Recharge Assessment Tool (GRAT) Demonstration Project provides irrigation districts and GSAs with a decision support tool that will enable them to create and assess recharge scenarios for inclusion in their Groundwater Sustainability Plans. The tool allows water managers to evaluate where (using fallow land, active cropland, and dedicated recharge basins) and when to optimally capture available flood flows at the lowest cost without creating unintended environmental and social impacts in their basins.

Together, Sustainable Conservation and Earth Genome, the project team, envision making geospatial/temporal natural resource planning data more readily available to all natural resource and water managers in the SJV so that water management alternatives can be more easily identified, compared, and prioritized. This demonstration project is working in partnership with Madera Irrigation District (MID) and Tulare Irrigation District (TID) to create Version 1 of the tool.

III. Data and Preliminary Findings

GRAT helps GSAs match the best available locations for groundwater recharge with available flood flows. To accomplish this, the tool requires both geospatial (location) and temporal (time) explicit data. These datasets include, but are not limited to, the following:

- » Datasets that define the existing situation. This includes the current spatial organization of the Irrigation District (ID) and GSA.
- » Datasets that depict local data by individual field units, such as field delineation, crop type, crop suitability, and infiltration.
- » Datasets defining available flood waters.
- » Costs, such as on-farm recharge and dedicated recharge, to help guide GSA planning based on attractiveness of investment.
- » Miscellaneous dataset layers including disadvantaged communities, drought intensity, groundwater data, and flood risk, to help inform GSA decision-making.

When processed with the computation capabilities of GRAT, this combination of datasets allows the end user to match groundwater recharge locations with flood flows. Geospatially, GRAT provides a view of groundwater planning at both the GSA level and at the individual field unit level. Temporally, it stretches across the 20-year time horizon of SGMA implementation while also looking at individual weeks of any given year.

Overarching Finding

The project team is addressing where and how to recharge groundwater sources cost-effectively when flood flows are available. During a November meeting with the districts, GRAT was well received by MID and TID, both stating that the tool is incredibly valuable to inform their Groundwater Sustainability Plans by identifying optimal places to recharge available flood flows. The districts would like to perform an in-depth search for available water supply, including increasing groundwater recharge, before proposing water demand cutback strategies. They are also excited about the tool's visual interface, which is important for user adoption and long-term tool use.

The project team has also discovered that there are varying levels of data and GIS familiarity between the tool's end-users. Their goal with this version of GRAT is to train their end-users equally, no matter their skill level, to ensure ease of adoption. Too much complexity upfront can come at the expense of higher costs, longer build time, and limited adoption. Conversations with MID and TID about their experience with GIS-based tools has shown that the current scope carefully balances functionality, usability, and value to end users.

IV. Challenges and Data Limitations

The challenges and data limitations that Sustainable Conservation has encountered so far include the following:

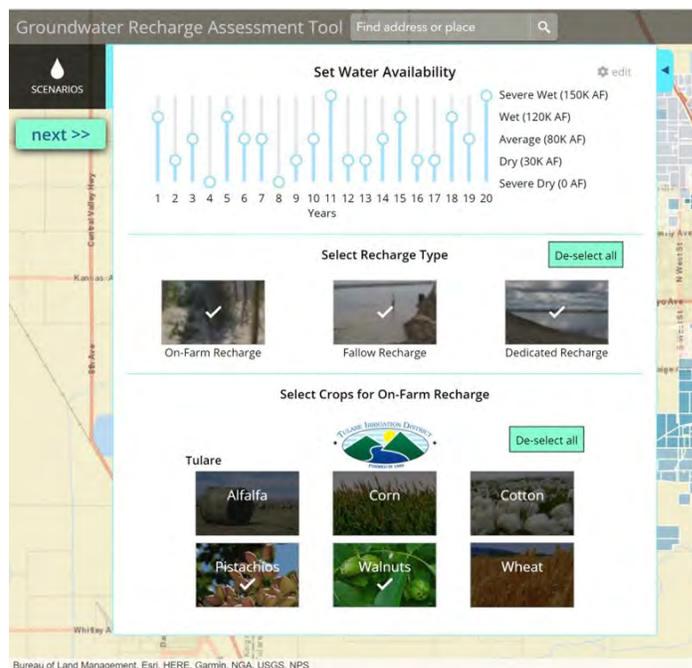
- » Predicting surface water availability. GRAT's advisors at UCLA, CSU Monterey Bay, and UC Davis have informed the project team that future forecasts are challenging, time-consuming, and misleading. Given the complexity of modelling future water availability, the project team agreed with the irrigation districts to define any scenarios that represent a range of potential future water availability scenarios (spanning between conservative and aggressive projections across the 20-year rolling time horizon of SGMA implementation planning). The project team believes that this is a way to compensate for a complicated dataset, replacing it with user-defined inputs that enable the end-user to do needed groundwater planning.
- » Using highly-varied data. A challenge with disparate datasets is that they are not interoperable unless further effort is put into them. The Madera and Tulare Irrigation Districts have data collection and visualization systems, which has required the Demonstration Project team to standardize and import datasets into the GIS tool. MID and TID, however, have been open to reach a new level of data interoperability by learning new ways of displaying their existing information. The Demonstration Project team is now supplying the Irrigation Districts with clean datasets that are standardized across both MID and TID regarding crop survey data.

Additional Tool Components Identified

During development of the project, several related issues were discussed among the Demonstration Project team, advisors, and the Irrigation Districts. These issues were not included in the original scope of the project, but deserve consideration for inclusion as new components in a later version of GRAT.

- » Avoidance of increased nitrate concentrations in groundwater because of recharge. The project team is leading a research modeling project with UC Davis and consultants to develop a guide on the appropriate water amounts to apply to different crops to decrease the risk of transporting high concentrations of nitrates and salts into the groundwater. The project team expects the model will show that more water should be applied on fewer acres of crops, especially those with lower accumulations of legacy nutrients, such as grapes, rather than spreading little water on extensive acreage. A future update to GRAT could be added to require that individual fields receive a minimum threshold amount of recharge water (based on crop type) before the field can be selected for the recharge sites portfolio to ensure that groundwater quality is protected.
- » Improved hydrogeological modeling of water movement to groundwater. The project team is developing GRAT to operate based on an index of recharge suitability that helps predict deep percolation and retention of water applied on the surface. However, the deeper stratigraphic data on percolation from USGS is only available on a one mile grid. More accurate geologic scanning techniques are being developed by academic and government researchers that will provide higher resolution and better estimates of both percolation rates as well as lateral movement. When available at scale, these new data layers could increase GRAT's accuracy in predicting the amount of water retained in the aquifer.

- » Targeting of recharge efforts to benefit groundwater-dependent disadvantaged communities. Communities that are reliant on groundwater for domestic use are interested in strategies that can improve their groundwater quality. GRAT could be used to target recharge efforts that will dilute the nitrate concentration of groundwater used by these communities. Additional data on the quality of groundwater and direction of subsurface flow will need to be incorporated into GRAT.



Interface of the Groundwater Assessment Tool webpage

5

Recommendations



The San Joaquin Valley faces many challenges and opportunities associated with the management and conservation of water, agricultural, energy, and biological resources. The SJV Greenprint project was developed to provide reliable data in support of the State and Federal agencies; non-governmental organizations; community-based organizations; universities and colleges; and individuals who are working to address these issues. The Greenprint was also intended to provide a forum for elected officials, agencies, local business leaders, and other stakeholders to collaborate on issues that affect the rural areas of the Valley.

The following recommendations will ensure this information resource will play an increasingly important role in planning the future of the San Joaquin Valley.

- 1. Maintain the SJV Greenprint Gateway.** The San Joaquin Valley Greenprint Gateway needs a long-term funding source and management to keep the information dynamic, relevant, and reliable. The Regional Policy Council should consider an annual funding allocation to maintain the Gateway database. Without database maintenance, the Gateway will cease to be a reliable data source.
- 2. Publicity and Outreach.** As the SJV Greenprint planning efforts advance, local agency and MPO staff and elected officials and NGOs should be actively engaged through major publicity efforts. This outreach would raise awareness of the Greenprint, outline the benefits of the Greenprint resources, and identify opportunities to participate in this initiative.
- 3. Demonstration Projects.** The three demonstration projects funded during Phase II showed the power of accessible standardized data to further our understanding of how water resources in the Valley can be more efficiently managed. Additional demonstration projects should be encouraged to use this resource to advance our understanding and management of Valley resources.

4. SJV Greenprint Summit. The Regional Policy Council should sponsor a Valley-wide Greenprint Summit similar to the 2005 summit to kick off the SJV Blueprint planning process. The focus of the summit would be on exchange of data and ideas, identification of pressing issues regarding non-urban lands and include expert panels, breakout sessions, and keynote speakers. The summit could either focus on a single key resource topic, such as groundwater planning efforts, or more broadly on the four Greenprint resource topics: agriculture, water, energy, and biodiversity. The objectives of the Summit would be to improve Valley-wide communication; help identify critical data and research needs; support a more unified, coordinated resource planning effort; and provide the basis for a truly regional approach to resource protection and management.

5. SJV Greenprint Implementation and Oversight Committee. A governing entity or oversight committee should be established to ensure that all of these recommendations are advanced. The implementation and oversight committee could potentially be made up of elected officials; MPO, county, and city planning staff; representatives from State and Federal agencies, groundwater management agencies, NGOs, and CBOs; and other recognized resource experts. This committee would provide a forum for resource management information exchange, coordination, cooperation, and policy development throughout the Valley. The Task Force could also help advance effective regional approaches to resource planning and management and provide oversight of the SJV Gateway.

6. Provide Policy Guidance on Managing and Protecting Valley Resources. In future phases of the Greenprint, the project should expand its role beyond being a data platform to provide guidance on policies and strategies for managing and protecting resources and enhancing economic growth and resource sustainability. The implementation and oversight committee should develop guiding principles for Valley resource protection and management. These principles would provide overarching guidance to local, regional, State, and Federal resource-related action in the Valley. The principles could also form the basis for policy development and implementation strategies for a broad range of organizations. Future phases of the Greenprint could include the review of existing policies, programs, and implementation tools in use in the Valley, and the development of a Comprehensive Resource Management Guide.

A

SJV Gateway User Guide



This section is a step-by-step guide on how to use many of the basic features of the San Joaquin Valley (SJV) Gateway. The Conservation Biology Institute, creator of Data Basin, also offers tutorial videos and webinars on how to navigate the site, which can be viewed at <https://sjvp.databasin.org/videos>.

Home Page

The Home Page of the San Joaquin Valley Gateway is the introduction to the website. It describes ways for users to start using the website, and contains the portals for the San Joaquin Valley Greenprint and Least Conflict Solar project, two initiatives that house their datasets and maps on the SJV Gateway.

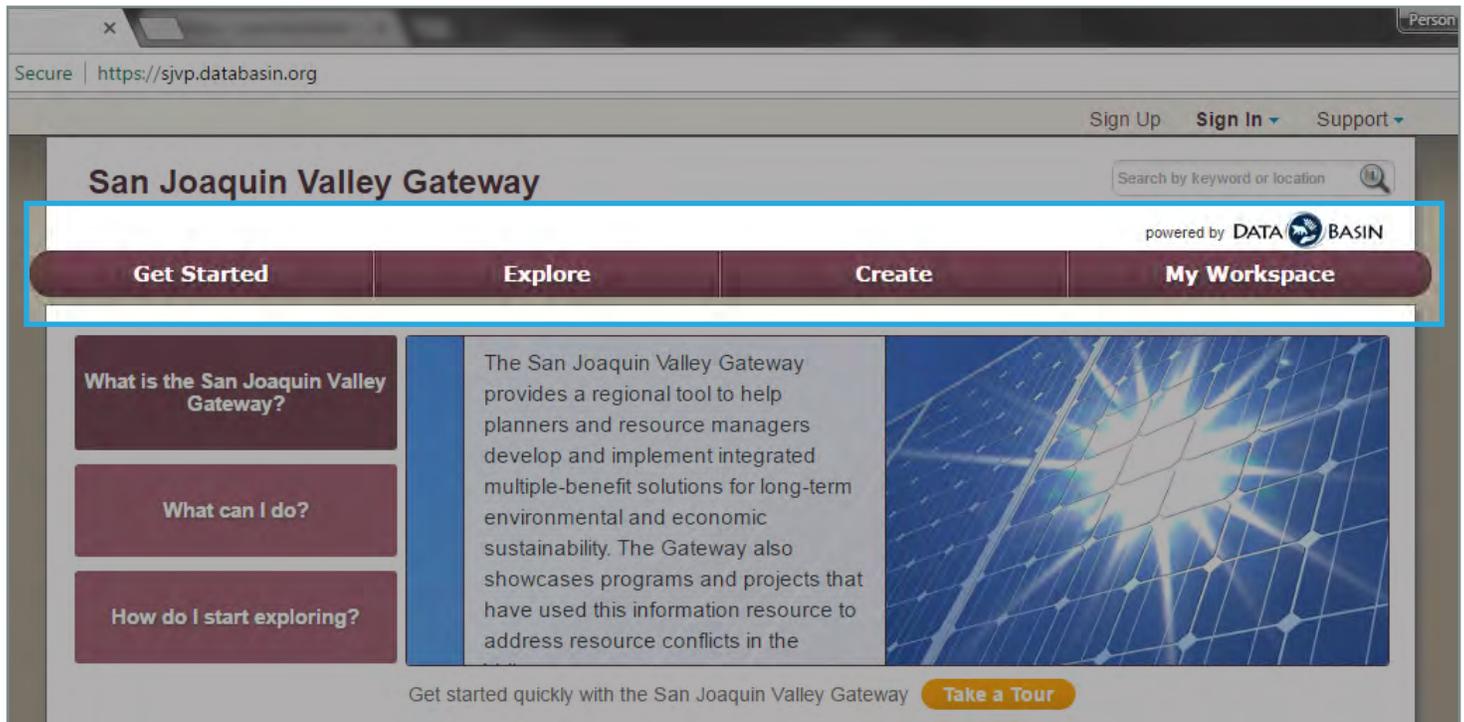
The Greenprint portal is on the right side of the Home Page. From here, users can directly access the Greenprint datasets, which are organized in galleries. Galleries are essentially folders that organize datasets and maps by topic.

Users can also link to the Greenprint Demonstration Projects from the Home Page.

The screenshot shows the San Joaquin Valley Gateway website. At the top, there's a navigation bar with 'Get Started', 'Explore', 'Create', and 'My Workspace'. Below that, a central banner area features the title 'San Joaquin Valley Gateway', a search bar, and a 'powered by DATA BASIN' logo. A 'Take a Tour' button is also present. The main content area is divided into two columns. The left column is titled 'Least Conflict Solar' and contains a map of the region with highlighted areas. Below the map is a section titled 'A Path Forward' with links to 'Report' and 'Appendices'. The right column is titled 'Greenprint' and features a map of California with a 'Greenprint' overlay. Below this is a section titled 'Explore Greenprint Datasets' and another titled 'Explore Greenprint Pilot Projects' with several project thumbnails. At the bottom of the page, there's a footer with links for 'ABOUT DATA BASIN', 'TERMS OF USE', 'SUPPORT SERVICES', and 'CONTACT US', along with a copyright notice for '© 2017 Conservation Biology Institute'.

The Menu Bar

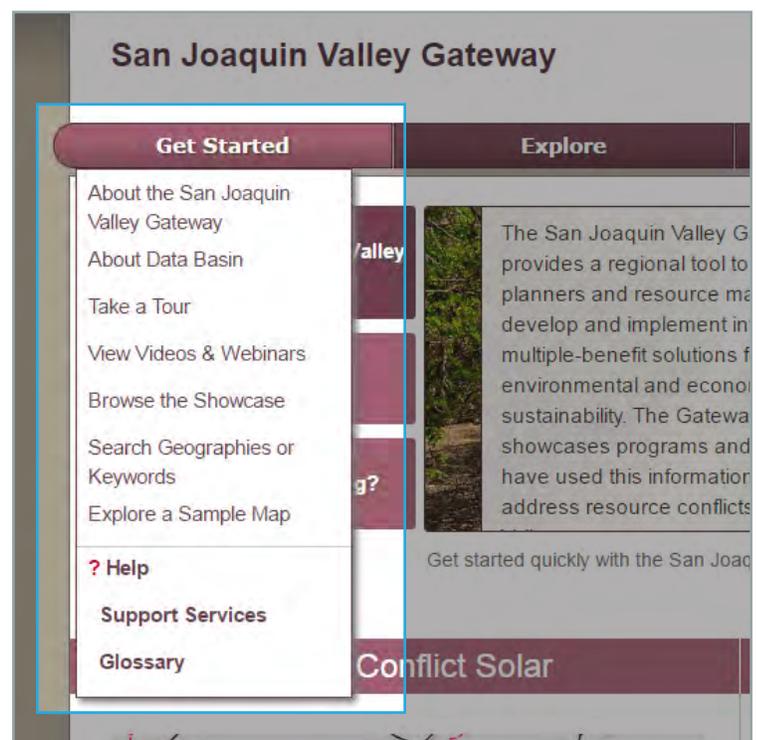
The Menu Bar gives users access to the functions of the Gateway. It consists of the **Get Started** tab, **Explore** tab, **Create** tab, and **My Workspace** tab.

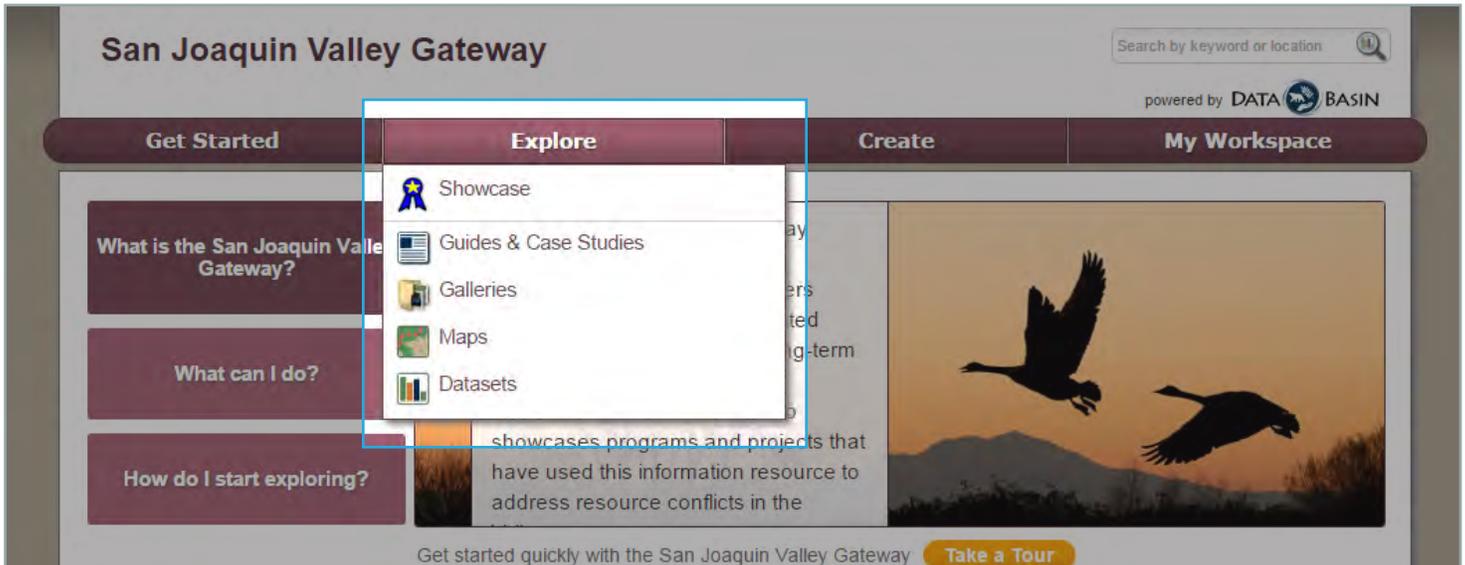


Get Started

The **Get Started** tab provides background information about the San Joaquin Valley Gateway and Data Basin and offers support services and tutorials on how to use the site. The categories within the tab are:

- » **About the San Joaquin Valley Gateway**
- » **About Data Basin**
- » **Take a Tour**
- » **View Videos and Webinars**
- » **Browse the Showcase**
- » **Search Geographies or Keywords**
- » **Explore a Sample Map**
- » **Help**
- » **Support Services**
- » **Glossary**



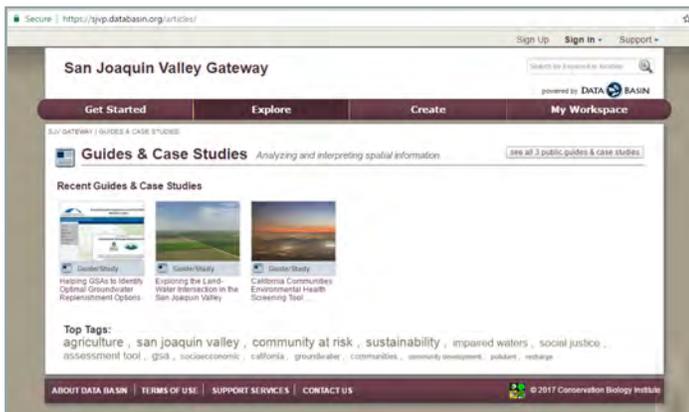


Explore

The Explore tab allows users to search through the information sources on the Gateway. The categories within this tab are:

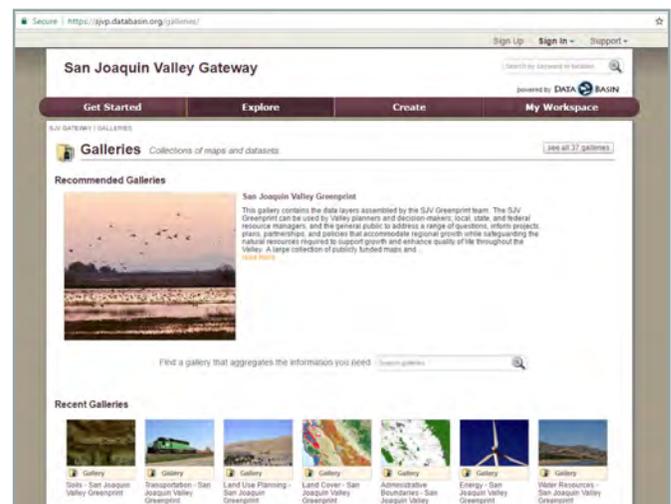
- » **Guides and Case Studies**
- » **Galleries**
- » **Maps**
- » **Datasets**

The following is a brief description of each of these pages.



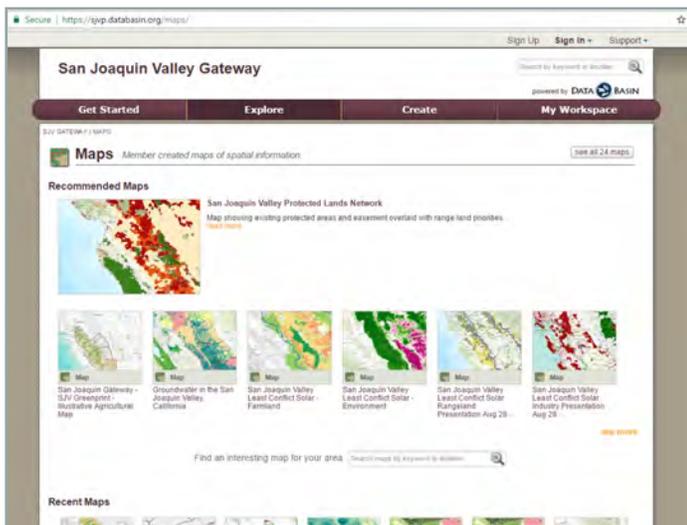
Guides and Case Studies

The **Guides and Case Studies** tab links to the Demonstration Projects as well as other projects and studies that showcase the use of data to demonstrate and analyze broad environmental and resource challenges.



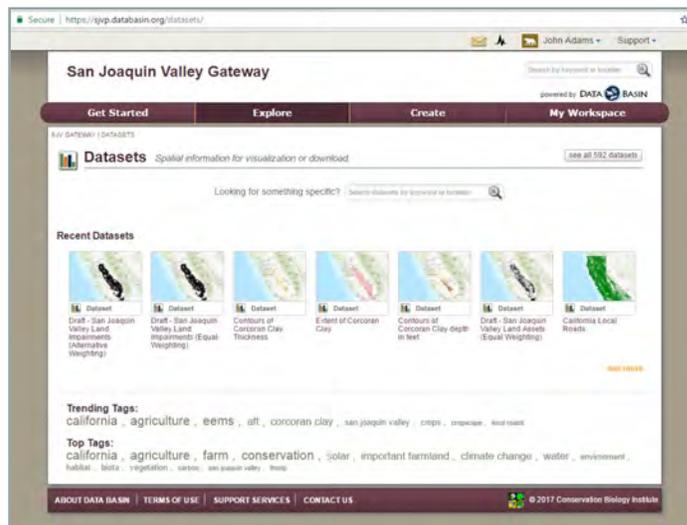
Galleries

The **Galleries** tab links to all the galleries, which are collections of datasets and maps organized by topic. See the discussion on Galleries on Page 40 for more information on the SJV Greenprint galleries.



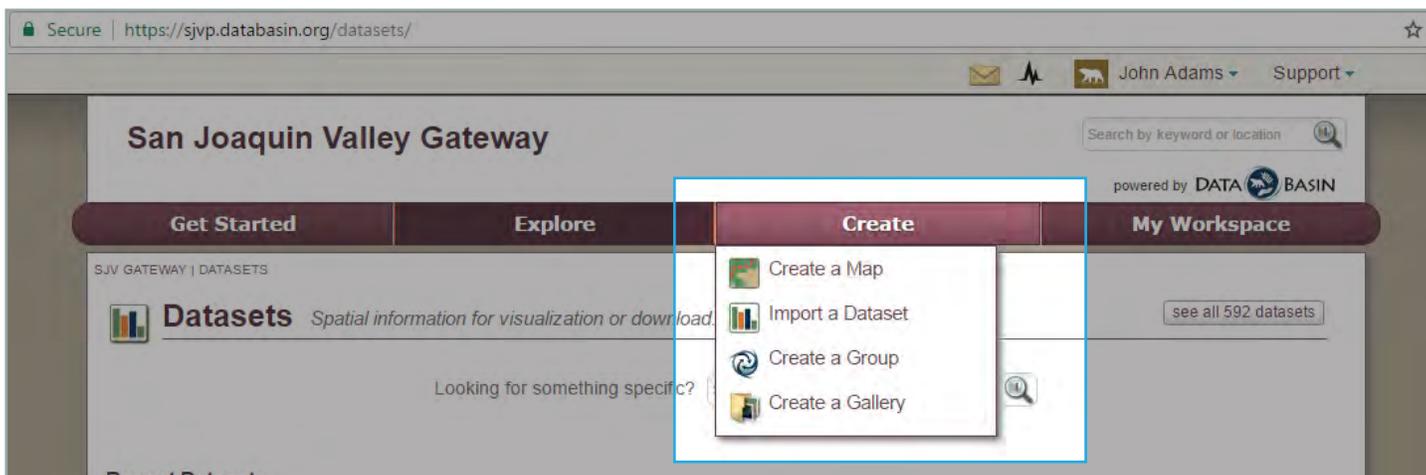
Galleries

The **Galleries** tab links to all the galleries, which are collections of datasets and maps organized by topic. See the discussion on Galleries on Page 40 for more information on the SJV Greenprint galleries.



Maps

The **Maps** tab links the user to all the maps that have been created for the San Joaquin Valley Greenprint and Least Conflict Solar project. See the discussion on Maps on Page 41 for more information on how to view and create maps.



Datasets

The **Datasets** tab provides a direct link to all datasets for the San Joaquin Valley Greenprint and Least Conflict Solar project.

San Joaquin Valley Gateway

powered by DATA BASIN

Get Started Explore Create **My Workspace**

SJV GATEWAY | MY WORKSPACE

My Workspace

Visualize & Share Insights

Create a Map

Maps are member-created dynamic web maps of spatial information, including datasets, drawings, and basemaps. They can be used to easily combine information and tell a story about a place or topic. Maps can be exported to a variety of formats.

Share Your Data

Import a Dataset

Datasets are member-uploaded spatial information, typically created using a Geographic Information System (GIS). They can be visualized and analyzed using mapping tools in Data Basin, and downloaded for use in desktop GIS software. Datasets include shapefiles, ArcGRID files, ESRI File Geodatabases, and NetCDF files. Most datasets can be overlaid, styled, analyzed, and downloaded.

Collaborate & Share Your Expertise

Create a Group

You have created 1 datasets so far.

- 1 in last 30 days
- 1 within the last year

You are a member of 1 groups.

[see all your groups](#)

Your Data Basin workspace is supported by member contributions. You can help by contributing.

Recent Activity

Member: John Adams with Mintie Haman

Group: Sample Group

Recently Viewed Items

Group: Sample Group

Dataset: Groundwater Recharge Areas

Map: Groundwater in the San Joaquin Valley, California

Member: jason kitto

Gallery: Sample Gallery

Gallery: San Joaquin Valley Greenprint

Guide/Study: California Communities Environmental Health Screening Tool ...

Gallery: Energy - San Joaquin Valley Greenprint

Gallery: Soils - San Joaquin Valley Greenprint

ABOUT DATA BASIN | TERMS OF USE | SUPPORT SERVICES | CONTACT US

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Create

The Create tab gives users the ability to create items. The categories within this tab are:

- » Create a Map
- » Import a Dataset
- » Create a Group
- » Create a Gallery

My Workspace

The **My Workspace** tab takes users to their membership home page, which is an interface for accessing and managing content, viewing messages, and seeing recently viewed content. See the discussion on My Workspace on Page 49.

Membership

Many of the SJV Gateway functions, such as viewing datasets and maps, do not require a Data Basin membership. However, signing up for a membership gives users access to the full functionality of the site. For example, signing up for a Data Basin membership will allow users to:

- » Download maps and datasets
- » Upload maps and datasets
- » Save maps on the SJV Gateway
- » Create and join groups
- » Create galleries

Data Basin membership is free. To sign up for a Data Basin account, click **Sign Up** at the top of the page.

Users can either sign up directly on Data Basin or use information from an existing Facebook account, Google account, Yahoo account, or USGS staff account.

Secure | https://sjvp.databasin.org

Sign Up Sign In Support

San Joaquin Valley Gateway

powered by DATA BASIN

Get Started Explore Create **My Workspace**

Datasets

Finding the Datasets

There are several options for linking to the datasets.

Explore Tab

Users can locate a dataset using the Explore tab. Click on **Datasets** or **Galleries** under the **Explore** tab on the SJV Gateway homepage.

By clicking on **Datasets**, the user can view all the datasets available on the SJV Gateway, including the SJV Greenprint datasets as well as the Least Conflict Solar datasets. The page will initially only show "Recent Datasets." Click on "**see more**" at the bottom right side of the page to show all datasets.

Users can use the **sort menu** to organize the datasets by creation date, modification date, or alphabetically. Users can also type a key word in the filter bar at the left side of the page to narrow down the list of datasets by topic.

Alternatively, users can click on **Galleries** under the **Explore** tab to view the datasets organized by gallery. See the discussion on **Galleries** on Page 40 to learn more.

Greenprint Datasets on Home Page

Users can also link directly to the SJV Greenprint datasets from the Home Page. Click **Explore Greenprint Datasets** under the San Joaquin Valley Greenprint section of the Gateway homepage. This will bring users to the SJV Greenprint Galleries page.

The screenshot shows the San Joaquin Valley Gateway homepage. At the top, there is a search bar with the text "Search by keyword or location" and a "powered by DATA BASIN" logo. Below the search bar is a navigation bar with four tabs: "Get Started", "Explore", "Create", and "My Workspace". Under the "Explore" tab, a dropdown menu is open, showing options: "Showcase", "Guides & Case Studies", "Galleries", "Maps", and "Datasets". The "Datasets" option is highlighted with a blue box and an arrow. Below the navigation bar, there are two main sections: "Least Conflict Solar" and "Greenprint". The "Least Conflict Solar" section features a map of California with yellow and green areas, and a link to "View interactive least conflict solar map". The "Greenprint" section features a map of California with a green outline and a link to "Explore Greenprint Datasets".

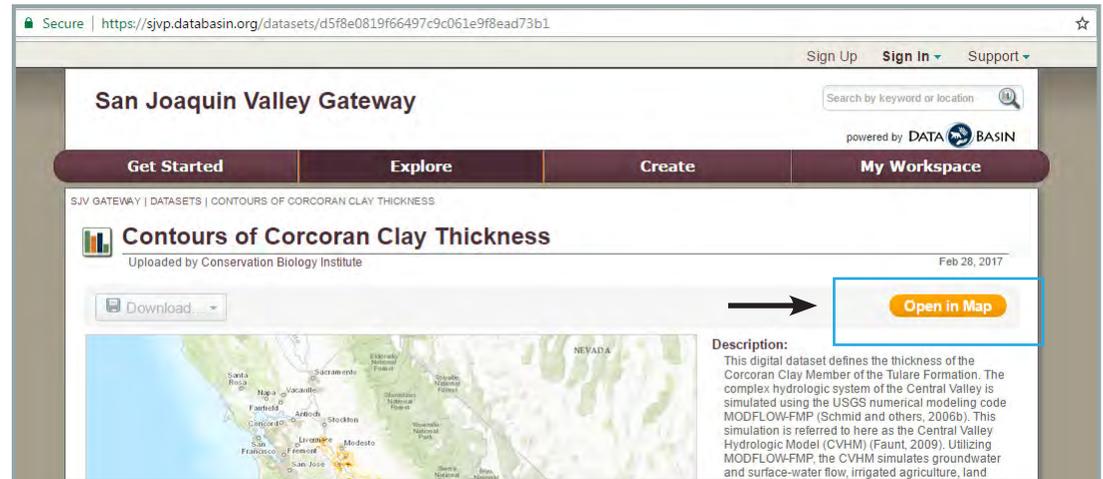
Search Field

The search field at the top of the Home Page allows users to search for datasets by keyword or location. For example, if "recharge" is typed into the search field, all relevant information related to groundwater recharge will be identified, including datasets, maps, galleries, guides and case studies, members, and groups. Users can filter the results by clicking on Datasets under the filter option.

The screenshot shows the search results page for the San Joaquin Valley Gateway. The search field contains the word "recharge". Below the search field, there is a "Search" button. The results are displayed in a list format. The first two results are "Groundwater Recharge Areas" datasets, each with a thumbnail image and a brief description. The first result is titled "Groundwater Recharge Areas" and is from the California Water Institute. The second result is titled "Groundwater Recharge Areas in San Joaquin County" and is also from the California Water Institute. Below the search results, there is a filter bar with options for "Datasets (4)", "Maps (1)", "Galleries (0)", "Guides & Case Studies (1)", "Members (5)", and "Groups (0)". The "Datasets" filter is selected. There is also a "Sort by" dropdown menu set to "Relevance" and a "Display" button.

Viewing a Dataset

After navigating to the datasets using one of the methods described above, click on the desired dataset. On the dataset overview page, click on **Open in Map** at the upper right hand side of the page or click on the image of your dataset. This will open the dataset in the map viewer.



Importing a Dataset

Before uploading a dataset, users must contact Data Basin Administrators to request permission. They can be contacted by using the **contact us** link at the bottom of the page or by e-mail at databasin@consbio.org.

Once permission has been granted, click **Import a Dataset** under the **Create** tab of the homepage.

To begin importing a dataset, upload the file and read the Data Basin Terms of Use. Click **submit**.

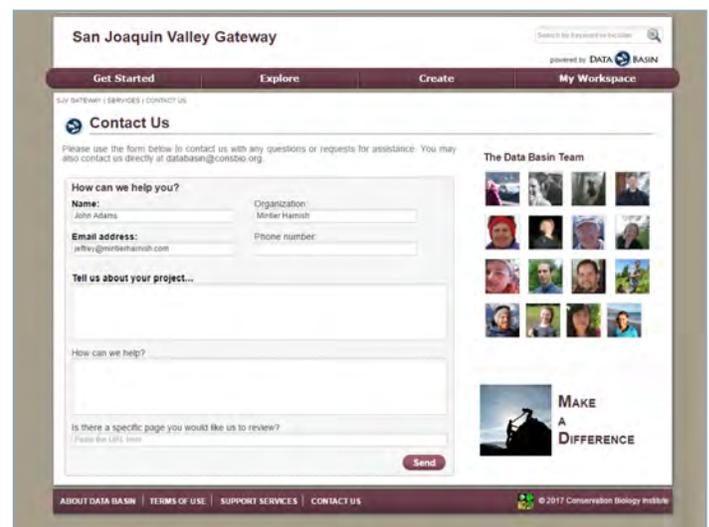
Sufficient metadata is for users to determine the credibility of the data and decide if the data is relevant to their project. If valid metadata is found, it will be used to help populate these steps. If uploading files with similar metadata, click **import information from one of your existing datasets**. Users must change the metadata as appropriate for each specific dataset.

If there is an XML metadata file with the data set, the user can click **import information from an XML metadata file to populate the fields**.

Give the dataset a title.

Decide whether the dataset should be public or private. Public datasets are visible to all users of Data Basin and private datasets are only visible to the user and those who are granted access.

Choose whether to enable downloads of the dataset.



Continue to fill out the required fields.

The **layers** tab alerts the user to any areas that have been left blank.

Under **attribute details**, the user must provide a description. Attributes tend to be cryptic. This description allows for more clarity.

Click the **submit** button once finished.

To edit and manage your dataset, select the **Manage** button, for options to edit the dataset, manage permissions, or delete the dataset. The user can also open the dataset in a new map.

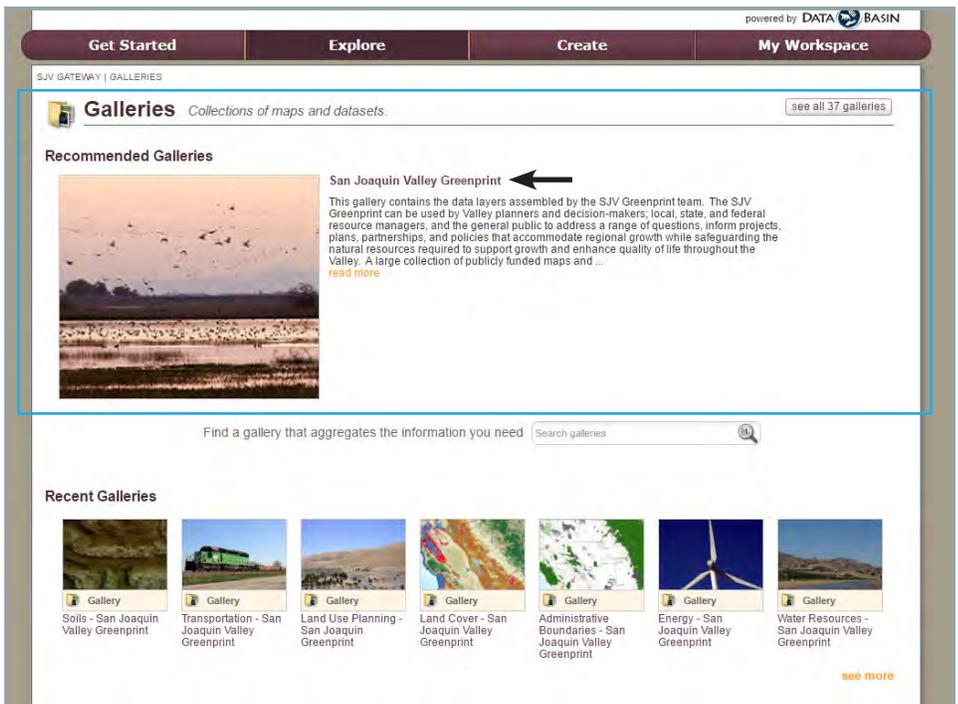
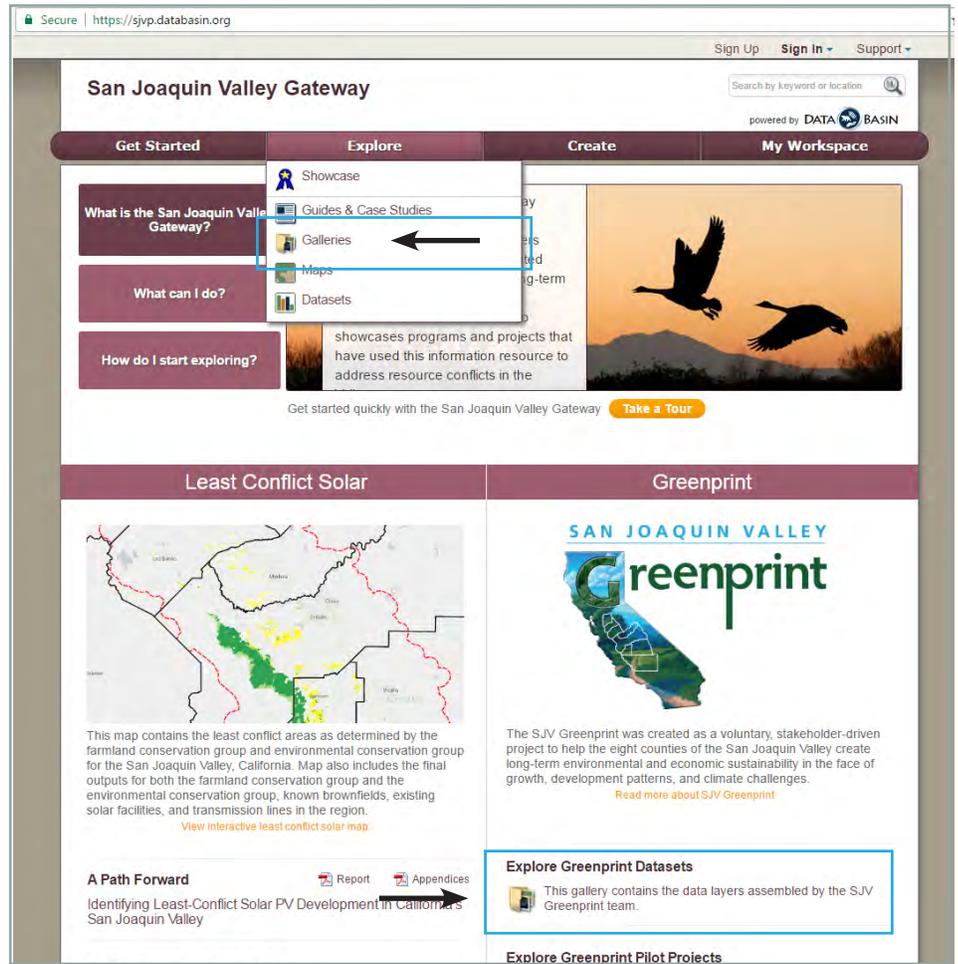
Galleries

Galleries are used to organize a set of similar datasets and maps. For example, the galleries for the SJV Greenprint contain maps and datasets organized by subjects addressed in the project (agriculture, biodiversity, water resources, energy) as well as other relevant data (soils, land cover, land use planning, transportation, administrative boundaries).

Viewing the SJV Greenprint Galleries

There are two ways to access the galleries from the Gateway homepage. The first way is by clicking on **Explore Greenprint Datasets** located in the middle of the Greenprint section on the Gateway Home Page. This will take users directly to all the galleries for the SJV Greenprint.

The second way is to click on **Galleries** under the **Explore** tab on the menu bar. This will take users to the **Galleries** main page. Click **San Joaquin Valley Greenprint** under the **Recommended Galleries** section. This will take users to the page showcasing all the galleries for the SJV Greenprint.



Viewing all Galleries

To view galleries for both the San Joaquin Valley Greenprint and Least Conflict Solar project, click **Galleries** under the **Explore** tab on the menu bar, and then click **see more** at the bottom right corner of the Galleries main page.

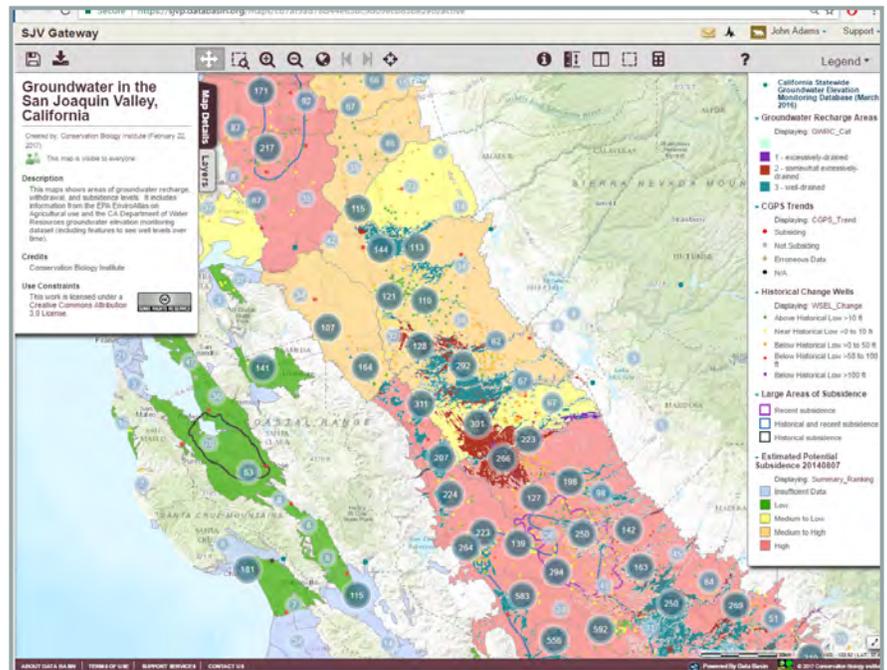
To do a more specified search of all the galleries, use the **search field** in the middle of the Galleries main page. For example, if users search for "agriculture" using the **search field**, it will identify several galleries that contain datasets and maps related to agriculture.

Maps

Viewing Existing Maps

The Gateway includes numerous maps created by users as part of the San Joaquin Valley Greenprint and Least Conflict Solar Project that show the interconnectedness of natural resource challenges. Users can link to these maps by clicking on **Maps** under the **Explore** tab on the menu bar. Recommended maps are highlighted at the top of the page, and recent maps are shown underneath. Click on **see more** at the bottom right side of the page to see all the maps.

For example, the map at right is focused on groundwater in the San Joaquin Valley. This map shows areas of groundwater recharge, withdrawal, and subsidence levels.



Groundwater in the San Joaquin Valley

Creating a Map

Users can create their own maps using data from the SJV Gateway.

Click the **Create** tab and select **Create a Map**. This will bring users to a topography basemap.

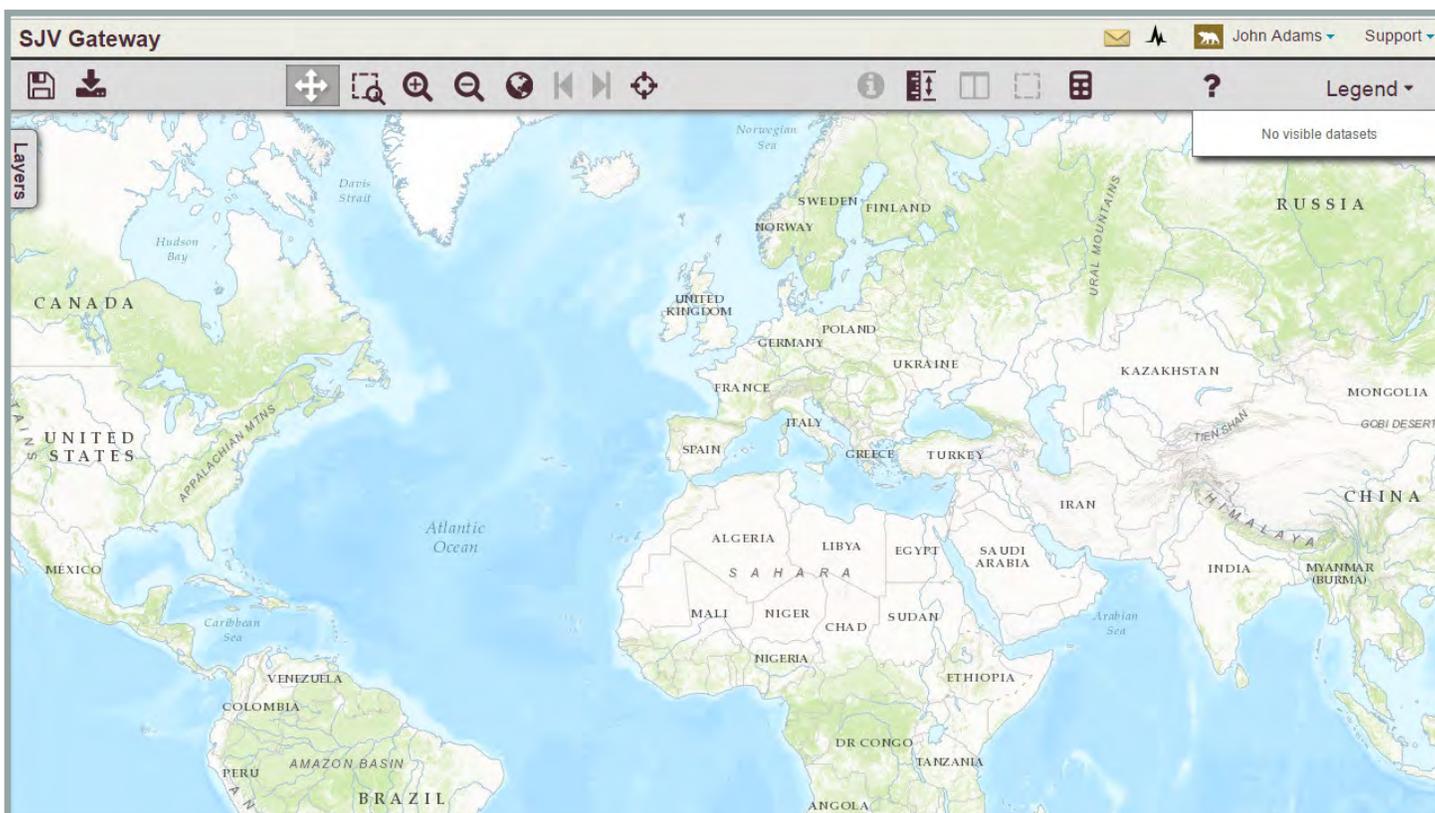
The top of the map displays the **toolbar**. Within the toolbar, users can:

- » **Save** the map for later use or to share with others.
- » **Export** the map as a PDF, PowerPoint, or set of PNG files.
- » The **Earth** tool allows users to view the full extent of the datasets. If no datasets are included, a map of the world will appear.
- » The **Locate** tool enables users to pinpoint a location on the map by looking at location name or latitude and longitude. When users search a location name, it will add a point to the map to identify that location.

To edit that point, click on **Drawings** in the **Layers** tab at the upper left side of the page. In the arrow drop down menu, users can zoom to the point, edit it by drawing type (shape or text), color, style, size, or transparency; as well as remove it.

- » The **Identify** tool allows users to click on the map and display an information window for all layers at that location. Users must have at least one dataset in the map to use this feature.
- » The **Select** tool allows users to select features (points, lines, or polygons) from the top visible layer in an area that you draw. Users must have at least one dataset in a map to use this feature.
- » The **Legend** shows all styles used by visible layers in the map.

The **Layers** tab in the upper left corner contains the user's drawings, datasets, and a variety of basemaps to choose from.



Adding a Dataset to a Map

To add a dataset to a map, click on the **Datasets** tab and select **add datasets**.

To find datasets, users can do a keyword search; browse recommended or popular items including datasets, maps, or galleries; and choose from recently viewed items, or items that the user created.

Once the desired items are selected, scroll to the bottom of the page and click **Add items**. The datasets will appear on the map.

Using the arrow button within the **Layers** tab at the upper left hand side of your screen, users can access Dataset Details, Zoom, and Customize the Transparency.

Turn layers on and off by checking the boxes.

If users would like to change the layer order, click and drag the layer to the desired position within the table.

Creating a Drawing

The drawing tool allows users to accentuate important aspects of their maps. Users can create shapes (polygons, rectangles, circles), draw lines and points, highlight features, and place text.

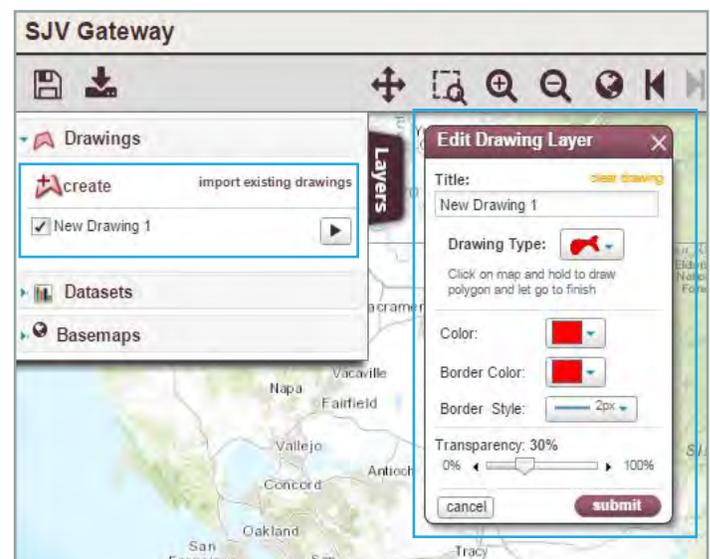
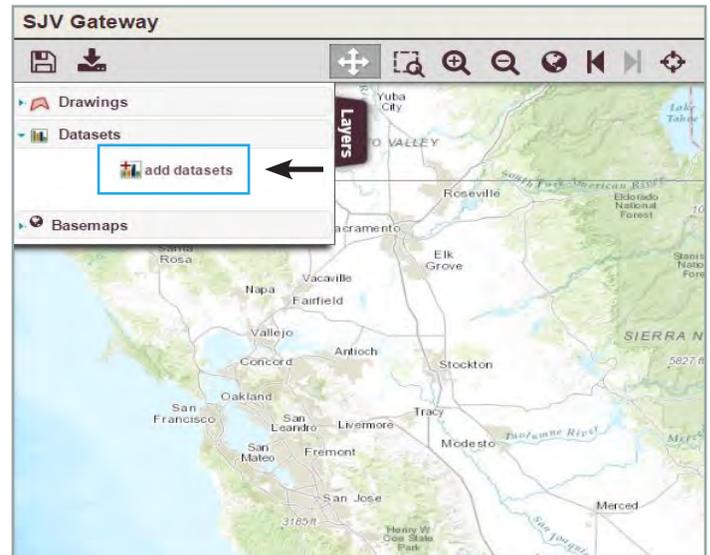
To create a drawing, click on the **Create a Drawing** tab under the **Layers** tab at the upper left hand side of the page.

Give the drawing a title, then choose the drawing type, color, border color, border style, and transparency.

Create the drawing and click submit.

After users are satisfied with their map, they can save it by clicking the **Save** icon. Users need to be signed in to save maps.

Save the map as either public or private, give it a title, credits, a description, and tag it with key search terms.



Exporting a Map

To export a map, hover the mouse over the **Export** button at the top left corner of the map toolbar. Make sure the areas to be included in the exported map are within the gray box.

Click the **Export** button. Users can export a map as a PDF, PowerPoint presentation, or set of PNG picture files.

Searching

There are various ways to search for content in the SJV Gateway. Users can search using a keyword, geography, or a combination of the two for a more targeted search.

The primary search field is located at the top right of every page. To start a new search, type a keyword into the search field and click the magnifying glass to the right. For better results, users can try running separate searches using the singular and plural forms of your keyword. If a phrase is being searched, it should be surrounded by quotes.

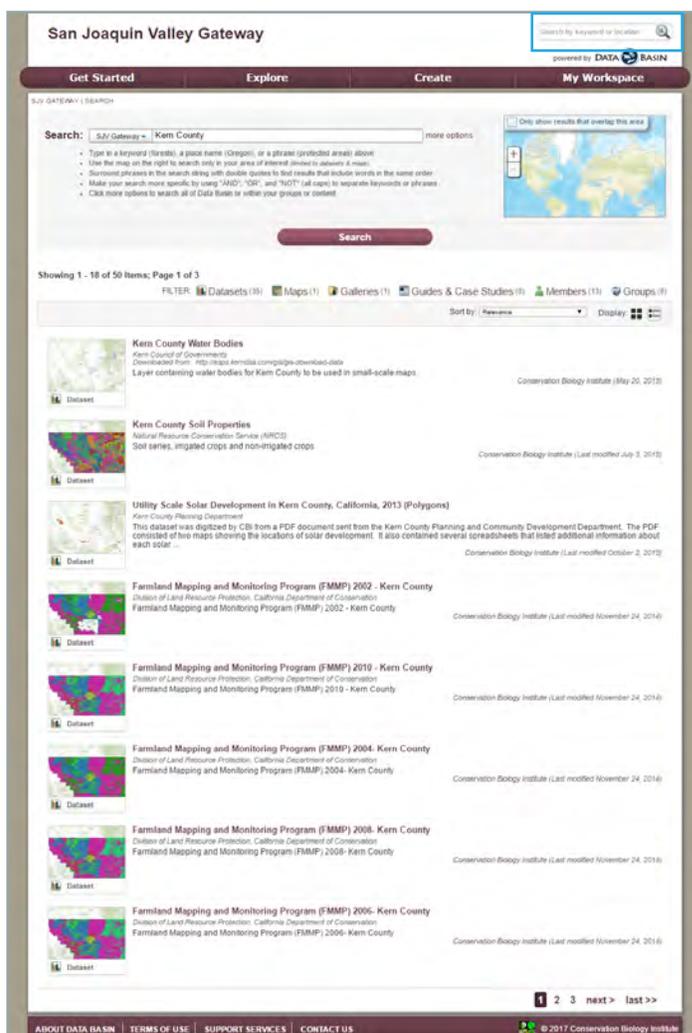
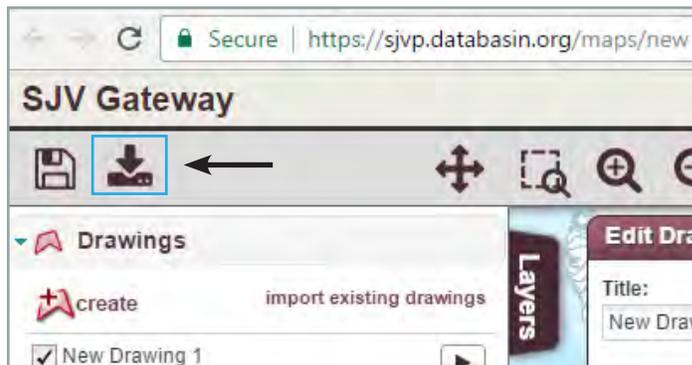
Using the checkboxes, users can show filtered results of combinations of datasets, maps, galleries, guides and case studies, members, and groups. For information about the different types of items, refer to the glossary found under the **Get Started** tab.

Search results can be sorted by name, date, or relevance.

Users can also change the display of the results to show as a grid or in list view.

If users want to add more conditions to their search, they can click **more options** to the right of the search view. Here users can modify their search to be within content they've uploaded or created in the SJV Gateway, shared items in their groups, or within all of the SJV Gateway.

Click **Add search condition** to make searches more specific.



Map Search

Users can also search the SJV Gateway using the map on the right of the page to define an area of interest.

Click and hold the map to pan to a specific area. Zoom in and out using the plus and minus buttons. When the area of interest is within the frame, check the box and click search. Results for the search will appear below the map. For example, if a user is interested in searching for Kern County

datasets, make sure that the area to be searched is within the frame, check the box, and click **search**.

Depending on the scale of your map location, users may come up with more results than desired. One way to narrow results is to combine the map search with the keyword search.

San Joaquin Valley Gateway

Search by keyword or location

powered by DATA BASIN

Get Started **Explore** **Create** **My Workspace**

SJV GATEWAY | SEARCH

Search: more options

- Type in a keyword (forests), a place name (Oregon), or a phrase (protected areas) above
- Use the map on the right to search only in your area of interest (limited to datasets & maps)
- Surround phrases in the search string with double quotes to find results that include words in the same order
- Make your search more specific by using "AND", "OR", and "NOT" (all caps) to separate keywords or phrases
- Click more options to search all of Data Basin or within your groups or content

Search

Only show results that overlap this area

SJV GATEWAY | SEARCH

Search: more options

- Type in a keyword (forests), a place name (Oregon), or a phrase (protected areas) above
- Use the map on the right to search only in your area of interest (limited to datasets & maps)
- Surround phrases in the search string with double quotes to find results that include words in the same order
- Make your search more specific by using "AND", "OR", and "NOT" (all caps) to separate keywords or phrases
- Click more options to search all of Data Basin or within your groups or content

Search

Only show results that overlap this area

Showing 1 - 18 of 500 Items; Page 1 of 28

FILTER: Datasets (480) Maps (20) Galleries (0) Guides & Case Studies (0) Members (0) Groups (0)

Sort by: Display:

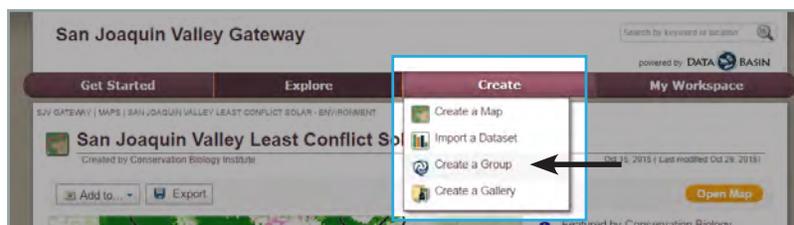
Kern County Soil Properties
Natural Resource Conservation Service (NRCS)
Soil series, irrigated crops and non-irrigated crops
[Dataset](#)
Conservation Biology Institute (Last modified July 3, 2015)

San Joaquin Valley Least Conflict Solar Rangeland Presentation Aug 28 2015
Conservation Biology Institute
Map presented by the California Rangeland Conservation Coalition at the Aug 28, 2015 convening on identifying least conflict lands for solar development in the San Joaquin Valley in California. Map includes a priority conservation areas dataset developed by the California Rangeland Conservation ...
[Map](#) [Featured Map](#)
James R. Stritholt (Last modified August 31, 2015)

Kern County Farmland Mapping and Monitoring Program (FMMP), 2012
California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program
Abstract: Established in 1982, Government Code Section 65570 mandates FMMP to biennially report on the conversion of farmland and grazing land, and to provide maps and data to local government and the public.
Purpose: The Farmland Mapping and Monitoring Program ...
[Dataset](#)
Conservation Biology Institute (July 24, 2015)

Groups

Groups are created by members to facilitate collaboration on specific topics, geographic areas, or projects. They make it easier to share user data, spatial information, and supporting information. For example, a county planning department could use the **Groups** function to coordinate planning efforts, such as a regional conservation plan, where there are multiple staff members or stakeholders involved.



Creating Groups

To create a group, click on **Create a Group** under the **Create** tab on the Menu Bar on the San Joaquin Valley Gateway Home Page.

Give the group a name.

Decide whether the group will be public or private. Group administrators can control privacy settings. Public profiles can be searched and reviewed by everyone. Users can request to join and be approved by group administrators. Private groups are only accessible to members of that group and members must be added manually by administrators. If a group is private, a lock icon will appear once the group is created.

Describe the group.

Tag it based on its type or subject. Examples of tags include location of the group and topics the group is focusing on.

Upload a photo for the user profile. If the user doesn't have a profile, a generic image will be generated.

Lastly, create a workspace welcome message to provide information about common group tasks.

Click **submit** once the profile is finished.

 A screenshot of the 'Create Group' form in the San Joaquin Valley Gateway. The form is titled 'Create Group' and includes several sections:

- Group Name:** A text input field.
- Group is:** Radio buttons for 'Public: group profile is visible to everyone and users can request to join this group' (selected) and 'Private: group is visible only to members and new members must be added manually'. A note below states: 'Note: Group workspace pages are always restricted to group members.'
- Describe this group and its objectives:** A rich text editor with a toolbar and a large text area. A note above the editor says: 'This description is shown on the group profile page. Use this to describe the main objectives of the group, especially if the group is public and you wish to recruit additional members.'
- Tags that describe this group:** A text input field with a note '(separate with commas)' and a 'My Tags | All Tags' link.
- Group Thumbnail:** A section with 'Choose File' (No file chosen) and 'Upload Photo' buttons.
- Workspace Welcome Message:** A text area with a note: 'This message is shown on the group workspace home page. Use it to welcome group members to the workspace, or provide information about common group tasks.'

 At the bottom, there are 'CANCEL' and 'SUBMIT' buttons. The footer contains 'ABOUT DATA BASIN | TERMS OF USE | SUPPORT SERVICES | CONTACT US' and '© 2017 Conservation Biology Institute'.

Group Workspace Areas

Once the profile has been created, there are four main areas on the workspace:

Home, Content, Members, and Public Profile.

The **Home** tab can be customized to describe the group's purpose. The page can be edited by clicking the manage button on the right-hand side of the page.

The **Content** tab is where group members can access datasets, maps, and documents.

To add content, click on the gear icon on the far right of the page and select **Add Content**. Search a topic, select the desired data, and click **add items**. The data will appear on the group's content page.

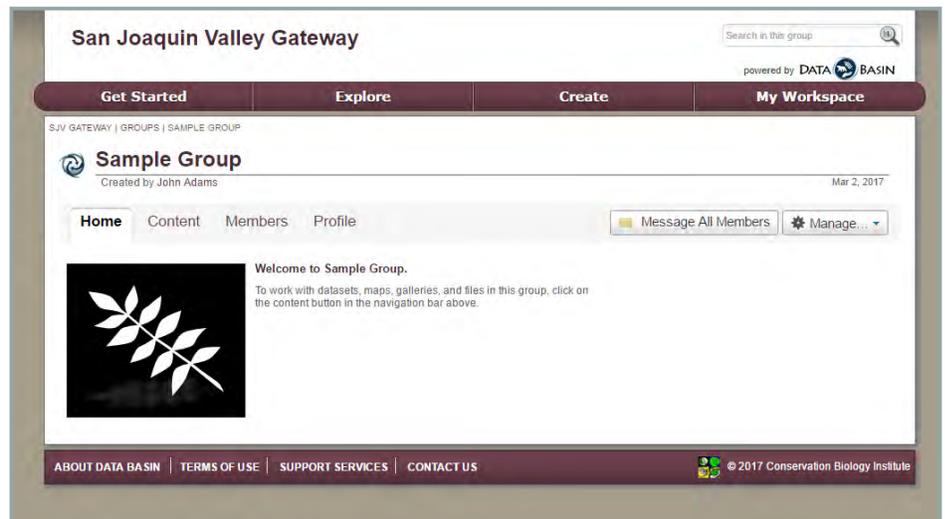
The dataset can also be added using the toolbar at the top of the page, which appears when the dataset is selected. Navigate to the toolbar and click **Add to**.

The dataset can also be added to a group while on the map page. Click on the dataset, open the map page, and select **Add to**.

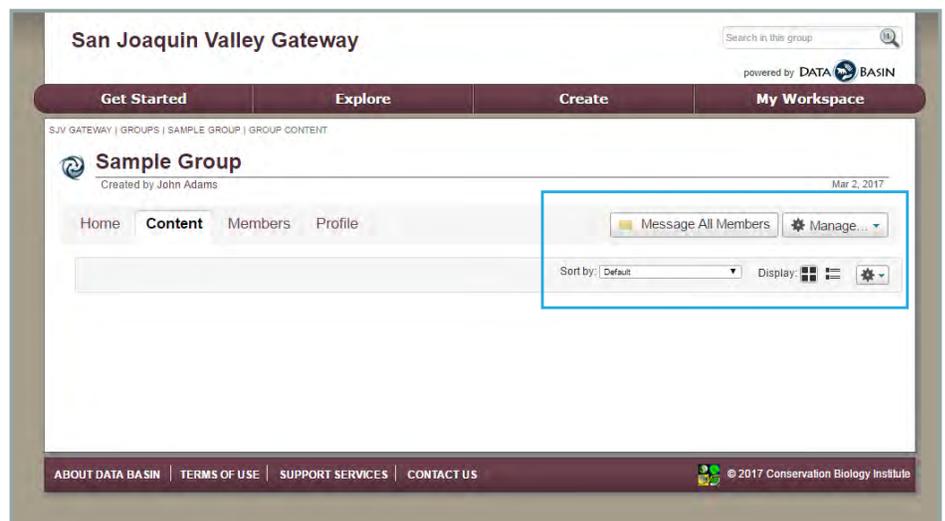
The datasets in the group can be organized by creating folders. To do this, click **Create Folder** under the **gear** icon on the far right of the page.

Content can be added to these folders by using the toolbar at the top of the page that appears once a dataset is selected. Click **Move Items** in the dataset toolbar and choose the folder.

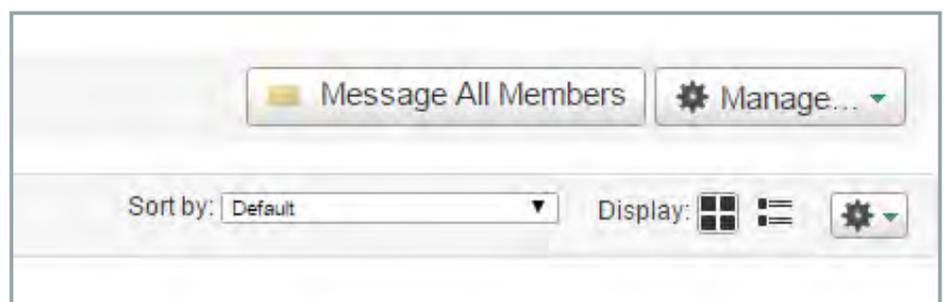
Within the toolbar, content can also be bookmarked, added to a group workspace, exported into PowerPoint, or removed from a group.



Group Workspace: Home Tab



Group Workspace: Content Tab

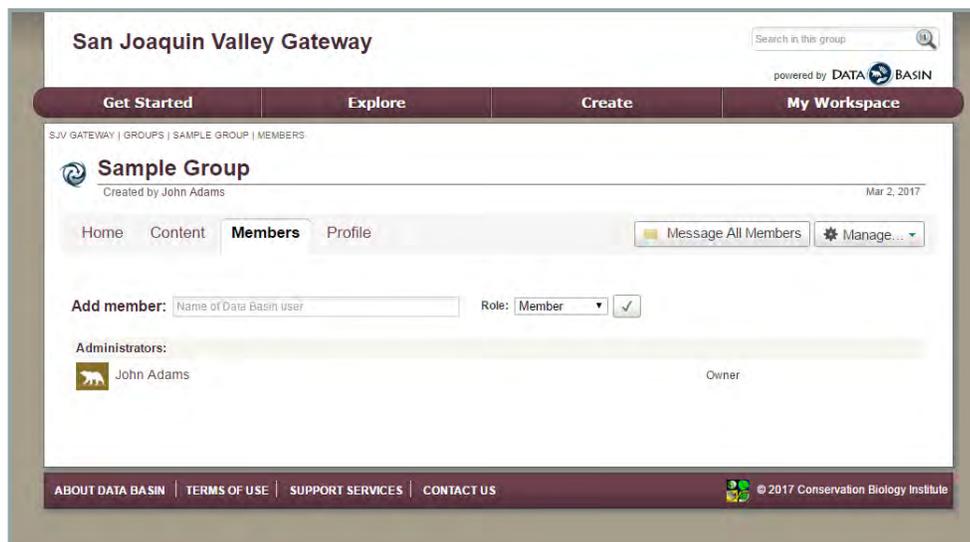


Group Workspace: Content Tab Toolbar

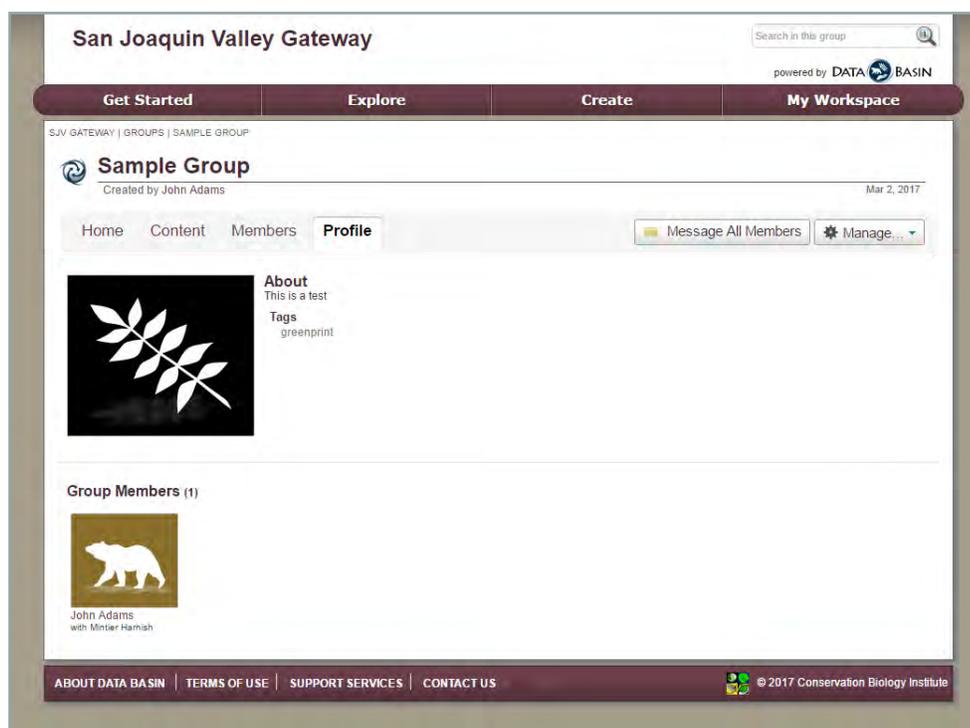
Members can be added in the **Members** tab of a user's profile. Group administrators can add, remove, or change the status of any group member. When a member is added to the group, they have access to the group's workspace and content. Type the name of the member to be added, define their role as member or administrator, and click the green **check mark** button. When a member is added to the group, they will receive an email notifying them of their acceptance into the group.

To message a member, click on the **message** button on their page. Members will receive a message within their account as well as within their email.

The **Profile** tab displays what people will see when they search for the group. Private profiles are only available to invited members of the group.



Group Workspace: Members Tab



Group Workspace: Profile Tab

My Workspace

My Workspace is a user's personalized and private space to manage their content and groups, to view messages.

To access My Workspace, click on **My Workspace Home** under the **My Workspace** tab on the Home Page.

Within the My Workspace home page, users can view recent activity and access and manage their content. They can see the maps they have created and their groups.

There are also buttons to **Create a Map**, **Import a Dataset**, or **Create a Group**.

The Workspace tab allows users to quickly access their work including their bookmarks, groups they belong to, guides and studies they have contributed to, maps they have created, and messages other members have sent to them.

San Joaquin Valley Gateway

Search by keyword or location

powered by DATA BASIN

Get Started | **Explore** | **Create** | **My Workspace**

SJV GATEWAY | MY WORKSPACE

My Workspace

Visualize & Share Insights

[Create a Map](#)

Maps are member-created dynamic web maps of spatial information, including datasets, drawings, and basemaps. They can be used to easily combine information and tell a story about a place or topic. Maps can be exported to a variety of formats.

Share Your Data

[Import a Dataset](#)

Datasets are member-uploaded spatial information, typically created using a Geographic Information System (GIS). They can be visualized and analyzed using mapping tools in Data Basin, and downloaded for use in desktop GIS software. Datasets include shapefiles, ArcGRID files, ESRI File Geodatabases, and NetCDF files. Most datasets can be overlaid, styled, analyzed, and downloaded.

Collaborate & Share Your Expertise

[Create a Group](#)

You have created 1 datasets so far.

- 1 in last 30 days
- 1 within the last year

You are a member of 1 groups.

[see all your groups](#)

Your Data Basin workspace is supported by member contributions. You can help by contributing.

Recent Activity

- Member**: John Adams with Mintier Hamish
- Group**: Sample Group
- Gallery**: Sample Gallery

Recently Viewed Items

- Group**: Sample Group
- Dataset**: Groundwater Recharge Areas
- Map**: Groundwater in the San Joaquin Valley, California
- Member**: jason kitto
- Gallery**: San Joaquin Valley Greenprint
- Guide/Study**: California Communities Environmental Health Screening Tool ...
- Gallery**: Energy - San Joaquin Valley Greenprint
- Gallery**: Soils - San Joaquin Valley Greenprint

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Phase I Data Layers



The following table lists the datasets assembled by the SJV Greenprint team. The datasets are available for viewing and downloading through the SJV Gateway (<https://sjvp.databasin.org>).

Theme	Map Name	Data Source	Source Date
Administrative Boundaries	Air Quality Basins	CA Air Resources Board	2004
Administrative Boundaries	Air Quality Districts	CA Air Resources Board	2004
Administrative Boundaries	BLM Federal and State Surface Estate	U.S. Bureau of Land Management	2012
Administrative Boundaries	BLM Grazing Allotments	U.S. Bureau of Land Management	2011
Administrative Boundaries	BLM Historic Grazing Allotments	U.S. Bureau of Land Management	2011
Administrative Boundaries	BLM Land Use Planning Areas	U.S. Bureau of Land Management	2012
Administrative Boundaries	California Protected Areas Database (CPAD)	GreenInfo Network/California Strategic Growth Council	2013
Administrative Boundaries	City Limits	San Joaquin Valley Counties	2012
Administrative Boundaries	County Boundaries	CalAtlas	2005
Administrative Boundaries	Disadvantaged Communities	CA Dept of Water Resources	2010
Administrative Boundaries	Incorporated City Limits	CalFire	2013
Administrative Boundaries	National Conservation Easement Database	U.S. Endowment for Forestry and Communities	2012
Administrative Boundaries	National Landscape Conservation System (NLCS) Wilderness Areas	U.S. Bureau of Land Management	2011
Administrative Boundaries	Private Water Districts	CalAtlas	2003
Administrative Boundaries	Public Water Agencies	CA Dept of Water Resources	2009
Administrative Boundaries	SJV Counties	CalAtlas	2009
Administrative Boundaries	Spheres of Influence	San Joaquin Valley Counties	2012
Administrative Boundaries	State Water Districts	CalAtlas	2003
Administrative Boundaries	Taylor Grazing Act Grazing Districts	U.S. Bureau of Land Management	2011
Agriculture	Crops	National Agricultural Statistics Service, CropScape	Varies
Agriculture	Farmland Mapping and Monitoring Program	CA Dept of Conservation	Varies
Agriculture	Retired Farmland	California State University, Stanislaus - Endangered Species Recovery Program	2007

Theme	Map Name	Data Source	Source Date
Agriculture	Williamson Act	Various	Varies
Biodiversity	Animal Distributions - San Joaquin Kit Fox Suitability	California State University, Stanislaus - Endangered Species Recovery Program	2012
Biodiversity	Audubon Society Important Bird Areas	Audubon California	2008
Biodiversity	BLM Area of Critical Environmental Concern	U.S. Bureau of Land Management	2010
Biodiversity	California Essential Habitat Connectivity	CalTrans, CA Fish & Game, Federal Highway Admin	2010
Biodiversity	California Natural Diversity Database (CNDDDB)	CA Dept of Fish and Wildlife	2012
Biodiversity	Critical Habitats	U.S. Fish and Wildlife Service	Varies
Biodiversity	DFG Areas of Conservation Emphasis (ACEII)	CA Dept of Fish and Wildlife	2010
Biodiversity	Dr. Huber's Dissertation Connectivity	Dr. Patrick Huber	2011
Biodiversity	Herptile Distribution- Tiger Salamander Suitability	California State University, Stanislaus - Endangered Species Recovery Program	2012
Biodiversity	Southern Sierra Partnership Regional Conservation Design	Data Basin	2012
Biodiversity	TNC Ecoregion Priorities	The Nature Conservancy	2005
Energy	BLM Solar and Wind Projects	CA Energy Commission	2008
Energy	BLM Utility Corridors	CA Energy Commission	2008
Energy	Dept. of Oil, Gas, and Geothermal Resources Districts	CA Dept of Conservation	2014
Energy	Geothermal Leases	U.S. Bureau of Land Management	2010
Energy	Geothermal Wells	CA Dept of Conservation	2013
Energy	Known Geothermal Resource Areas	CA Energy Commission	2008
Energy	Oil Fields/Administrative Areas	CA Dept of Conservation	2013
Energy	Oil Well Locations	CA Dept of Conservation	2014
Energy	Preliminary and Verified Renewable Energy Right-Of-Way	U.S. Bureau of Land Management	2008
Energy	Proposed DOE 368 Energy Corridors	CA Energy Commission	2008
Energy	Proposed Energy Corridor on Federal Land	USDA Forest Service	2008
Energy	Renewable Energy Transmission Initiative (RETI) Phase 2B	CA Energy Commission	2010
Energy	Solar Resource Potential	National renewable Energy Laboratory	2002
Land Cover	2001 National Land Cover Database (NLCD 2001)	U.S. Geological Survey	2001
Land Cover	2006 National Land Cover Database (NLCD 2006)	U.S. Geological Survey	2006
Land Cover	California Augmented Multisource Landcover map (CAML)	Allan Hollander/ UC Davis - ICE	2010
Land Cover	CalVeg	USDA Forest Service	Varies
Land Cover	Dept of Water Resources (DWR) Land Cover	CA Dept of Water Resources	Varies
Land Cover	DFG Delta Veg Map	CA Dept of Fish and Wildlife	2007
Land Cover	FRAP Best available multi-source	CalFire	2002
Land Cover	FRAP Hardwood Rangeland Vegetation	CalFire	1990
Land Cover	FRAP Riparian Vegetation in Hardwood Rangelands	CalFire	1994
Land Cover	Hardwood Rangeland Vegetation	CA Dept of Forestry and Fire Protection	1990
Land Cover	Historic Vegetation (CSU Chico)	U.S. Fish and Wildlife Service and the U.S. Bureau of Reclamation	2001

Theme	Map Name	Data Source	Source Date
Land Cover	National Wetlands Inventory	U.S. Fish and Wildlife Service	2010
Land Cover	Potential Natural Plant Communities (Kuchler 1976)	U.S. Bureau of Reclamation	1976
Land Cover	Riparian Vegetation	CA Dept of Water Resources	2011
Land Cover	Vernal Pool Complexes	Dr. Bob Holland, Placer Land Trust	2009
Land Use Planning	Disadvantaged Communities in SJR and Tule Basins	Geospatial Information Center	2010
Land Use Planning	Fire Threat	CA Dept of Forestry and Fire Protection	2004
Land Use Planning	Flood risk	Federal Emergency Management Agency	2014
Land Use Planning	General Plans	CA Natural Resources Agency	2004
Land Use Planning	General Plans	SJV local governments with assembly by ICE	2013
Land Use Planning	General Plans (generalized)	UC Davis - ULTRANS	2010
Land Use Planning	General Plans (Individual)	San Joaquin Valley Cities and Counties	Varies
Land Use Planning	Geothermal Leasing Areas	U.S. Bureau of Land Management	2010
Land Use Planning	HCP and NCCP Plans	CA Dept of Fish and Wildlife	Varies
Land Use Planning	Parcel data	San Joaquin Valley Cities and Counties	Varies
Land Use Planning	SJV Blueprint	San Joaquin Valley Blueprint	2009
Land Use Planning	Zoning (as available)	San Joaquin Valley Cities and Counties	Varies
Soils	Contours of Corcoran Clay Depth in feet	U.S. Geological Survey	2009
Soils	Contours of Corcoran Clay Thickness	U.S. Geological Survey	2009
Soils	Extent of Corcoran Clay	U.S. Geological Survey	2009
Soils	Land Classification of Soils for Irrigation Suitability	U.S. Bureau of Reclamation	2001
Soils	Land Subsidence 1926-1970	U.S. Geological Survey	1984
Soils	Land Subsidence in the Central SJV	U.S. Geological Survey	2013
Soils	Salt Affected Soils of California	Natural Resources Conservation Service	2011
Soils	Soils (SSURGO)	USDA/UC Davis	Varies
Transportation	Local Roads	Census Bureau (TIGER)	2008
Transportation	Major Roads	Census Bureau (TIGER)	2008
Transportation	Rail lines	Census Bureau (TIGER)	2008
Water Resources	Agriculture Applied Water Variability	CA Dept of Water Resources	2013
Water Resources	Average Water Use by sector	CA Dept of Water Resources	2013
Water Resources	Central Valley Rivers	National Hydrography Dataset	2009
Water Resources	Depth to Shallow Groundwater	U.S. Bureau of Reclamation	1987
Water Resources	Groundwater Elevation Contours	CA Dept of Water Resources	2013
Water Resources	Groundwater Basins	CA Dept of Conservation	2012
Water Resources	Groundwater Contamination-Boron/ Selenium/ Molybdenum/Electrical Conductivity	U.S. Bureau of Reclamation	1990
Water Resources	Groundwater Rechargeable Soils	California Water Institute	2009
Water Resources	Hydrologic Unit Maps	U.S. Geological Survey	2012
Water Resources	Lakes and Reservoirs	CalAtlas	2009
Water Resources	Major Canals	CA Dept of Water Resources	2009
Water Resources	National Hydrography Dataset (NHD) - High Resolution	U.S. Geological Survey	2012
Water Resources	National Hydrography Dataset (NHD) - Medium Resolution	U.S. Geological Survey	2012

Theme	Map Name	Data Source	Source Date
Water Resources	Rivers of California	National Hydrography Dataset	2012
Water Resources	Spring Ground Surface to Water Surface: SJR and Tule Lake Basins	California Water Institute	2009
Water Resources	Spring Groundwater Surface Elevation	California Water Institute	2009
Water Resources	Total Groundwater Withdrawl	CA Dept of Water Resources	2013
Water Resources	Water Supply	CA Dept of Water Resources	2013
Water Resources	Watersheds (CalWater)	CA Dept of Forestry and Fire Protection	1999