

Open Data & Data Management - - - Perspectives from SacPAS





Open data &
data management

Perspectives from SacPAS

- **Overall Goal:**

- Make your work easier by providing efficient access to data
 - Support Interagency Ecological Program and AB1755
-

- **FAIR and CARE**

- Brief description & in context of SacPAS
-

- **What this looks like in practice at SacPAS**

- Examples
-

- **Three handouts**

- FAQs, Guidelines, Pathways
-

** Help us streamline data management processes for SacPAS so that we can help with that first bullet point on overall goal*

MOTIVATION FOR DELIVERING DATA & TOOLS ONLINE



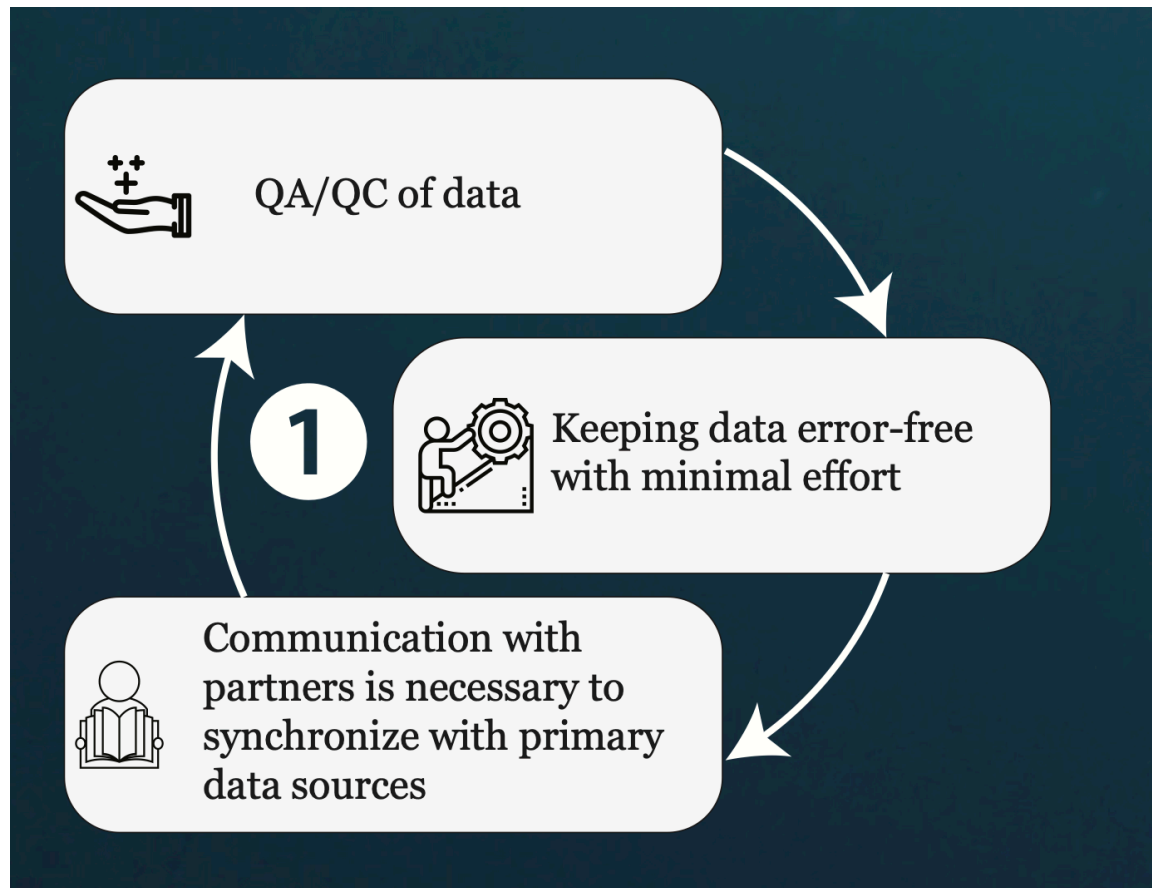
MOTIVATION FOR DELIVERING DATA & TOOLS ONLINE



MOTIVATION FOR DELIVERING DATA & TOOLS ONLINE

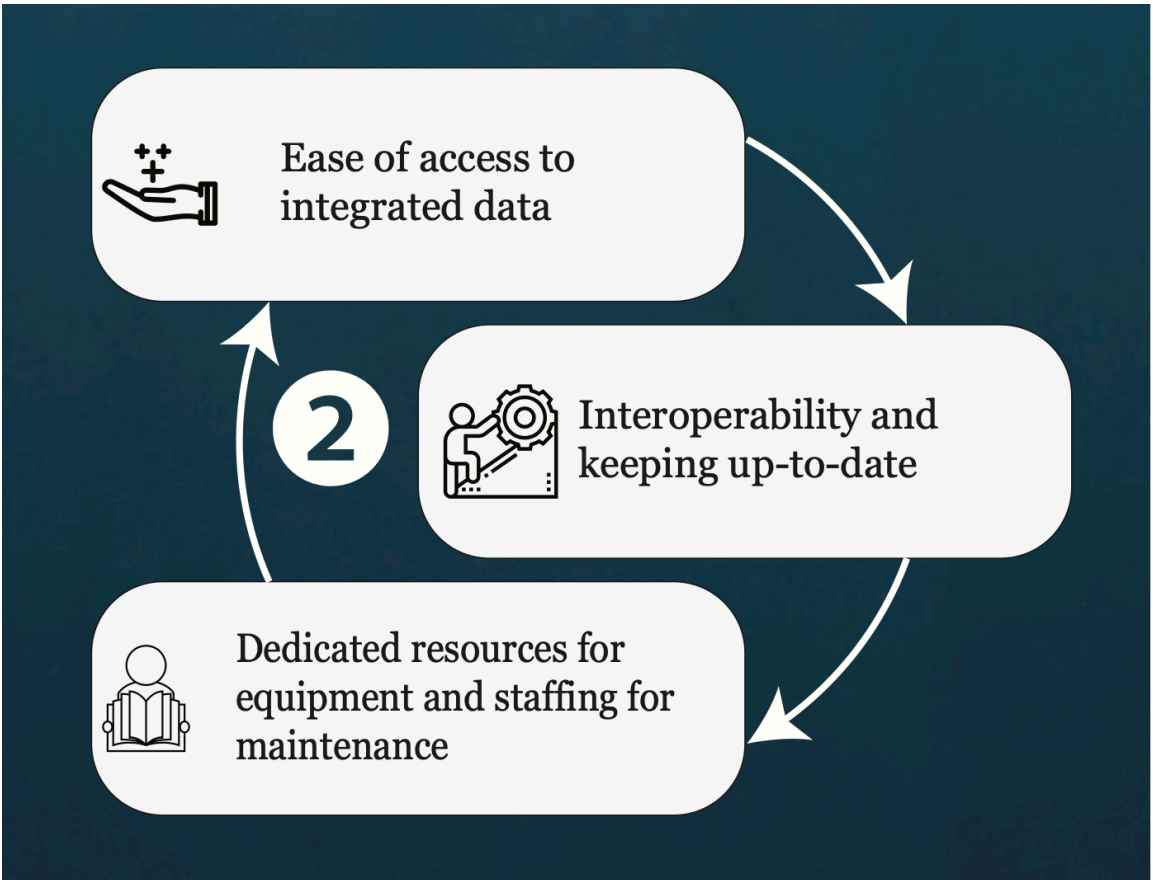


COLLABORATION & CO-CREATION



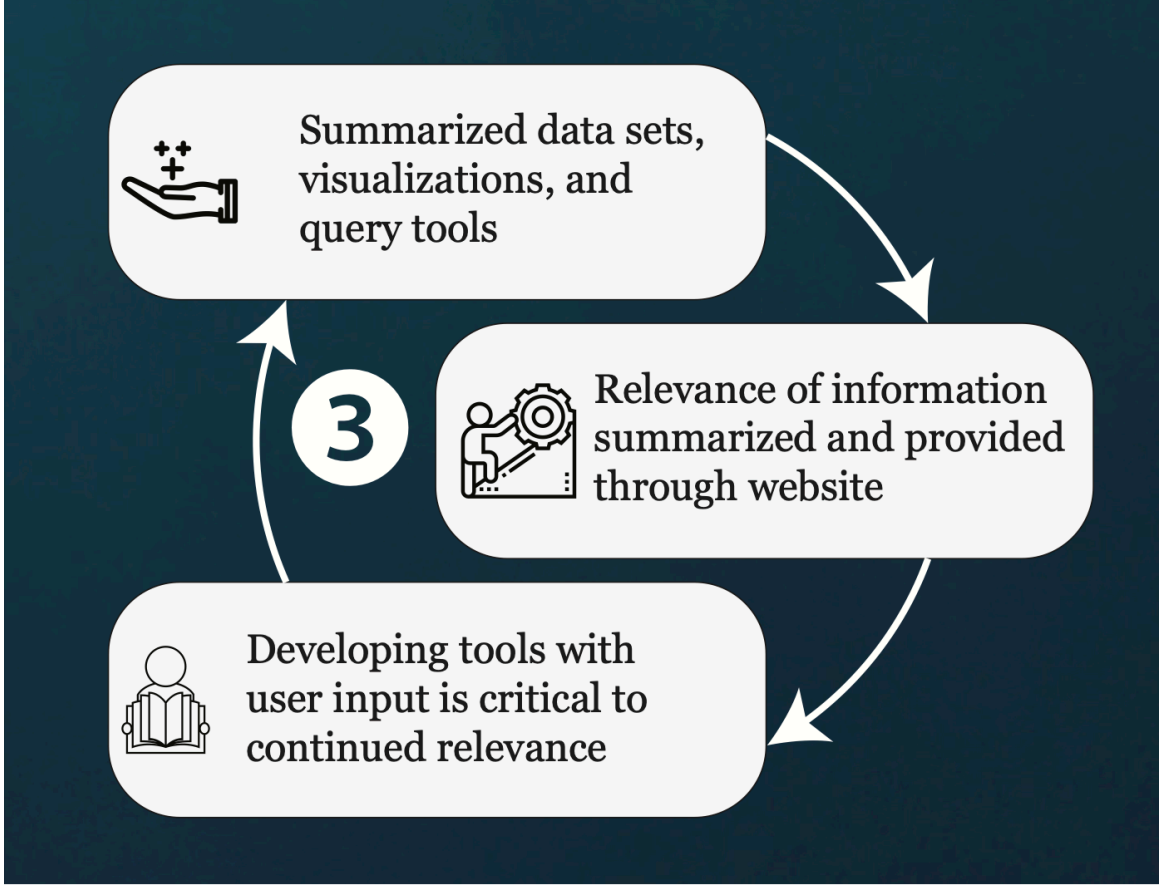


COLLABORATION & CO-CREATION

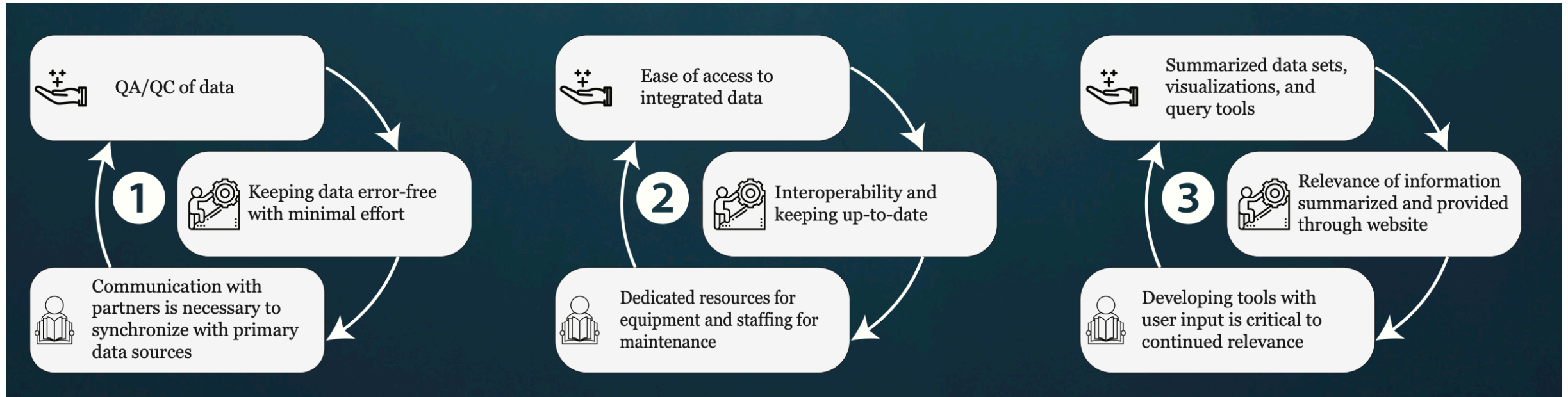




COLLABORATION & CO-CREATION



COLLABORATION & CO-CREATION

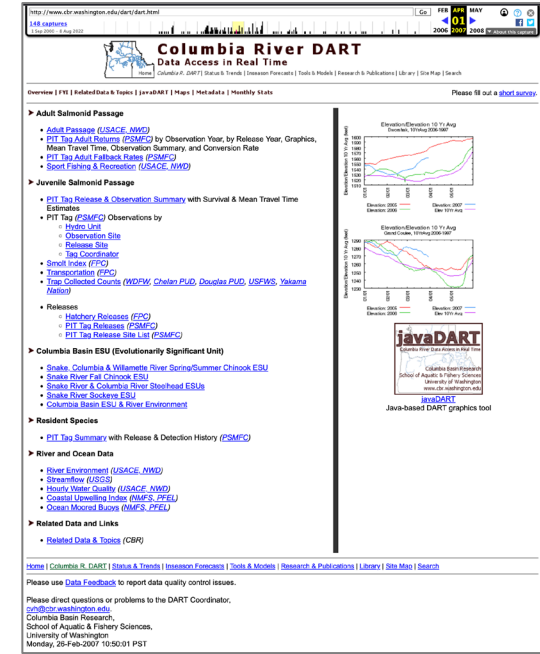


SacPAS

- Secondary data repository of integrated and aggregated data
- Open data mission since early 1990s with Columbia River DART

More info:
SacPAS Database
Management (DBM)
FAQs (handout #3)

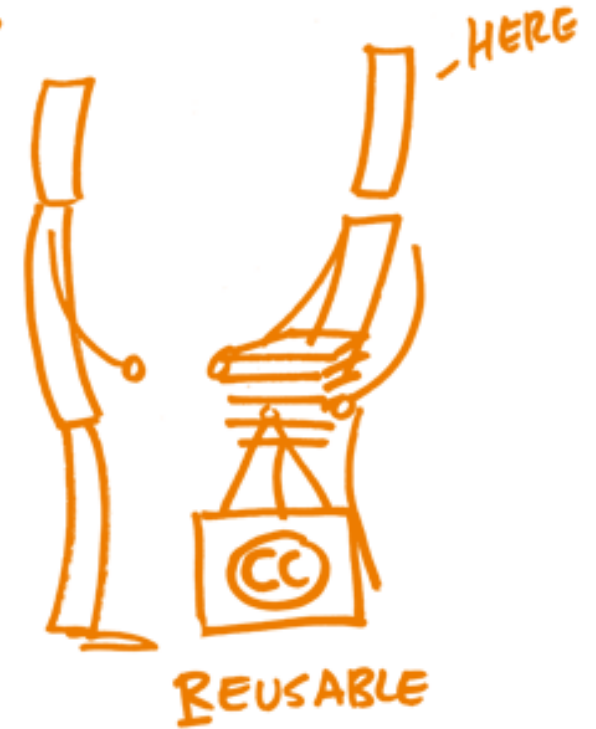
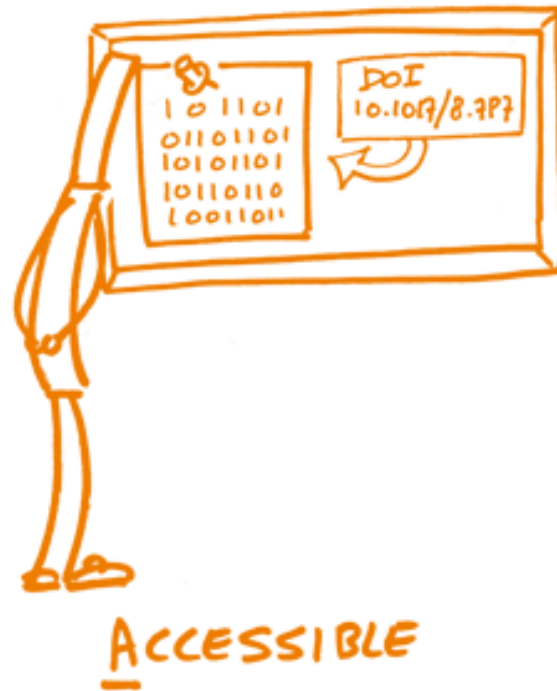
- Continually developing principles of open data and database management:
 - FAIR principles
 - CARE principles



<https://www.gida-global.org/care⁰>

FAIR principles

FAIR DATA PRINCIPLES



CARE principles

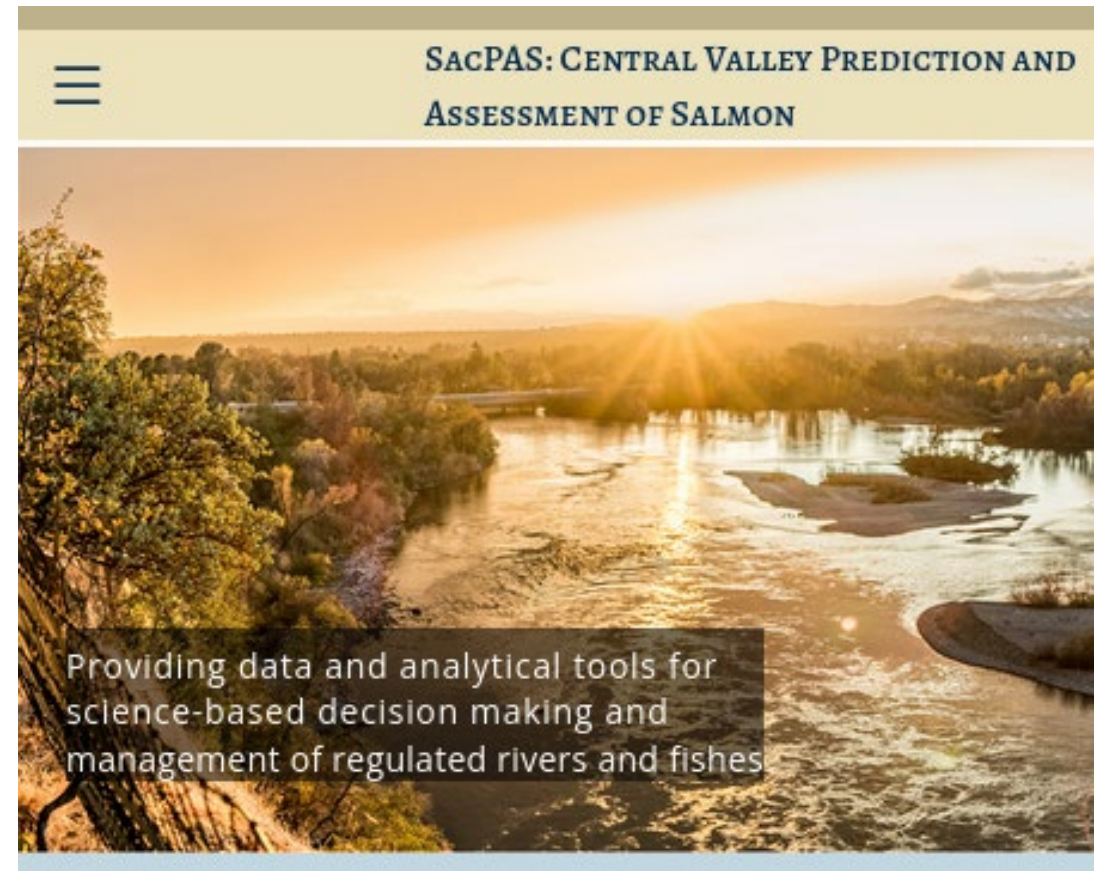


<https://www.gida-global.org/care>

“Start where you are
to go
where you need to go.”

- Margaret Kovach

What open data looks like in practice with SacPAS



Home	Data Queries & Alerts	Work Groups & Teams	Fish Model	Tools	Contact			
Data Queries & Alerts	Alert: Weir Overtopping	Temperature Thresholds	Juvenile Monitoring & Sampling	Juvenile Salvage & Loss	Adult Escapement	River Conditions	Exposure Index	Data Sites & Inventory

Data Sites

View: [Heatmap Plots for All Sites, All Parameters, All Years](#)

SacPAS River Data Sites						
Code	Name	Basin	County	Operator	Elevation	View
AFO	American R at Fair Oaks	AMERICAN R	SACRAMENTO	US Geological Survey	72	SacPAS Data Inventory
AFD	American R blw Folsom Dam	AMERICAN R	SACRAMENTO	US Geological Survey	220	SacPAS Data Inventory
FOL	Folsom Lake, American R	AMERICAN R	SACRAMENTO	US Bureau of Reclamation	466	SacPAS Data Inventory
AHZ	American R at Hazel Ave Bridge	AMERICAN R	SACRAMENTO	US Geological Survey	100	SacPAS Data Inventory
NAT	Lake Natoma (Nimbus Dam)	AMERICAN R	SACRAMENTO	US Bureau of Reclamation	132	SacPAS Data Inventory
AWB	American R blw Watt Ave Bridge	AMERICAN R	SACRAMENTO	US Geological Survey	50	SacPAS Data Inventory
AWP	American R at William B Pond Park	AMERICAN R	SACRAMENTO	US Geological Survey	45	SacPAS Data Inventory
BAT	Battle Creek	SACRAMENTO R	TEHAMA	USGS/DWR	200	SacPAS Data Inventory
BNF	NF Battle Creek nr Manton	SACRAMENTO R	TEHAMA	CA Dept of Water Resources/North Region Office	998	SacPAS Data Inventory
BSD	SJR Basin, Bear Creek blw Eastside Canal	SAN JOAQUIN R	MADERA	CA Dept of Water Resources/South Central Region Office	95	SacPAS Data Inventory
BET	Bethel Island	DELTA	CONTRA COSTA	CA Dept of Water Resources/North Central Region Office	9	SacPAS Data Inventory
IGO	Clear Creek nr Igo	SACRAMENTO R	SHASTA	US Geological Survey/US Bureau of Reclamation	673	SacPAS Data Inventory
CLC	Clifton Court	DELTA	CONTRA COSTA	CA Dept of Water Resources/Operations and Maintenance	3	SacPAS Data Inventory
DCV	Deer Creek nr Vina	SACRAMENTO R	TEHAMA	US Geological Survey	479	SacPAS Data Inventory
DLC	Delta Cross Channel	SACRAMENTO R	SACRAMENTO	US Geological Survey	10	SacPAS Data Inventory
DTO	Delta Outflow	DELTA	SOLANO	CA Dept of Water Resources/Operations and Maintenance	0	SacPAS Data Inventory
EMM	Emmaton	DELTA	SACRAMENTO	US Bureau of Reclamation	0	SacPAS Data Inventory
FRA	Feather R at mile 61.6	FEATHER R	BUTTE	CA Dept of Water Resources/O&M Oroville Field Division	125	SacPAS Data Inventory
GRL	Feather R nr Gridley	FEATHER R	BUTTE	CA Dept of Water Resources/Operations and Maintenance	92	SacPAS Data Inventory
ORO	Feather R, Oroville Dam	FEATHER R	BUTTE	CA Dept of Water Resources/O&M Oroville Field Division	900	SacPAS Data Inventory
HRO	Harvey O Banks Pumping Plant	DELTA	CONTRA COSTA	CA Dept of Water Resources/O&M San Joaquin Field Division	4	SacPAS Data Inventory
LDC	SJR Basin, Little Dry Creek	SAN JOAQUIN R	FRESNO	US Bureau of Reclamation	350	SacPAS Data Inventory
CRS	Merced R at Cressy	MERCED R	MERCED	CA Dept of Water Resources/South Central Region Office	165	SacPAS Data Inventory
MBH	Merced R blw Crocker-Huffman Dam	MERCED R	MERCED	Merced Irrigation District	294	SacPAS Data Inventory

PRI	San Joaquin R at Prisoners Pt nr Termino	SAN JOAQUIN R	SAN JOAQUIN	US Geological Survey	0	SacPAS Data Inventory
RRI	San Joaquin R, Rough and Ready Island	SAN JOAQUIN R	SAN JOAQUIN	CA Dept of Water Resources/Div of Environmental Services	15	SacPAS Data Inventory
SSH	San Joaquin R, Salt Slough	SAN JOAQUIN R	MERCED	US Geological Survey	75	SacPAS Data Inventory
SJS	San Joaquin R, Stevinson	SAN JOAQUIN R	MERCED	CA Dept of Water Resources/South Central Region Office	82	SacPAS Data Inventory
TRP	San Joaquin R, Tracy Pumping Plant	SAN JOAQUIN R	SAN JOAQUIN	CA Dept of Water Resources/Operations and Maintenance	3	SacPAS Data Inventory
VNS	San Joaquin R nr Vernalis	SAN JOAQUIN R	SAN JOAQUIN	USGS/DWR	35	SacPAS Data Inventory
VER	San Joaquin R, Vernalis USBR	SAN JOAQUIN R	SAN JOAQUIN	US Bureau of Reclamation	0	SacPAS Data Inventory
SWA	San Joaquin R, Washington Road	SAN JOAQUIN R	MERCED	CA Dept of Water Resources/South Central Region Office	109	SacPAS Data Inventory
GDW	Stanislaus R, Goodwin Dam	STANISLAUS R	CALAVERAS	US Bureau of Reclamation	359	SacPAS Data Inventory
KOT	Stanislaus R at Koetitz Ranch	STANISLAUS R	STANISLAUS	CA Dept of Water Resources/South Central Region Office	54	SacPAS Data Inventory
NML	Stanislaus R, New Melones Reservoir	STANISLAUS R	CALAVERAS	US Bureau of Reclamation	1135	SacPAS Data Inventory
OBB	Stanislaus R at Orange Blossom Bridge	STANISLAUS R	STANISLAUS	CA Dept of Water Resources/South Central Region Office	117	SacPAS Data Inventory
RPN	Stanislaus R at Ripon	STANISLAUS R	SAN JOAQUIN	US Bureau of Reclamation	35	SacPAS Data Inventory
RIP	Stanislaus R at Ripon (USGS)	STANISLAUS R	SAN JOAQUIN	US Geological Survey	73	SacPAS Data Inventory
DNP	Tuolumne R,Don Pedro Reservoir	TUOLUMNE R	TUOLUMNE	USGS/USACE	830	SacPAS Data Inventory
TLG	Tuolumne R, La Grange Dam	TUOLUMNE R	STANISLAUS	Turlock Irrigation District	170	SacPAS Data Inventory
LGN	Tuolumne R blw La Grange Dam nr La Grange	TUOLUMNE R	STANISLAUS	US Geological Survey	170	SacPAS Data Inventory
MOD	Tuolumne R at Modesto	TUOLUMNE R	STANISLAUS	US Geological Survey	90	SacPAS Data Inventory
TRT	Tuolumne R at Tuolumne City	TUOLUMNE R	STANISLAUS	CA Dept of Water Resources/O&M San Joaquin Field Division	53	SacPAS Data Inventory
TRW	Tuolumne R at Waterford	TUOLUMNE R	STANISLAUS	CA Dept of Water Resources/South Central Region Office	100	SacPAS Data Inventory
UNI	Union Island	DELTA	SAN JOAQUIN	US Bureau of Reclamation	0	SacPAS Data Inventory
VCU	Victoria Canal	DELTA	SAN JOAQUIN	USGS/DWR	0	SacPAS Data Inventory

Click on the icon next to the site Code to view California Data Exchange Center (CDEC) Metadata for the site.

Generated: 05 Nov 2023 06:59:01 PST. www.cbr.washington.edu/sacramento/data/.

Juvenile Monitoring & Sampling



SacPAS: Central Valley Prediction & Assessment of Salmon UW Columbia Basin Research

[Home](#) | [Data Queries & Alerts](#) | [Work Groups & Teams](#) | [Fish Model](#) | [Tools](#) | [Contact](#)

[Data Queries & Alerts](#) | [Alert: Weir Overtopping](#) | [Temperature Thresholds](#) | [Juvenile Monitoring & Sampling](#) | [Juvenile Salvage & Loss](#) | [Adult Escapement](#) | [River Conditions](#) | [Exposure Index](#) | [Data Sites & Inventory](#)

Juvenile Monitoring & Sampling

Analysis & Queries: [Cohort Juvenile Monitoring](#) | [Current Catch](#) | [Juvenile Salmonid Monitoring](#) | [Red Bluff Daily Table with Biweekly](#) | [Red Bluff Daily Graph with Biweekly](#) | [Migration Timing and Conditions](#)

Cohort Juvenile Monitoring

◆ [Cohort Juvenile Monitoring](#) at Sacramento River rotary screw traps, beach seines, and trawls with Red Bluff Estimates

Winter Chinook Cohort Juvenile Monitoring (7/1/2022 to 6/30/2023)
 Run Sampling Data 2022-07-01 to 2023-04-16
 Red Bluff Daily Estimates Brood year: 2022

◆ [Current Catch](#)

Unmarked ◆ [Winter Chinook](#), ◆ [Spring](#), ◆ [Fall](#), ◆ [Late Fall](#), and ◆ [Steelhead](#) at Sacramento River (Red Bluff) and Lower Sacramento River (Knights Landing, Sacramento Trawls, Chipps Island) monitoring locations

Current Catch Juvenile Unclipped Winter Chinook
 By Apr 12 | Annual Total | 2022 Predicted

Juvenile Salmonid Monitoring

Unmarked ◆ [Older Chinook](#), ◆ [Fry/Smolt Chinook](#), and ◆ [Steelhead](#) at Sacramento River (Red Bluff, Tisdale), Lower Sacramento River (Knights Landing, Sacramento Trawls, Chipps Island) and San Joaquin (Mossdale) with associated Water Temperature, Flow and Turbidity

Red Bluff Diversion Dam Rotary Screw Trap with CDEC Daily Average River Data
 Unmarked ◆ [Older Juvenile Chinook](#) (Fork Length=44-46a DRL) (over model)
 Total 219,162 for Sampling Dates: 2022-08-01 to 2022-04-07

Red Bluff Daily Table

◆ [Red Bluff Juvenile Daily Estimates Table Query](#) with Biweekly Totals

Red Bluff Daily Graph

◆ [Red Bluff Daily Graph](#) with Biweekly Estimated Totals, Fork Length, Flow, Turbidity, Water Temperature (C), or Water Temperature (F)

Red Bluff Juvenile Passage Estimates BY2022 Winter Chinook
 2022-08-18 to 2023-04-07

Migration Timing and Conditions

◆ [Migration Timing & Conditions](#) at Red Bluff, Sacramento River rotary screw traps, beach seines, and trawls with Cumulative Passage, Migration Timing Characteristics, Temperature and Flow Exposure

Migration Timing, Brood Year 2008 - 2021
 Juvenile Unclipped Winter Chinook
 Chipps Island Trawls (Raw Catch), 7/1 - 6/30

https://www.cbr.washington.edu/sacramento/data/juv_monitoring.html

Snapshot of data available on SacPAS

■ Environmental data

(courtesy of CDEC)

- Reservoir storage
- Reservoir elevation
- Reservoir outflow
- River discharge
- River stage
- Control regulating discharge
- Water temperature
- Water velocity
- Dissolved oxygen
- Weir overtopping
(stage, SacPAS metric)
- Air temperature
- Etc.

■ Fish data (Salmon, smelt)

■ **Cohort Juvenile Monitoring**

(CDFW via CalFish, USFWS Lodi, USFWS Red Bluff)

Counts and migration timing; RSTs, trawls, beach seines

■ **Red Bluff Diversion Dam biweekly**

(USFWS Red Bluff)

Counts, migration timing, length-at-date (LAD)

■ **Salvage and Loss**

(CDFW Bay Delta Region)

Counts, migration timing, LAD, genetic run ID, CWT run

■ **Adult escapement**

(GrandTab, CDFW via CalFish)

■ **Coded wire tag**

(RMPC/RMIS, PSMFC)

Smolt-to-adult survival

■ **Redd and carcass survey**

(CDFW via CalFish)

■ **Juvenile Production Estimate (JPE)**

(NOAA)

■ **Delta Smelt**

(USFWS Lodi, CDFW; not CalFish)

Current and historical surveys

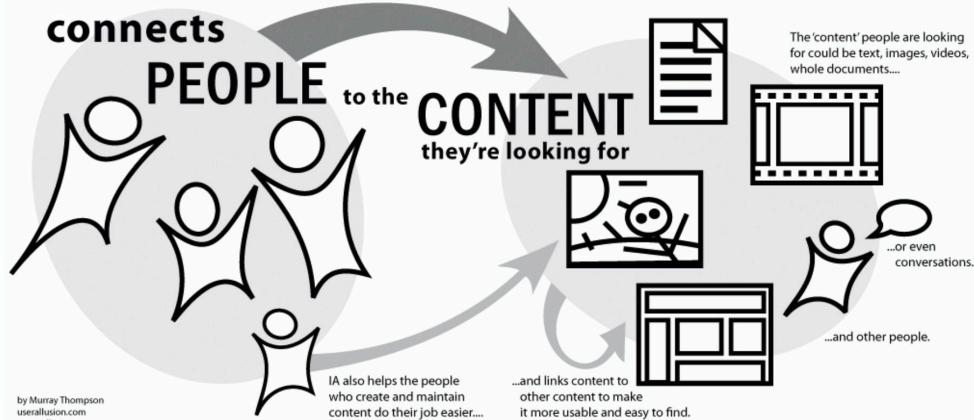
■ Etc.

INFORMATION ARCHITECTURE

(IA for short)

connects

PEOPLE to the CONTENT they're looking for



by Murray Thompson
userillusion.com
@userillusion

by sorting out things like this:



CLASSIFICATION
and HIERARCHY



LABELS and
TAGGING



NAVIGATION and
WAYFINDING



SEARCH

MegaMenu

SACPAS: CENTRAL VALLEY PREDICTION AND ASSESSMENT OF SALMON UNIVERSITY of WASHINGTON
Columbia Basin Research

Data & Alerts Workgroups & Teams Tools & Models 4th Dimension About

DATA & ALERTS
Publicly accessible, web-based query and reporting system of historical and current fish, environmental, and hydrologic information, vital to year-round planning and adaptive management of the Central Valley Project and State Water Project. Data uploads provide the most up-to-date data as it is made available, whether it be daily, biweekly, monthly or annually.

Basic conditions, performance measures, and threshold-based alerts are available through data aggregation and analysis of environmental conditions.

RIVER CONDITIONS
River Graph&Text
Daily River Table
All Years Graph
Basin Conditions
Exposure Index
more

TEMPERATURE THRESHOLDS
Clear Creek
Lower American
Sacramento
Stanislaus Flow&Temp
more

ALERTS
Weir Overtopping

JUVENILE MONITORING & SAMPLING
Cohort Juvenile Monitoring
Current Catch
Juvenile Salmonid Monitoring
Red Bluff Daily Table
Red Bluff Daily Graph
Cohort Migration Timing
more

JUVENILE SALVAGE & LOSS
Salvage and Loss Summary
Delta Loss Graphs
Delta Salvage Graphs
Salvage Timing
Hatchery Chinook Loss Tables
Salvage and Loss Detail
more

SMOLT-TO-ADULT RETURN
CWT SAR Survival

ADULT ESCAPEMENT
CDFW GrandTab

RESOURCES
Overview of Data&Alerts
Access all Data&Alerts tools
Metadata and Glossaries
Data Inventory
Data Site Maps
News and Announcements
Data Feedback

SACPAS
Data Queries & Alerts
Temperature Thresholds
Juvenile Monitoring & Sampling

Customized query forms

All Years River Graph Query

Data Courtesy of CDEC

Queries: [River Graph&Text](#) || [River Graph&Text Map](#) || [Daily River Table](#) || **All Years River Graph** || [Basin Conditions](#)

Limit Locations by Hydrologic Area

- All Locations Sacramento River Basin San Joaquin River Basin Delta

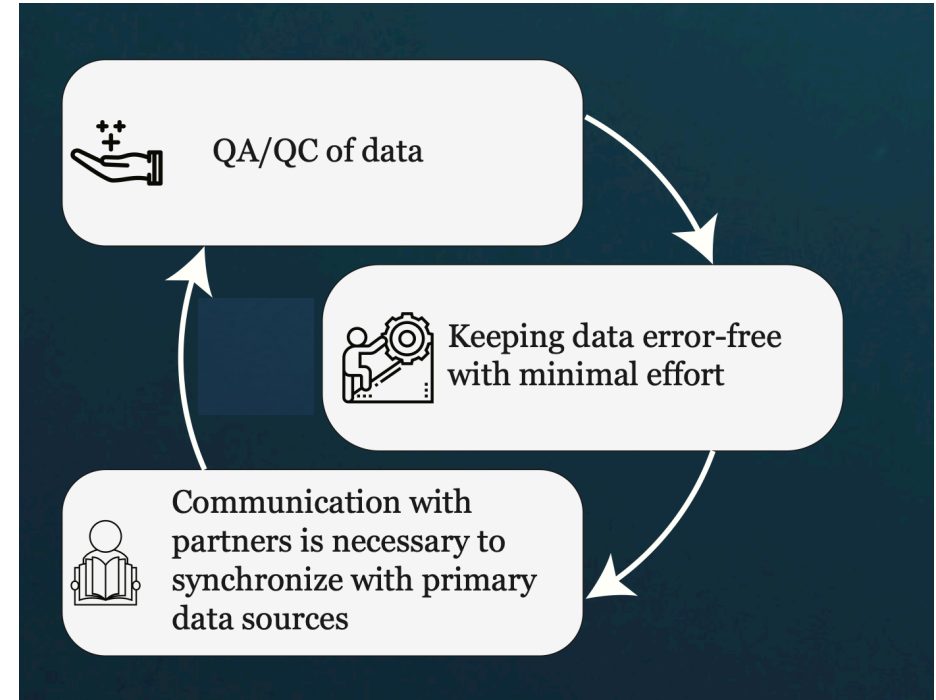
Select Location, River Data

Sacramento R blw Georgiana Slough (GES)	OMR USGS Tidally Filtered [Location Combined]
Sacramento R at Hamilton City-Main Ch (HMC)	OMR 5-day USGS Tidally Filtered [Location Combined]
Sacramento R upstream of Hwy 44 (SAC)	OMR 14-day USGS Tidally Filtered [Location Combined]
Sacramento R at Jellys Ferry (JLF)	San Joaquin I:E Ratio [Location Combined]
Sacramento R, Keswick Reservoir (KES)	San Joaquin I:E Ratio 14-day Running Average [Location Combined]
Sacramento R, Keswick, WQ (KWK)	San Luis Storage Reservoir [Location Combined]

For special parameters, select **Combined** from **All Locations** list.
Please refer to the [River Parameters](#) inventory below to look up location-parameter availability.



What database management looks like in practice with SacPAS





EXAMPLES

- Sharing some perspectives from SacPAS with examples that we've experienced



How To Increase Efficiency Of Sharing Data

Data location is findable and accessible.

File format is simple and consistent.

EXAMPLES:

- Keeping fixed location online, ftp, sftp
- Keeping file format consistent (.csv to .xlsx)
- Avoiding .pdf files
- Checking that your cells format correctly when converted to .csv



How To Increase Efficiency Of Sharing Data

Keep data files simple for programmable loads.

EXAMPLES:

- Avoiding gaps in between columns in a spreadsheet for aesthetics
- Limiting to one table per worksheet
- Including ID column and keep rows unique



How To Increase Efficiency Of Sharing Data

Data is machine readable.

EXAMPLES:

- Not including double quotes "" in comments column
- Avoiding line breaks and commas in the comments column




How To Increase Efficiency Of Sharing Data

Data is consistent.

EXAMPLES:

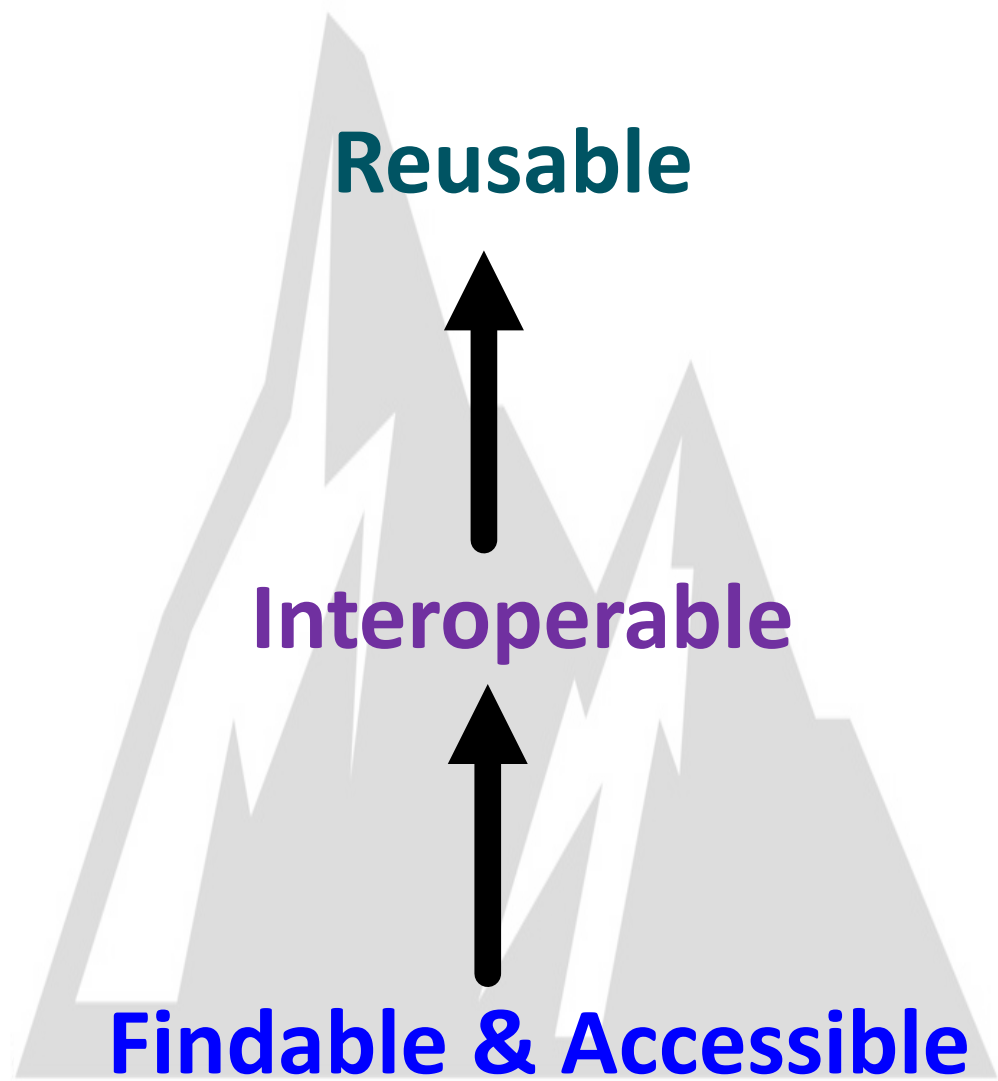
- Checking for Spelling or human error in data entry
- Keeping data type consistent
- Choosing one null (N/A, na, NN, NA, NULL, n/p, -9999, -99999, UNK, n:/a, N/R)
- Including all data as they accumulate through the season (or year) in the data file
- Keeping format of revised data similar to preliminary data



Data sharing: pathways across a range of efficiencies

(see DBM handout #3)

- To improve the efficiency and quality of shared data
- Not always a straightforward one-size-fits-all process
- We acknowledge some data require more caution and discretion when sharing openly
- We are always happy to discuss how to best represent the wishes of the primary data owners (A in CARE principles)



Data are...

- released in close to real time and later revised as data are corrected
- released in close to real time with no revisions
- published as a yearly revised dataset
- published over a year after collection
- the original collected data with corrections or omissions explained in a comments column
- aggregated by the day in a more detailed spreadsheet
- aggregated into a simple spreadsheet over an extended observation period
- aggregated down to a single number without clear methods

Data types are...

- consistent, or cells are left blank with a comment in the comments column.
- inconsistent, comments are placed in integer rows, dates and times are not represented consistently

Data...

- has consistent column headers in a consistent order
- are inconsistent with column names, number of columns, or order of columns

Data are...

- published to website in a consistent location with a consistent naming scheme
- shared through personal communication or consistently to a location that requires approved access
- published to a website inconsistently or with inconsistent URL or filename
- kept in house

Efficient



Inefficient



Open data &
data management

Perspectives from SacPAS

- **Overall Goal:**



- Make your work easier by providing efficient access to data
 - Support Interagency Ecological Program and AB1755
-

- **FAIR and CARE**

- Brief description & in context of SacPAS
-

- **What this looks like in practice at SacPAS**

- Examples
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- **Three DBM handouts**

- FAQs, Guidelines, Pathways
-

** Help us streamline data management processes for SacPAS so that we can help with that first bullet point on overall goal*



ACKNOWLEDGEMENTS

US BUREAU OF RECLAMATION

**Catarina Pien, Elissa Buttermore,
Josh Israel, and many more**

**All of the data collectors
over the decades!**

**We hope to hear from you!
web@cbr.washington.edu**

**Hearing about errors, bugs,
etc. makes us better.**