# Package: discretewq (via r-universe)

August 23, 2024

**Title** Integrated Dataset of Discrete Water Quality in the San Francisco Estuary

**Version** 2.4.0.9000

**Description** Produce an integrated dataset of discrete water quality measurements using any combination of the 17 source datasets included.

**License** GPL-3

**Depends** R (>= 2.10)

**Imports** dplyr, lubridate, magrittr, stringr, tidyr, wql

**Suggests** conflicted, covr, dataRetrieval, hms, purrr, readr, readxl, spelling, testthat, tibble

**Remotes** InteragencyEcologicalProgram/deltamapr

**Encoding** UTF-8

**Language** en-US

**LazyData** true

**LazyDataCompression** xz

**Roxygen** list(markdown = TRUE)

**RoxygenNote** 7.2.3

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

**RemoteUrl** https://github.com/sbashevkin/discretewq

**RemoteRef** HEAD

**RemoteSha** d8c8452c41ba49dec7ee54476a7dc9b9e762cc6f

## Contents

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`baystudy` *Bay Study water quality data*

---

## Description

Water quality data from the California Department of Fish and Wildlife Bay Study.

## Usage

```
baystudy
```

## Format

a tibble with 21,836 rows and 14 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Field_coords** Were lat/long coordinates collected in the field (TRUE), or do they represent the location of a fixed station (FALSE)?

**Date** Date sample was collected.

**Datetime** Date and time of sample collection.

**Depth** Bottom depth (m).

**Tide** Tidal stage.

**Secchi** Secchi depth (cm).

**Temperature** Temperature (°C) at surface.

**Temperature_bottom** Temperature (°C) at bottom.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

**Conductivity_bottom** Specific conductance ($\mu$S $cm^{-1}$) at bottom.

## Details

More metadata and information on methods are available here.

## See Also

wq

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`discretewq` *discretewq: A package to integrate discrete water quality data from the San Francisco Estuary*

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## Description

This package contains the source datasets and a function to combine any combination into an integrated dataset

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`DJFMP` *DJFMP water quality data*

---

## Description

Water quality data from the United States Fish and Wildlife Service Delta Juvenile Fish Monitoring Program.

## Usage

```
DJFMP
```

## Format

a tibble with 150,488 rows and 9 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Date** Date sample was collected.

**Datetime** Date and time of sample collection.

**Secchi** Secchi depth (cm).

**Temperature** Temperature in °C.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

**DissolvedOxygen** Dissolved oxygen (mg/L) at surface.

## Details

More metadata and information on methods are available here.

## See Also

wq

---

DOP *Directed Outflow Project water quality data*

---

## Description

Water quality data from the ICF/USBR Directed Outflow Project.

## Usage

```
DOP
```

## Format

a tibble with 3,473 rows and 16 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected. Includes Station_Code and Habitat from the source dataset because multiple habitats are collected at each station.

**Latitude** Latitude at start of zooplankton tow in decimal degrees.

**Longitude** Longitude at start of zooplankton tow in decimal degrees.

**Field_coords** Were lat/long coordinates collected in the field (TRUE), or do they represent the location of a fixed station (FALSE)?

**Date** Date sample was collected.

**Datetime** Date and time of sample collection.

**Depth** Bottom depth at start of trawl (m).

**Secchi** Secchi depth (cm).

**Temperature** Temperature (°C) at surface.

**Salinity** Salinity at surface.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

**DissolvedOxygen** Dissolved oxygen (mg/L) at surface.

**pH** pH (dimensionless) at surface.

**TurbidityFNU** Turbidity (FNU) at surface.

**Chlorophyll** Chlorophyll-a concentration ($\mu$g $L^{-1}$) at surface.

## Details

More metadata and information on methods are available here.

## See Also

wq

---

EDSM *EDSM water quality data*

---

## Description

Water quality data from the United States Fish and Wildlife Service Enhanced Delta Smelt Monitoring Program.

## Usage

```
EDSM
```

## Format

a tibble with 30,957 rows and 14 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected. This represents an identifier for the unique EDSM target location. Multiple tows (and water quality samples) were often collected at each target location on a day.

**Latitude** Latitude in decimal degrees. This is the actual latitude of the sample collection, not the latitude of the target location.

**Longitude** Longitude in decimal degrees. This is the actual longitude of the sample collection, not the longitude of the target location.

**Field_coords** Were lat/long coordinates collected in the field (TRUE), or do they represent the location of a fixed station (FALSE)?

**Date** Date sample was collected.

**Datetime** Date and time of sample collection.

**Depth** Bottom depth (m).

**Tide** Tidal stage.

**Secchi** Secchi depth (cm).

**Temperature** Temperature in °C.

**Temperature_bottom** Temperature (°C) at bottom.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

**DissolvedOxygen** Dissolved oxygen (mg/L) at surface.

**DissolvedOxygen_bottom** Dissolved oxygen (mg/L) at bottom.

**Notes** Comments.

## Details

More metadata and information on methods are available here.

## See Also

wq

---

EMP *EMP water quality data*

---

## Description

Water quality data from the California Department of Water Resources Environmental Monitoring Program.

## Usage

```
EMP
```

## Format

a tibble with 17,366 rows and 68 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Field_coords** Were lat/long coordinates collected in the field (TRUE), or do they represent the location of a fixed station (FALSE)?

**Date** Date sample was collected.

**Datetime** Date and time sample was collected.

**Notes** Notes or comments.

**Depth** Bottom depth (m).

**Tide** Tidal stage (always High Slack).

**Microcystis** Microcystis bloom intensity on a qualitative scale from 1 to 5 where 1 = absent, 2 = low, 3 = medium, 4 = high, and 5 = very high.

**Chlorophyll_Sign** Whether the Chlorophyll value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**Chlorophyll** Chlorophyll concentration ($\mu$g $L^{-1}$).

**Secchi** Secchi depth (cm).

**Temperature** Temperature (°C) at surface.

**Temperature_bottom** Temperature (°C) at bottom.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

**Conductivity_bottom** Specific conductance ($\mu$S $cm^{-1}$) at bottom.

**DissolvedOxygen** Dissolved oxygen (mg/L) at surface.

**DissolvedOxygen_bottom** Dissolved oxygen (mg/L) at bottom.

**DissolvedOxygenPercent** Dissolved oxygen percent (dimensionless) at surface.

**DissolvedOxygenPercent_bottom** Dissolved oxygen percent (dimensionless) at bottom.

**pH** pH (dimensionless) at surface.

**pH_bottom** pH (dimensionless) at bottom.

**TurbidityNTU** Turbidity (NTU) at surface.

**TurbidityNTU_bottom** Turbidity (NTU) at bottom.

**TurbidityFNU** Turbidity (FNU) at surface.

**TurbidityFNU_bottom** Turbidity (FNU) at bottom.

**Pheophytin_Sign** Whether the Pheophytin value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**Pheophytin** Pheophytin concentration ($\mu$g $L^{-1}$).

**TotAlkalinity_Sign** Whether the Total Alkalinity value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**TotAlkalinity** Total Alkalinity (mg/L).

**TotAmmonia_Sign** Whether the Total Ammonia value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**TotAmmonia** Total Ammonia (mg/L).

**DissAmmonia_Sign** Whether the Dissolved Ammonia value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DissAmmonia** Dissolved Ammonia (mg/L). If DissAmmonia_Sign is <, this is equal to the reporting limit, NA = RL unknown.

**DissBromide_Sign** Whether the Dissolved Bromide value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DissBromide** Dissolved bromide (mg/L).

**DissCalcium_Sign** Whether the Dissolved Calcium value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DissCalcium** Dissolved calcium (mg/L).

**TotChloride_Sign** Whether the Total Chloride value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**TotChloride** Total chloride (mg/L).

**DissChloride_Sign** Whether the Dissolved Chloride value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DissChloride** Dissolved chloride (mg/L).

**DissNitrateNitrite_Sign** Whether the Dissolved Nitrate Nitrite value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DissNitrateNitrite** Dissolved Nitrate and Nitrite (mg/L). If DissNitrateNitrite_Sign is <, this is equal to the reporting limit, with NA = RL unknown.

**DOC_Sign** Whether the DOC value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DOC** Dissolved organic carbon (mg/L).

**TOC_Sign** Whether the TOC value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**TOC** Total Organic Carbon (mg/L).

**DON_Sign** Whether the DON value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DON** Dissolved Organic Nitrogen (mg/L).

**TON_Sign** Whether the Total Organic Nitrogen value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**TON** Total Organic Nitrogen (mg/L).

**DissOrthophos_Sign** Whether the Dissolved Ortho-phosphate value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DissOrthophos** Dissolved Ortho-phosphate (mg/L). If DissOrthophos_Sign is <, this is equal to the reporting limit, with NA = RL unknown.

**TotPhos_Sign** Whether the Total Phosphate value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**TotPhos** Total phosphorous (mg/L).

**DissSilica_Sign** Whether the Dissolved Silica value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DissSilica** Dissolved silica (mg/L).

**TDS_Sign** Whether the Total Dissolved Solids value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**TDS** Total Dissolved Solids (mg/L).

**TSS_Sign** Whether the TSS value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**TSS** Total Suspended Solids (mg/L).

**VSS_Sign** Whether the VSS value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**VSS** Volatile Suspended Solids (mg/L).

**TKN_Sign** Whether the TKN value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**TKN** Total Kjeldahl Nitrogen (mg/L).

## Details

More metadata and information on methods are available here.

## See Also

wq; for more information on _Sign variables: sign_variables

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FMWT *FMWT water quality data*

---

## Description

Water quality data from the California Department of Fish and Wildlife Fall Midwater Trawl.

## Usage

```
FMWT
```

## Format

a tibble with 29,237 rows and 16 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Date** Date sample was collected.

**Datetime** Date and time of sample collection.

**Depth** Bottom depth (m).

**Tide** Tidal stage.

**Microcystis** Microcystis bloom intensity on a qualitative scale from 1 to 5 where 1 = absent, 2 = low, 3 = medium, 4 = high, and 5 = very high.

**Secchi** Secchi depth (cm).

**Secchi_estimated** Was Secchi depth estimated? Y/N

**Temperature** Temperature (°C) at surface.

**Temperature_bottom** Temperature (°C) at bottom.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

**Conductivity_bottom** Specific conductance ($\mu$S $cm^{-1}$) at bottom.

**TurbidityNTU** Turbidity (NTU) at surface.

## Details

More metadata and information on methods are available here.

## See Also

wq

---

NCRO *NCRO water quality data*

---

## Description

Water quality data from the California Department of Water Resources North Central Region Office.

## Usage

```
NCRO
```

## Format

a tibble with 10,652 rows and 49 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Date** Date sample was collected.

**Datetime** Date and time sample was collected.

**Secchi** Secchi depth (cm).

**Microcystis** Microcystis bloom intensity on a qualitative scale from 1 to 5 where 1 = absent, 2 = low, 3 = medium, 4 = high, and 5 = very high.

**Temperature** Temperature (°C) at surface.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

**DissolvedOxygen** Dissolved oxygen (mg/L) at surface.

**DissolvedOxygen_bottom** Dissolved oxygen (mg/L) at bottom.

**pH** pH (dimensionless) at surface.

**TurbidityNTU** Turbidity (NTU) at surface.

**TurbidityFNU** Turbidity (FNU) at surface.

**TotAlkalinity_Sign** Whether the Total Alkalinity value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**TotAlkalinity** Total Alkalinity (mg/L).

**DissAmmonia_Sign** Whether the Dissolved Ammonia value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DissAmmonia** Dissolved Ammonia (mg/L). If DissAmmonia_Sign is <, this is equal to the reporting limit

**DissBromide_Sign** Whether the Dissolved Bromide value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DissBromide** Dissolved bromide (mg/L). If DissBromide_Sign is <, this is equal to the reporting limit

**DissCalcium_Sign** Whether the Dissolved Calcium value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DissCalcium** Dissolved calcium (mg/L). If DissCalcium_Sign is <, this is equal to the reporting limit

**DissChloride_Sign** Whether the Dissolved chloride value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DissChloride** Dissolved chloride (mg/L).

**Chlorophyll_Sign** Whether the Chlorophyll value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "="

**Chlorophyll** Chlorophyll concentration ($\mu$g $L^{-1}$).

**Pheophytin_Sign** Whether the Pheophytin is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**Pheophytin** Pheophytin concentration ($\mu$g $L^{-1}$).

**DissNitrateNitrite_Sign** Whether the Dissolved Nitrate Nitrite value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DissNitrateNitrite** Dissolved Nitrate and Nitrite (mg/L). If DissNitrateNitrite_Sign is <, this is equal to the reporting limit

**DOC_Sign** Whether the Dissolved Organic Carbon value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "="

**DOC** Dissolved organic carbon (mg/L). If DOC_Sign is <, this is equal to the reporting limit

**TOC_Sign** Whether the Total Organic Carbon value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "="

**TOC** Total Organic Carbon (mg/L).If TOC_Sign is <, this is equal to the reporting limit

**DON_Sign** Whether the Dissolved Organic Nitrate value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "="

**DON** Dissolved Organic Nitrogen (mg/L).If DON_Sign is <, this is equal to the reporting limit

**DissOrthophos_Sign** Whether the Dissolved Orthophos value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**DissOrthophos** Dissolved Ortho-phosphate (mg/L). If DissOrthophos_Sign is <, this is equal to the reporting limit

**TotPhos_Sign** Whether the Total Phosphate value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "="

**TotPhos** Total phosphorous (mg/L). If TotPhos_Sign is <, this is equal to the reporting limit.

**TSS_Sign** Whether the Total Suspended Solids value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "="

**TSS** Total suspended solids (mg/L). If TSS_Sign is <, this is equal to the reporting limit

**VSS_Sign** Whether the Volatile Suspended Solids value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "="

**VSS** Volatile suspended solids (mg/L). If VSS_Sign is <, this is equal to the reporting limit

**TKN_Sign** Whether the Total Kjeldahl Nitrogen value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=". "NA" indicates reporting limit unknown.

**TKN** Total Kjeldahl Nitrogen (mg/L). IF TKN_Sign is <, this is equal to the reporting limit.

**TDS_Sign** Whether the Total Dissolved Solids value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), or reported as the measured value "=".

**TDS** Total Dissolved Solids (mg/L).

## Details

Contact Jared Frantzich Jared.Frantzich@water.ca.gov for more information.

## See Also

wq; for more information on _Sign variables: sign_variables

---

SDO *SDO water quality data*

---

## Description

Water quality data from the California Department of Water Resources Stockton Dissolved Oxygen monitoring.

## Usage

```
SDO
```

## Format

a tibble with 3,112 rows and 16 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Date** Date sample was collected.

**Datetime** Date and time of sample collection.

**Microcystis** Microcystis bloom intensity on a qualitative scale from 1 to 5 where 1 = absent, 2 = low, 3 = medium, 4 = high, and 5 = very high.

**Secchi** Secchi depth (cm).

**Temperature** Temperature (°C) at surface.

**Temperature_bottom** Temperature (°C) at bottom.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

**Conductivity_bottom** Specific conductance ($\mu$S $cm^{-1}$) at bottom.

**DissolvedOxygen** Dissolved oxygen (mg/L) at surface.

**DissolvedOxygen_bottom** Dissolved oxygen (mg/L) at bottom.

**pH** pH (dimensionless) at surface.

**pH_bottom** pH (dimensionless) at bottom.

## Details

More metadata and information on methods are available here.

## See Also

wq

SKT *SKT water quality data*

## Description

Water quality data from the California Department of Fish and Wildlife Spring Kodiak Trawl.

## Usage

```
SKT
```

## Format

a tibble with 4,505 rows and 13 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Field_coords** Were lat/long coordinates collected in the field (TRUE), or do they represent the location of a fixed station (FALSE)?

**Date** Date sample was collected.

**Datetime** Date and time of sample collection.

**Depth** Bottom depth (m).

**Tide** Tidal stage.

**Secchi** Secchi depth (cm).

**Temperature** Temperature (°C) at surface.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

**Notes** Comments.

## Details

More metadata and information on methods are available here.

## See Also

wq

SLS *SLS water quality data*

## Description

Water quality data from the California Department of Fish and Wildlife Smelt Larva Survey.

## Usage

```
SLS
```

## Format

a tibble with 2,889 rows and 12 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Date** Date sample was collected.

**Datetime** Date and time of sample collection.

**Depth** Bottom depth (m).

**Tide** Tidal stage.

**Secchi** Secchi depth (cm).

**Temperature** Temperature (°C) at surface.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

**Notes** Comments.

## Details

More metadata and information on methods are available here.

## See Also

wq

STN *STN water quality data*

## Description

Water quality data from the California Department of Fish and Wildlife Summer Townet Survey.

## Usage

```
STN
```

## Format

a tibble with 8,074 rows and 16 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Date** Date sample was collected.

**Datetime** Date and time of sample collection.

**Depth** Bottom depth (m).

**Tide** Tidal stage.

**Microcystis** Microcystis bloom intensity on a qualitative scale from 1 to 5 where 1 = absent, 2 = low, 3 = medium, 4 = high, and 5 = very high.

**Secchi** Secchi depth (cm).

**Temperature** Temperature (°C) at surface.

**Temperature_bottom** Temperature (°C) at bottom.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

**Conductivity_bottom** Specific conductance ($\mu$S $cm^{-1}$) at bottom.

**TurbidityNTU** Turbidity (NTU) at surface.

**Notes** Comments.

## Details

More metadata and information on methods are available here.

## See Also

wq

suisun *Suisun water quality data*

## Description

Water quality data from the UC Davis Suisun Marsh Fish Study.

## Usage

```
suisun
```

## Format

a tibble with 14,206 rows and 11 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Date** Date sample was collected.

**Datetime** Date and time of sample collection.

**Depth** Bottom depth (m).

**Tide** Tidal stage.

**Secchi** Secchi depth (cm).

**Temperature** Temperature (°C) at surface.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

**DissolvedOxygen** Dissolved oxygen (mg/L) at surface.

**DissolvedOxygenPercent** Dissolved oxygen percent (dimensionless) at surface.

## Details

More metadata and information on methods are available here.

## See Also

wq

`twentymm` *20mm water quality data*

## Description

Water quality data from the California Department of Fish and Wildlife 20mm survey.

## Usage

```
twentymm
```

## Format

a tibble with 10,469 rows and 14 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Field_coords** Were lat/long coordinates collected in the field (TRUE), or do they represent the location of a fixed station (FALSE)?

**Date** Date sample was collected.

**Datetime** Date and time of sample collection.

**Depth** Bottom depth (m).

**Tide** Tidal stage.

**Secchi** Secchi depth (cm).

**Temperature** Temperature (°C) at surface.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

**Conductivity_bottom** Specific conductance ($\mu$S $cm^{-1}$) at bottom.

**Notes** Comments.

## Details

More metadata and information on methods are available here.

## See Also

`wq`

USBR *USBR water quality data*

## Description

Water quality data from the United States Bureau of Reclamation Sacramento Deepwater Ship Channel cruises.

## Usage

```
USBR
```

## Format

a tibble with 904 rows and 13 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Date** Date sample was collected.

**Datetime** Date and time of sample collection.

**Depth** Bottom depth (m). Only 1 value per station, probably an average?

**Sample_depth_surface** Depth (m) of surface sample.

**Sample_depth_bottom** Depth (m) of bottom sample.

**Chlorophyll** Chlorophyll concentration ($\mu$g $L^{-1}$).

**Temperature** Temperature (°C) at surface.

**Temperature_bottom** Temperature (°C) at bottom.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

## See Also

wq

USGS_CAWSC *USGS CAWSC water quality data*

## Description

Discrete water quality data from the USGS California Water Science Center

## Usage

```
USGS_CAWSC
```

## Format

a tibble with 16,751 rows and 19 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Date** Date sample was collected.

**Datetime** Date and time sample was collected.

**Chlorophyll_Sign** Whether the Chlorophyll value is estimated (extrapolated at low end) or reported as measured.

**Chlorophyll** Chlorophyll concentration ($\mu$g $L^{-1}$).

**DissAmmonia_Sign** Whether the Dissolved Ammonia value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), estimated "~", or reported as the measured value "=".

**DissAmmonia** Dissolved Ammonia (mg/L). If DissAmmonia_Sign is <, this is equal to the reporting limit, NA = RL unknown.

**DissNitrateNitrite_Sign** Whether the Dissolved Nitrate Nitrite value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), estimated "~", or reported as the measured value "=".

**DissNitrateNitrite** Dissolved Nitrate and Nitrite (mg/L)

**DOC** Dissolved Organic Carbon (mg/L)

**DissOrthophos_Sign** Whether the Dissolved Orthophosphate value is lower than reported ("<" because it is below the reporting limit and the reporting limit is used as the value), estimated "~", or reported as the measured value "=".

**DissOrthophos** Dissolved Ortho-phosphate (mg/L)

**DissolvedOxygen** Dissolved oxygen (mg/L) at surface.

**pH** pH (dimensionless) at surface.

**Temperature** Temperature (°C) at surface.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

### Details

More metadata and information on methods are available here for data and here for metadata.

### See Also

wq; for more information on _Sign variables: sign_variables

---

`USGS_SFBS` *USGS SFBS water quality data*

---

### Description

Water quality data from the United States Geological Survey San Francisco Bay Water Quality Survey.

### Usage

```
USGS_SFBS
```

### Format

a tibble with 23,923 rows and 22 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Date** Date sample was collected.

**Datetime** Date and time of sample collection. Reported as an average when the collection times varied among the the surface and bottom WQ and nutrient parameters.

**Sample_depth_surface** Depth (m) of surface sample. Reported as an average when surface depths varied among the WQ parameters.

**Sample_depth_bottom** Depth (m) of bottom sample. Reported as an average when bottom depths varied among the WQ parameters.

**Temperature** Temperature (°C) at surface.

**Temperature_bottom** Temperature (°C) at bottom.

**Salinity** Salinity at surface.

**Salinity_bottom** Salinity at bottom.

**Chlorophyll** Chlorophyll concentration ($\mu g\ L^{-1}$) at surface.

**DissolvedOxygen** Dissolved oxygen (mg/L) at surface.

**DissolvedOxygen_bottom** Dissolved oxygen (mg/L) at bottom.

**DissolvedOxygenPercent** Dissolved oxygen percent (dimensionless) at surface.

**DissolvedOxygenPercent_bottom** Dissolved oxygen percent (dimensionless) at bottom.

**Sample_depth_nutr_surface** Depth (m) paired w/ nutrient sampling (range: 0-5 m). Reported as an average when surface depths varied among the nutrient parameters.

**DissNitrateNitrite** Dissolved Nitrate and Nitrite (mg/L).

**DissAmmonia** Dissolved Ammonia (mg/L).

**DissOrthophos** Dissolved Ortho-phosphate (mg/L).

**DissSilica** Dissolved Silica (mg/L).

## Details

More metadata and information on methods are available here for data from 1969-2015 and here for data from 2016-2019.

## See Also

`wq`

---

`wq` *Process and combine water quality data*

---

## Description

Imports, filters, and processes water quality datasets and outputs an integrated dataset

## Usage

```
wq(Sources = NULL, Start_year = NULL, End_year = NULL)
```

## Arguments

| | |
|---|---|
| `Sources` | Character vector of data sources for the water quality variables. No default, this must be specified. Choices include "20mm" (20mm Survey, `twentymm`), "Baystudy" (Bay Study, `baystudy`), "DJFMP" (Delta Juvenile Fish Monitoring Program, `DJFMP`), "DOP" (Directed Outflow Project `DOP`)), "EDSM" (Enhanced Delta Smelt Monitoring, `EDSM`), "EMP" (Environmental Monitoring Program, `EMP`), "FMWT" (Fall Midwater Trawl, `FMWT`), "NCRO" (NCRO, `NCRO`), "SDO" (Stockton Dissolved Oxygen Survey, `SDO`), "SKT" (Spring Kodiak Trawl, `SKT`), "SLS" (Smelt Larva Survey, `SLS`), "STN" (Summer Townet Survey, `STN`), "Suisun" (Suisun Marsh Fish Study, `suisun`), "USBR" (United States Bureau of Reclamation Sacramento Deepwater Ship Channel data, `USBR`), "USGS_CAWSC" (USGS California Water Science Center monitoring data, `USGS_CAWSC`), "USGS_SFBS" (USGS San Francisco Bay Surveys, `USGS_SFBS`), and "YBFMP" (Yolo Bypass Fish Monitoring Program, `YBFMP`). |
| `Start_year` | Earliest year you would like included in the dataset. Must be an integer. Defaults to year `0`. |
| `End_year` | Latest year you would like included in the dataset. Must be an integer. Defaults to the current year. |

## Value

An integrated dataset

## Examples

```
Data <- wq(
  Sources = c(
    "20mm",
    "Baystudy",
    "DJFMP",
    "DOP",
    "EDSM",
    "EMP",
    "FMWT",
    "NCRO",
    "SDO",
    "SKT",
    "SLS",
    "STN",
    "Suisun",
    "USBR",
    "USGS_CAWSC",
    "USGS_SFBS",
    "YBFMP"
  )
)
```

---

# YBFMP *YBFMP water quality data*

---

## Description

Water quality data from the California Department of Water Resources Yolo Bypass Fish Monitoring Program.

## Usage

```
YBFMP
```

## Format

a tibble with 8,883 rows and 14 variables

**Source** Name of the source dataset.

**Station** Station where sample was collected.

**Latitude** Latitude in decimal degrees.

**Longitude** Longitude in decimal degrees.

**Date** Date sample was collected.

**Datetime** Date and time sample was collected.

**Tide** Tidal stage ('overtopping' refers to periods of floodplain inundation that drown out tidal effects).

**Microcystis** Microcystis bloom intensity on a qualitative scale from 1 to 5 where 1 = absent, 2 = low, 3 = medium, 4 = high, and 5 = very high.

**Secchi** Secchi depth (cm).

**Temperature** Temperature (°C) at surface.

**Conductivity** Specific conductance ($\mu$S $cm^{-1}$) at surface.

**DissolvedOxygen** Dissolved oxygen (mg/L) at surface.

**pH** pH (dimensionless) at surface.

**Notes** Notes or comments.

## Details

More metadata and information on methods are available here and here.

## See Also

wq

# Index