YOLO BYPASS WESTSIDE TRIBUTARIES FLOW MONITORING PROJECT
GRANT NO: P169008-00

PREPARED FOR
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

# YOLO BYPASS DATA SHARING PROPOSAL

MARCH 2020

PREPARED BY

CONSEROSOLUTIONS

# ABOUT THE YOLO BYPASS

The Yolo Bypass is a 57,000-acre flood bypass designed by the U.S. Army Corp of Engineers in the early 1930s to divert over five times the flow of the Sacramento River during high water years and provide flood protection to the Sacramento region. Prior to development into a flood bypass, this area was part of an inland sea 20 miles wide that provided tule marsh and other habitat. Today's Yolo Bypass includes the 17,000-acre Yolo Bypass Wildlife Area (home to shorebirds and migrating waterfowl), thousands of acres of farmland, and numerous duck clubs. The Bypass also provides important habitat for endangered terrestrial species, such as the western pond turtle and the giant garter snake. As a result of the large expanse of unique open space and habitat, state, federal, and local agencies are exploring ways to further improve flood protection and enhance fish and terrestrial species habitat.

# I. INTRODUCTION

Although millions of dollars have been spent by public and private agencies to collect data relevant to Yolo Bypass management and projects, these data are not located in a centralized location or consistently available to the public or decision makers to inform future research or policy decisions. Since Yolo County has been involved in high-level policy discussions related to the Yolo Bypass for decades, Yolo County requested and received funding from the California Department of Fish and Wildlife in 2016, as part of the larger $331,148 "Yolo Bypass Westside Tributaries Flow Monitoring Project" grant, to research options for creating a centralized location for Yolo Bypass data. Referred to throughout this document as the "Yolo Bypass Data Sharing Proposal" or "Proposal," Yolo County intends this work to allow the San Francisco Estuary Institute (Institute) to apply for a grant to develop the portal based on the information provided. The Institute could also handle different aspects of the recommendations that follow within this document.

The Yolo Bypass Data Sharing Proposal has three main parts:

**Recommendations.**
The County provides recommendations developed in collaboration with partners for collecting, sharing and distributing Yolo Bypass data through the new portal.

**Cost estimates.**
The County provides cost estimates developed in coordination with the Institute for development and maintenance of a Yolo Bypass data portal. The cost estimates will provide the basis for a grant or other funding proposal to develop the portal.

**Data list.**
The County includes a list of known Yolo Bypass data related to land-use in the Bypass as examples of the types of data the Institute could provide on the portal. Additional work is necessary to identify all of the available data.

Yolo County realized a centralized system for Yolo Bypass data did not exist as part of its work to evaluate potential land use impacts of the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project, a state and federal proposal to increase the duration and frequency of flooding in the Yolo Bypass to benefit fish species.

Over a decade, Yolo County and its partners collected crop data, wetlands data, terrestrial species data, and easement data related to the Yolo Bypass, as well as developed new models to evaluate agricultural and wetlands impacts of the proposed project. As part of the Yolo Bypass Westside Tributaries Flow Monitoring Project, the County also collected three years of flow data from four Yolo Bypass tributaries. Although all of these data are public, the data are currently only available upon request because there is no centralized portal to access Yolo Bypass data. Although the California Department of Fish and Wildlife grant requires Yolo County as the grantee to upload the Westside Tributaries data to a secure site, none of the available options are suitable for time-series flow data or provide a holistic view of data collected from the Yolo Bypass.

Through its Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project work, Yolo County determined the existing data management system is not sufficient to support robust policy discussions about the future of the Yolo Bypass. The County therefore decided to develop a proposal to ensure all data are not only centralized but meet the criteria of "open data." These criteria include ensuring the data is: 1) available at reasonable reproduction costs, preferably free by downloading over the internet; 2) available in a format that is easy to modify; 3) available under terms that permit re-use and redistribution.[1] The County also determined that additional coordination is needed between local and state agencies, the University of California, Davis, and non profit organizations to coordinate efforts to centralize the visualization and filtering of data.

As Yolo County worked to evaluate Yolo Bypass data management efforts, the County researched four other efforts related to Delta data management to determine whether they would align with Yolo County's interest in improving data management. Highlights of these four efforts are as follows:

**The Open and Transparent Water Data Act**. In 2016, Senator Bill Dodd authored and Governor Jerry Brown signed AB 1755 into law. Also known as the Open and Transparent Water Data Act, the new law requires the California Department of Water Resources to make water and fisheries data available to the public. Yolo County acknowledges, however, this effort underway by the Department of Water

[1] "Open Definition 2.1," Open Knowledge Foundation, https://opendefinition.org/od/2.1/en/.

Resources, and other efforts underway by the State Water Resource Control Board, California Department of Fish and Wildlife, the California Water Quality Monitoring Council, Governor's Office of Planning and Research, California Natural Resources Agency, California Government Operations Agency, and Delta Stewardship Council to leverage the California Natural Resources Agency data portal and the California Open Data Portal to make water and fisheries data transparent and accessible to the public as part of AB-1755. The Institute influenced this new policy, as they edited the white paper "Enhancing the Vision for Managing California's Environmental Information" (2015), composed for the Delta Stewardship Council, which was in turn quoted in drafts of the AB 1755 legislation.

**Integrated Adaptive Management Integration Team.** Integrated Adaptive Management Integration Team. The Delta ScienceProgram formed the Integrated Adaptive Management Integration Team (IAMIT) in 2016, consisting of representatives from 15 state, federal, and non-governmental agencies interested in developing a coordinated approach to adaptive management in the Sacramento-San Joaquin Delta, Suisun Marsh, and the Yolo Bypass. Although not a separate state agency or non-profit organization, IAMIT aims to improve interagency collaboration, and provide input and guidance on adaptive management for Delta conservation efforts.[1] IAMIT drafted a white paper with the following three data management recommendations: "(1) Establish a position for an EcoRestore Data Manager; (2) Develop an open data strategy and strategic plan for data management; (3) Identify data science resources at participating agencies and allocate additional resources for web-servicing and data access."[2] IAMIT does not have dedicated funding to implement all of their data recommendations.

**San Francisco Estuary Institute.** Established in 1986, the San Francisco Estuary Institute is a non-profit, non-governmental organization, the mission of which is to help ensure objective science guides water quality regulations and policy. The Institute encourages use of a holistic approach toward assessing the health of the estuary, with a focus on providing scientific support and tools for decision-making and

[1] "Open Definition 2.1," Open Knowledge Foundation, https://opendefinition.org/od/2.1/en/.

2] Interagency Adaptive Management Integration Team, Draft EcoRestore Adaptive Management White Paper (2017), 7, https://resources.ca.gov/ecorestore/wpcontent/uploads/2017/04/2017-3-8-EcoRestore-Adaptive Management-Program-White-Paper-v3-7-2017.pdf.

communication through collaborative efforts. An associated joint powers authority (JPA), the Aquatic Science Center, helps facilitate interagency agreements, is staffed by the Institute and includes the State Water Resources Control Board and Bay Area Clean Water agencies as members. The Institute initiated developed the statewide EcoAtlas portal in 1994 and started to develop long-term relationships with data managers to host their data. The Institute now hosts multiple data portals with multiple data types, including discrete water quality, ecological, and continuous measurements. [3] The Institute raises money for data management through grants and long-term contracts with local, state, and federal agencies to host data in a manner consistent with open-data principles. The Institute communicated to the County that if funding is available, they are willing to develop and host the Yolo Bypass data portal. No funding for this effort has yet been identified.

After participating in many IAMIT meetings, coordinating with the San Francisco Estuary Institute, and consulting with public and private partners working on Yolo Bypass issues, Yolo County determined partnering with the Institute is the most appropriate long-term approach to developing a centralized Yolo Bypass data portal. Yolo County determined through its research that it is unlikely a state agency will be interested in hosting such a portal, plus the County is concerned that state funding for data management may be reduced during a fiscal crisis. Yolo County also believes a partnership with the Institute is consistent with IAMIT's data management goals. The Institute should coordinate closely with the IAMIT as the portal develops to ensure integration of IAMIT's recommendations into the portal.

# II. RECOMMENDATIONS

Yolo County developed the following specific recommendations the County and other stakeholders can use to further the development of a Yolo Bypass data portal.

**Recommendation R-1. Partner with the Institute to develop the data portal.** The County recommends partnering with the Institute to develop the data sharing portal. The County recommends that the Institute apply for a grant to develop the portal, as well as seek a 20-year contract with the State of California to manage the data portal. The Institute has long-term experience with data portal development for other

[3] "Data Center," San Francisco Estuary Institute & The Aquatic Resource Center, 2018, https://www.sfei.org/sfeidata.htm.

agencies, including the State Water Resources Control Board, the California Department of Fish and Wildlife, and the Santa Clara Valley Water District. The Institute has successfully managed the data portal EcoAtlas for over 20 years in partnership with 30 agencies and organizations. The Institute administers and manages the data for the Delta Regional Monitoring Program. In addition, the Institute's Resilient Landscapes Program has led the development of several important publications related to Delta landscapes, including "A Delta Renewed: A Guide to Science-Based Ecological Restoration in the Sacramento-San Joaquin Delta" (2016) and "A Delta Transformed: Ecological Functions, Spatial Metrics, and Landscape Change in the Sacramento-San Joaquin Delta" (2014).

**Recommendation R-2. Develop a public outreach strategy to solicit feedback about the data portal from stakeholders.** Users of the data, whether project managers or decision makers, should be involved early in the data portal process to ensure the end product meets the needs of its intended users. Both the California Department of Fish and Wildlife and cbec ecoengineering stressed the importance of outreach to stakeholders, including public events at which data portal options are vetted, early in the data portal development process. The public outreach strategy may include one-on-one or small group outreach to key stakeholders as well. The County further suggests that the Institute start with uploading high-quality data and asking users to review the portal as a pilot project before making the portal widely accessible to users.

**Recommendation R-3. Leverage existing data tools to reduce redundancy in developing the data portal.** The Institute should leverage existing data management systems in building the portal, providing links to existing datasets hosted on other web sites where possible instead of importing the data into the new portal. This will reduce costs because Institute data managers will not have to constantly research whether the portal's data is consistent with the original data source. The Institute expressed a desire to align Yolo's open-data strategy with the AB 1755 mandate described above, including leveraging common data formats, data exchange strategies, and publication processes.

**Recommendation R-4. Utilize scripts developed in-house by the Institute to collect data from other websites (web scraping).** Collecting and formatting data files can be costly. Therefore, Yolo County recommends the Institute use in-house scripts to collect data from other websites (web-scraping) and centralize the data on a Yolo Bypass data portal. Web scraping ensures individuals will not need to continually check third-party websites for additional data, scripts will automatically check and update the data portal.

**Recommendation R-5. Continue coordination with IAMIT during portal development and as part of regular portal maintenance.** IAMIT and the Institute have similar goals for data management, so continued coordination is essential to minimize duplication and ensure data managers and users are aware of the new portal. Yolo County suggests quarterly calls to check on portal progress and data management, as well as working with IAMIT to identify new datasets and features to improve the usefulness of the portal. The Institute should also work with each individual state agency that comprises IAMIT to ensure links to the Yolo Bypass portal are prominently displayed on agency web sites.

**Recommendation R-6. Include a section in the data portal for updates on ongoing projects that utilize portal data.** This section will help inform users about potential uses of the portal, as well as provide a means for decision makers to track analyses related to proposed Yolo Bypass projects.

**Recommendation R-7. Include metadata, such as a short project description, contact information for two or more project managers, area covered, time period covered and definition of any abbreviations used within the data.** Including metadata in the data portal allows stakeholders other than the project manager to use and understand the data and contact project managers with any questions.

**Recommendation R-8. Develop a post-launch public outreach strategy.** Outreach to stakeholders should continue after the launch of the portal to ensure the portal is meeting the needs of users. The Institute should also manage a robust communications strategy as part of as portal maintenance, including draft press releases and social media posts about projects that use the data to showcase its usefulness. A public outreach campaign should also be launched when the portal is live to inform legislators and other policy makers about its potential uses for Yolo Bypass decision-making processes.

# III. COSTS

Developing a data portal will require an initial one-time funding source followed by ongoing funding for maintenance, technical support, and additional acquisition of data. Yolo County received cost estimates from the Institute (Table 1) for development of different types of data portals specific to the Yolo Bypass. The initial one-time funding source amount depends in part on who will format and review data that is not currently available online. Significant formatting and quality control/quality assurance will be needed on certain datasets. If data managers at the institutions can format the data, the initial one-time funding source will be less than if the Institute formats the data. Without specifics on the datasets or desired features, this cost estimate is rough and the Institute will need to refine cost estimate as part of a more specific plan for portal development, including assessing the possibility of leveraging functionality developed for existing tools. Initial development costs, annual maintenance costs, and technical support costs increase as complexity of the data portal increases.

## Table 1. San Francisco Estuary Institute Estimated Costs for Yolo Bypass Data Portal.

| Development Options | Annual Maintenance Costs | Annual Technical Support Costs | Functional Goal(s) | Functionality | Example |
|---|---|---|---|---|---|
| **Option 1: $150,000 - $300,000** | $21,600 | $14,400 | • Visualize projects that impact or restore aquatic habitats<br>• ·Share information about such projects<br>• Demonstrate how projects affect the condition and distribution of aquatic resources | • Users can create customizable reports and synthesis tools<br>• Extensive data visualization tools<br>• Advanced data interpretation tools<br>• Users can download datasets in multiple formats<br>• Online data entry and editing is allowed | EcoAtlas www.ecoatlas.org |
| **Option 2: $60,000 - $150,000** | $10,800 | $3,600 | • Capture and display continuous monitoring data for use by researchers and agencies | • Provides data visualization for continuous data<br>• Users can select and graph multiple parameters and data points<br>• Users can print and download graphs | SF Bay Nutrients Visualization Tool www.enviz.org |
| **Option 3: $40,000 - $80,000** | $5,400 | $7,200 | • Facilitate exploration of geospatial data layers around a theme and specific location with varied, user-defined options for visualizing the combination of layers | • ·Interactive map for visualizing data layers<br>• Users can download datasets and reports<br>• Does not include advanced reporting tools or ability to print summary reports | Resilience Atlas resilienceatlas.sfei.org |
| **Option 4: $80,000** | $13,000 | $5,400 | • Provide access to data for researchers and public agencies<br>• Visualize basic statistics based on filtered data | • Users can filter data displayed on map and download charts<br>• Can calculate basic statistics for selected datasets<br>• Users can download data in multiple formats | Contaminant Data Display and Download cd3.sfei.org |

**Table 1. Continued.**

| Development Options | Annual Maintenance Costs | Annual Technical Support Costs | Functional Goal(s) | Functionality | Example |
|---|---|---|---|---|---|
| **Option 5: $80,000** | $3,600 | $1,800 | • Convey a story through scenarios | • Some data visualization<br>• Users can upload relevant datasets<br>• Users can print maps | Bay Shoreline Flood Explorer explorer.adaptingtorisingtides.org/explorer |
| **Option 6: $50,000** | $1,800 | $1,800 | • Visualize a landscape using data layers assembled into an expansive data catalog | • Can add map layers from data catalog<br>• Cannot download individual datasets or print summary reports | McCormack Williamson Tract Map Terra mwtmapterra.sfei.org/ |

# IV. TIMELINE

The proposed timeline below (Table 2) provides an example the Institute could follow to develop a data portal and seek funding. The Institute will not develop the portal without a source of both initial and ongoing funding.

## Table 2. Timeline for Data Portal Development

| Date | Action |
|---|---|
| **May 2020 - June 2021** | Research grant opportunities to fund data portal, as well funding for ongoing maintenance of portal<br>Apply for grant opportunities |
| **January 2022** | After contract execution for funding, convene a working group to discuss the needs and requirements of the data portal |
| **July 2022** | Host public outreach event to solicit input from Yolo Bypass stakeholders on data portal<br>Identify the requirements and software needed for the data portal |
| **August - September 2022** | Develop database functions for displaying data on the portal |
| **October 2022** | Create designs for the portal |
| **November 2022** | Develop beta data portal<br>Host public outreach event for Yolo Bypass stakeholders to provide feedback on data portal |
| **January 2023** | Participate in meetings with workgroup to review progress on the development and address questions |
| **January - February 2023** | Incorporate changes and feedback from workgroup |
| **March 2023** | Develop user guidance and technical documentation |
| **April 2023** | Release production data portal |
| **May 2023 - ongoing** | Provide technical support for portal users<br>Perform regular data backups and maintenance tasks |

# V. POSSIBLE YOLO BYPASS DATASETS

To acquire data collected in the Yolo Bypass, the County; (1) developed a list of potential data owners; (2) developed an inquiry email (Appendix A) and questionnaire (Appendix B); (3) sent email with questionnaire; and (4) incorporated information from data managers into tables (Tables A1, A2, A3).

The contact list was developed utilizing institutional knowledge of projects occurring in the Bypass, and using the internet to research projects and available data. This list of potential Yolo Bypass datasets is likely incomplete. More outreach is ongoing and more outreach by the Institute is needed to identify and secure additional datasets if they find a grant. The County collected contact information (email and phone numbers) for project managers associated with Yolo Bypass projects. Within the email Yolo County gave them the option to answer the questionnaire independently or the County could schedule a call with them to review the questionnaire. Yolo County developed the email and questionnaire internally, and then solicited input from the Institute on the email and questionnaire. If no response was received, from the initial email, the County sent a subsequent email, and then followed up with a phone call.

# VI. APPENDIX

## Appendix A. Data Inquiry Email

Hello
[Name/Organization],

I'm working on behalf of Yolo County to coordinate development of a proposal with the San Francisco Estuary Institute to centralize all Yolo Bypass data to ensure access for decision makers evaluating proposed projects that affect existing local uses, such as flood protection or habitat enhancement projects. As part of the first step in this process, we are reaching out to organizations and individuals we think might have Yolo Bypass data to get a sense of the amount and types of existing data. We will use this information to draft a data sharing proposal with recommendations for next steps in the data centralization process.

I am reaching out to see if it's possible to access this data and/or if you're aware of any additional Yolo Bypass data that might be useful to this effort. If you can find the data, we hope you either respond to the attached questionnaire or schedule a call with us to review the questionnaire. In addition, please let us know if you have any suggestions for additional organizations or individuals to whom we should reach out.

## Appendix B. Data Inquiry Questionnaire

1. How many datasets from the Yolo Bypass do you own or manage?

2. Who funded the project? Was the project funded with public dollars (Federal, State, County, etc.)?

3. For each dataset:

- What type of data do you have (e.g., water flow data, species surveys, visitor use
- data, water quality)?
- Where and how is the data stored (Excel, csv file, kmz file, database, online
- repository)?
- Is a standard template format used? If yes, which one?
- When were the data collected?
- Are there associated Quality Assurance data and documentation?
- Does the dataset fill an important gap?

4. Is the data actively maintained? If so, who is the contact person?

5. Is the data currently accessible to the public? If not publicly available, is it accessible for a fee? If so, how much?

6. What was the end product/deliverable (model, memo, etc.) from the data? Where is this end product/deliverable stored?

7. What are your future data use and storage needs for your organization?

8. Are there other contacts you recommend we reach out to? Or other sources of Yolo Bypass data you recommend we track down?

9. Would you consider contributing data to a publicly accessible data portal? If so, what permissions (Board approval, attorney approval, memorandum of understanding) would you need to participate in the data portal?

## Appendix B. Data Inquiry Questionnaire, continued

10. If we decided to submit a grant application to fund the creation of a data portal, what level of participation would you want to have (none, match, in-kind contribution, letter of support, workgroup representative, etc.)? What types of features do you think would be useful to include in the data portal interactive map, download data, generate report summaries, etc.)?

11. Do you have any additional comments or concerns you wish to share?

SFEI AQUATIC SCIENCE CENTER

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March 30, 2020

Ms. Elisa Sabatini
Natural Resources Manager
Yolo County
625 Court Street
Woodland, CA 95695

**Subject: Letter of Support for Yolo Bypass Data Sharing Proposal**

Dear Ms. Sabatini,

The San Francisco Estuary Institute (Institute) is pleased to offer its support for the *Yolo Bypass Data Sharing Proposal* submitted to Yolo County.

The proposed project would develop a new data portal for collecting, sharing, and distributing Yolo Bypass data. Although millions of dollars have been spent by public and private agencies to collect data relevant to Yolo Bypass management and projects, these data are not consistently available to decision-makers, researchers, or the public to inform research or policy decisions.

If this data sharing proposal is funded, our organization would collaboratively engage with key partners to develop a new web tool for compiling, disseminating, and visualizing data for the Yolo Bypass. The Institute has many years of experience in co-developing web tools and meaningfully engaging stakeholders through data sharing arrangements, technical advisory workgroups, and user groups.

In addition, the Institute is committed to regularly using open-source technology and facilitating open-data sharing among partners. The Institute participated in the Open Data Symposium and edited the white paper *Enhancing the Vision for Managing California's Environmental Information*, which was quoted in drafts of the Open and Transparent Water Data Act (AB 1755) legislation.

The Institute encourages a holistic approach toward assessing the health of the San Francisco Bay Delta by providing objective scientific support and tools for decision-making and communication through collaborative efforts. The Institute hosts multiple data portals for serving discrete water quality, complex ecological, and continuous measurements. Furthermore, our organization has extensive expertise in managing and disseminating data

from numerous sources. Whenever possible, we leverage existing data tools to reduce redundancy and costs, maximize features, and promote sustainability in efficiently maintaining interrelated tools. As a partner, the Institute can contribute the skills and experience gained during the development of the following web tools:

- **EcoAtlas** (ecoatlas.org) provides access to information for effective wetland management. EcoAtlas is a web map associated with an innovative toolset for generating, assembling, storing, visualizing, sharing, and reporting environmental data and information. The tools can be used individually or together, and they can be customized to synthesize information at different scales to inform decision-making and meet the specific needs of environmental planners, regulators, managers, scientists, and educators. The maps and tools can be used to create a comprehensive picture of aquatic resources in the landscape by integrating stream and wetland maps, restoration information, and monitoring results with land use, and other information important to the state's wetlands.

- **Contaminant Data Display and Download Tool** (CD3; cd3.sfei.org) is an innovative visualization tool for accessing water quality data throughout California. It is the primary tool for visualizing and downloading the long-term datasets for the Regional Monitoring Program for Water Quality in San Francisco Bay (sfei.org/rmp) and Delta Regional Monitoring Program (sfei.org/DeltaRMP), which are both administered by the Institute, along with other project data stored in the Institute's Regional Data Center (RDC). Data stored in the RDC are comparable with the state's data management business rules and are exchanged weekly with the California Environmental Data Exchange Network (CEDEN).

- **Delta Environmental Data for the Understanding of a California Estuary** (DEDUCE; sfei.org/DEDUCE). The purpose of this project was to expand the existing San Francisco Bay Regional Data Center (RDC) to include the Sacramento-San Joaquin Delta and Suisun Marsh (Delta). Completed in 2017, the project created an estuary-wide data repository where one currently did not exist. The partners successfully achieved the project's goals to work with data providers collecting data in the Delta, harmonize data for improved interoperability, and increase access to, and exchange of, high-quality environmental data from public and private sector sources for scientists, environmental program staff, managers, the public and other stakeholders.

- **San Francisco Bay Nutrients Visualization Tool** (enviz.org) facilitates the intuitive comparison of continuous water quality data for a number of nutrient-related

parameters collected by several programs at sampling stations throughout the San Francisco Bay and Delta.

A collaboratively developed data portal for collecting, sharing and distributing data for the Yolo Bypass will allow stakeholders access to the information they need to inform better research and decision-making.

If you have any questions, please contact me at (510) 746-7396 or via email warnerc@sfei.org

Sincerely,

Warner Chabot
Executive Director
San Francisco Estuary Institute

**Table A1. The location, owner, project and description of data files.**

| Reference Number | Location | Owner | Project | Data Description | Data file type |
|---|---|---|---|---|---|
| **1** | EDI Data Portal | Department of Water Resources - Interagency Ecological Program | Yolo Bypass Fish Monitoring Program | Fish catch and water quality data, fish taxonomy, trap effort, site locations | csv |
| **2** | National Water Information System | United States Geological Survey | · Yolo Bypass Pesticide Analysis | Pesticides | csv |
| **3** | Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project Data Viewer | United States Bureau of Reclamation and California Department of Water Resources | Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project | Modeled results of how increased flows may affect inundation | Model |
| **4** | Yolo County GIS Division | Yolo County | Various | Land use, crop/planting data, soils data, wetland data, inundation, parcel data | Excel, csv, kmz and online repository |
| **5** | University of California, Davis - Museum of Wildlife and Fisheries Biology | University of California, Davis - Museum of Wildlife | Wildlife of Riparian Habitats in the Yolo Bypass, California | Avian point counts, vegetation percent cover and species composition, avian species occurrence, butterfly distribution and relative abundance | Excel database, Word document |

**Table A1. Continued.**

| Reference Number | Location | Owner | Project | Data Description | Data file type |
|---|---|---|---|---|---|
| **6** | California Environmental Data Exchange Network | California Environmental Data Exchange Network | ·Various | Water quality, water toxicity, organism tissue, benthic, and habitat | Excel, csv |
| **7** | Yolo County Water Resources Informational Database | Yolo County Flood Control and Water Conservation District | Various | Groundwater levels, groundwater quality | Unknown |
| **8** | Pesticide Use Report Database | California Department of Pesticide Regulation | Various | Pesticide use and crop type | Text file |
| **9** | Central Valley Prediction and Assessment of Salmon | University of Washington, School of Aquatic and Fishery Sciences (agency hosting the portal); U.S. Bureau of Reclamation (funding agency) | Central Valley Prediction and Assessment of Salmon through Ecological Data and Modelling for In-Season Management | River stage height, salmon counts, fish salvage/loss counts, adult fish escapement counts, water quality data, flow data, river condition | Online repository, model simulations, csv |

**Table A2. Point of contact for located data files.**

| Reference Number | Contact Person | Contact Information |
|---|---|---|
| **1** | Brian Schreier (Supervisor) | Brian.Schreier@water.ca.gov |
| | Brittany Davis (Data Manager) | Brittany.e.Davis@water.ca.gov |
| **2** | James Orlando (Hydrologist) | jorland@usgs.gov |
| **3** | Ben Nelson (Bureau of Reclamation) | bcnelson@usbr.gov |
| **4** | Elisa Sabatini (Yolo County) | Elisa.sabatini@yolocounty.org |
| | Mary Ellen Rosebrough-Gay (Yolo County) | Maryellen.rosebrough-gay@yolocounty.org |
| **5** | Melanie Truan | mltruan@ucdavis.edu |
| **6** | Jarma Bennett | jarma.bennett@waterboards.ca.gov |
| **7** | Max Stevenson | mstevenson@ycfcwcd.org |
| **8** | Generic email | PUR.inquiry@cdpr.ca.gov |
| **9** | Generic email | web@cbr.washington.edu |

**Table A3. Number of datasets associated with projects referenced.**

| Reference Number | Owner - Project | Number of Datasets |
|---|---|---|
| **1** | Department of Water Resources - Interagency Ecological Program - Yolo Bypass Fish Monitoring Program | 4 |
| **2** | USGS - Pesticide Occurrence in California - Yolo Bypass Pesticide Analyses | 13 |
| **3** | Bureau of Reclamation and California Department of Water Resources | Unknown |
| **4** | Yolo County | > 10 |
| **5** | University of California, Davis - Museum of Wildlife and Fisheries Biology, and California Department of Water Resources | 3 |
| **6** | California Environmental Data Exchange Network | 126,428 rows of data |
| **7** | Yolo County Flood Control and Water Conservation District | Unknown |
| **8** | California Department of Pesticide Regulation | Unknown |
| **7** | University of Washington - Central Valley Prediction and Assessment of Salmon | Unknown |