

Photo: American River

SacPAS Data Inventory

Matt Carter and
Jennifer L. Gosselin

SacPAS
CENTRAL VALLEY PREDICTION AND ASSESSMENT OF SALMON

Outline

1. **SacPAS Data Inventory**
   Brief overview

1. **Data through the salmonid life cycle**
   Data relevant to each salmon/steelhead life stage

1. **Other fish species**
   Smelt, sturgeon, etc.

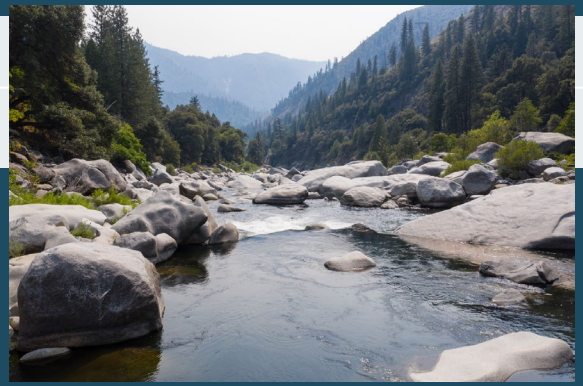


Photo: Feather River

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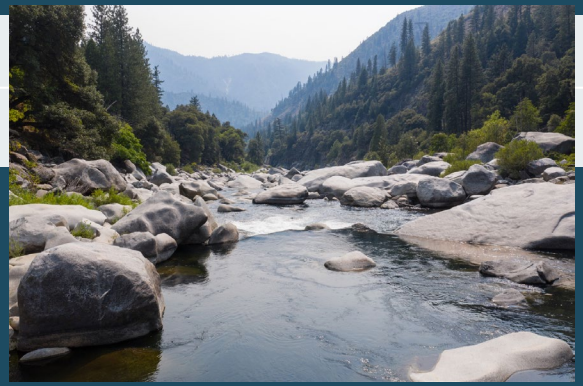


Photo: Feather River

4. **Data from owners to SacPAS database**
   Different possible workflows

4. **FAIR and CARE**
   What we've applied and what we're working on

1. SacPAS Data Inventory: **Overview**

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- Juvenile Salmon
  - Delta Juvenile Fish Monitoring Program (DJFMP) data
  - Rotary Screw Trap data
- Adult Salmon
  - Carcass and Redd data
  - Escapement data

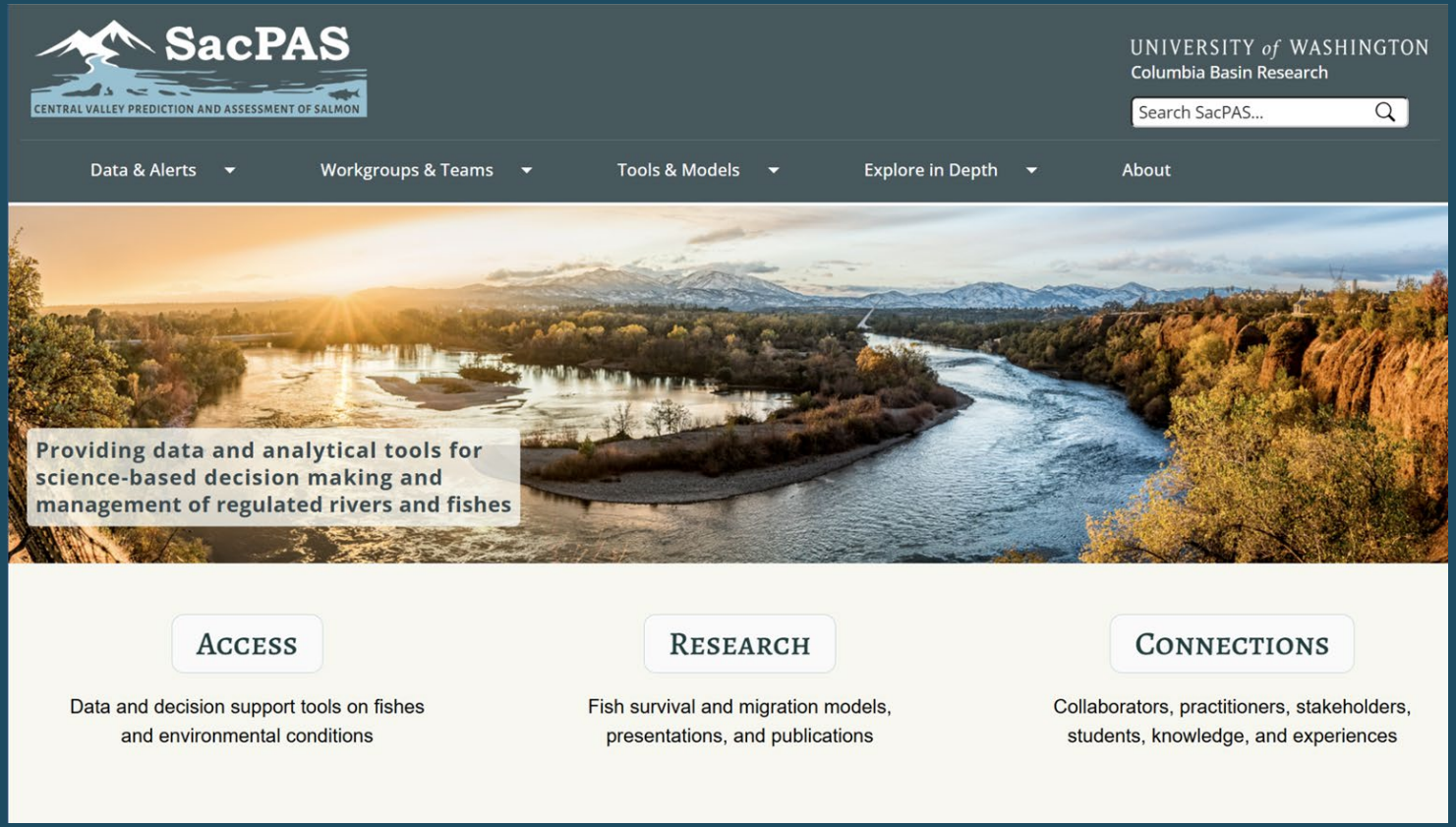
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- **Juvenile Salmon**
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  - Enhanced Delta Smelt Monitoring Program (EDSM) data
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- **Environmental Conditions**
  - River conditions data
  - Air conditions data
  - Operations data

1. SacPAS Data Inventory: **Overview**



1. SacPAS Data Inventory: 1-pager

SacPAS
CENTRAL VALLEY PREDICTION AND ASSESSMENT OF SALMON

https://cbr.washington.edu/sacramento/

DATA INVENTORY (updated 2026-10-28)

Environmental Conditions

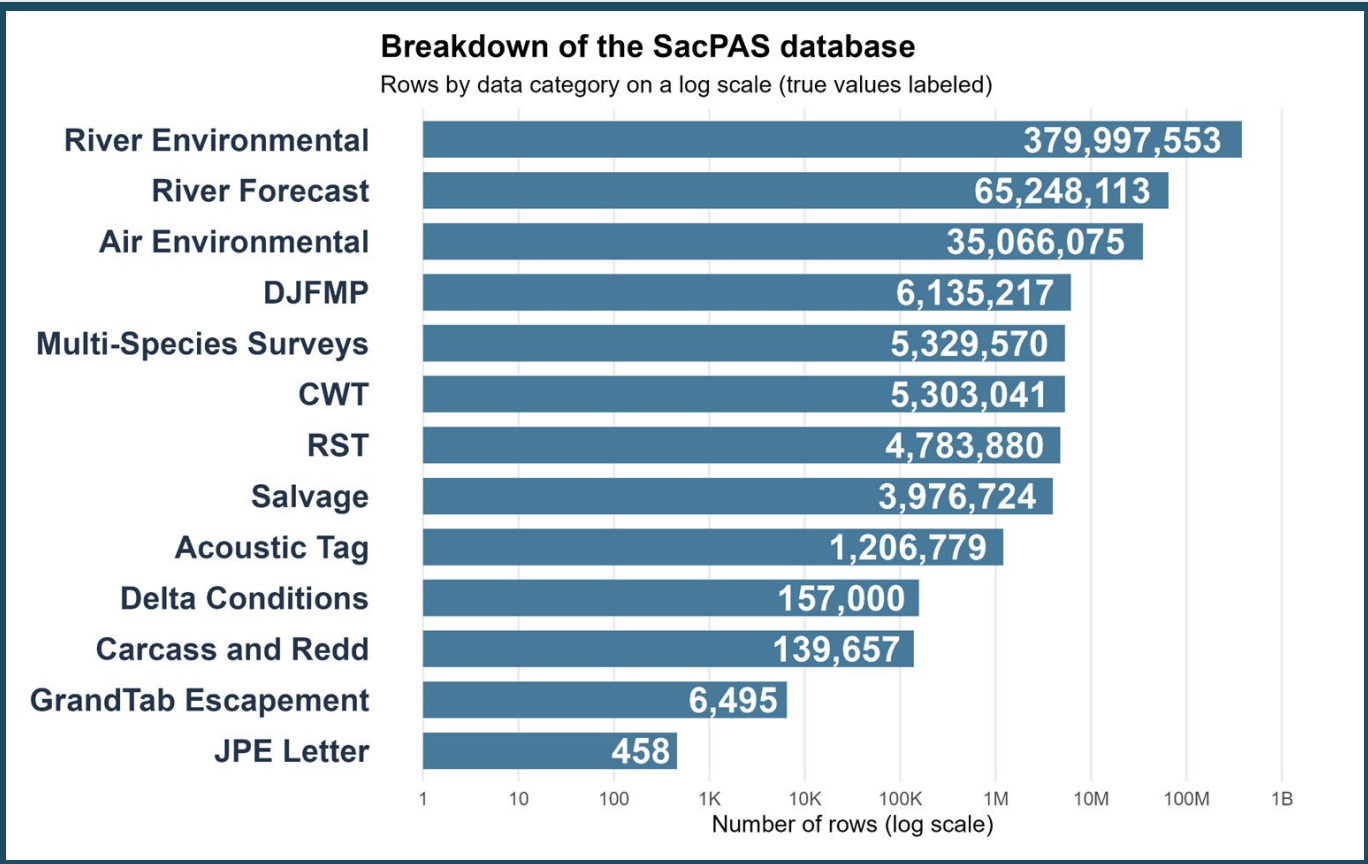
Dataset	Data Owner	Data Location	Frequency	Date Range	Description
Air Quality	EPA	AQS	Daily	2014-2026	The Air Quality System (AQS) contains ambient air pollution data with 7 sites around the Central Valley river system loaded into our database.
	EPA	AirNow	Daily	2024-2026	AirNow is a Real Time Air Quality data set with 6 sites around the Central Valley river system loaded into our database.
Air Temperature	NOAA/NCEI	GHCN	Daily	1990-2026	Air Temperature in both hourly and daily formats from 187 sites in and around California.
Discharge/Flow	DWR	CDEC	Daily	1948-2026	Hourly and daily discharge measurements from 103 sites for River Discharge, 11 sites for Full Natural Flow, 10 sites for Regulating Discharge, 7 sites for Pumping Discharge, 9 sites for Spillway Discharge, and 4 sites for Tidally Filtered Discharge.
	USGS	Water Data	Daily	1900-2026	Hourly and daily discharge measurements from 121 sites for River Discharge, 41 sites for Tidally Filtered Discharge, and 39 sites for Water Velocity.
Dissolved Oxygen	DWR	CDEC	Daily	1989-2026	Hourly and daily Dissolved Oxygen measurements from 42 sites in the Central Valley.
Electrical Conductivity	DWR	CDEC	Daily	1987-2026	Hourly and daily electrical conductivity measurements from 69 sites in the Central Valley.
Stage/Elevation	DWR	CDEC	Daily	1984-2026	Hourly and daily River Stage measurements from 103 sites in the Central Valley.
	USGS	Water Data	Daily	1913-2026	Hourly and daily stream level measurements from 103 sites in the Central Valley.
Turbidity	DWR	CDEC	Daily	1988-2026	Hourly and daily Turbidity measurements from 38 sites for NTU and 18 sites for FNU in the Central Valley.
	USGS	Water Data	Daily	2007-2026	Hourly and daily FNU Turbidity measurements from 48 sites in the Central Valley.
Water Temperature	DWR	CDEC	Daily	1987-2026	Hourly and daily Water Temperature measurements from 105 sites in the Central Valley.
	USGS	Water Data	Daily	1971-2026	Hourly and daily Water Temperature measurements from 78 sites in the Central Valley.
OMR	USGS	Water Data	Daily	1987-2026	Combination of Old River Tidally Filtered Discharge and Middle River Tidally Filtered Discharge (OMR).
OMRI	SacPAS	OMR Index Calculations	Daily	2016-2026	An index for OMR Calculated from USGS and CDFW data. Follow the link for more details on the calculations.
Hydrologic Classification Indices (HCI)	DWR	HCI Historical	Annually	1901-2026	Reconstructed Sacramento and San Joaquin Valley Water Year Hydrologic Classification Indices based on measured unimpaired runoff.
		HCI Current			Official Sacramento and San Joaquin Valley Water Year Hydrologic Classification Indices based on measured unimpaired runoff for October-March and using predicted flows for April-July as of May 1st.
River Forecast Data	NOAA/SWFSC	CVTEMP	Daily	2017-2024	Predicted river water temperatures. No longer published as of 2024.
	NOAA/CNRFC	CNRFC	Daily	2022-2026	Predicted and observed river flows.
Delta Hydrology	CDFW	Delta Operations	Daily	2016-2026	Flows and operations in the Delta area. Data is parsed from PDF reports daily.

Juvenile Salmon

Dataset	Data Owner	Data Location	Frequency	Date Range	Description
Hatchery Releases	CDFW	FTP site with permissions	Periodically	1973-2026	Hatchery release info available from CDFW via FTP site.
	CDFW	CDFW Fish Planting and Stocking Data	Annually		Files released on the website annually that contain finalized data from the CDFW hatchery releases.
	USFWS	Via Email	On Release		Email with hatchery release info from USFWS staff.
Acoustic Data	NOAA	CalFishTrack	Seasonally	2013-2024	Juvenile Salmon are tagged and tracked with Acoustic Telemetry through the Central Valley.

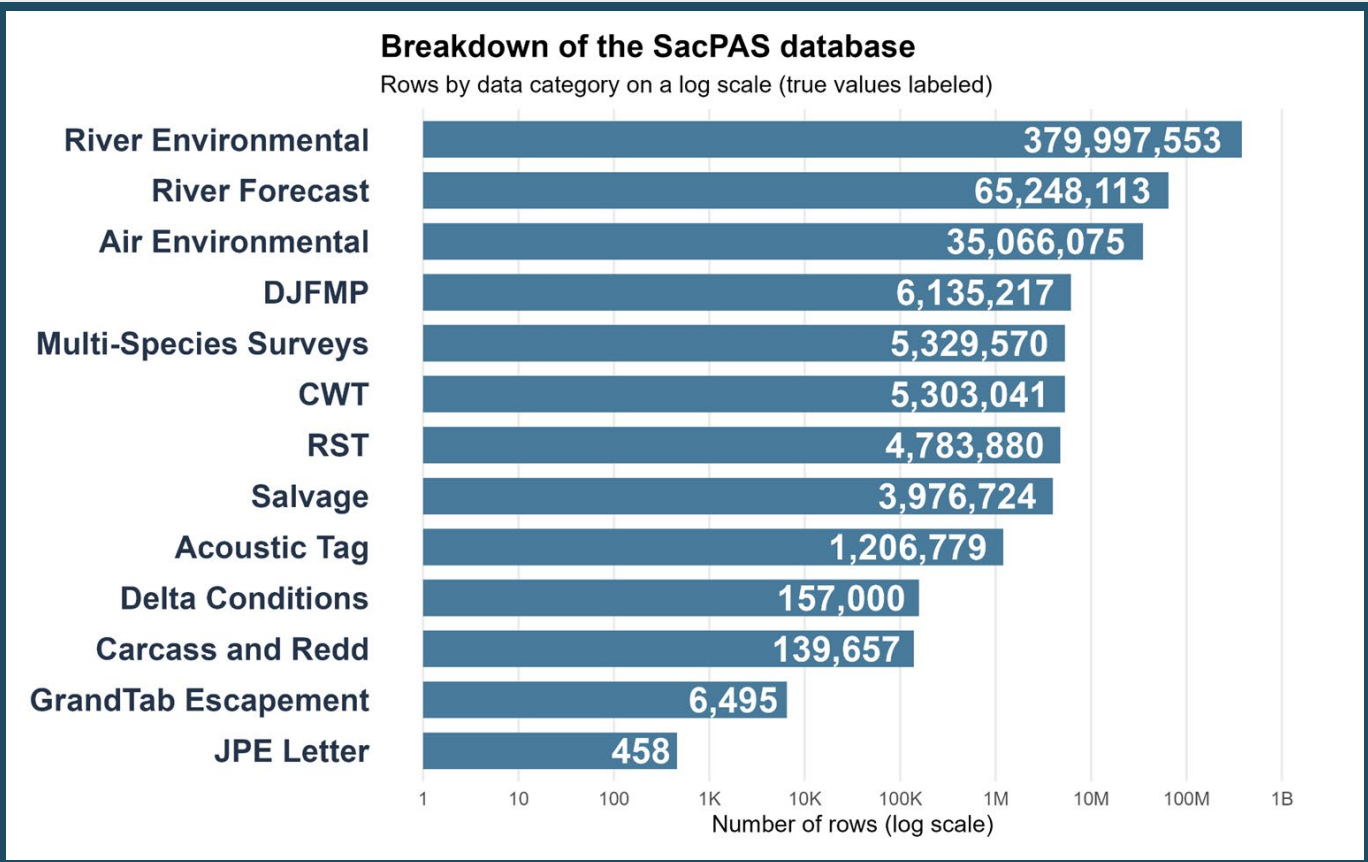
https://cbr.washington.edu/sacramento/SacPAS2026workshop/index.html

1. SacPAS Data Inventory: **Amount of data**



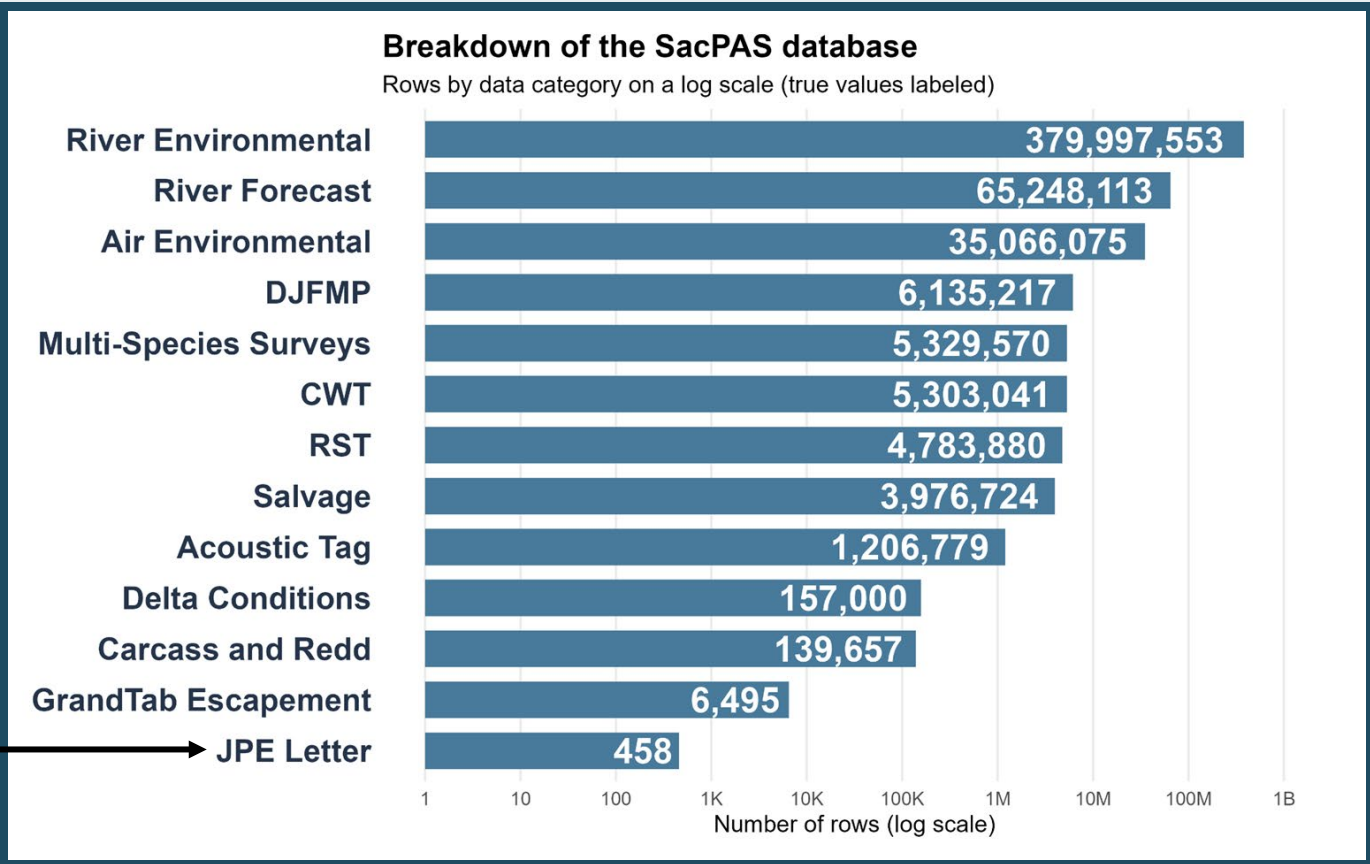
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Some data rows are more valuable in info



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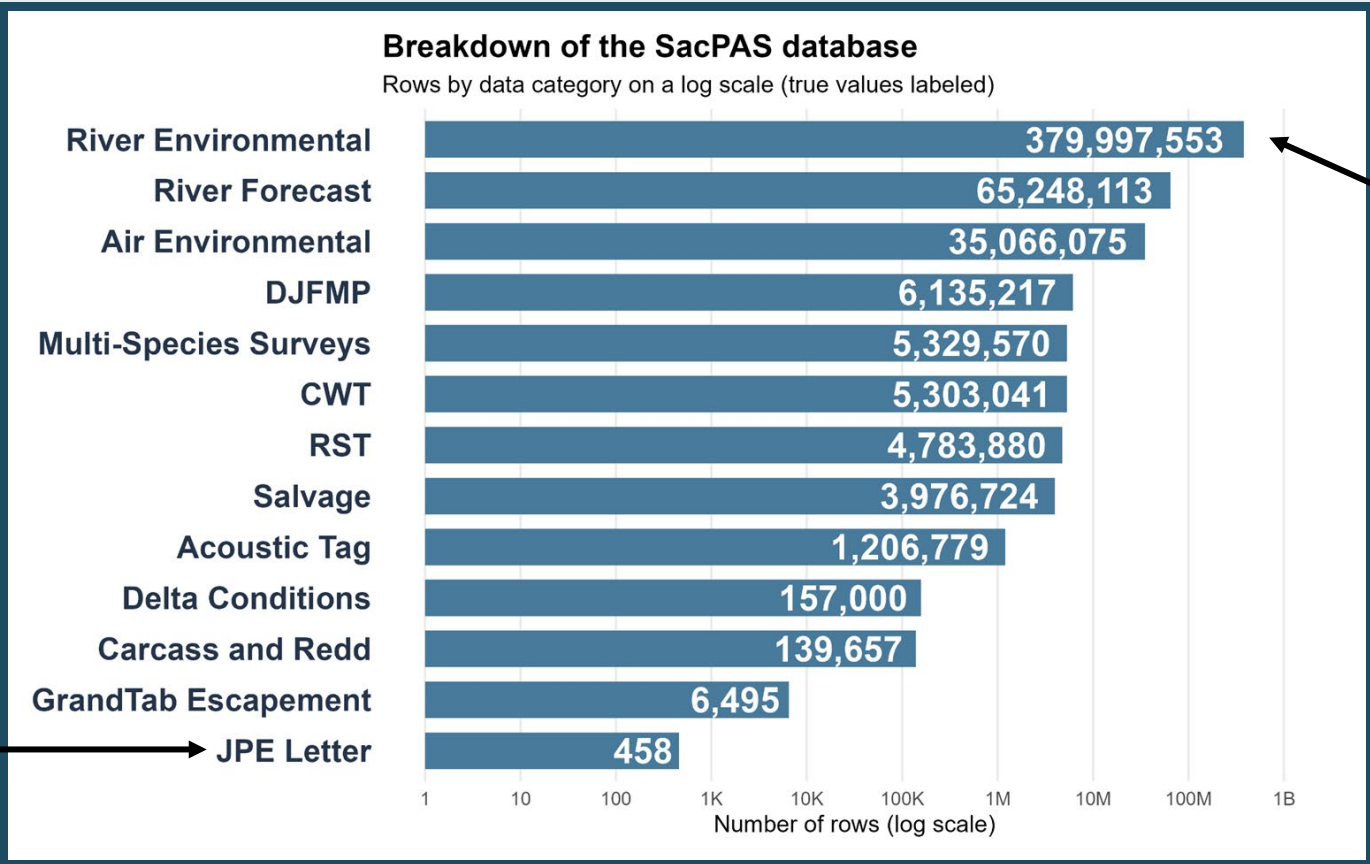
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Each row is a metric for all winter-run Chinook for one brood year

1. SacPAS Data Inventory: **Amount of data**

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Each row is one measurement at one site at one hour

Each row is a metric for all winter-run Chinook for one brood year

1. SacPAS Data Inventory vs Data Query Tools

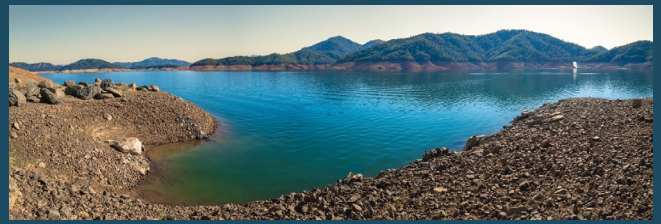
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1. SacPAS Data Inventory vs Data Query Tools

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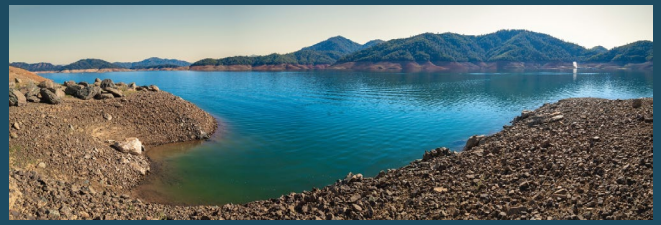


- Not all datasets in the region are in our database

1. SacPAS Data Inventory vs Data Query Tools

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- Not all datasets in the region are in our database

- Please feel free to request what is useful to you

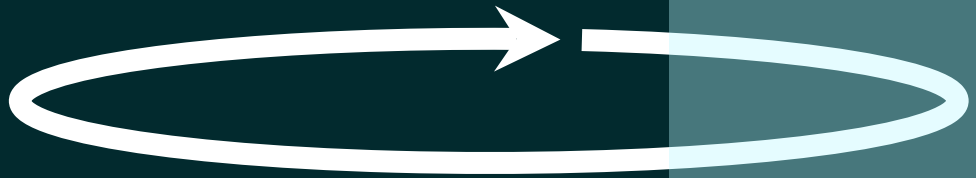


2. Data through the salmonid life cycle



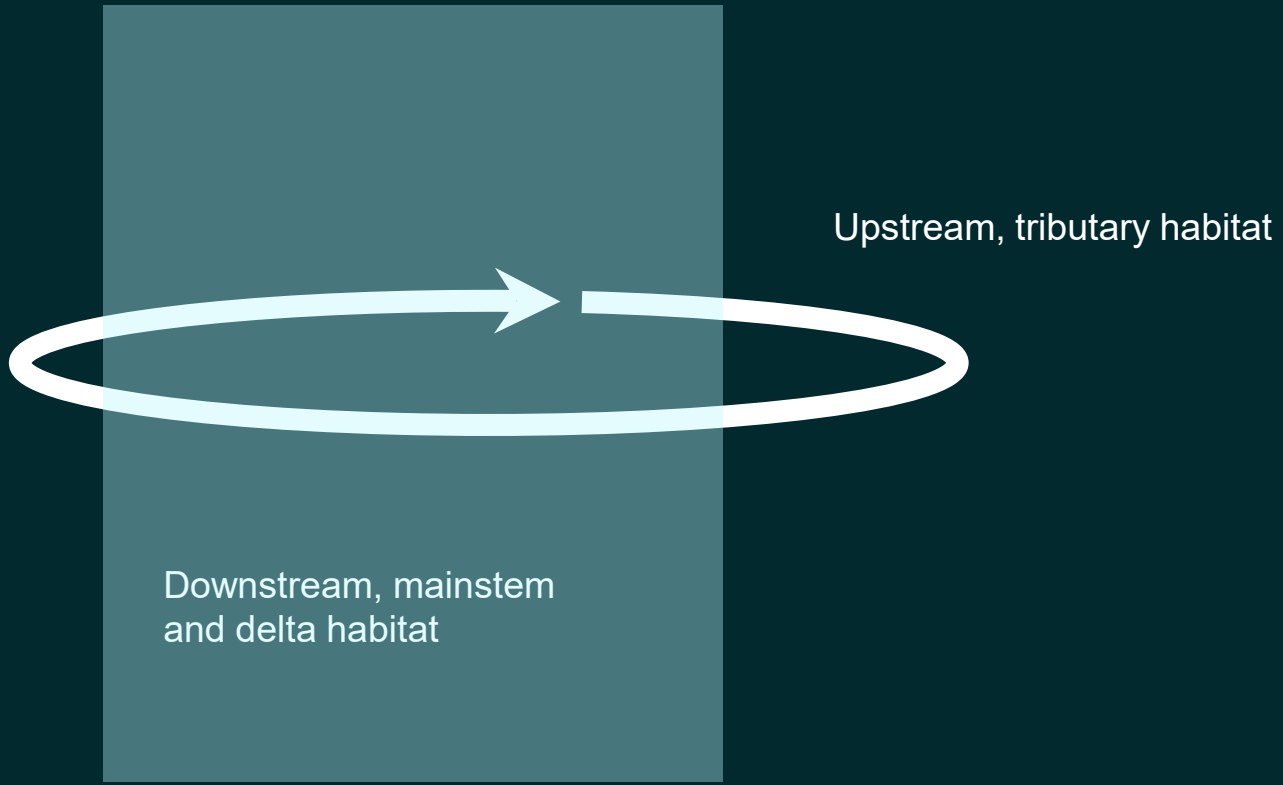
Illustrations by UW intern: Carina Jiang

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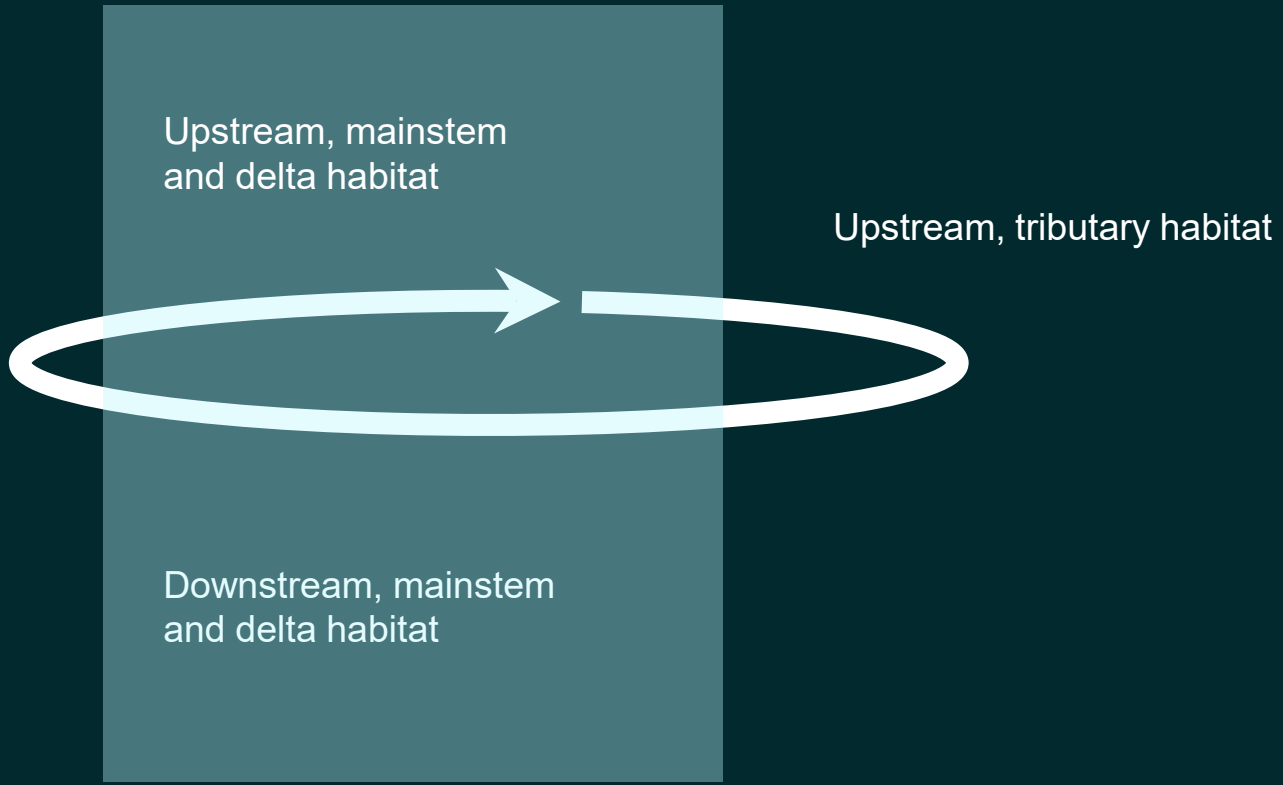


Upstream, tributary habitat

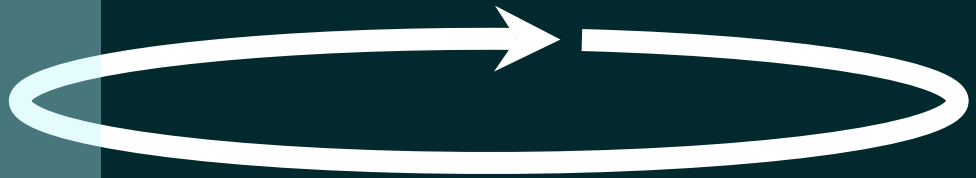
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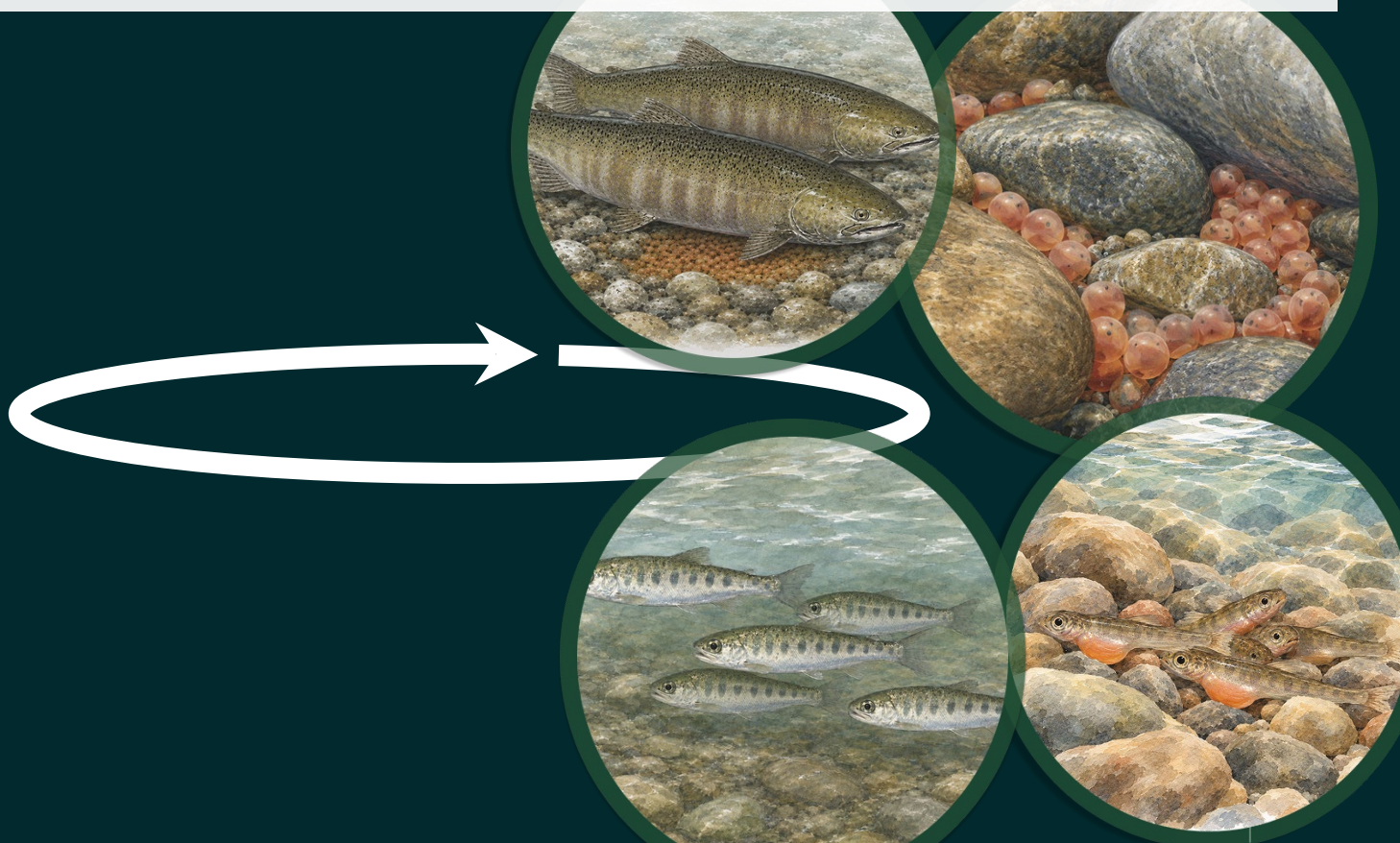
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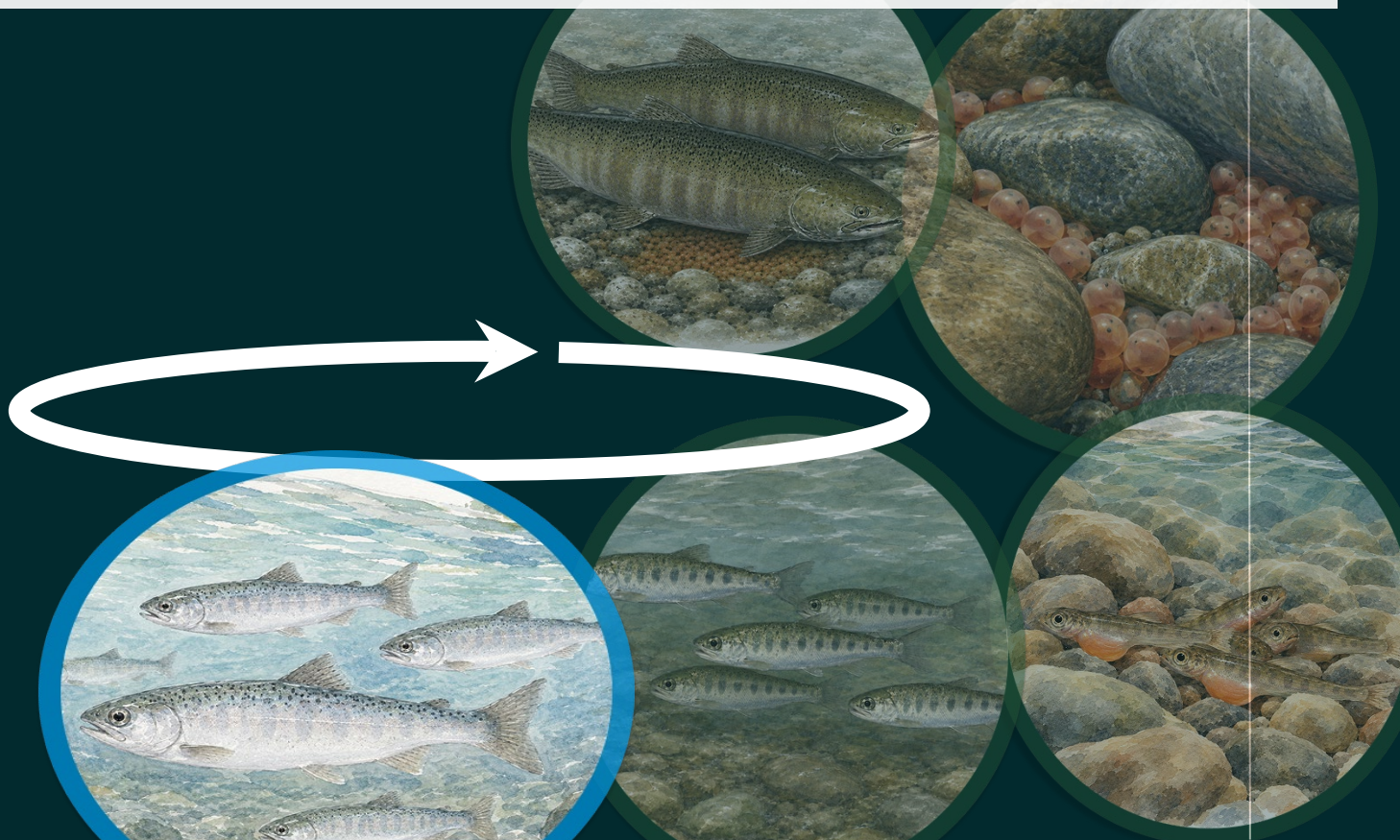
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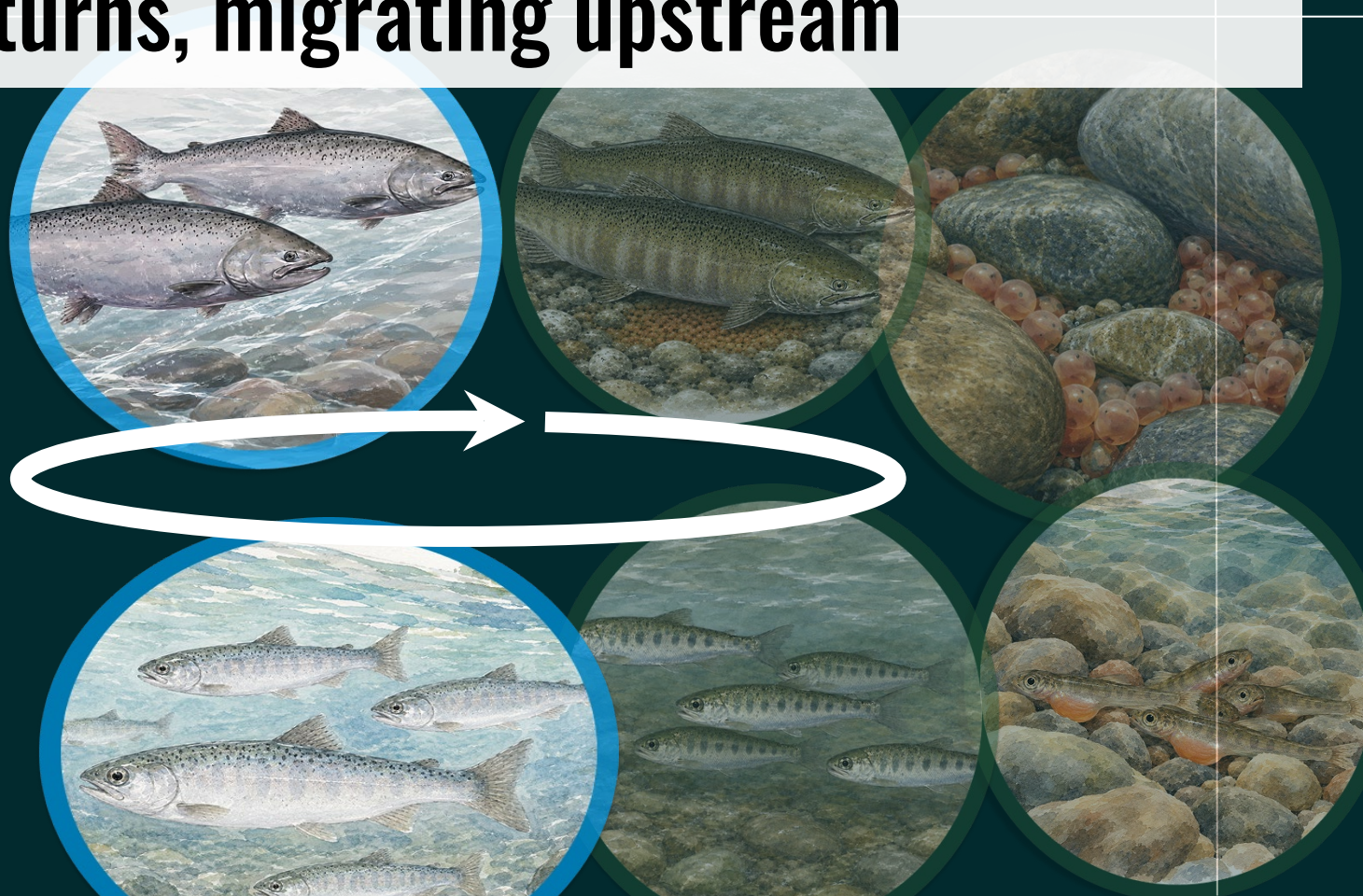
Early life stages in upstream, tributary habitat



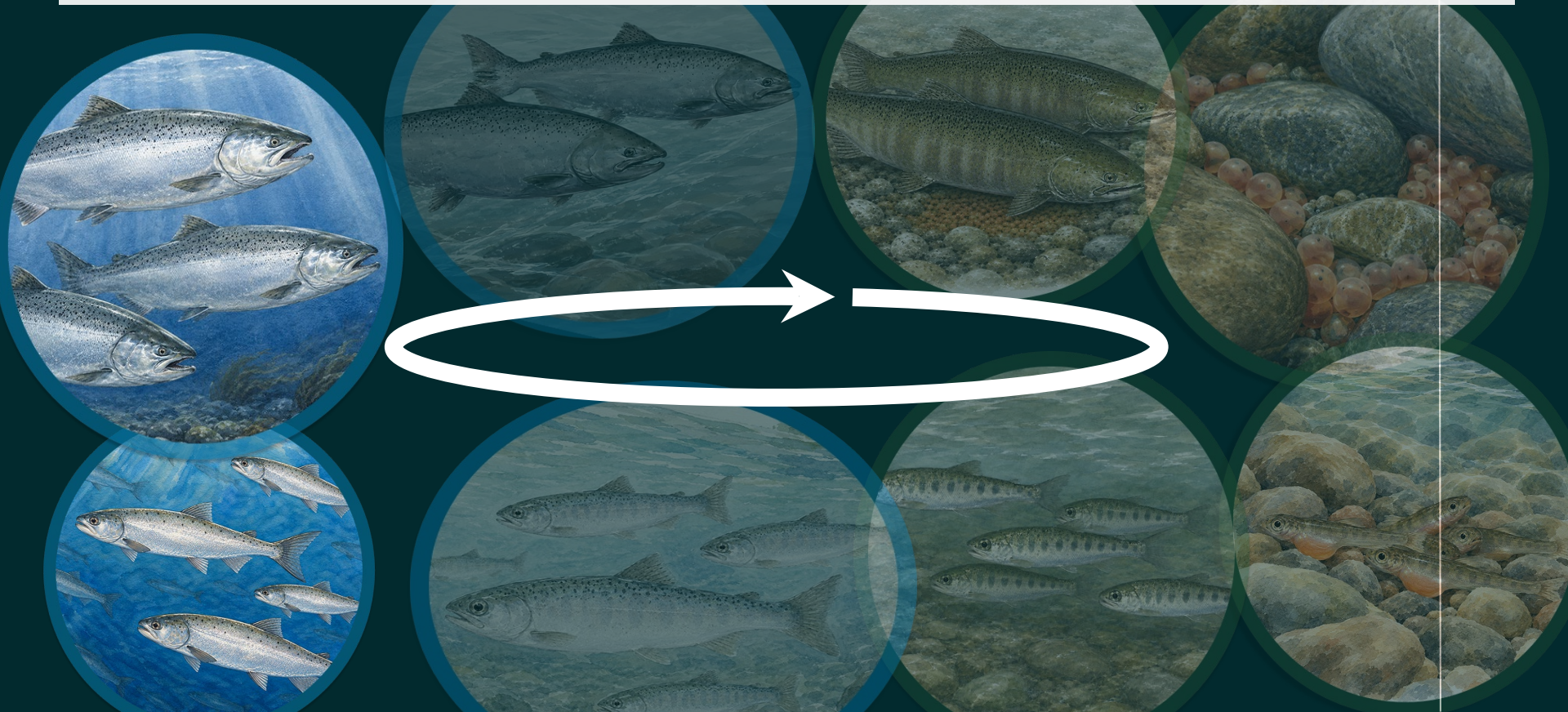
Juveniles, rearing and migrating downstream



Adult returns, migrating upstream



Subadults/Adults in the ocean



Egg and alevin life stages



Data	Data Source
Aerial Redds	CDFW
Redd Dewatering	CDFW
Fecundity	JPE Letter* (NMFS)
Total Eggs	JPE Letter* (NMFS)
Estimated Egg-to-Fry Survival	JPE Letter* (NMFS)

*including sources within JPE Letter for each metric

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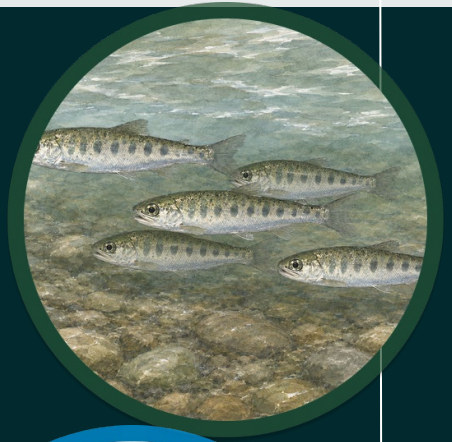
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Juvenile life stages (Upper Sacramento River)

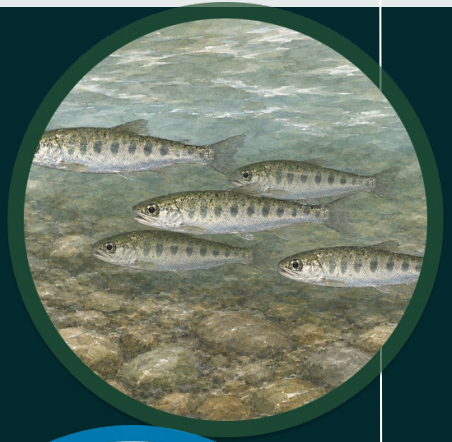
Data	Data Source
Hatchery Releases	CDFW and USFWS
CWT Releases	RMIS
Juvenile Stranding	CDFW
Acoustic Tag Data	CalFishTrack (NOAA)
Red Bluff Passage Estimates	USFWS
Yuba River Rotary Screw Trap (RST)	CDFW
Caswell RST	FishBio and PSMFC
Lower American River RST	FishBio and PSMFC
Tisdale RST	CDFW
Lower Feather River RST	CDFW
Feather River RST	CDFW
Battle and Clear Creek RSTs	USFWS
Butte Creek RST	CDFW
Deer and Mill Creek RSTs	CDFW
Estimated Fry-to-Smolt Survival	JPE Letter (NMFS)





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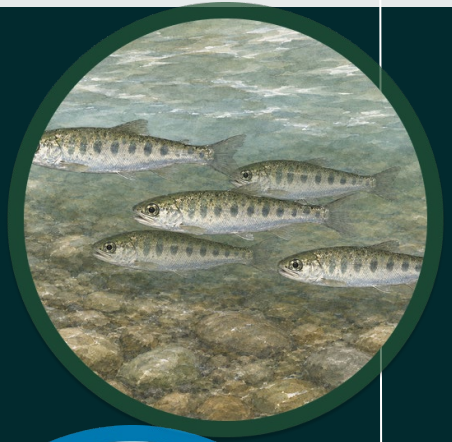
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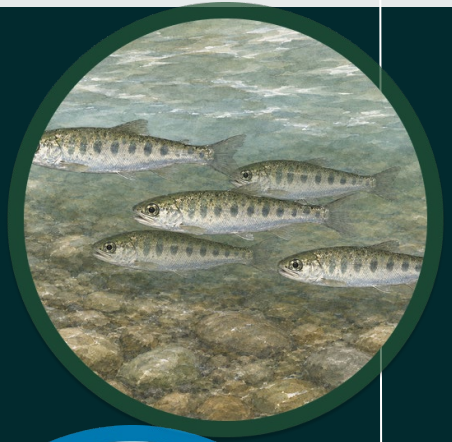
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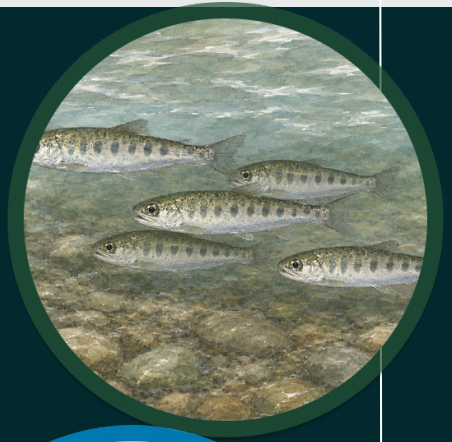
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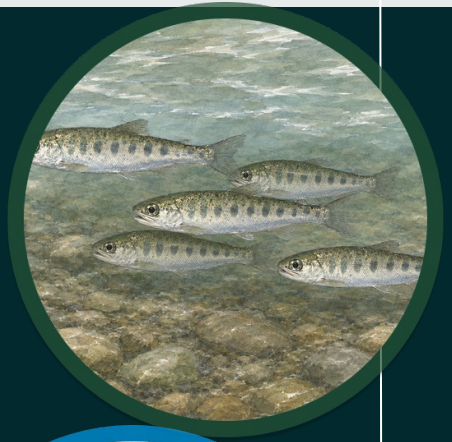
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Juvenile life stages (Lower river/Confluence/Delta)

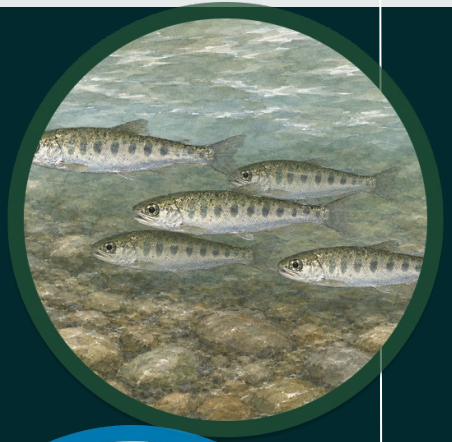
Data	Data Source
Acoustic Tag Data	CalFishTrack (NOAA)
Loss and Salvage	CDFW
Knights Landing RST	FishBio and CDFW
Lower Sacramento River RST	CDFW
Sacramento Trawls (Delta Juvenile Fish Monitoring Program)	DJFMP (USFWS)
Chipps Island Trawls (Delta Juvenile Fish Monitoring Program)	DJFMP (USFWS)
Beach Seines (Delta Juvenile Fish Monitoring Program)	DJFMP (USFWS)
Mossdale Trawl	CDFW
Total Natural Production Entering the Delta	JPE Letter (NMFS)
Total LSNFH Production Entering the Delta	JPE Letter (NMFS)
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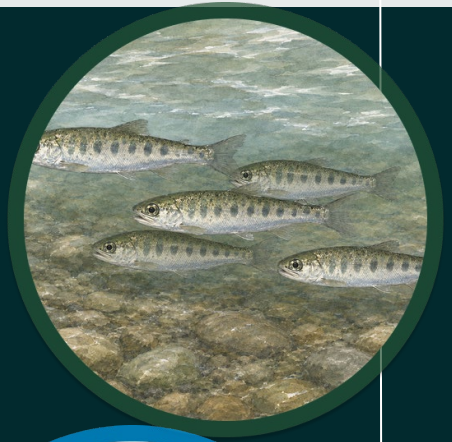
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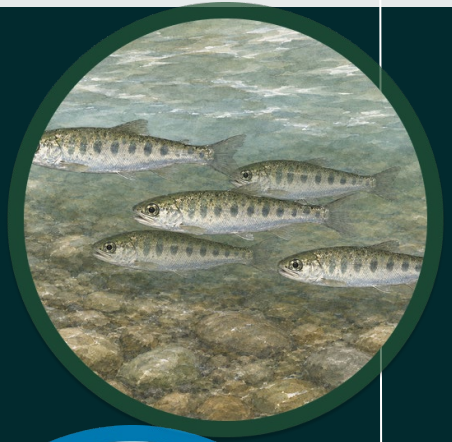
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Total Jumpstart Production Entering the Delta	JPE Letter (NMFS)





Data relevant to all freshwater life stages

Data	Data Source
Air Quality	EPA
Air Temperature	NCEI (NOAA)
Discharge/Flow	CDEC (DWR) and USGS
Dissolved Oxygen and Electrical Conductivity	CDEC (DWR)
Stage and Elevation	CDEC (DWR) and USGS
Turbidity	CDEC (DWR) and USGS
Water Temperature	CDEC (DWR) and USGS
OMR	USGS
OMRI	SacPAS Calculated Using Data From USGS, CDEC, and CDFW
Hydrologic Classification Indices (HCI)	CDEC (DWR)
River Forecast Data	SWFSC (NOAA) and CNRFC (NOAA)
Delta Hydrology	CDFW

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Water Temperature	CDEC (DWR) and USGS
OMR	USGS
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Hydrologic Classification Indices (HCI)	CDEC (DWR)
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Air Quality	EPA
Air Temperature	NCEI (NOAA)
Discharge/Flow	CDEC (DWR) and USGS
Dissolved Oxygen and Electrical Conductivity	CDEC (DWR)
Stage and Elevation	CDEC (DWR) and USGS
Turbidity	CDEC (DWR) and USGS
Water Temperature	CDEC (DWR) and USGS
OMR	USGS
OMRI	SacPAS Calculated Using Data From USGS, CDEC, and CDFW
Hydrologic Classification Indices (HCI)	CDEC (DWR)
River Forecast Data	SWFSC (NOAA) and CNRFC (NOAA)
Delta Hydrology	CDFW

Data relevant to all freshwater life stages

Data	Data Source
Air Quality	EPA
Air Temperature	NCEI (NOAA)
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Dissolved Oxygen and Electrical Conductivity	CDEC (DWR)
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SacPAS: Central Valley Prediction & Assessment of Salmon

RIVER CONDITION QUERY

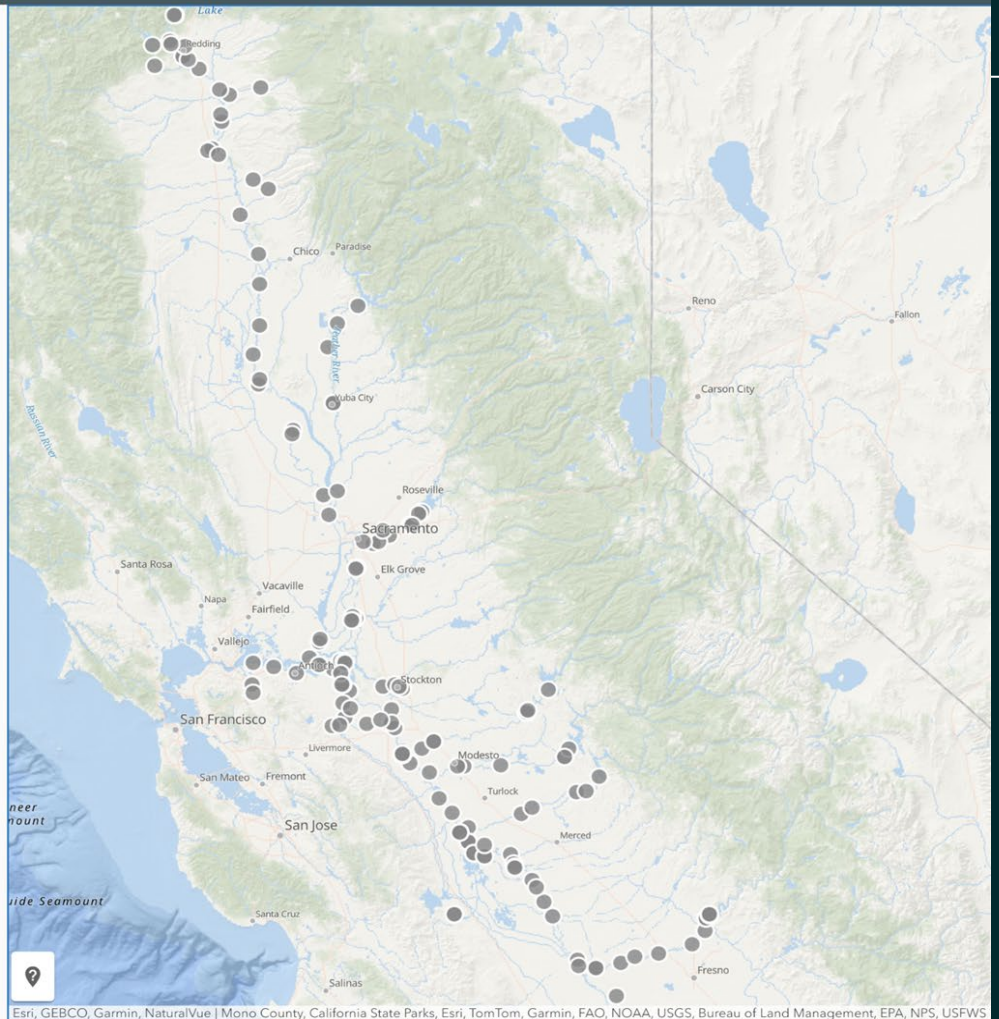
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- Output Types
- Hydrologic Area(1/4)
- Location(0/155)
- Data Type(0/22)
- Year(0/37)

MAP OPTIONS

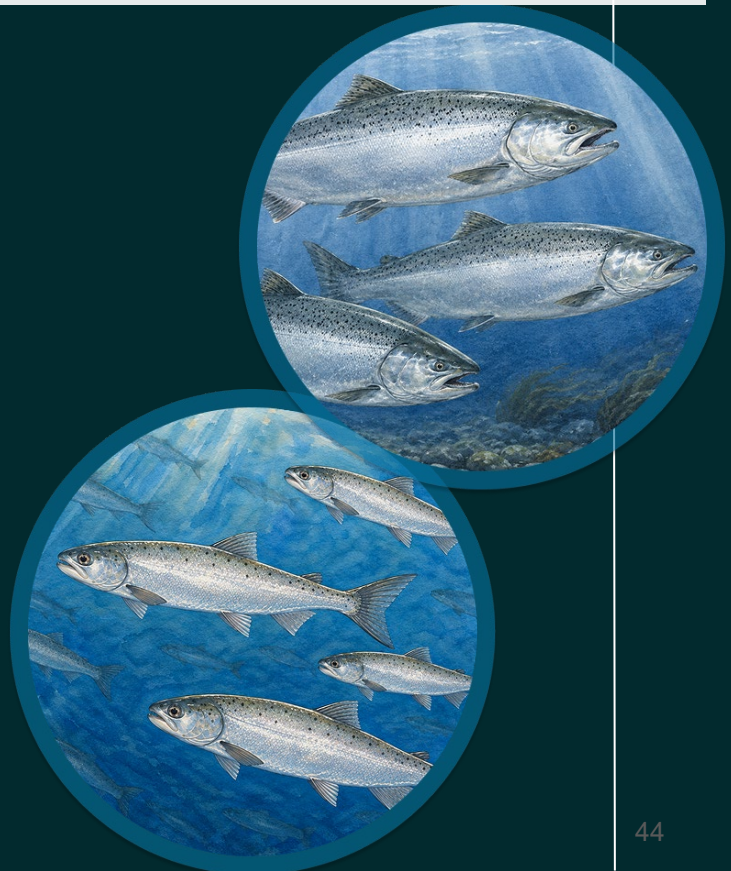
- Additional Layers(0/1)

Submit | Get URL | Reset



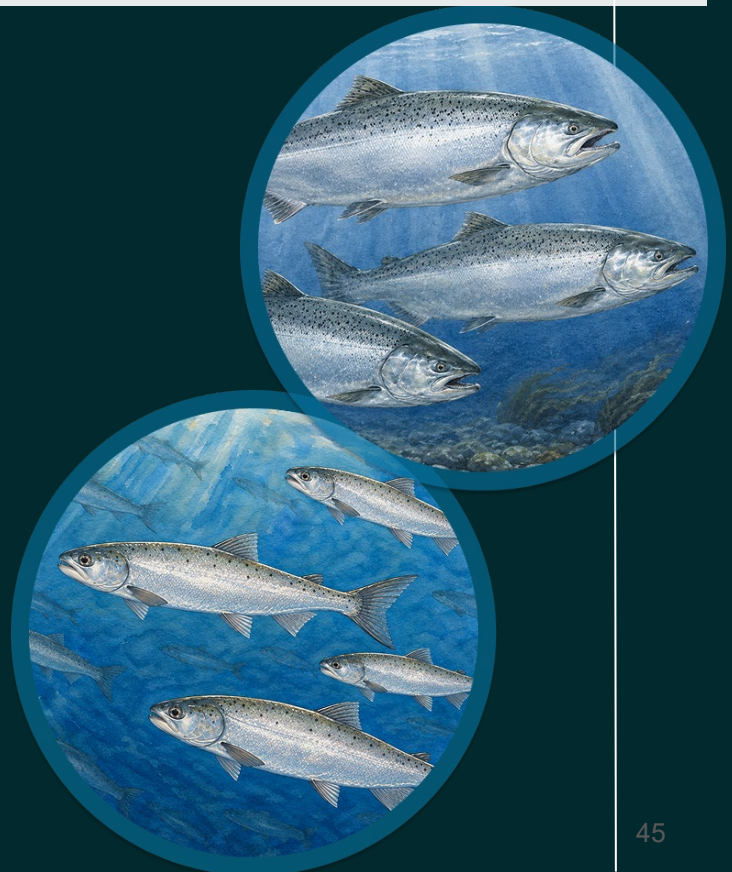
Subadult and adult life stages in ocean habitat

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Abundance Forecast	PFMC
Ocean Harvest Impact Rate	PFMC



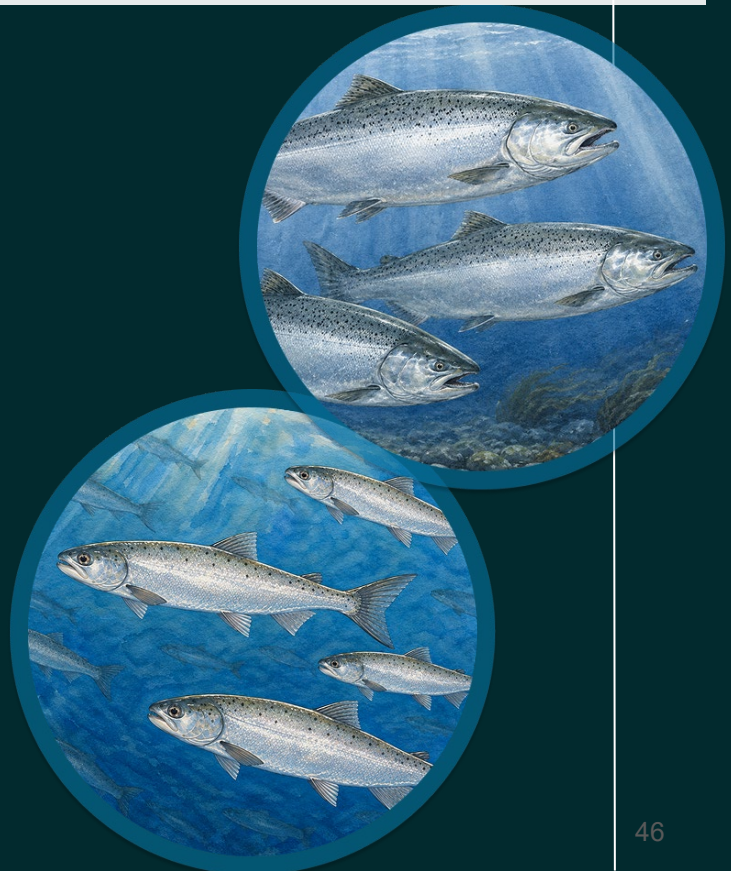
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Adults returning and spawning in freshwater habitat

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Escapement	GrandTab (CDFW)
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4. Email
   a. Privately share custom email for data inputs
   b. Still automatable and good for provisional or unreleased data

5. FAIR and CARE:

What we've applied and what we're working on

Findability

Accessibility

Interoperability

Reproducibility

(Wilkinson et al. 2016)

Collective benefit

Authority to control

Respect

Ethics

(Carroll et al. 2020)

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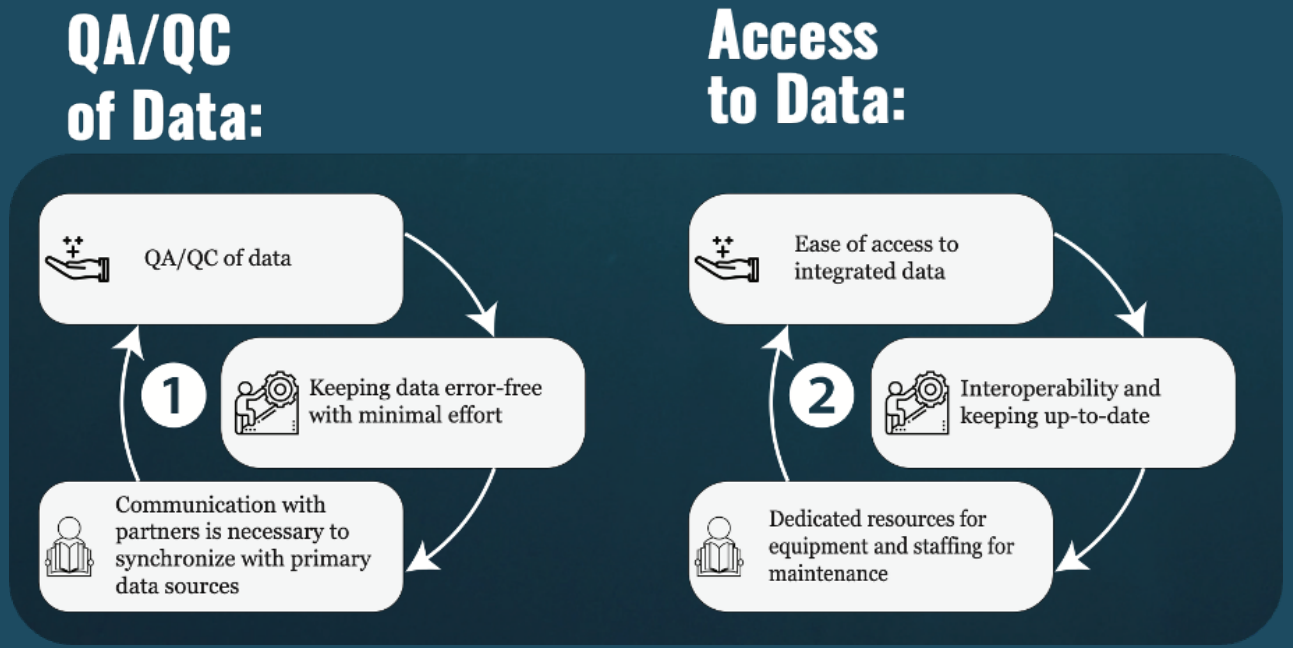
Indigenous Data Alliance
"CARE Directs Us Home"



(People)

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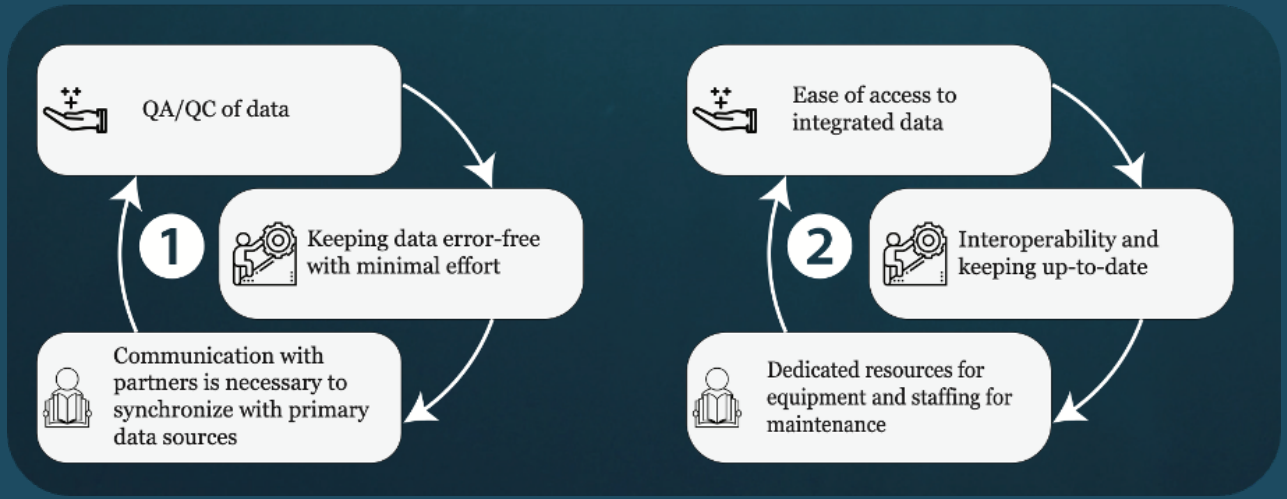
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QA/QC of Data:

Access to Data:

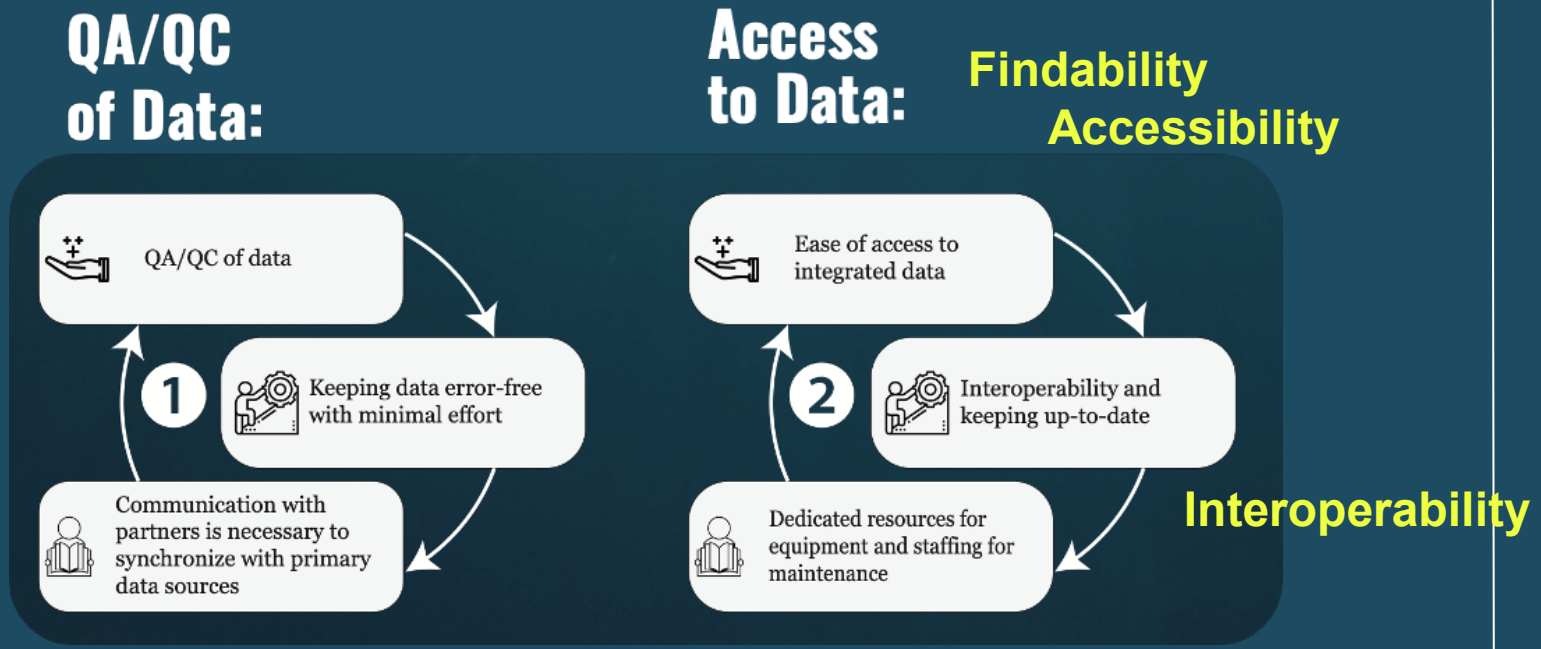
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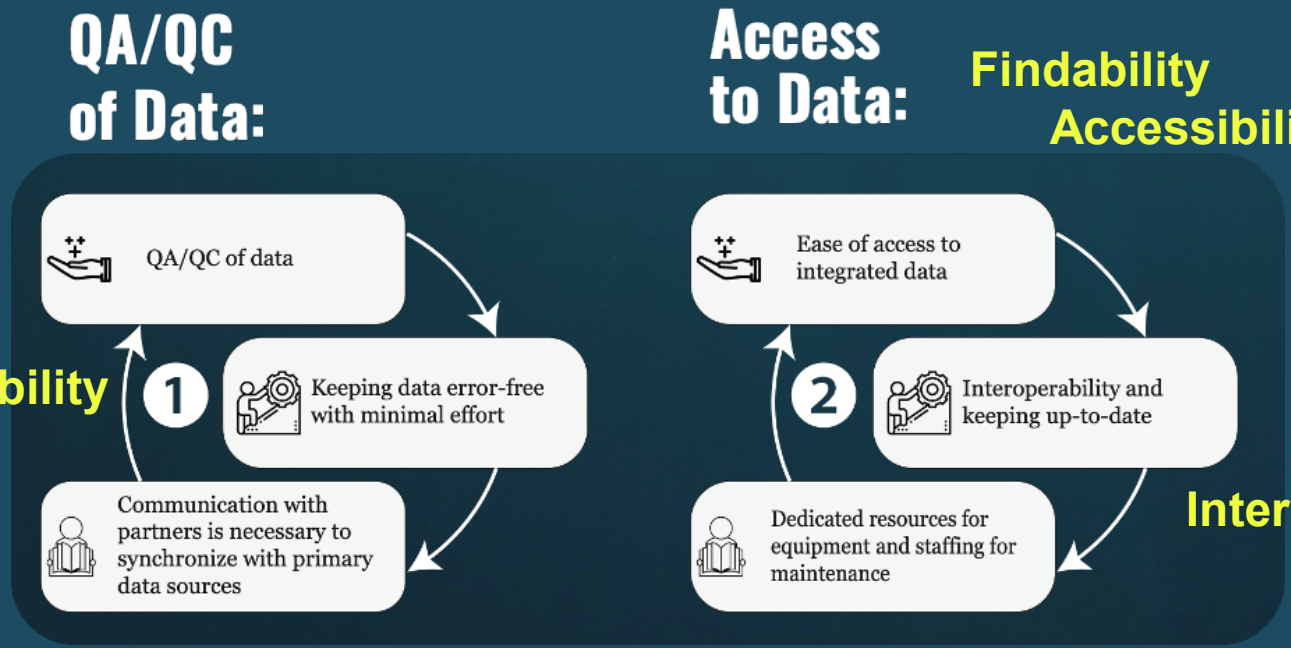
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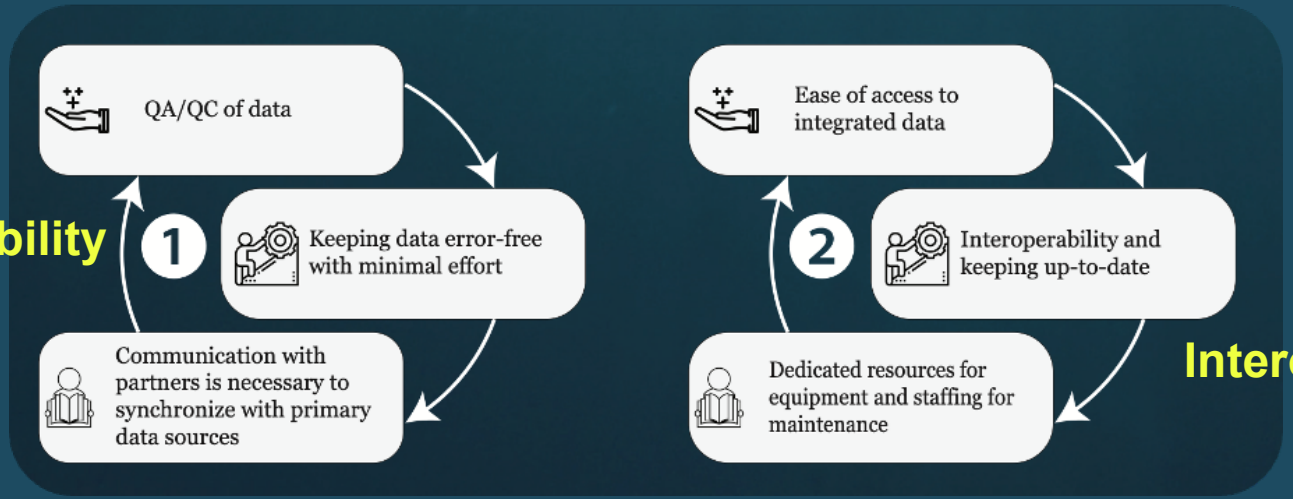


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QA/QC of Data: Collective Benefit

Access to Data: Findability, Accessibility

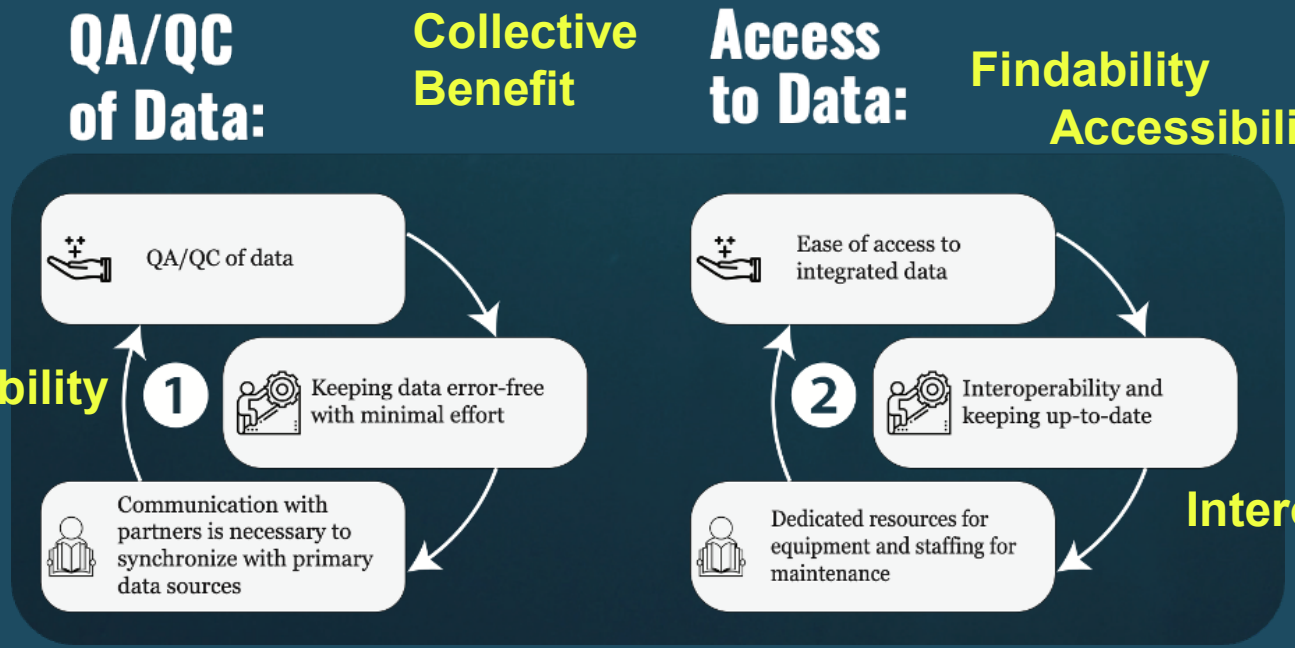


Reproducibility

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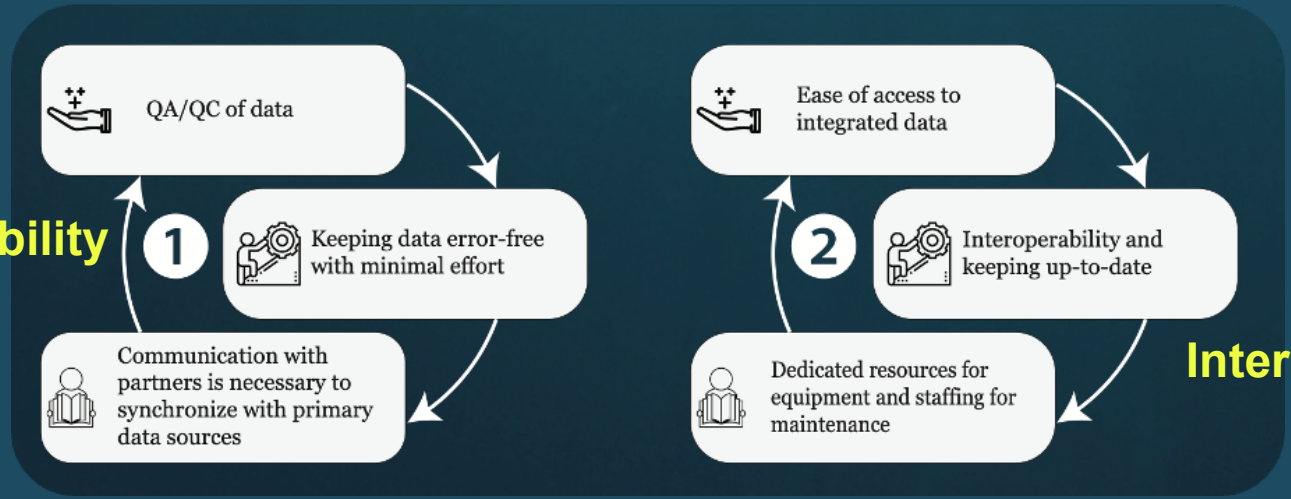
Authority to control

QA/QC of Data:

Collective Benefit

Access to Data:

Findability
Accessibility



Interoperability

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   - 1-pager
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5. **FAIR and CARE**
   - SacPAS makes data Findable and Accessible
   - Working towards a Collective Benefit
   - Collaborate with Data Owners
   - Learn and grow

Acknowledgments

We are grateful for Reclamation funding our SacPAS work, and in particular Lisa Elliott (GOTR) and Josh Israel.

We are deeply grateful for all of the field biologists and practitioners who collect and share their data with the region.



BUREAU OF RECLAMATION