

Package ‘waterYearType’

July 22, 2025

Type Package

Title Sacramento and San Joaquin Valley Water Year Types

Version 1.0.1

Description Provides Water Year Hydrologic Classification Indices based on measured unimpaired runoff (in million acre-feet). Data is provided by California Department of Water Resources and subject to revision.

Depends R (>= 2.10)

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water_year_indices

*Water Year Index and Type 1901-2017***Description****Department of Water Resources**

<http://cdec.water.ca.gov/cgi-progs/iodir/WSIHIST>

California Cooperative Snow Surveys / Chronological Reconstructed Sacramento and San Joaquin Valley

Water Year Hydrologic Classification Indices based on measured unimpaired runoff (in million acre-feet), subject to revision.

Abbreviations:

- WY - Water year (Oct 1 - Sep 30)
- W - Wet year type
- AN - Above normal year type
- BN - Below normal year type
- D - Dry year type
- C - Critical year type

Notes:

Unimpaired runoff represents the natural water production of a river basin, unaltered by upstream diversions, storage, export of water to or import of water from other basins.

Sacramento River Runoff is the sum (in maf) of Sacramento River at Bend Bridge, Feather River inflow to Lake Oroville, Yuba River at Smartville, and American River inflow to Folsom Lake. The WY sum is also known as the Sacramento River Index, and was previously referred to as the "4 River Index" or "4 Basin Index". It was previously used to determine year type classifications under State Water Resources Control Board (SWRCB) Decision 1485.

Sacramento Valley Water Year Index = $0.4 * \text{Current Apr-Jul Runoff Forecast (in maf)} + 0.3 * \text{Current Oct-Mar Runoff in (maf)} + 0.3 * \text{Previous Water Year's Index}$ (if the Previous Water Year's Index exceeds 10.0, then 10.0 is used). This index, originally specified in the 1995 SWRCB Water Quality Control Plan, is used to determine the Sacramento Valley water year type as implemented in SWRCB D-1641. Year types are set by first of month forecasts beginning in February. Final determination is based on the May 1 50

Sacramento Valley Water Year Hydrologic Classification:

- Wet - Equal to or greater than 9.2
- Above Normal - Greater than 7.8, and less than 9.2
- Below Normal - Greater than 6.5, and equal to or less than 7.8
- Dry - Greater than 5.4, and equal to or less than 6.5
- Critical - Equal to or less than 5.4

San Joaquin River Runoff is the sum of Stanislaus River inflow to New Melones Lake, Tuolumne River inflow to New Don Pedro Reservoir, Merced River inflow to Lake McClure, and San Joaquin River inflow to Millerton Lake (in maf). San Joaquin Valley Water Year Index = $0.6 * \text{Current Apr-Jul Runoff Forecast (in maf)} + 0.2 * \text{Current Oct-Mar Runoff in (maf)} + 0.2 * \text{Previous Water Year's Index}$ (if the Previous Water Year's Index exceeds 4.5, then 4.5 is used).

This index, originally specified in the 1995 SWRCB Water Quality Control Plan, is used to determine the San Joaquin Valley water year type as implemented in SWRCB D-1641. Year types are set by first of month forecasts beginning in February. Final determination for San Joaquin River flow objectives is based on the May 1 75

San Joaquin Valley Water Year Hydrologic Classification:

- Wet - Equal to or greater than 3.8
- Above Normal - Greater than 3.1, and less than 3.8
- Below Normal - Greater than 2.5, and equal to or less than 3.1
- Dry - Greater than 2.1, and equal to or less than 2.5
- Critical - Equal to or less than 2.1

Eight River Index = Sacramento River Runoff + San Joaquin River Runoff This Index is used from December through May to set flow objectives as implemented in SWRCB Decision 1641.

Usage

water_year_indices

Format

A data frame with 227 rows and 7 variables:

WY October-September

Oct_Mar Runoff (maf)

Apr_Jul Runoff (maf)

WYsum Year Total Runoff (maf)

Index Water Year Type Index Score

Yr_type Water Year Type

location Sacramento Valley or San Joaquin Valley

Source

California Department of Water Resources, California Data Exchange Center (CDEC)

Examples

```
head(water_year_indices)
```

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* **datasets**

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