

# Package: deltareportr (via r-universe)

September 1, 2024

**Title** Tools and Data for Automated Delta Reporting

**Version** 2.0.0

**Description** An R package for producing automated reports on the Sacramento San Joaquin Delta.

**License** GPL-3

**ByteCompile** true

**Encoding** UTF-8

**LazyData** true

**Depends** R (>= 3.5.0)

**Imports** sf, dplyr, tidyr, tibble, ggplot2, mapview, leaflet, lubridate, RColorBrewer, magrittr, rlang, ggthemes, stats, zooper (>= 0.2.0), deltamapr, discretewq (>= 0.0.0.9000), purrr

**Suggests** devtools, readr, readxl, rmarkdown, bookdown, here, git2r, spelling, knitr, DT

**URL** <https://github.com/sbashevkin/deltareportr>

**BugReports** <https://github.com/sbashevkin/deltareportr/issues>

**Remotes** InteragencyEcologicalProgram/zooper, InteragencyEcologicalProgram/deltamapr, sbashevkin/discretewq

**RoxygenNote** 7.1.2

**Language** en-US

**VignetteBuilder** knitr

**Repository** <https://sbashevkin.r-universe.dev>

**RemoteUrl** <https://github.com/sbashevkin/deltareportr>

**RemoteRef** HEAD

**RemoteSha** 22712800d5dc6af0a99dca633ac60e00eaaa4495

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bivalves	<i>Bivalve dataset</i>
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### Description

Bivalve abundance dataset from the California Department of Water Resources Environmental Monitoring Program.

### Usage

bivalves

### Format

a tibble with 8,892 rows and 7 variables

**Date** Sample collection date.

**Station** Station where sample was collected.

**Taxa** Bivalve species name.

**CPUE** Catch per unit effort in number of clams ( $m^{-2}$ ).

**Year** Year sample was collected.

**MonthYear** Month and year of sample collection.

**Source** Name of the source dataset.

**Details**

More metadata and information on methods are available [here](#).

**See Also**

[DeltaBivalver](#), [DeltaDater](#), [DeltaMetadater](#)

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dayflow	<i>Dayflow dataset</i>
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**Description**

Outflow and X2 from the California Department of Water Resources Dayflow model.

**Usage**

dayflow

**Format**

a tibble with 13,149 rows and 7 variables

**Date** Date.

**Out** Delta outflow ( $ft^3 s^{-1}$ ).

**X2** X2 (km).

**Details**

More metadata and information on methods are available [here](#).

**See Also**

[DeltaBivalver](#), [DeltaDater](#), [DeltaMetadater](#)

---

DeltaBivalver      *Plot bivalve data*

---

## Description

Function to process and plot bivalve data

## Usage

```
DeltaBivalver(  
  Data,  
  End_year,  
  Start_year = 2002,  
  Regions = c("Suisun Bay", "Suisun Marsh", "Lower Sacramento River",  
             "Sac Deep Water Shipping Channel", "Cache Slough/Liberty Island",  
             "Lower Joaquin River", "Southern Delta"),  
  Seasons = c("Winter", "Spring", "Summer", "Fall")  
)
```

## Arguments

Data	Input dataset created by <a href="#">DeltaDater</a> .
End_year	Last year (integer) that should be included in the plot. This year will also be highlighted.
Start_year	First year (integer) that should be included in the plot
Regions	Character vector of regions to include in the plot. The data will be filtered to only include these regions and ordered in the order provided here. To include data with NA regions, set Regions=NULL.
Seasons	Character vector of seasons to include. One plot will be produced for each season. Should be a combination of "Summer", "Fall", "Winter", or "Spring".

## Value

A list with the plot and processed data.

## See Also

[DeltaDater](#)

DeltaDater

*Process report data***Description**

Imports, filters, and processes datasets and outputs a list of desired datasets

**Usage**

```
DeltaDater(
  Start_year = 2002,
  End_year = 2020,
  Variables = c("Bivalves", "Zooplankton", "Phytoplankton", "Water quality"),
  WQ_sources = c("EMP", "STN", "FMWT", "EDSM", "SKT", "20mm", "Suisun"),
  Shapefile = deltamapr::R_EDSM_Strata_1819P1,
  Region_column = "Stratum",
  Regions = c("Suisun Bay", "Suisun Marsh", "Lower Sacramento River",
    "Sac Deep Water Shipping Channel", "Cache Slough/Liberty Island",
    "Lower Joaquin River", "Southern Delta"),
  Phyt_start = 2008
)
```

**Arguments**

Start_year	Earliest year you would like included in the report. Must be an integer. Defaults to 2002. For these purposes, December is pushed to the next year to ensure Winters are in the same year.
End_year	Latest year you would like included in the dataset. Must be an integer. Defaults to 2020. For these purposes, December is pushed to the next year to ensure Winters are in the same year.
Variables	Character vector of variables you would like included in the dataset. Defaults to all possible options: Variables = c("Bivalves", "Zooplankton", "Phytoplankton", "Water quality").
WQ_sources	Character vector of data sources for the water quality variables, pulled from the <a href="#">discretewq</a> package. See <a href="#">wq</a> for choices.
Shapefile	Shapefile you would like used to define regions in the dataset. Must be in <a href="#">sf</a> format, e.g., imported with <a href="#">st_read</a> . Defaults to <a href="#">R_EDSM_Strata_1819P1</a> .
Region_column	Quoted name of the column in the Shapefile with the region designations.
Regions	Character vector of regions to be included in the dataset. Must correspond with levels of the Region_column. To include all data points regardless of whether they correspond to a region in the Shapefile set Regions = NULL.
Phyt_start	First year to include for phytoplankton data. Defaults to 2008, when better counting methods were first adopted. This parameter uses calendar year.

**Value**

A list of datasets

**Examples**

```
Data <- DeltaDater(Start_year = 1900,  
WQ_sources = c("EMP", "STN", "FMWT", "EDSM", "SKT", "20mm", "Suisun"),  
Variables = "Water quality",  
Regions = NULL)
```

---

DeltaDayFlower      *Plot dayflow data*

---

**Description**

Function to process and plot dayflow data

**Usage**

```
DeltaDayFlower(End_year, Start_year = 2002)
```

**Arguments**

End_year	Last year (integer) that should be included in the plot. This year will also be highlighted.
Start_year	First year (integer) that should be included in the plot

**Value**

A list with the plot and processed data.

**See Also**

[DeltaDater](#)

---

DeltaMapper

*Plot Delta Regions Map*

---

### Description

Function to map delta regions

### Usage

```
DeltaMapper(  
  Regions = c("Suisun Bay", "Suisun Marsh", "Lower Sacramento River",  
             "Sac Deep Water Shipping Channel", "Cache Slough/Liberty Island",  
             "Lower Joaquin River", "Southern Delta"),  
  Save = FALSE,  
  Save_location  
)
```

### Arguments

Regions	Character vector of regions to include in the plot. The data will be filtered to only include these regions and ordered in the order provided here. To include data with NA regions, set Regions=NULL.
Save	Logical. Should plot be saved?
Save_location	If Save=TRUE, where should plot be saved? Must end with a filename with a ".png" extension.

### Value

A list with the plot and processed data.

### See Also

[DeltaDater](#)

---

DeltaMetadater

*Plot Metadata*

---

### Description

Function to process and plot metadata

**Usage**

```
DeltaMetadater(  
  Data,  
  Start_year = 2002,  
  Regions = c("Suisun Bay", "Suisun Marsh", "Lower Sacramento River",  
             "Sac Deep Water Shipping Channel", "Cache Slough/Liberty Island",  
             "Lower Joaquin River", "Southern Delta")  
)
```

**Arguments**

Data	Input dataset created by <a href="#">DeltaDater</a> .
Start_year	First year (integer) that should be included in the plot
Regions	Character vector of regions to include in the plot. The data will be filtered to only include these regions and ordered in the order provided here. To include data with NA regions, set Regions=NULL.

**Value**

A list with the plot and processed data.

**See Also**

[DeltaDater](#)

---

DeltaPhyter

*Plot phytoplankton data*

---

**Description**

Function to process and plot phytoplankton data

**Usage**

```
DeltaPhyter(  
  Data,  
  End_year,  
  Start_year = 2002,  
  Regions = c("Suisun Bay", "Suisun Marsh", "Lower Sacramento River",  
             "Sac Deep Water Shipping Channel", "Cache Slough/Liberty Island",  
             "Lower Joaquin River", "Southern Delta"),  
  Seasons = c("Winter", "Spring", "Summer", "Fall")  
)
```



**Arguments**

Data	Input dataset created by <a href="#">DeltaDater</a> .
End_year	Last year (integer) that should be included in the plot. This year will also be highlighted.
Start_year	First year (integer) that should be included in the plot
Regions	Character vector of regions to include in the plot. The data will be filtered to only include these regions and ordered in the order provided here. To include data with NA regions, set Regions=NULL.
Seasons	Character vector of seasons to include. One plot will be produced for each season. Should be a combination of "Summer", "Fall", "Winter", or "Spring".

**Value**

A list with the plot and processed data.

**See Also**

[DeltaDater](#)

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deltareportr	<i>deltareportr: A package to create automated reports for the Sacramento San Joaquin Delta</i>
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**Description**

This package contains a number of functions and datasets to generate automated reports on the Delta, as well as the reports themselves in the analysis folder.

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DeltaSmelter	<i>Plot Delta Smelt data</i>
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**Description**

Function to process and plot Delta Smelt data

**Usage**

```
DeltaSmelter(
  End_year,
  Start_year = 2002,
  EDSM_regions = c("Suisun Bay", "Suisun Marsh", "Lower Sacramento River",
    "Sac Deep Water Shipping Channel", "Cache Slough/Liberty Island",
    "Lower Joaquin River")
)
```

**Arguments**

End_year	Last year (integer) that should be included in the plot. This year will also be highlighted.
Start_year	First year (integer) that should be included in the plot
EDSM_regions	Character vector of regions to include in the EDSM plot. The data will be filtered to only include these regions and ordered in the order provided here. To include data with NA regions, set Regions=NULL. No Delta Smelt were caught in the Southern Delta so that region is excluded by default.

**Value**

A list with the plot and processed data.

**See Also**

[DeltaDater](#)

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DeltaWQer	<i>Plot water quality data</i>
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---

**Description**

Function to process and plot water quality (temperature, Secchi depth, salinity, chlorophyll, and *Microcystis*) data

**Usage**

```
DeltaWQer(
  Data,
  End_year,
  Start_year = 2002,
  Regions = c("Suisun Bay", "Suisun Marsh", "Lower Sacramento River",
    "Sac Deep Water Shipping Channel", "Cache Slough/Liberty Island",
    "Lower Joaquin River", "Southern Delta"),
  Temp_seasons = c("Winter", "Spring", "Summer", "Fall"),
  Secchi_seasons = c("Winter", "Spring", "Summer", "Fall"),
  Salinity_seasons = c("Winter", "Spring", "Summer", "Fall"),
  Chl_seasons = c("Winter", "Spring", "Summer", "Fall"),
  Micro_seasons = c("Winter", "Spring", "Summer", "Fall")
)
```

**Arguments**

Data	Input dataset created by <a href="#">DeltaDater</a> .
End_year	Last year (integer) that should be included in the plot. This year will also be highlighted.

Start_year	First year (integer) that should be included in the plot
Regions	Character vector of regions to include in the plot. The data will be filtered to only include these regions and ordered in the order provided here. To include data with NA regions, set Regions=NULL.
Temp_seasons	Character vector of seasons to retain for temperature. One plot will be produced for each season. Should be a combination of "Summer", "Fall", "Winter", or "Spring".
Secchi_seasons	Character vector of seasons to retain for Secchi. One plot will be produced for each season. Should be a combination of "Summer", "Fall", "Winter", or "Spring".
Salinity_seasons	Character vector of seasons to retain for salinity. One plot will be produced for each season. Should be a combination of "Summer", "Fall", "Winter", or "Spring".
Chl_seasons	Character vector of seasons to retain for chlorophyll. One plot will be produced for each season. Should be a combination of "Summer", "Fall", "Winter", or "Spring".
Micro_seasons	Character vector of seasons to retain for <i>Microcystis</i> . One plot will be produced for each season. Should be a combination of "Summer", "Fall", "Winter", or "Spring".

**Value**

A list with the plot and processed data.

**See Also**

[DeltaDater](#)

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DeltaZoooper	<i>Plot phytoplankton data</i>
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---

**Description**

Function to process and plot phytoplankton data

**Usage**

```
DeltaZoooper(
  Data,
  End_year,
  Start_year = 2002,
  Regions = c("Suisun Bay", "Suisun Marsh", "Lower Sacramento River",
             "Lower Joaquin River", "Southern Delta"),
  Seasons = c("Winter", "Spring", "Summer", "Fall")
)
```

**Arguments**

Data	Input dataset created by <a href="#">DeltaDater</a> .
End_year	Last year (integer) that should be included in the plot. This year will also be highlighted.
Start_year	First year (integer) that should be included in the plot
Regions	Character vector of regions to include in the plot. The data will be filtered to only include these regions and ordered in the order provided here. To include data with NA regions, set Regions=NULL.
Seasons	Character vector of seasons to include. One plot will be produced for each season. Should be a combination of "Summer", "Fall", "Winter", or "Spring".

**Value**

A list with the plot and processed data.

**See Also**

[DeltaDater](#)

---

phyto

*Phytoplankton dataset*

---

**Description**

Phytoplankton abundance dataset from the California Department of Water Resources Environmental Monitoring Program.

**Usage**

phyto

**Format**

a tibble with 202,420 rows and 7 variables

**Date** Sample collection date.

**Station** Station where sample was collected.

**Taxa** Phytoplankton taxa.

**CPUE** Catch per unit effort in number of cells, colonies, or filaments ( $ml^{-1}$ ).

**Year** Year sample was collected.

**MonthYear** Month and year of sample collection.

**Source** Name of the source dataset.

## Details

More metadata and information on methods are available [here](#).

## See Also

[DeltaPhyter](#), [DeltaDater](#), [DeltaMetadater](#)

---

smelt\_edsm

*Delta Smelt EDSM abundance estimates*

---

## Description

Estimated Delta Smelt abundance dataset from the United States Fish and Wildlife Service Enhanced Delta Smelt Monitoring Program.

## Usage

```
smelt_edsm
```

## Format

a tibble with 1,370 rows and 5 variables

**Region** Region of abundance estimate.

**Date** Abundance estimate date. Abundances are estimated weekly, but these dates represent the midpoint of each week.

**Abundance** Estimated Delta Smelt abundance.

**Variance** Variance of the abundance estimate.

**MonthYear** Month and year of sample collection.

## Details

More metadata and information on methods are available [here](#).

## See Also

[DeltaSmelter](#)

smelt\_iep

*Delta Smelt IEP indices*

---

**Description**

Delta Smelt abundance indices from the California Department of Fish and Wildlife surveys.

**Usage**

```
smelt_iep
```

**Format**

a tibble with 157 rows and 3 variables

**Year** Index year.

**Index** Delta Smelt index number.

**Source** Name of the source dataset.

**Details**

More metadata and information on methods are available here: [Fall Midwater Trawl](#), [Spring Kodiak Trawl](#), [20mm Survey](#), and [Summer Towntnet](#).

**See Also**

[DeltaSmelter](#)

---

StationBrowser*Browse station locations*

---

**Description**

Launches a leaflet map to browse station locations.

**Usage**

```
StationBrowser(  
  Data = deltareportr::stations,  
  Sources = NULL,  
  StationIDs = NULL  
)
```

**Arguments**

Data	Station location data. Defaults to <code>stations</code> , which only includes fixed station locations + EMP EZ locations post 2004. Does not include EDSM. Data must include columns named Latitude, Longitude, Source, and StationID.
Sources	Which data sources would you like to include? Set <code>Sources=NULL</code> (the default) to include all.
StationIDs	Which StationIDs to include. StationIDs take the form "Source, Station". Set <code>StationIDs=NULL</code> (the default) to include all.

---

 stations

*Station locations*


---

**Description**

Locations of all sampling stations.

**Usage**

```
stations
```

**Format**

a tibble with 1,266 rows and 5 variables

**Source** Name of the source dataset..

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**StationID** Combined source and station for a unique station ID.

**See Also**

[DeltaDater](#), [DeltaMetadater](#)

---

zoop\_mass\_conversions *Zooplankton mass conversions*

---

**Description**

Average dry mass for each meso and micro zooplankton taxa

**Usage**

zoop\_mass\_conversions

**Format**

a tibble with 37 rows and 2 variables

**Mass** Average individual mass ( $\mu\text{g}$ ).

**Taxlifestage** Taxonomic name and lifestage.

**See Also**

[DeltaZoooper](#), [DeltaDater](#), [DeltaMetadater](#)

---

zoop\_mysid *Mysid data*

---

**Description**

Mysid biomass per unit effort from the California Department of Fish and Wildlife Environmental Monitoring Program

**Usage**

zoop\_mysid

**Format**

a tibble with 22,558 rows and 2 variables

**Date** Date sample was collected.

**Station** Station where sample was collected.

**Taxa** Taxonomic name.

**BPUE** Biomass per unit effort ( $\mu\text{g m}^{-3}$ ).

**Year** Year sample was collected.

**MonthYear** Month and year sample was collected.

**Source** Name of the source dataset.



**Details**

More metadata and information on methods are available [here](#).

**See Also**

[DeltaZooper](#), [DeltaDater](#), [DeltaMetadater](#)

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