

SacPAS R Scripts

Melanie Chen and
Jennifer L. Gosselin

SacPAS
CENTRAL VALLEY PREDICTION AND ASSESSMENT OF SALMON

UNIVERSITY of WASHINGTON

Who might be interested in SacPAS R Scripts?

1. Someone wanting to **automatically embed** into **their document** a **figure** that is a **SacPAS query output**.

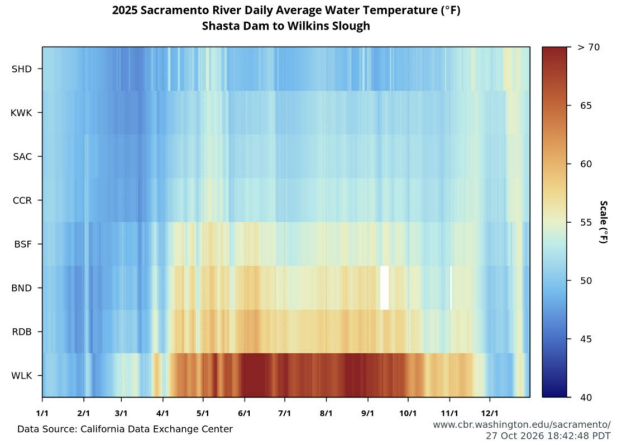
For example:

Meeting Agenda Template

This agenda requires background knowledge on 2025 water temperature data from Shasta Dam to Wilkins Slough.

Background

(Background text goes here)



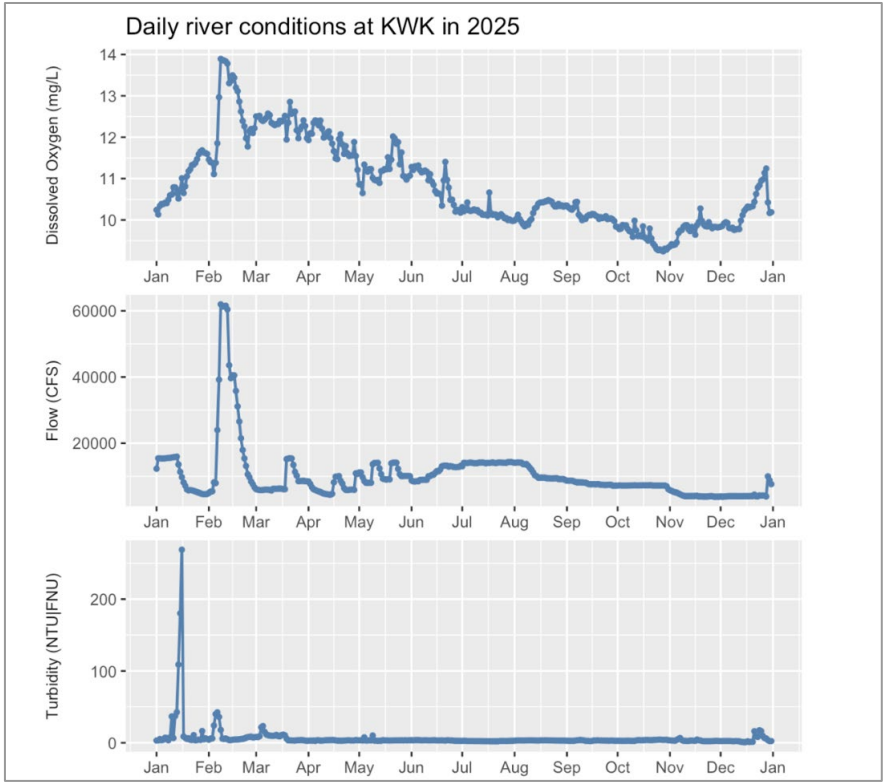
Agenda

(Agenda details go here.)

Who might be interested in SacPAS R Scripts?

2. Someone wanting to **create** their own **figure** from **data downloaded** via a **SacPAS query**.

For example:



Outline

- **Share three examples** *(progressively increasing in complexity)*

1. **Embed a figure** from **SacPAS query output**: figure with **real-time data**

1. **Embed a figure** from **SacPAS query output**: figure for **particular year(s)**

1. **Create a figure** in **R** from **data downloaded via SacPAS query**



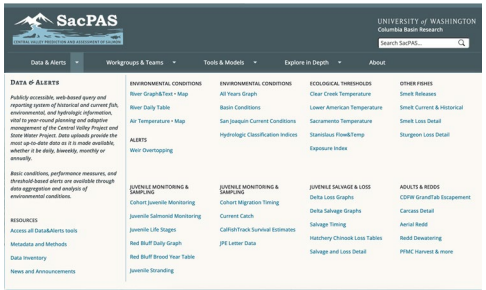
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- **Share three examples** *(progressively increasing in complexity)*
    - Three main steps for each example:

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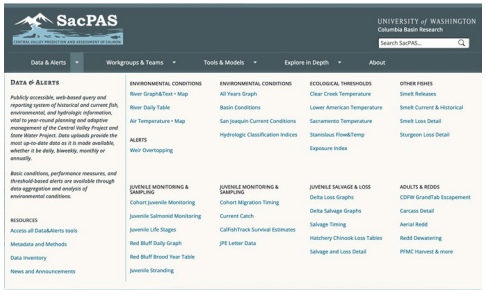
1. Get query URL



Outline

- **Share three examples** *(progressively increasing in complexity)*
  - Three main steps for each example:

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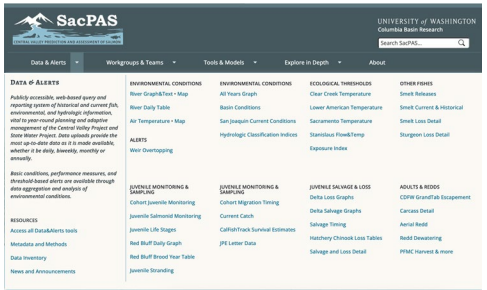
2. Code in R



Outline

- **Share three examples** *(progressively increasing in complexity)*
  - Three main steps for each example:

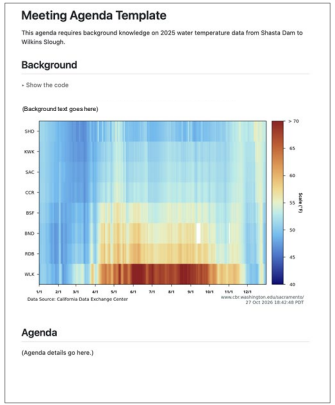
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2. Code in R



3. Create the product



Outline

- **Share three examples** *(progressively increasing in complexity)*

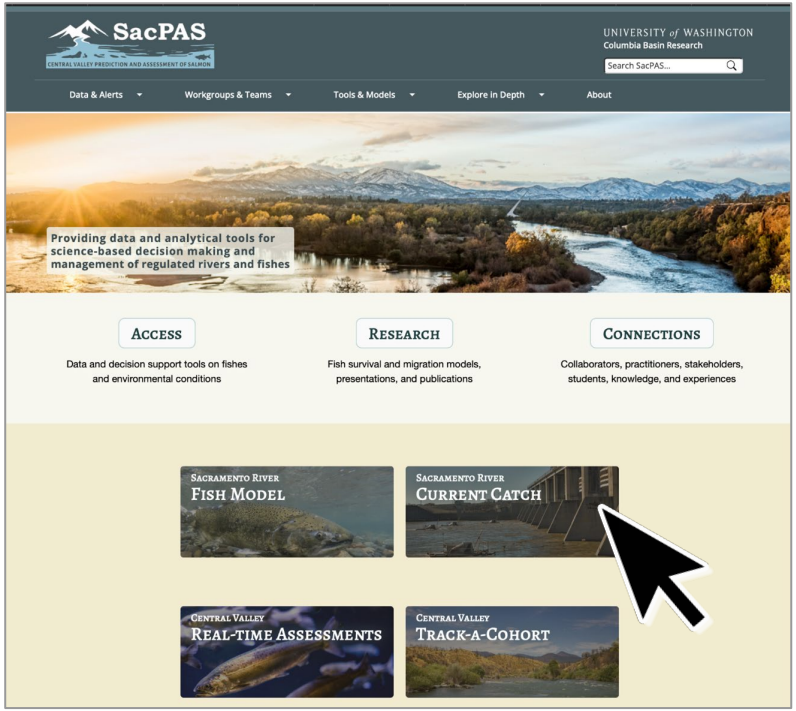
- **Share resources**
  - *Sample code in GitHub repo*
  - *1-pager of query URLs*

Example 1

Embed a figure from **SacPAS query output**: figure with **real-time data**

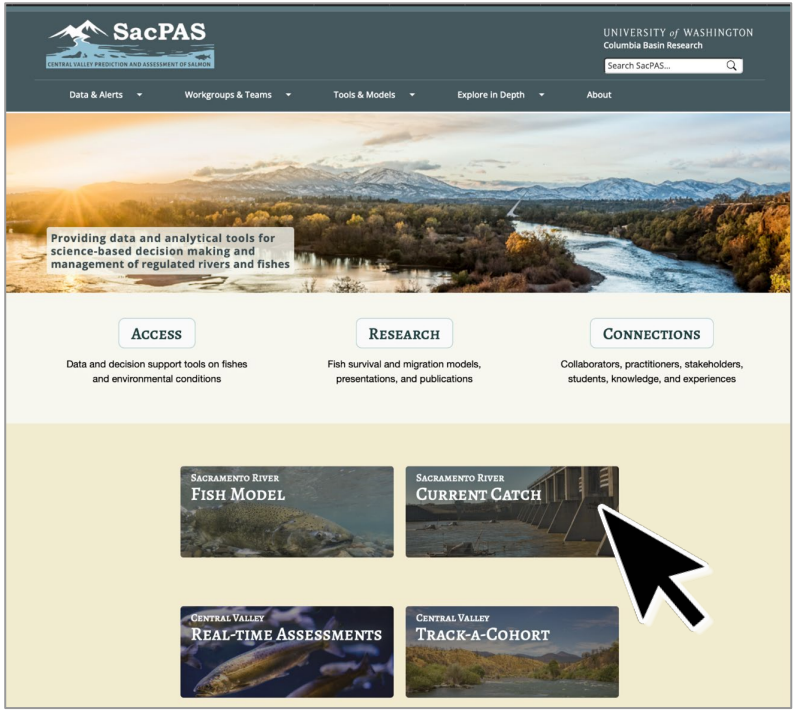
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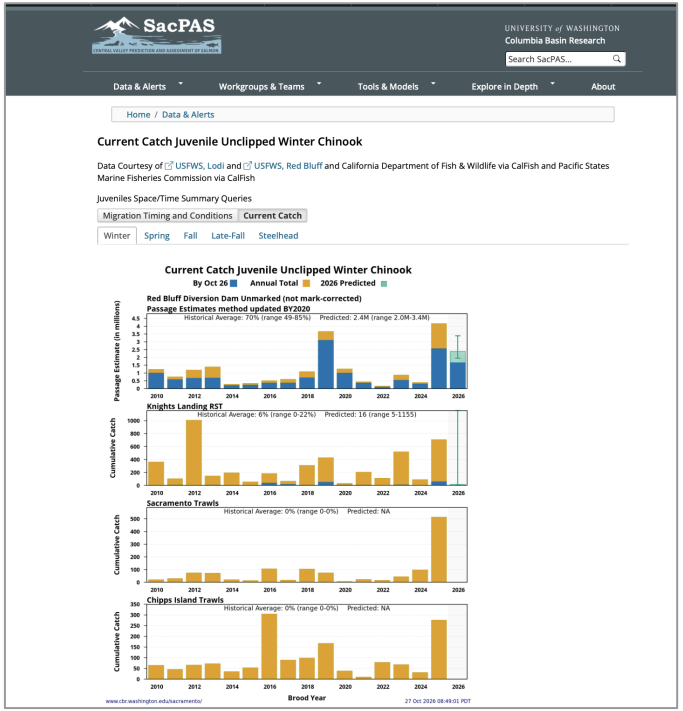
<u>Embed</u> a figure from **SacPAS query output**: figure with **real-time data**. E.g., Current Catch



Example 1

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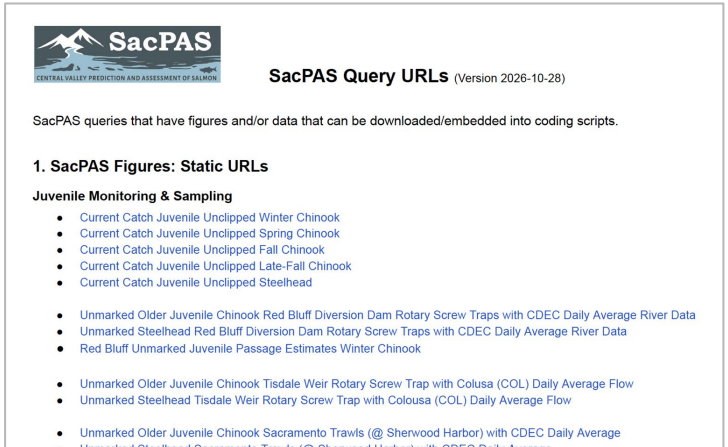
Embed a figure from **SacPAS query output**: figure with **real-time data**. E.g., Current Catch

Step 1: Get query URL

https://www.cbr.washington.edu/sacramento/data/graphics/currcatch_CHN_Winter.png

See 1-pager of SacPAS Query URLs for full list under section **SacPAS Figures: Static URLs**

Available via 2026 SacPAS Workshop webpage: https://cbr.washington.edu/sacramento/SacPAS2026workshop/index.html



SacPAS

CENTRAL VALLEY PREDICTION AND ASSESSMENT OF SALMON

SacPAS Query URLs (Version 2026-10-28)

SacPAS queries that have figures and/or data that can be downloaded/embedded into coding scripts.

1. SacPAS Figures: Static URLs

Juvenile Monitoring & Sampling

- Current Catch Juvenile Unclipped Winter Chinook
- Current Catch Juvenile Unclipped Spring Chinook
- Current Catch Juvenile Unclipped Fall Chinook
- Current Catch Juvenile Unclipped Late-Fall Chinook
- Current Catch Juvenile Unclipped Steelhead

- Unmarked Older Juvenile Chinook Red Bluff Diversion Dam Rotary Screw Traps with CDEC Daily Average River Data
- Unmarked Steelhead Red Bluff Diversion Dam Rotary Screw Traps with CDEC Daily Average River Data
- Red Bluff Unmarked Juvenile Passage Estimates Winter Chinook

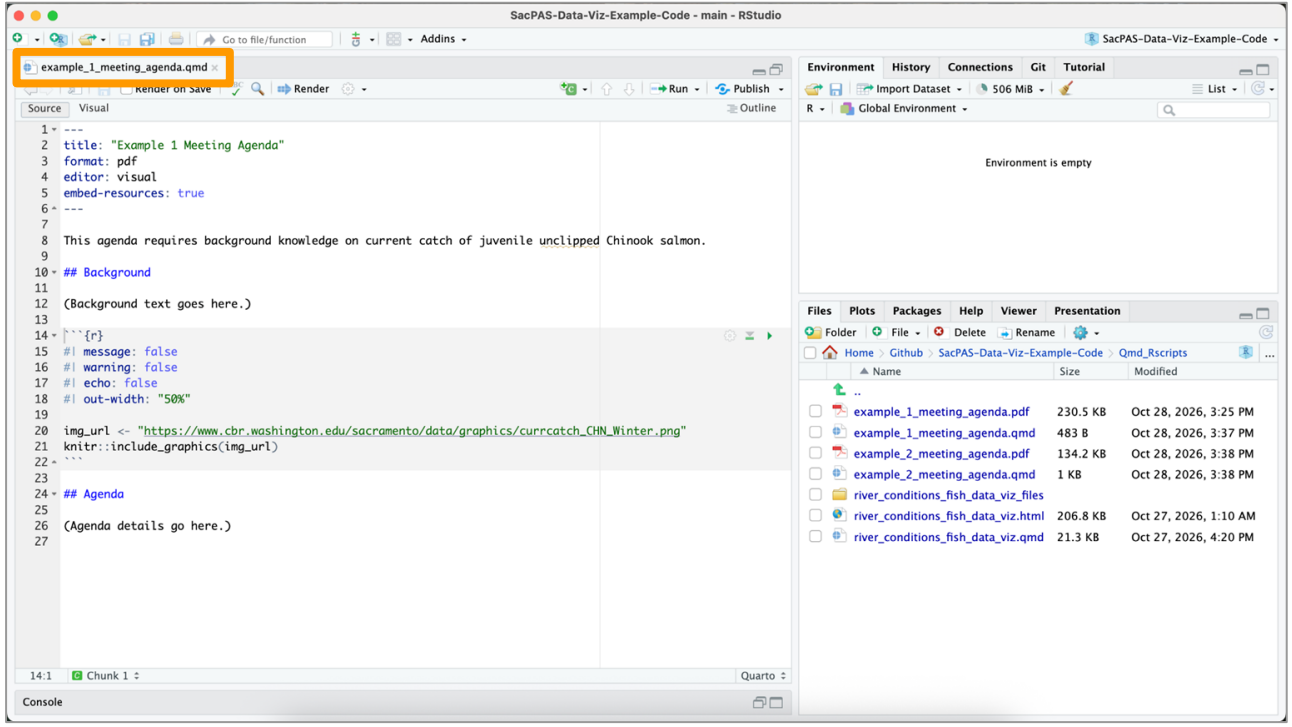
- Unmarked Older Juvenile Chinook Tisdale Weir Rotary Screw Trap with Colusa (COL) Daily Average Flow
- Unmarked Steelhead Tisdale Weir Rotary Screw Trap with Colousa (COL) Daily Average Flow

- Unmarked Older Juvenile Chinook Sacramento Trawls (@ Sherwood Harbor) with CDEC Daily Average

Example 1

<u>Embed</u> a figure from **SacPAS query output**: figure with **real-time data**. E.g., Current Catch

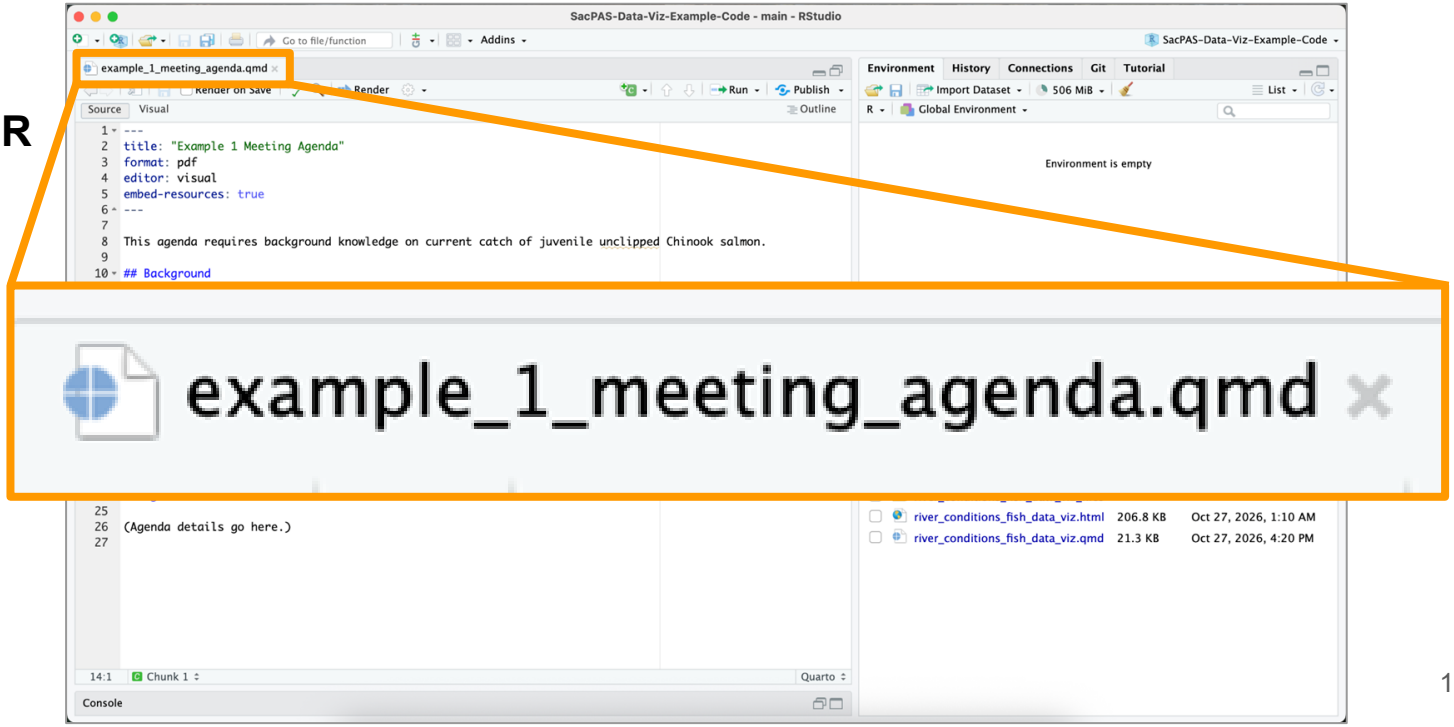
Step 2: Code in R



Example 1

<u>Embed</u> a figure from **SacPAS query output**: figure with **real-time data**. E.g., Current Catch

Step 2: Code in R



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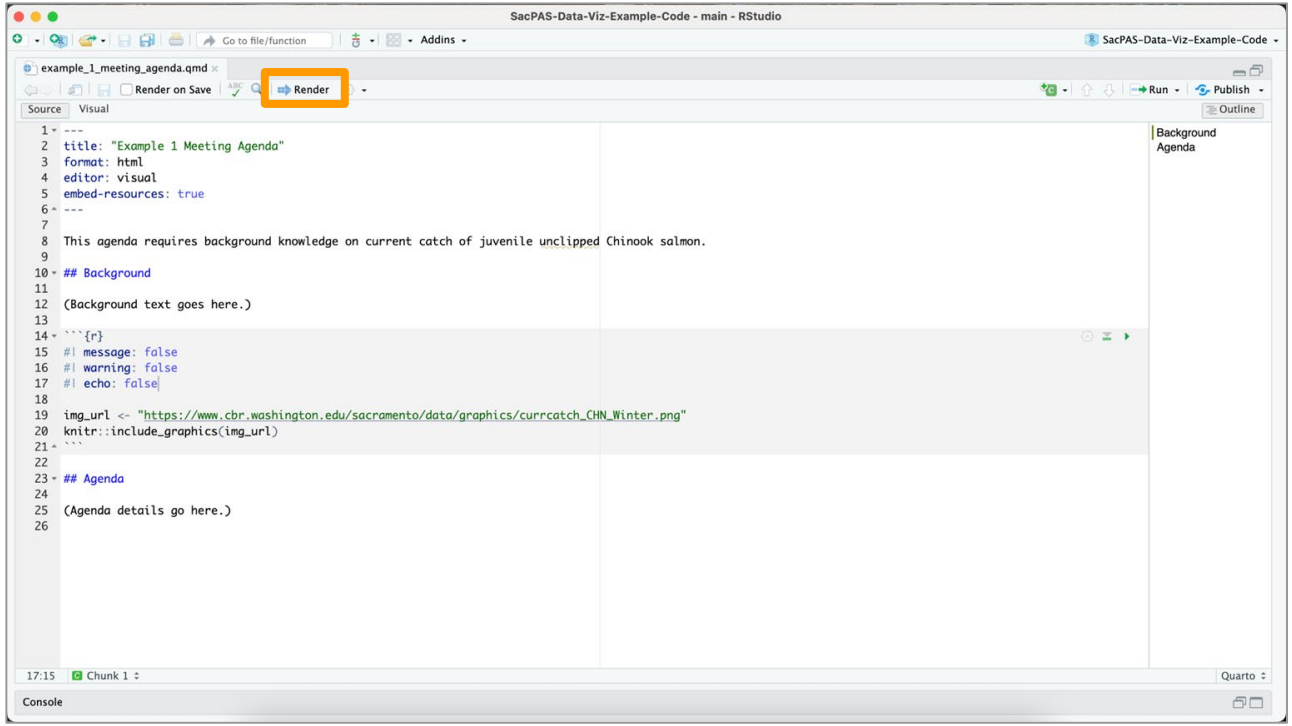
Step 2: Code in R

```
19  img_url <- "https://www.cbr.washington.edu/sacramento/data/graphics/currcatch_CHN_Winter.png"
20  knitr::include_graphics(img_url)
```

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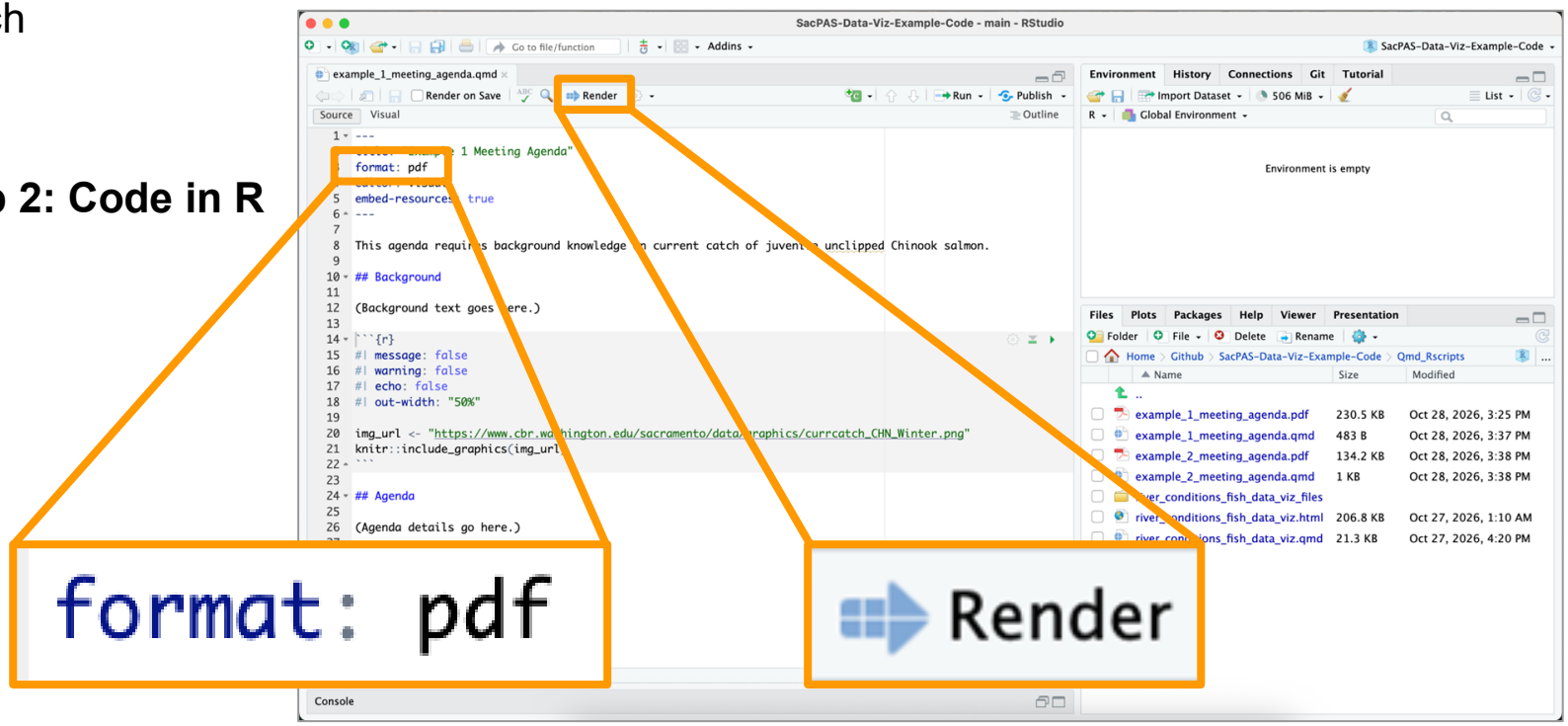
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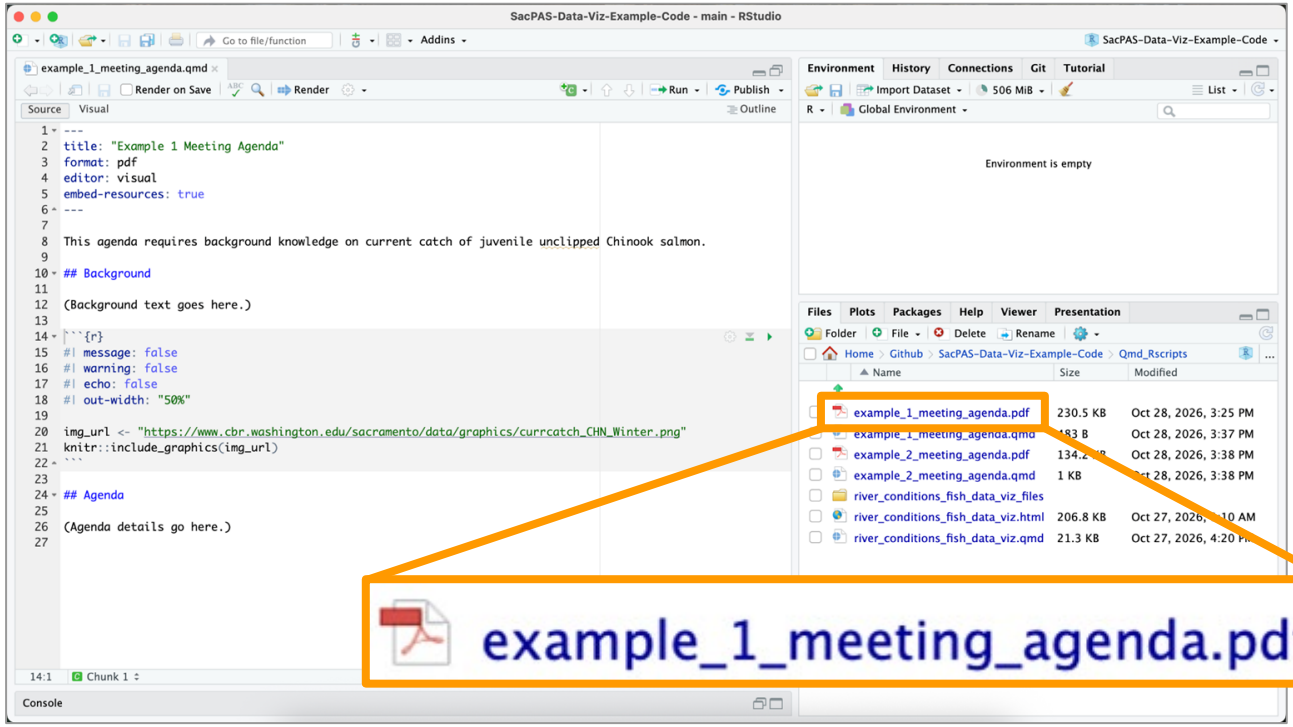
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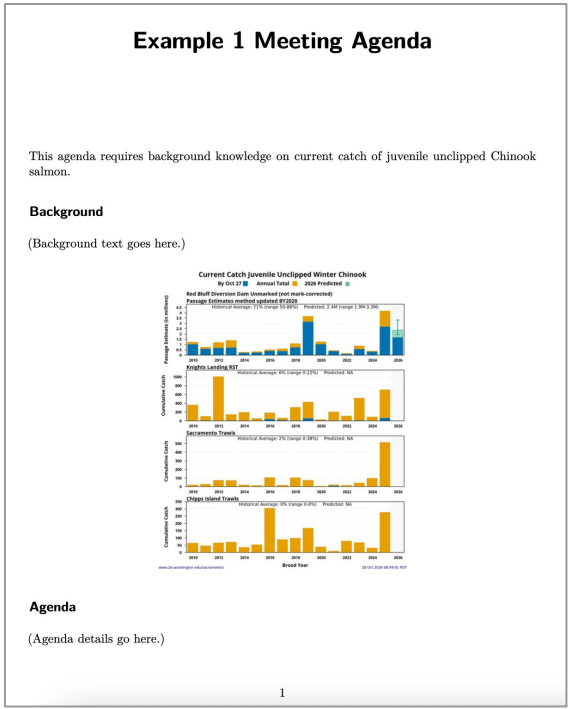
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Example 1

<u>Embed</u> a figure from **SacPAS query output**: figure with **real-time data**. E.g., Current Catch

Step 3: Create the product



Example 1 Meeting Agenda

This agenda requires background knowledge on current catch of juvenile unclipped Chinook salmon.

Background

(Background text goes here.)

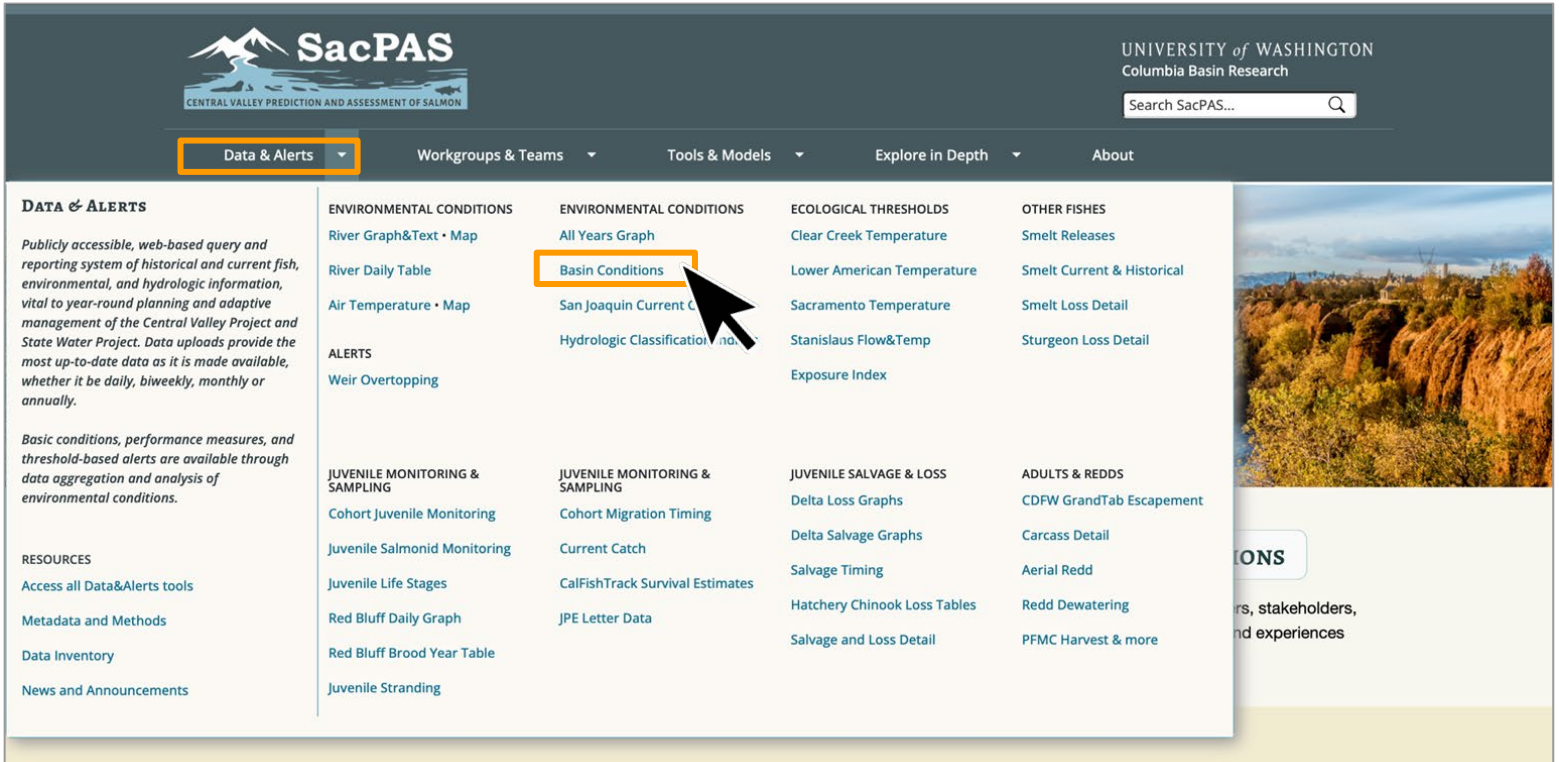
Agenda

(Agenda details go here.)

1

Example 2

Embed a figure from **SacPAS query output**: figure for **particular year(s)**. E.g., Heatmap

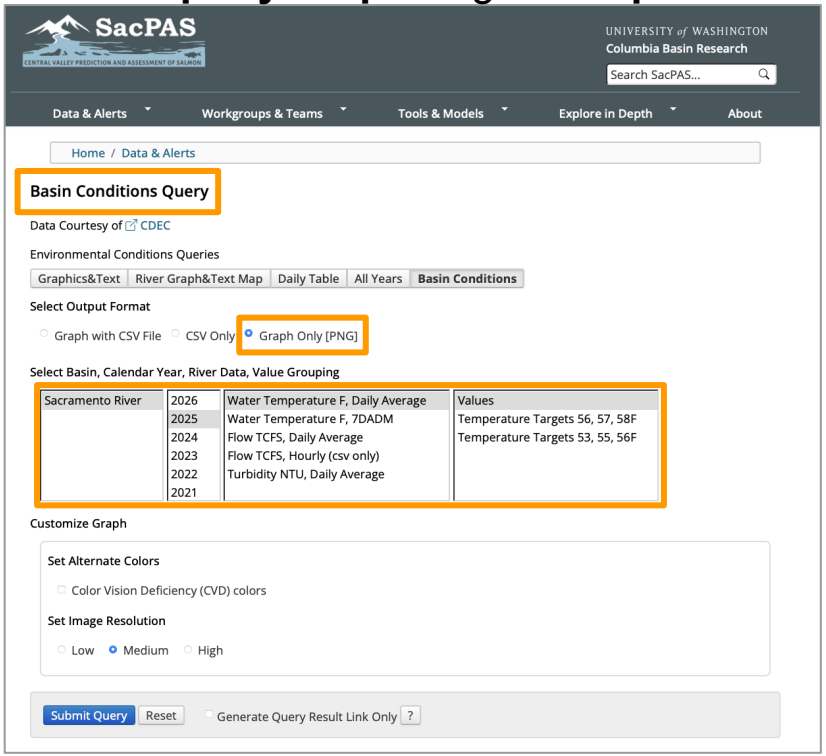


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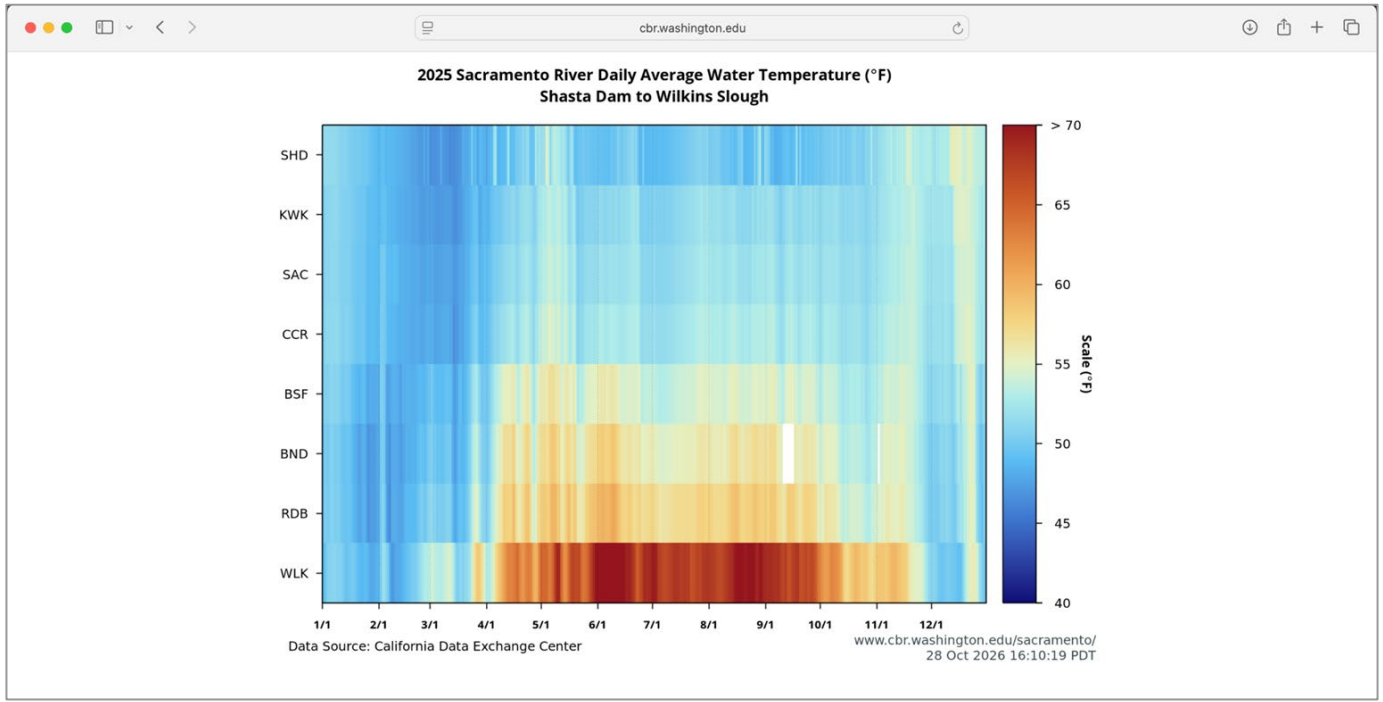
Graph Only [PNG] selected:

Multiple possible selections:



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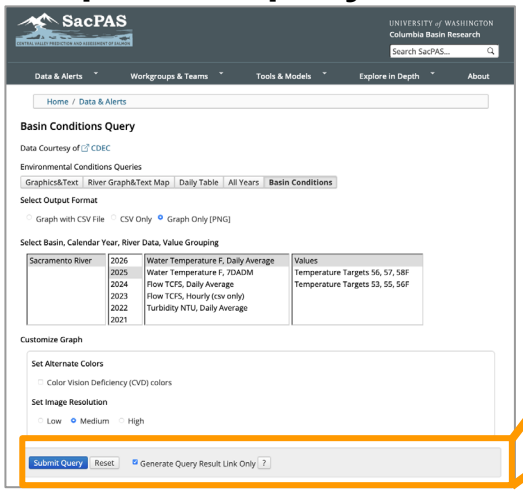
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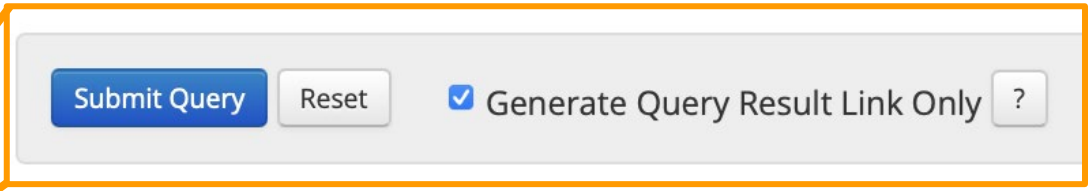
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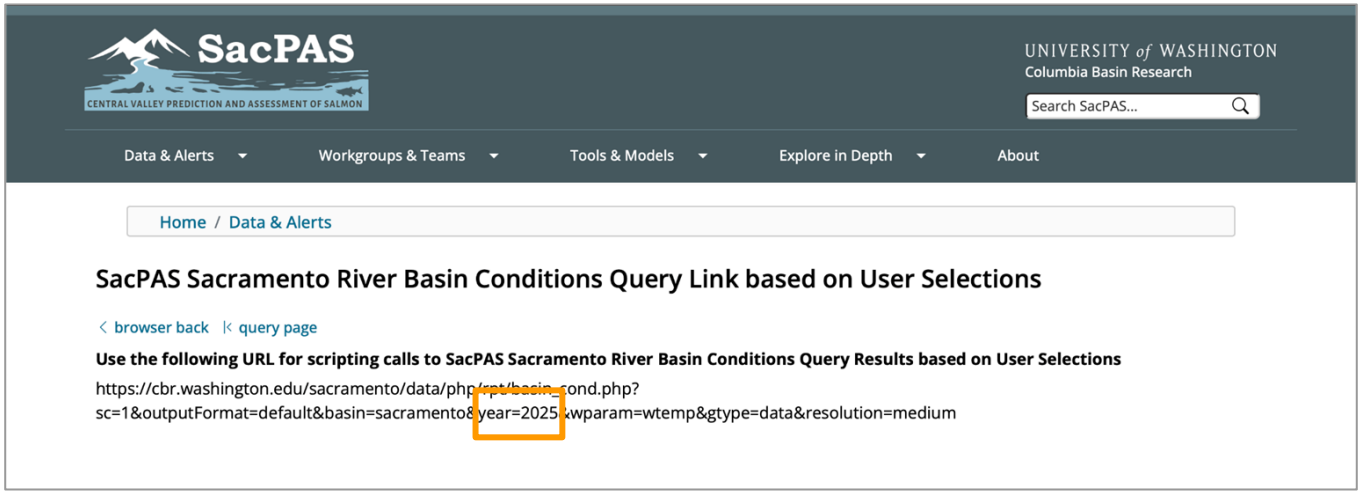




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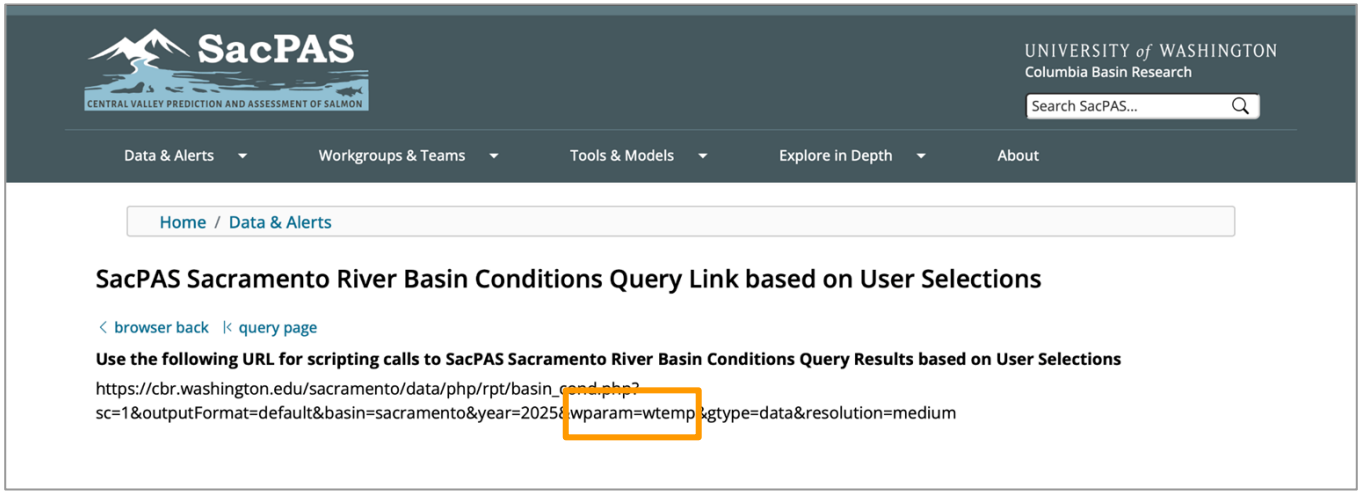
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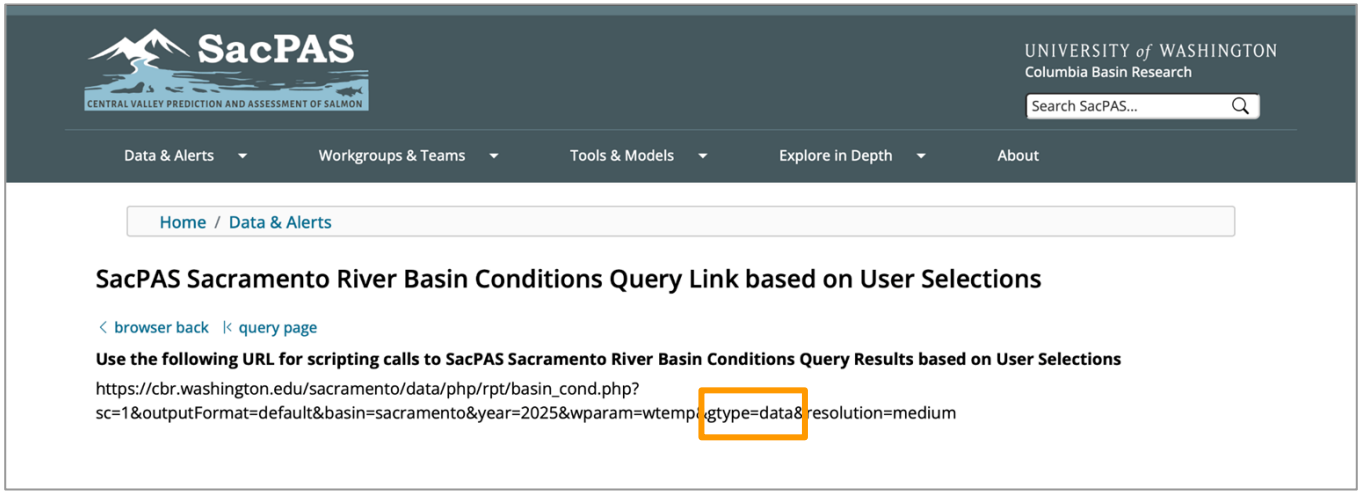
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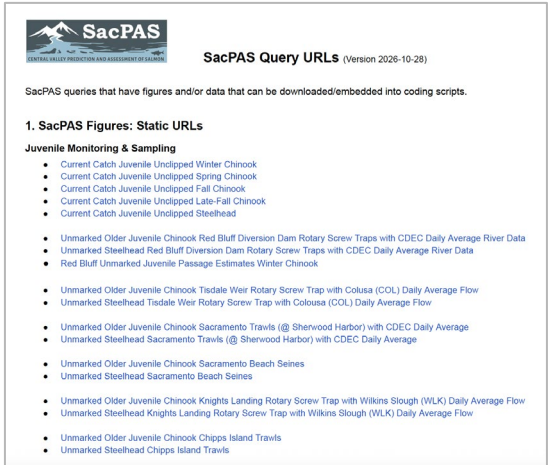
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Step 1: Get query URL

See 1-pager of SacPAS Query URLs for full list under the section **SacPAS Graph & Data Queries: Custom URLs**

Available via 2026 SacPAS Workshop webpage:
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- Unmarked Older Juvenile Chinook Sacramento Trawls (@ Sherwood Harbor) with CDEC Daily Average
- Unmarked Steelhead Sacramento Trawls (@ Sherwood Harbor) with CDEC Daily Average

- Unmarked Older Juvenile Chinook Sacramento Beach Seines
- Unmarked Steelhead Sacramento Beach Seines

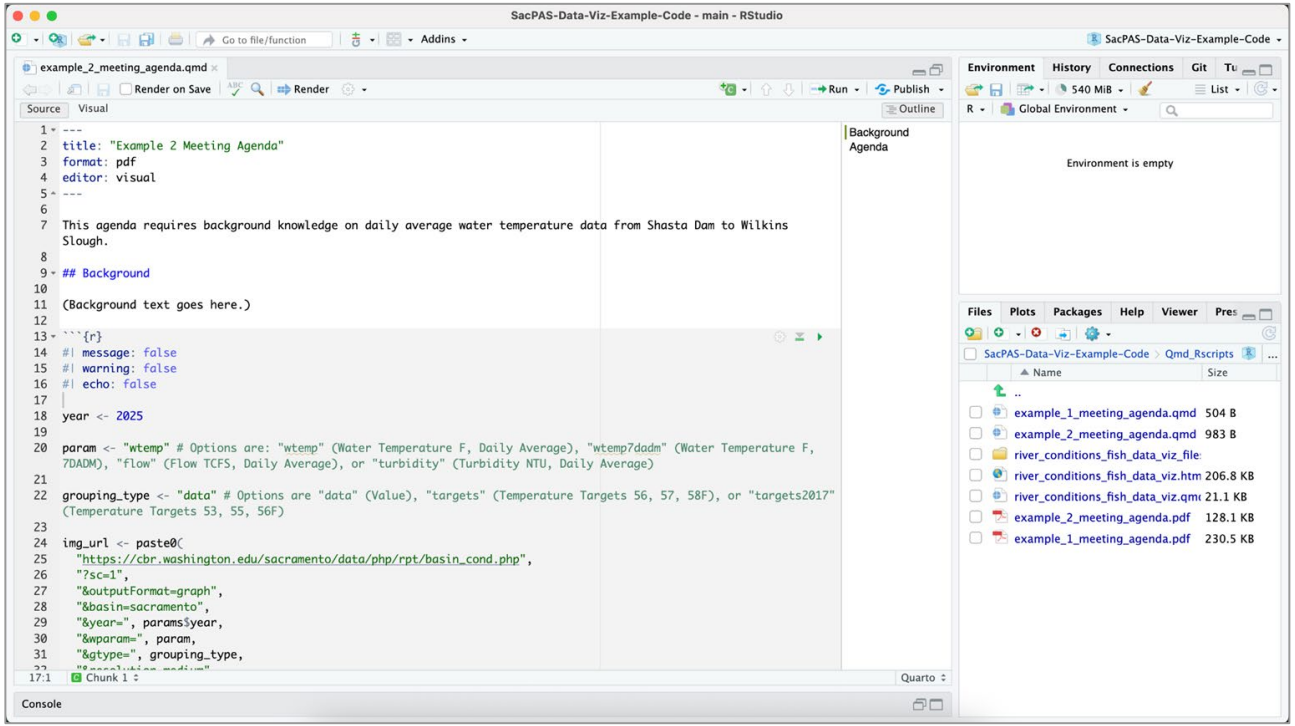
- Unmarked Older Juvenile Chinook Knights Landing Rotary Screw Trap with Wilkins Slough (WLK) Daily Average Flow
- Unmarked Steelhead Knights Landing Rotary Screw Trap with Wilkins Slough (WLK) Daily Average Flow

- Unmarked Older Juvenile Chinook Chipps Island Trawls
- Unmarked Steelhead Chipps Island Trawls

Example 2

Embed a figure from **SacPAS query output**: figure for **particular year(s)**. E.g., Heatmap

Step 2: Code in R



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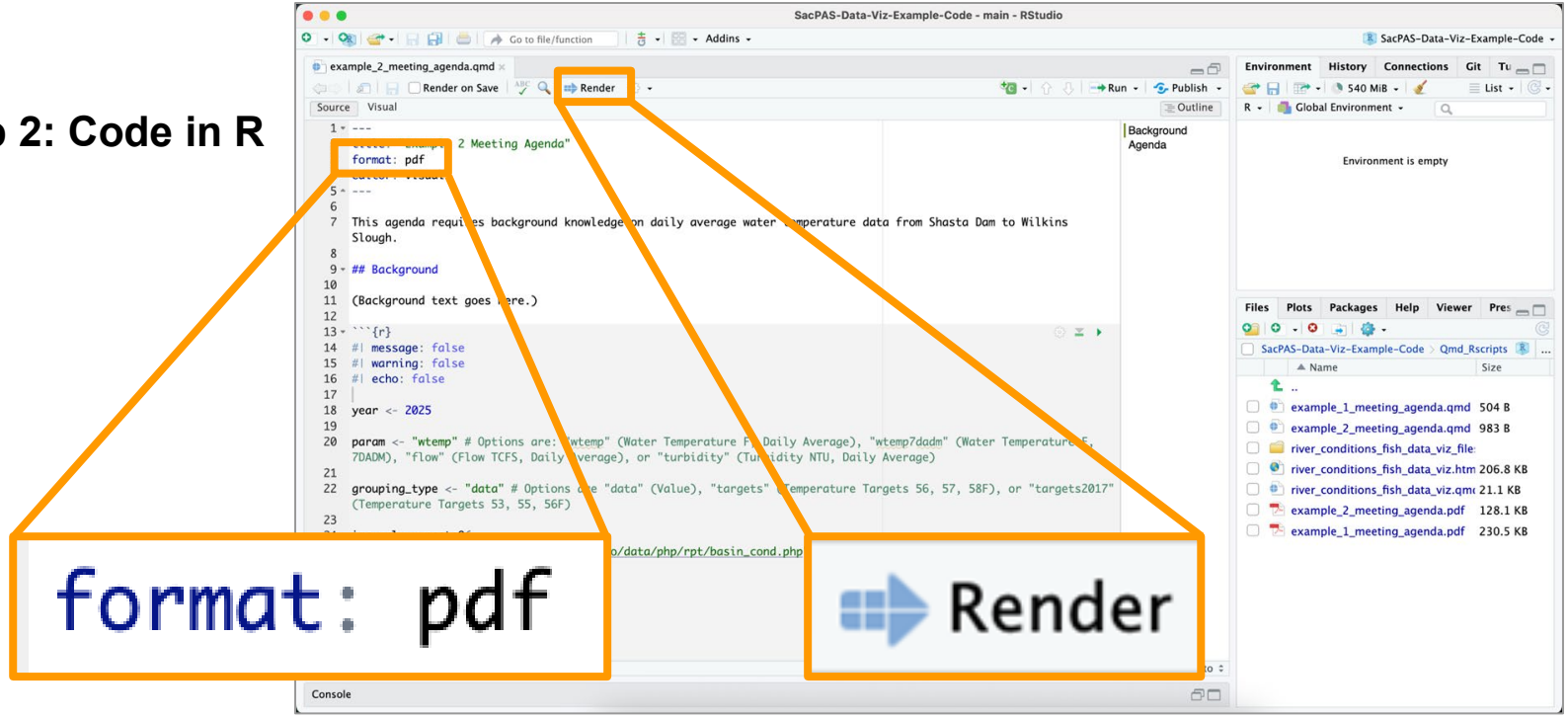
Step 2: Code in R

```
18  year <- 2024
19
20  param <- "wtemp" # Options are: "wtemp" (Water Temperature F, Daily Average), "wtemp7dadm"
    (Water Temperature F, 7DADM), "flow" (Flow TCFS, Daily Average), or "turbidity" (Turbidity
    NTU, Daily Average)
21
22  grouping_type <- "data" # Options are "data" (Value), "targets" (Temperature Targets 56, 57,
    58F), or "targets2017" (Temperature Targets 53, 55, 56F)
23
24  img_url <- paste0(
25    "https://cbr.washington.edu/sacramento/data/php/rpt/basin_cond.php",
26    "?sc=1",
27    "&outputFormat=graph",
28    "&basin=sacramento",
29    "&year=", year,
30    "&wparam=", param,
31    "&gtype=", grouping_type,
32    "&resolution=medium"
33  )
34  knitr::include_graphics(img_url)
```

Example 2

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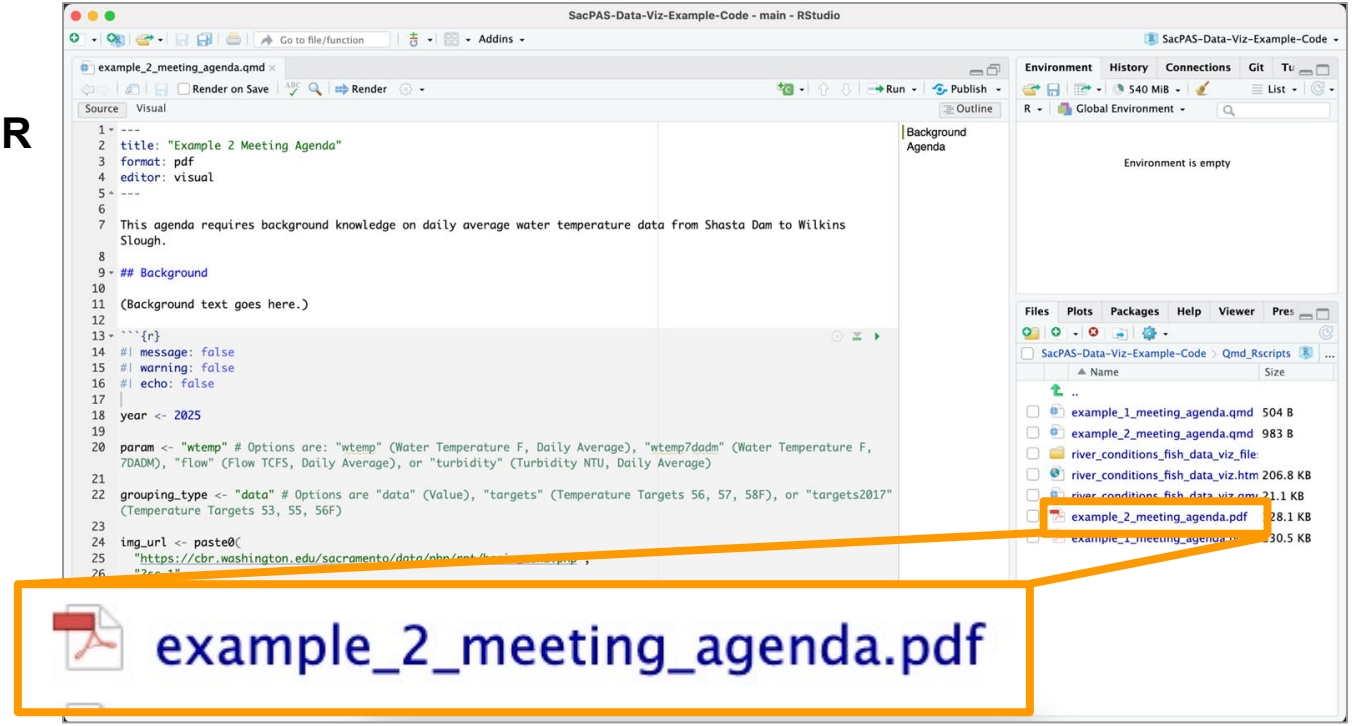
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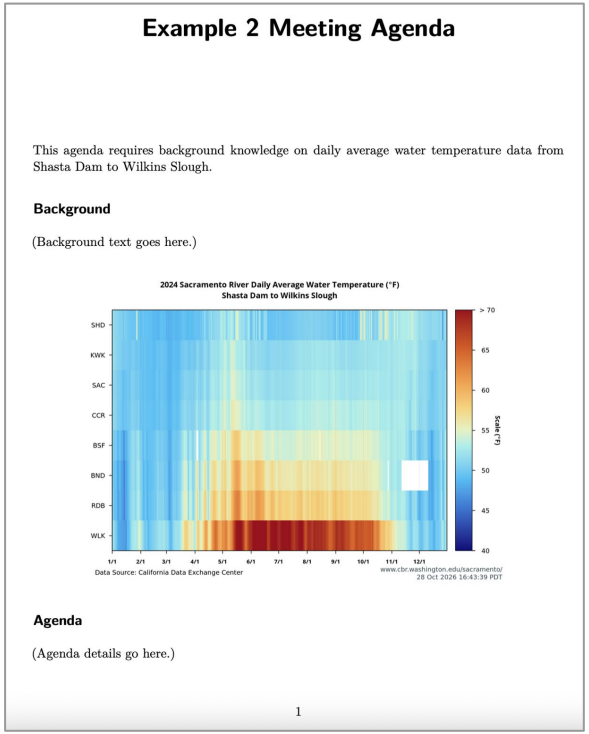
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Example 2

<u>Embed</u> a figure from **SacPAS query output**: figure for **particular year(s)**. E.g., Heatmap

Step 3: Create the product



Example 2 Meeting Agenda

This agenda requires background knowledge on daily average water temperature data from Shasta Dam to Wilkins Slough.

Background

(Background text goes here.)

Agenda

(Agenda details go here.)

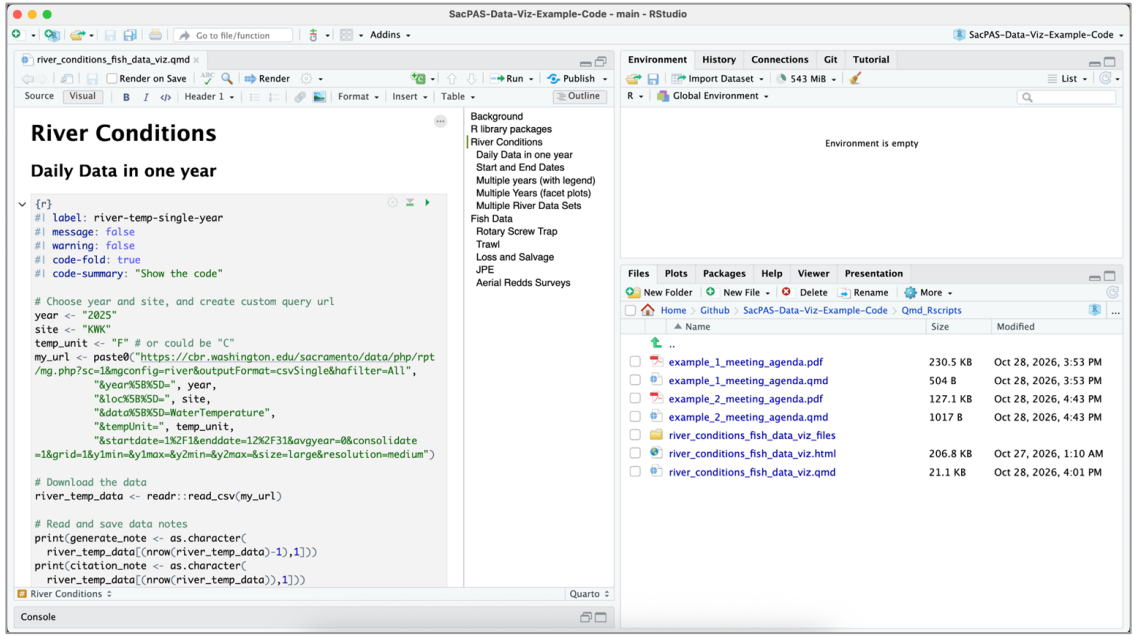
1

Example 3

<u>Create</u> a figure in **R** from **data downloaded via SacPAS query.**
Multiple examples in the **river_conditions_fish_data_viz.qmd** file.

Includes the 3 steps:

- Step 1: Get query URL
- Step 2: Code in R
- Step 3: Create the product

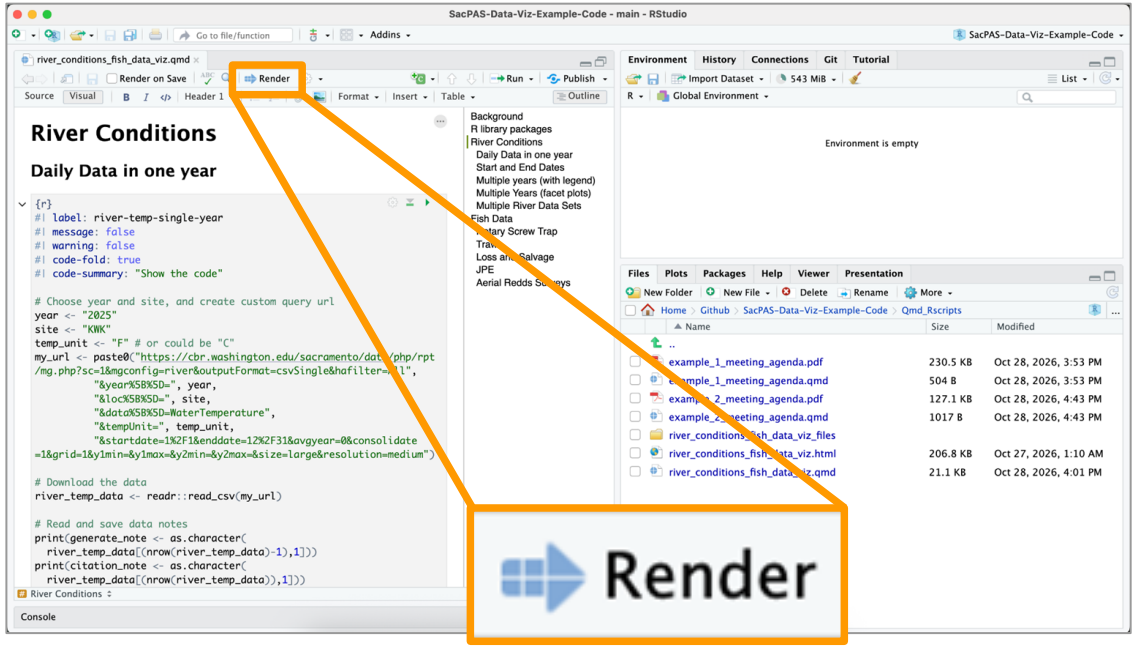


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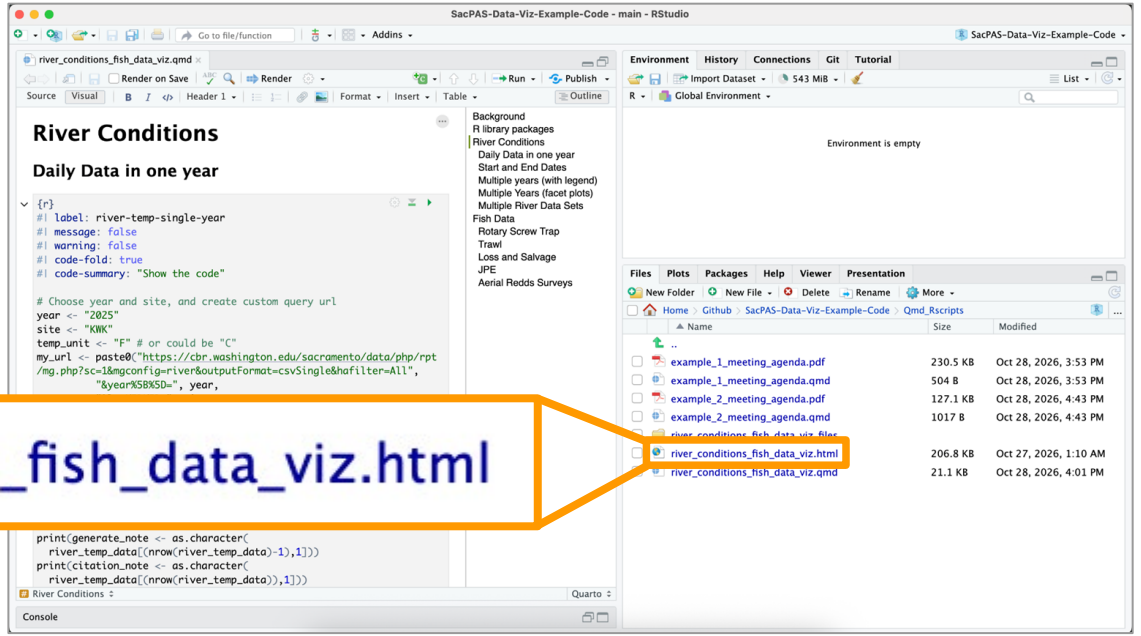


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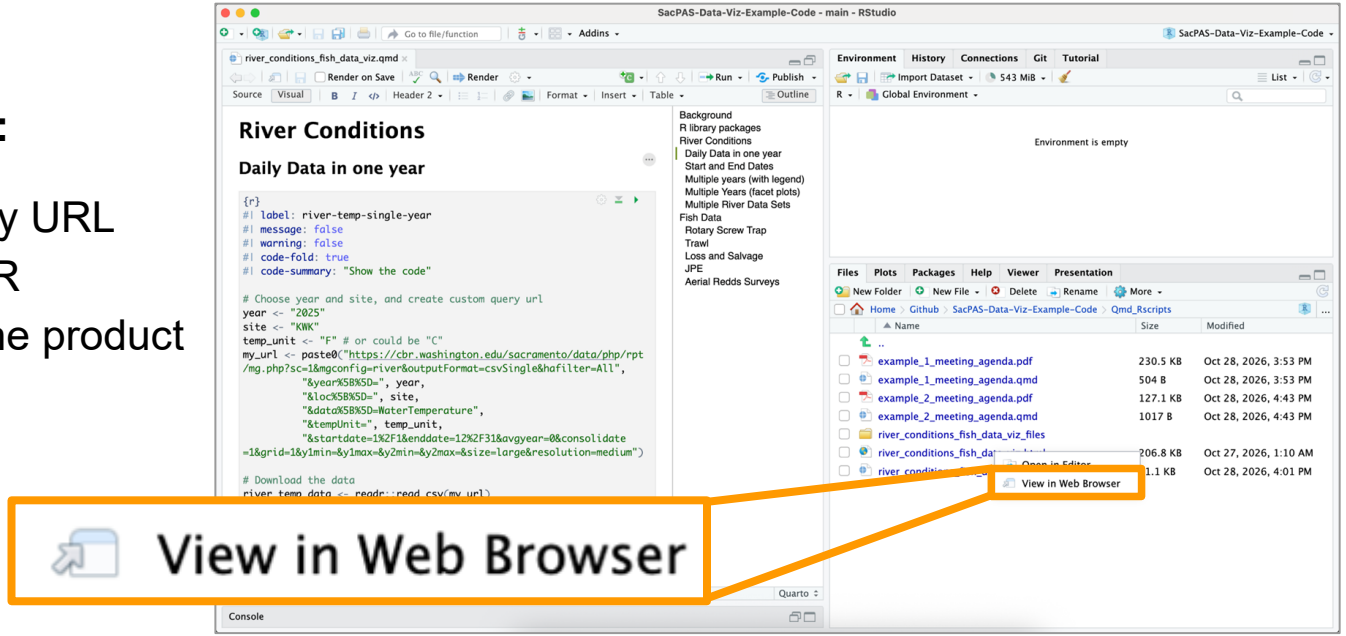


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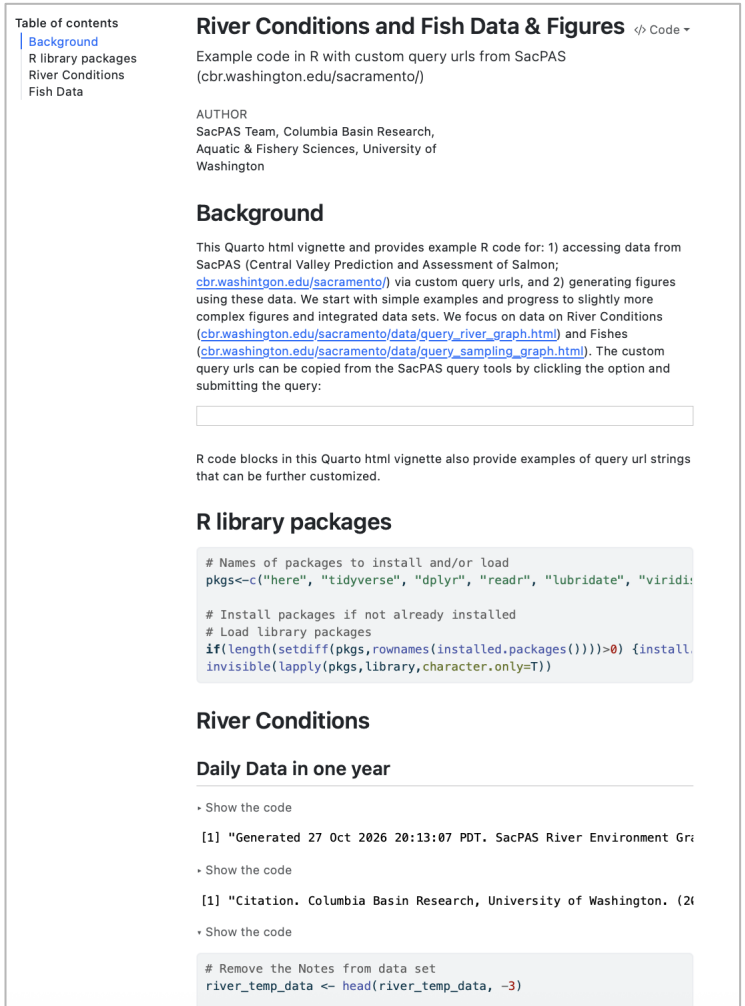
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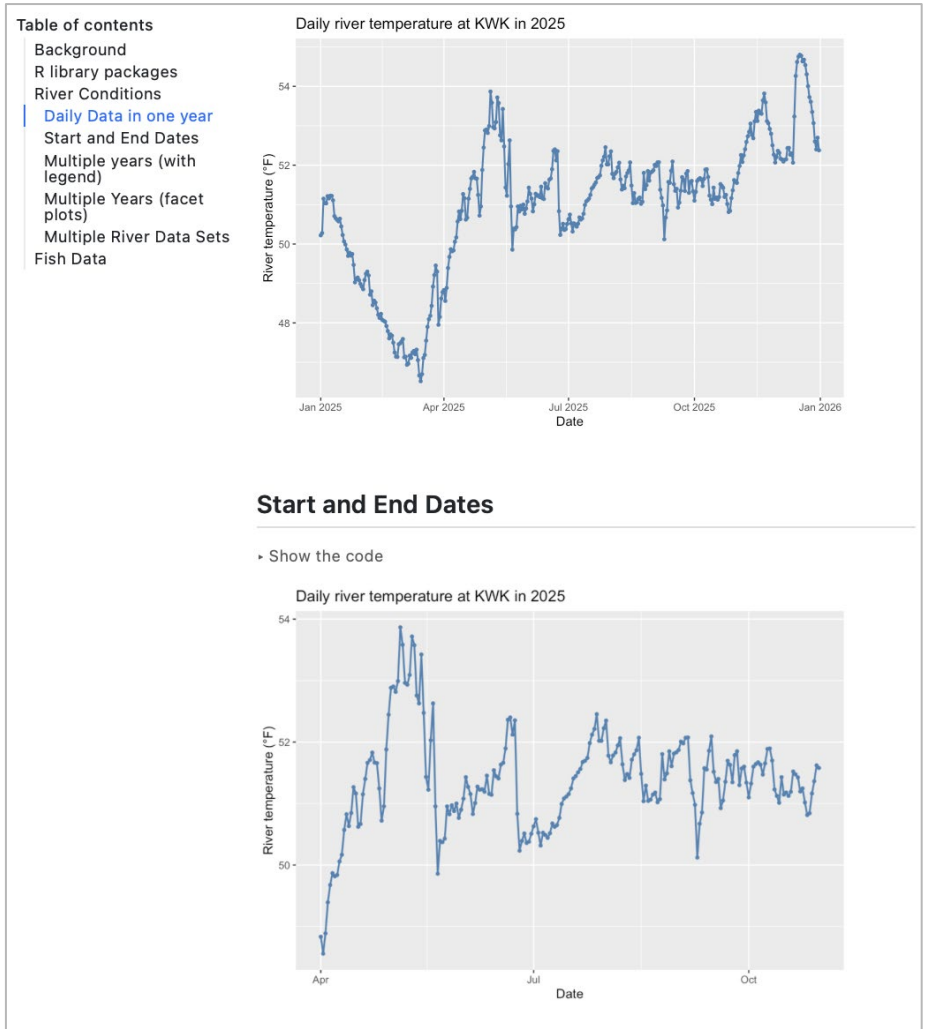
Example 3

Multiple examples can be viewed in the vignette that's an HTML file:



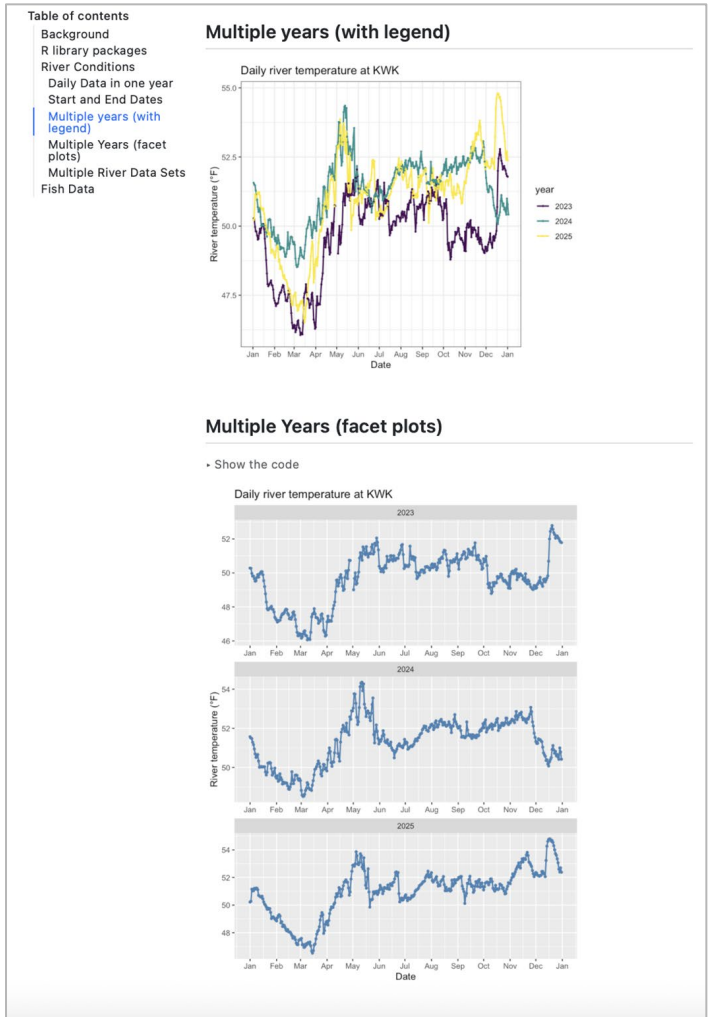
Example 3

Multiple examples can be viewed in the vignette that's an HTML file:



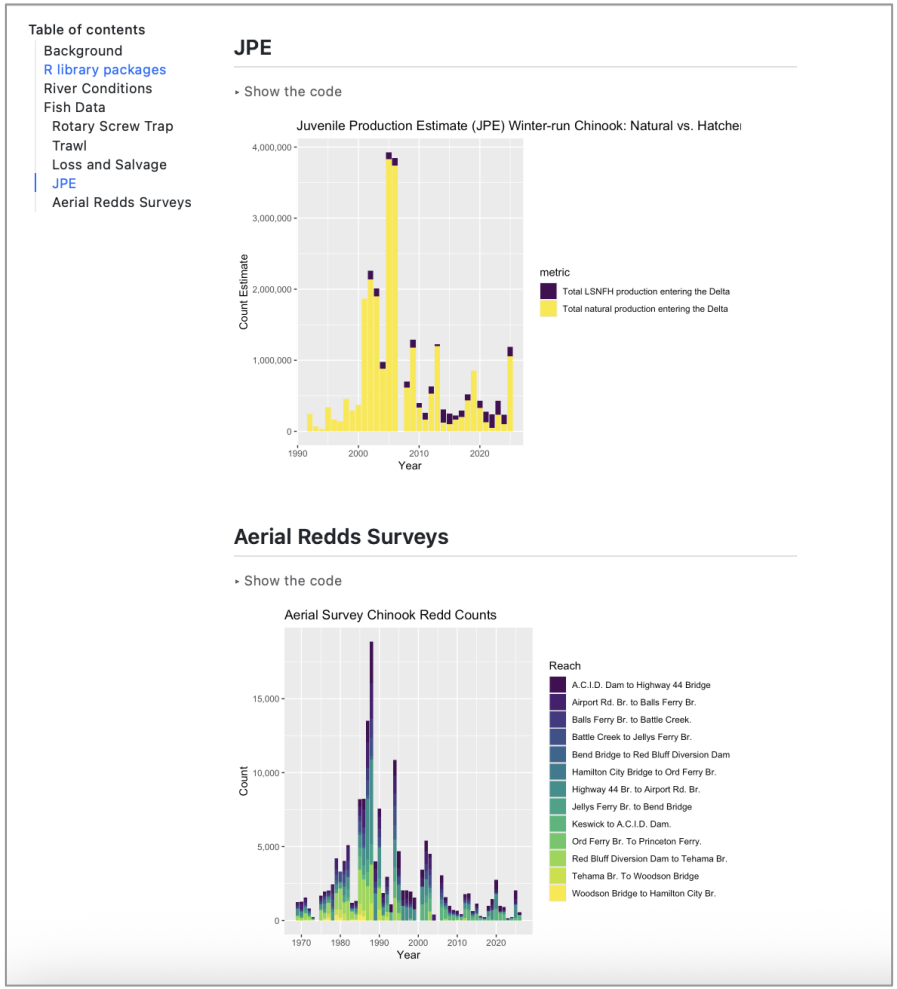
Example 3

Multiple examples can be viewed in the vignette that's an HTML file:



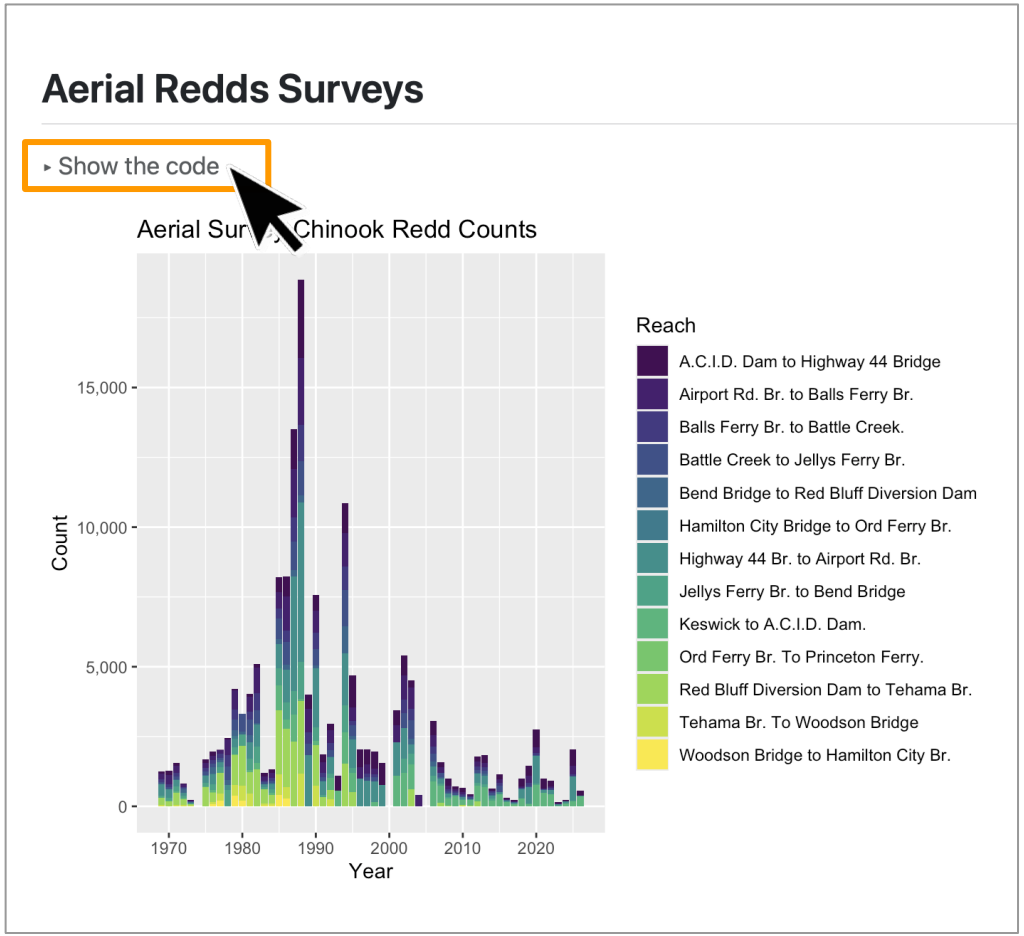
Example 3

Multiple examples can be viewed in the vignette that's an HTML file:



Example 3

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Example 3

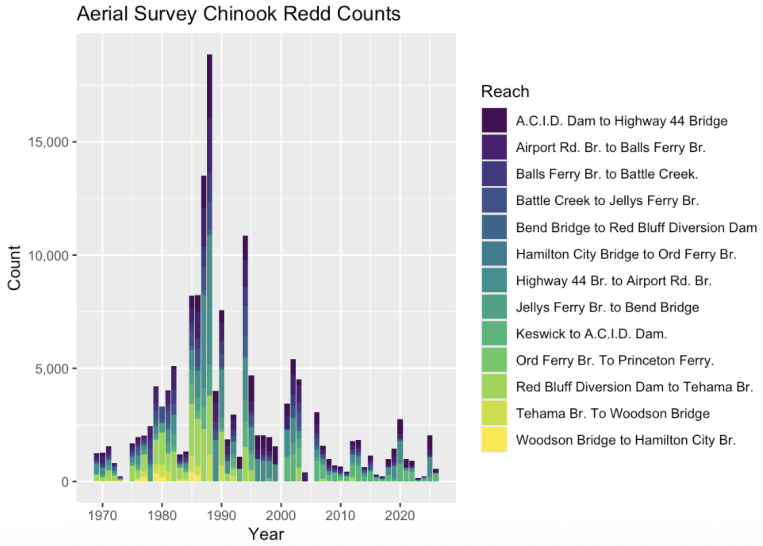
Multiple examples can be viewed in the vignette that's an HTML file:

Aerial Redds Surveys

▾ Show the code

```
url <- "https://cbr.washington.edu/sacramento/data/php/rpt/redd_aerial.php?sc=1&ou
data <- readr::read_csv(url) |> mutate(year = year(ymd(date))) |> group_by(year, r

ggplot(data, aes(x = year, y = count, fill = reach)) +
  geom_col() +
  scale_y_continuous(labels = scales::label_comma()) +
  labs(title = "Aerial Survey Chinook Redd Counts",
       x = "Year",
       y = "Count") +
  scale_fill_viridis_d(name = "Reach")
```



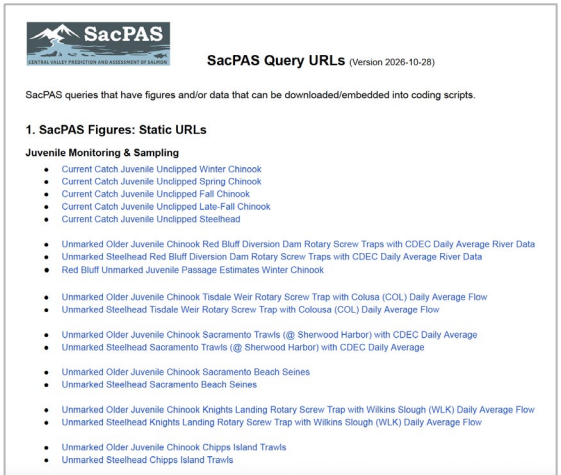
Example 3

<u>Create</u> a figure in **R** from **data downloaded via SacPAS query.**

Step 1: Get query URL

See 1-pager of SacPAS Query URLs for full list under the section **SacPAS Graph & Data Queries: Custom URLs**

Available via 2026 SacPAS Workshop webpage:
https://cbr.washington.edu/sacramento/SacPAS2026workshop/index.html



SacPAS

CENTRAL VALLEY PREDICTION AND ASSESSMENT OF SALMON

SacPAS Query URLs (Version 2026-10-28)

SacPAS queries that have figures and/or data that can be downloaded/embedded into coding scripts.

1. SacPAS Figures: Static URLs

Juvenile Monitoring & Sampling

- Current Catch Juvenile Unclipped Winter Chinook
- Current Catch Juvenile Unclipped Spring Chinook
- Current Catch Juvenile Unclipped Fall Chinook
- Current Catch Juvenile Unclipped Late-Fall Chinook
- Current Catch Juvenile Unclipped Steelhead

- Unmarked Older Juvenile Chinook Red Bluff Diversion Dam Rotary Screw Traps with CDEC Daily Average River Data
- Unmarked Steelhead Red Bluff Diversion Dam Rotary Screw Traps with CDEC Daily Average River Data
- Red Bluff Unmarked Juvenile Passage Estimates Winter Chinook

- Unmarked Older Juvenile Chinook Tisdale Weir Rotary Screw Trap with Colusa (COL) Daily Average Flow
- Unmarked Steelhead Tisdale Weir Rotary Screw Trap with Colousa (COL) Daily Average Flow

- Unmarked Older Juvenile Chinook Sacramento Trawls (@ Sherwood Harbor) with CDEC Daily Average
- Unmarked Steelhead Sacramento Trawls (@ Sherwood Harbor) with CDEC Daily Average

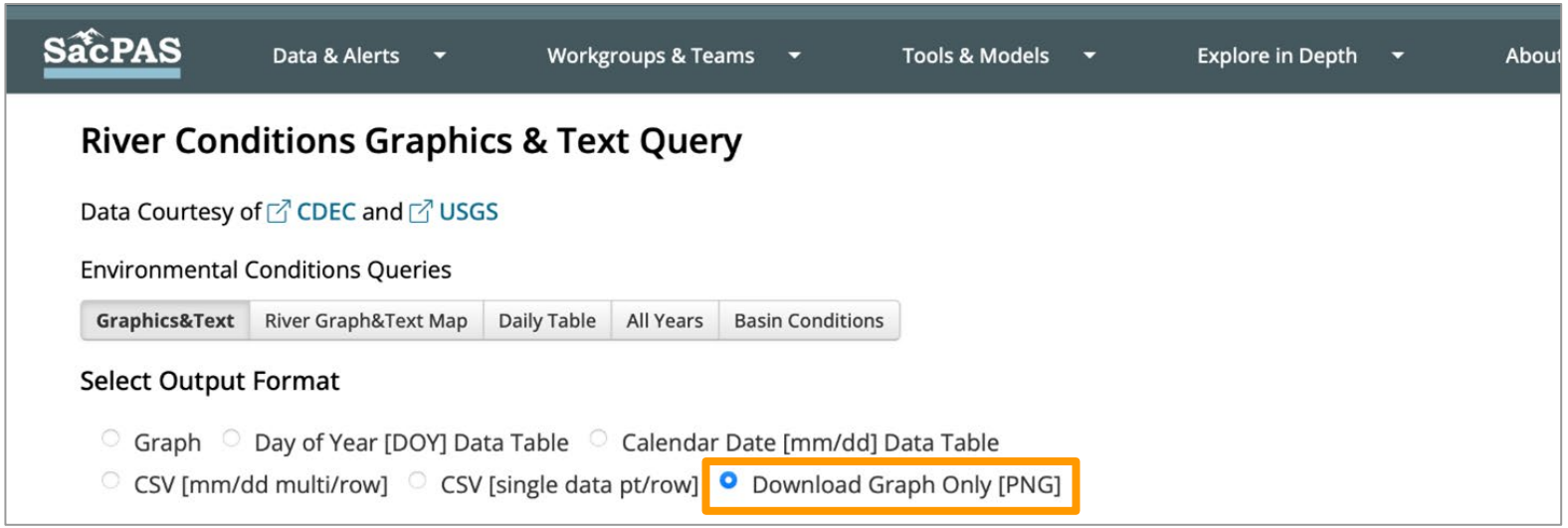
- Unmarked Older Juvenile Chinook Sacramento Beach Seines
- Unmarked Steelhead Sacramento Beach Seines

- Unmarked Older Juvenile Chinook Knights Landing Rotary Screw Trap with Wilkins Slough (WLK) Daily Average Flow
- Unmarked Steelhead Knights Landing Rotary Screw Trap with Wilkins Slough (WLK) Daily Average Flow

- Unmarked Older Juvenile Chinook Chipps Island Trawls
- Unmarked Steelhead Chipps Island Trawls

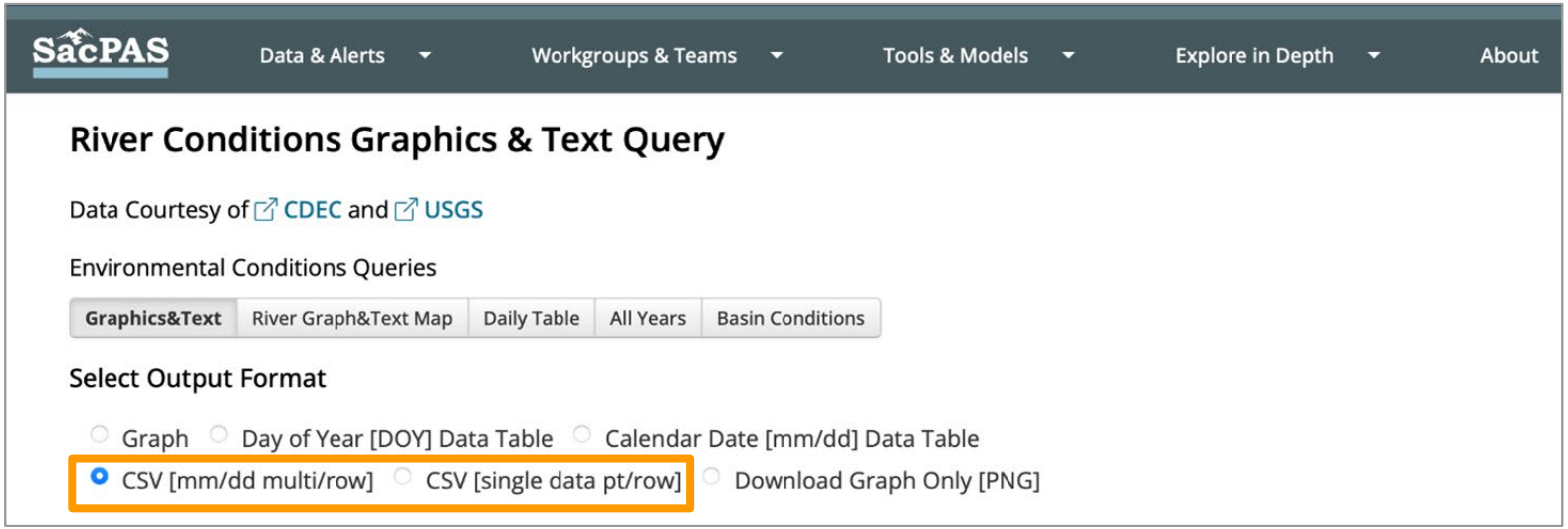
Tips & Tricks with SacPAS Query URLs

- Make the correct selection for what you want to download
  - Download Graph Only or CSV
  - CSV Format
    - CSV [mm/dd multi/row]
    - CSV [single data pt/row]



Tips & Tricks with SacPAS Query URLs

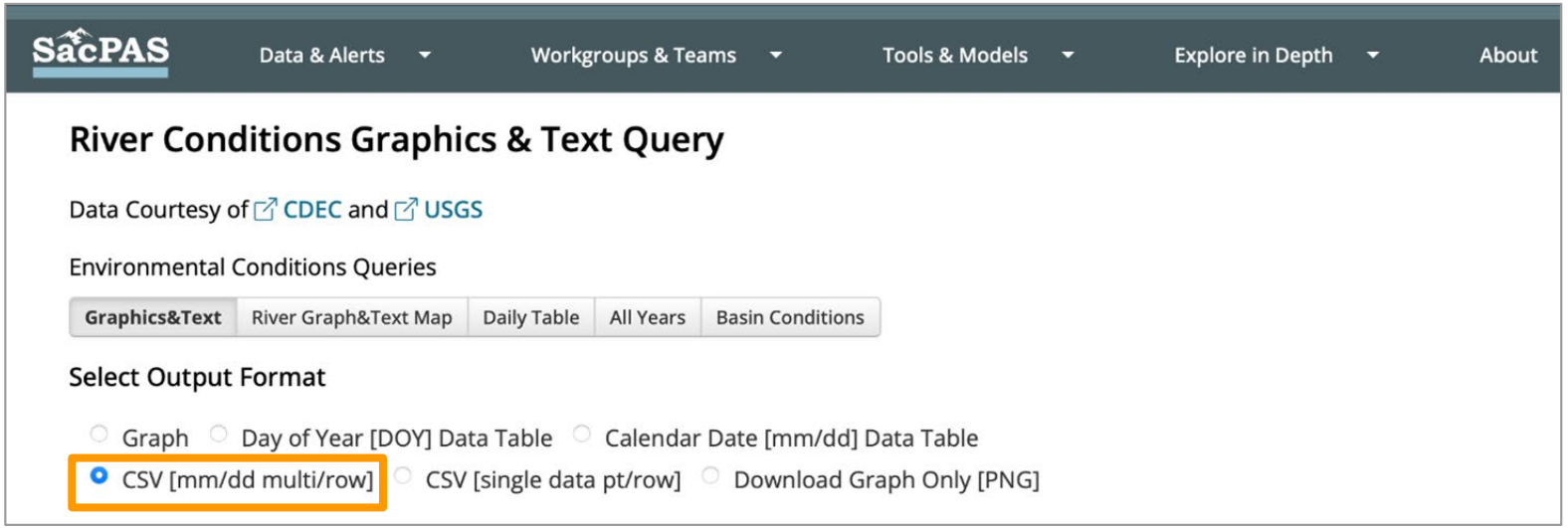
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  - Download Graph Only or CSV
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    - CSV [mm/dd multi/row]
    - CSV [single data pt/row]



Tips & Tricks with SacPAS Query URLs

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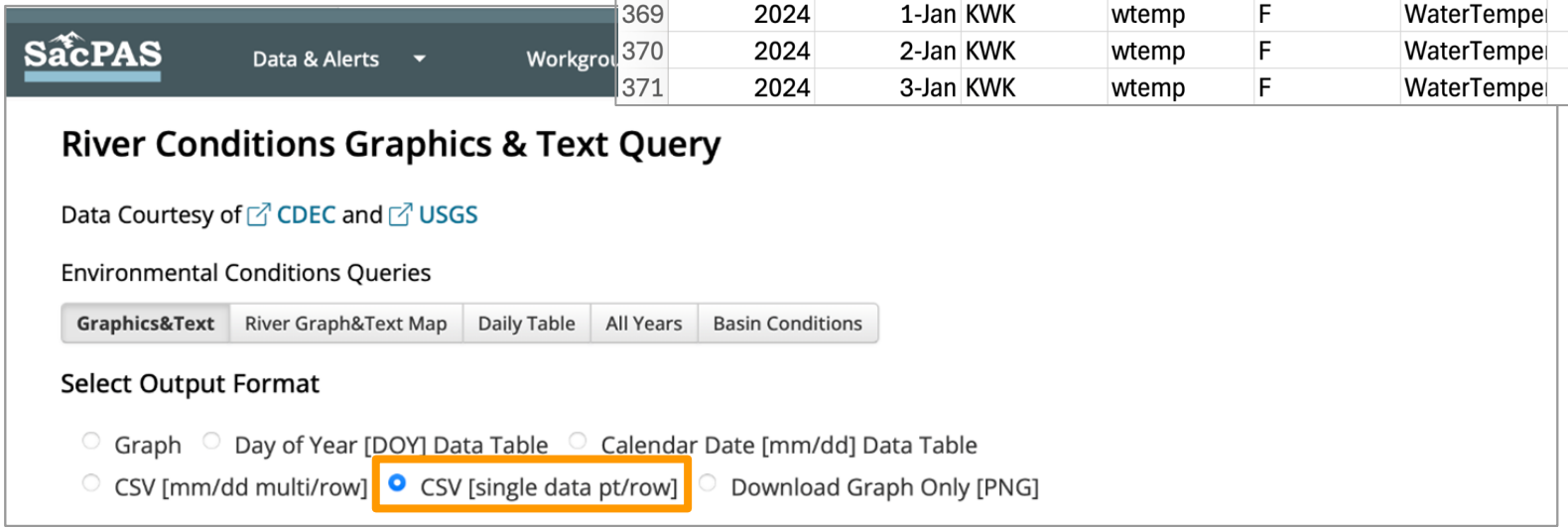
2	mm/dd	2024:KWK:flow (CFS)	2024:KWK:wtemp (F)
3	1-Jan	5257.5	51.567
4	2-Jan	5213.478	51.504
5	3-Jan	5251	51.471



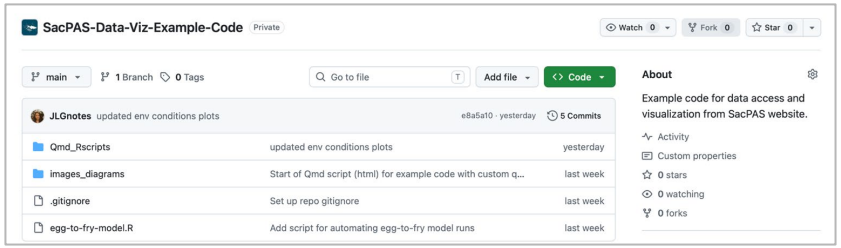
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  - Download Graph Only or CSV
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    - CSV [mm/dd multi/row]
    - CSV [single data pt/row]

	year	mm-dd	location	parameter	unit	datatype	value
2							
3	2024	1-Jan	KWK	flow	CFS	Flow	5257.5
4	2024	2-Jan	KWK	flow	CFS	Flow	5213.478
5	2024	3-Jan	KWK	flow	CFS	Flow	5251
				...			
369	2024	1-Jan	KWK	wtemp	F	WaterTempe	51.567
370	2024	2-Jan	KWK	wtemp	F	WaterTempe	51.504
371	2024	3-Jan	KWK	wtemp	F	WaterTempe	51.471

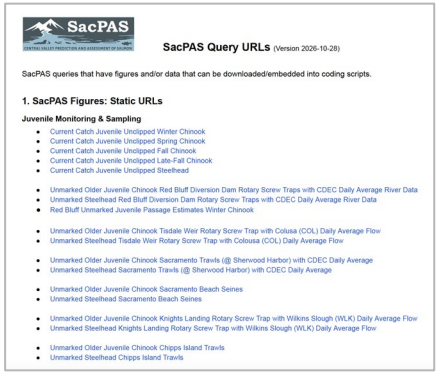


All code examples available on GitHub



https://github.com/Columbia-Basin-Research-CBR/SacPAS-Data-Viz-Example-Code

SacPAS Query URLs available in 1-pager


SacPAS

SacPAS Query URLs (Version 2026-10-28)

SacPAS queries that have figures and/or data that can be downloaded/embedded into coding scripts.

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Acknowledgments

We are grateful for Reclamation funding our SacPAS work.



BUREAU OF RECLAMATION