



The Navigable Waters Protection Rule: Definition of “Waters of the United States”

TRAINING ON “TYPICAL YEAR” FOR STATES AND TRIBES

JUNE 16, 2020

Today's Presentation

- Definition, Concept, and Application of “Typical Year”
- “Typical Year” Tools and Resources
- Questions and answers

Upcoming Presentations in State and Tribal Series

June 23: Tributaries, Ditches, Flow Regime, and Assessment

June 30: Adjacent Wetlands, Lakes, Ponds, and Impoundments

July 7: Exclusions and More

“Typical Year” Definition

When precipitation and other climatic variables are within the normal periodic range (e.g., seasonally, annually) for the geographic area of the applicable aquatic resource based on a rolling thirty-year period.

Normal Periodic Range

Compares climatic data for a specified time period to the same date range over a 30-year period.

- “Typical year” is not necessarily synonymous with a calendar year.
- When assessing antecedent rainfall, the agencies will generally use the previous three months of data prior to the date associated with the point in time data source (e.g., date of aerial photo, date of site visit).
- “Typical year” may be assessed by comparing climatic metrics from a time period that is shorter than one year (e.g., 90 days), equal to one year, or longer than one year to climatic metrics from a 30-year record, if justified.

Geographic Area

- Climatic data should be collected from the geographic area that is appropriate for the relevant aquatic resource.
- Watershed boundaries should be a consideration.
- A particular HUC size is not specified since this could preclude the use of the best available data sources.
- Other considerations include:
 - geographic scale of the rainfall or snowpack sources,
 - data availability,
 - topography, and
 - distance of climatic data collection in relation to the aquatic resource location.

Rolling 30-Year Period

- The normal periodic range is determined using a standardized time frame, which is necessary to ensure consistent application across the country.
- National Oceanic & Atmospheric Administration (NOAA) uses a 30-year timeframe for climatic data programs which is based on World Meteorological Organization requirements.
- The agencies are familiar with using a 30-year period when assessing hydrology for wetlands.
- 30 years accounts for variability without being confounded by a year or two of unusual data.
- A rolling 30-year record accounts for incremental changes and prevents extreme events from skewing the normal range.

Determining “Typical Year”

- “Typical year” will generally be determined by:
 - Normal precipitation conditions based on the three 30-day periods preceding the observation date.
 - For each period, a weighted condition value is assigned by determining whether the 30-day precipitation total falls within, above, or below the 70th and 30th percentiles for totals from the same date range over the preceding 30 years.
 - A determination of “normal,” “wetter than normal,” or “drier than normal” is made based on the condition value sum.
- Other accurate and reliable measurements of normal precipitation and other climatic conditions may be considered when scientifically warranted.

Determining “Typical Year” – Antecedent Precipitation Tool (APT)

- Developed by the Corps.
- Assesses rainfall data from the preceding 30 years.
- Uses the parameters referenced in the NWPR’s preamble (e.g., three 30-day periods, 30th-70th percentiles).
- The APT is automated and provides a consistent methodology.
- Includes information from the Web-based Water-Budget Interactive Modeling Program (WebWIMP) and Palmer Drought Severity Index (PDSI).

Determining “Typical Year” – Typical vs. Atypical

- Hydrologic conditions (e.g., surface water connections, inundation by flooding or flow regime) during atypically wet or dry periods may not accurately represent hydrology during typical year conditions.
- When making a determination during a dry or wet period, it may be necessary to rely on other resources like remote tools or field-based indicators.
- Consider the weight of the evidence.
 - For example, if flow is observed during an abnormally dry period and not only after recent precipitation, more weight may be given to the flow meeting the perennial or intermittent requirements of the “tributary” definition in the NWPR.
 - In situations where flow is observed on-site during a period of abnormally high precipitation, it might be necessary to rely on remote tools to provide a stronger and more accurate indication of flow conditions that would typically occur.

“Typical Year” Application

- Provides a predictable framework to appropriately interpret data when determining the jurisdictional status of certain waterbodies.
- Applies to some of the requirements for the following categories of waters:
 - (a)(2) -Tributaries;
 - (a)(3) - Lakes and ponds, and impoundments of jurisdictional waters; and
 - (a)(4) - Adjacent wetlands
- May also be applied to determine if a water or feature is not jurisdictional (e.g., an ephemeral stream).

“Typical Year” Application - Tributaries

1. To meet the tributary definition, a channel must have **perennial or intermittent flow in a typical year.**
2. To meet the tributary definition, a channel must **contribute surface water flow to a downstream (a)(1) water in a typical year.**
 - Does not have to occur every calendar year, just once a typical year.



“Typical Year” Application – Lakes, Ponds, and Impoundments

1. A lake, pond, or an impoundment of jurisdictional waters is jurisdictional if it **contributes surface water flow to a water identified in paragraph (a)(1) in a typical year.**
 - Only one flow event is required in a typical year.
 - Does not have to occur every calendar year, just once in a typical year.
2. A lake, pond, or an impoundment of a jurisdictional water is also jurisdictional if it **is inundated by flooding from a water identified in paragraph (a)(1), (2), or (3) in a typical year.**
 - Required inundation frequency is only once in a typical year.
 - Does not have to occur every calendar year, just once in a typical year.

“Typical Year” Application – Adjacent Wetlands

1. Adjacent wetlands include those that are inundated by flooding from a water identified in paragraph (a)(1), (2), or (3) in a typical year.
 - Required inundation frequency is only once in a typical year.
2. Adjacent wetlands include those that are physically separated from a water identified in paragraph (a)(1), (2), or (3) by an artificial structure **so long as that structure allows for a direct hydrological surface connection to the water identified in paragraph (a)(1), (2), or (3) in a typical year** over/through an artificial feature.
 - Only one flow event is required in a typical year.

NOTE: Abutting wetlands and wetlands separated by a natural barrier do not require a Typical Year analysis.

“Typical Year” Resources

- Definition, Concept, & Application
- “Typical Year” Tools and Resources

“Typical Year” Tools and Resources

1. Antecedent Precipitation Tool (APT)
2. *Palmer Drought Severity Index - <https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/psi/201811-201910>
3. *WebWIMP - <http://climate.geog.udel.edu/~wimp/>
4. NOAA National Snow Analysis Map - <https://www.nohrsc.noaa.gov/nsa/>
5. NRCS Snow Telemetry – <https://www.wcc.nrcs.usda.gov>
6. Standard Precipitation Index - <https://www.ncdc.noaa.gov/temp-and-precip/drought/nadm/indices>
7. NOAA/National Weather Service Meteorological Stations
8. WETS tables - https://www.wcc.nrcs.usda.gov/climate/wets_doc.html
9. Continuous flow models
10. Hydrologic models
11. Familiar resources (aerials, topographic maps, soil surveys, etc...)
12. Physical and biological field indicators

*Tools already included in the APT

“Typical Year” Tools and Resources

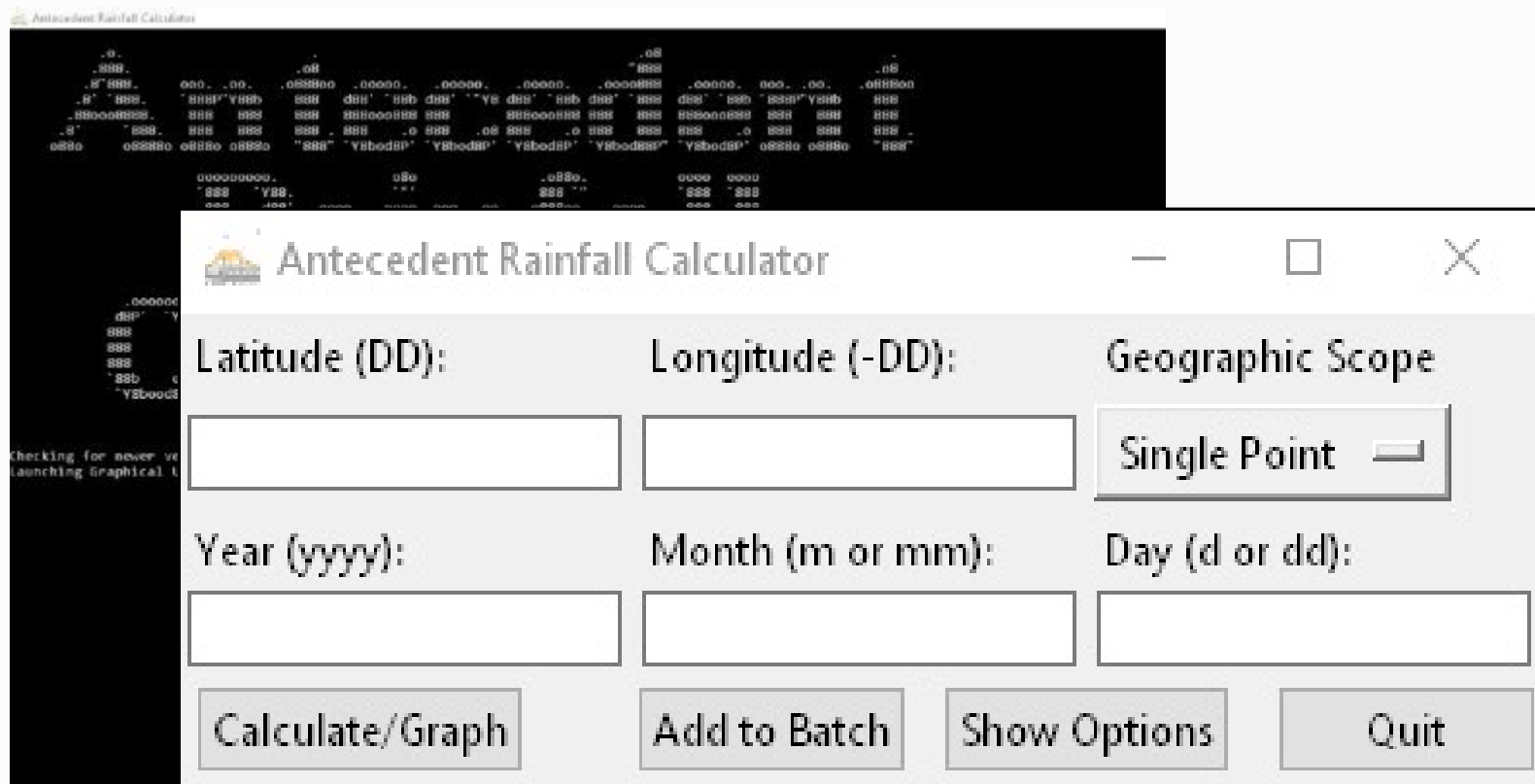
Antecedent Precipitation Tool (APT)

- Automated and applies a consistent methodology for determining normal precipitation that aligns with the parameters in the NWPR.
- Incorporates PDSI and WebWIMP to provide additional climatic information.
- The agencies plan to provide public access to the APT by the effective date of the rule; a link to the tool will be posted on EPA’s website.

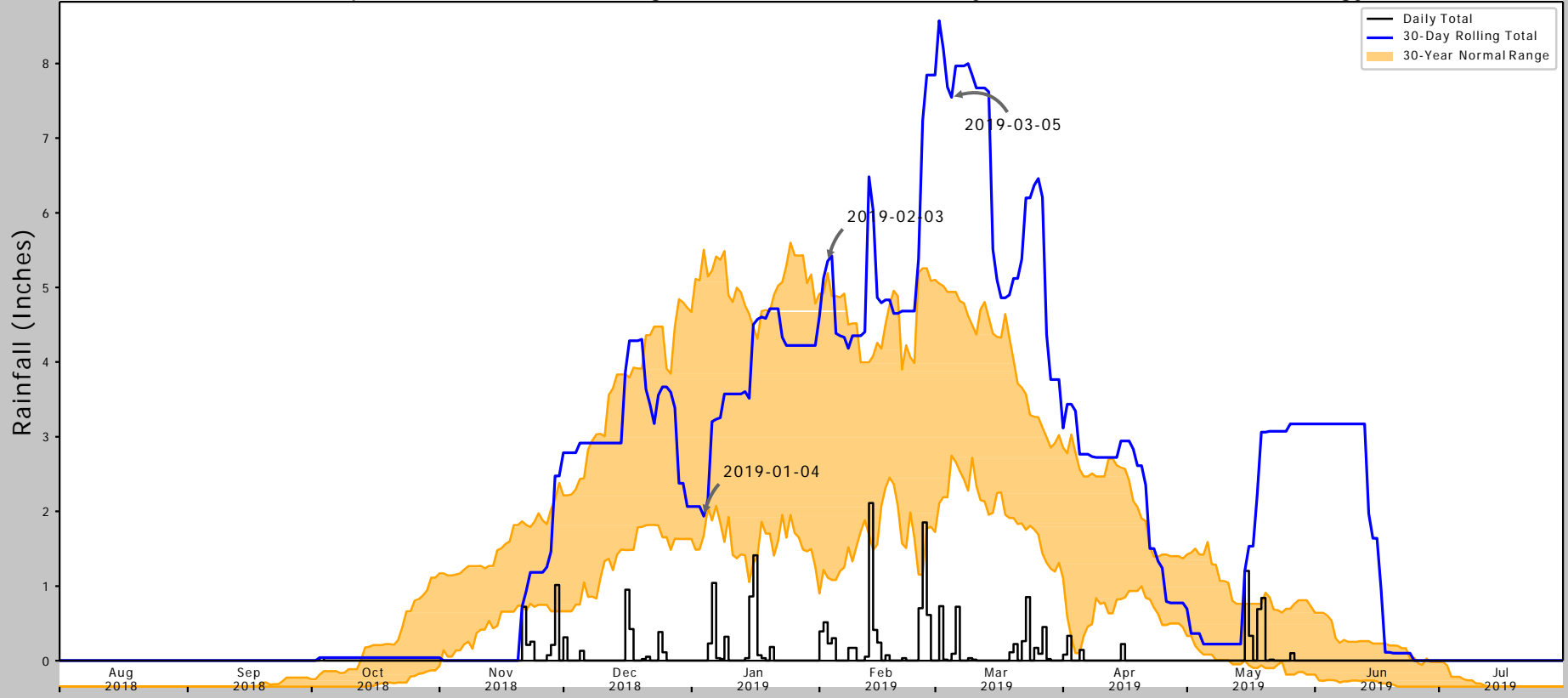
“Typical Year” Tools and Resources

Antecedent Precipitation Tool (APT)

(note: an earlier version of the tool was called the Antecedent Rainfall Calculator)



Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	38.5, -121.5
Observation Date	2019-03-05
Elevation (ft)	7.14
Drought Index (PDSI)	Moderate wetness
WebWIMP H ₂ O Balance	Wet Season

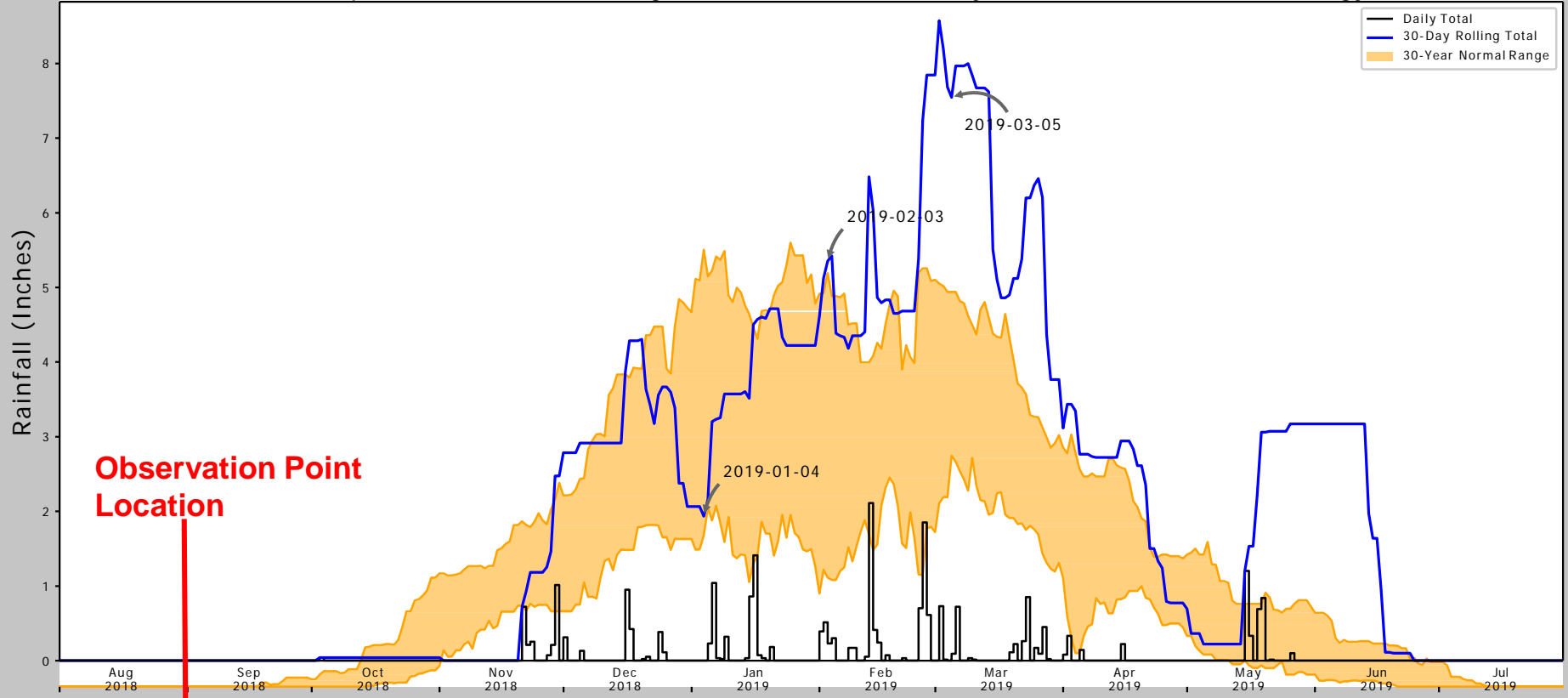
30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2019-03-05	2.669291	4.561024	7.543307	Wet	3	3	9
2019-02-03	1.259449	4.777953	5.350394	Wet	3	2	6
2019-01-04	1.748425	5.048425	1.933071	Normal	2	1	2
Result							Wetter than Normal-17

Weather StationName	Coordinates	Elevation (ft)	Distance (mi)	Elevation _A	Weighted _A	Days (Normal)	Days (Antecedent)
SACRAMENTO EXECUTIVEAP	38.5069, -121.495	15.092	0.548*	7.952*	0.251*	11345	90
SACRAMENTO SESE	38.5556, -121.4169	38.058	5.398	22.966	2.553	8	0

Figure generated using the Antecedent Rainfall Calculator

Written by Jason C. Deters
 Jason.Deters@usace.army.mil
 Phone: (916) 557-7152

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Observation Point Location



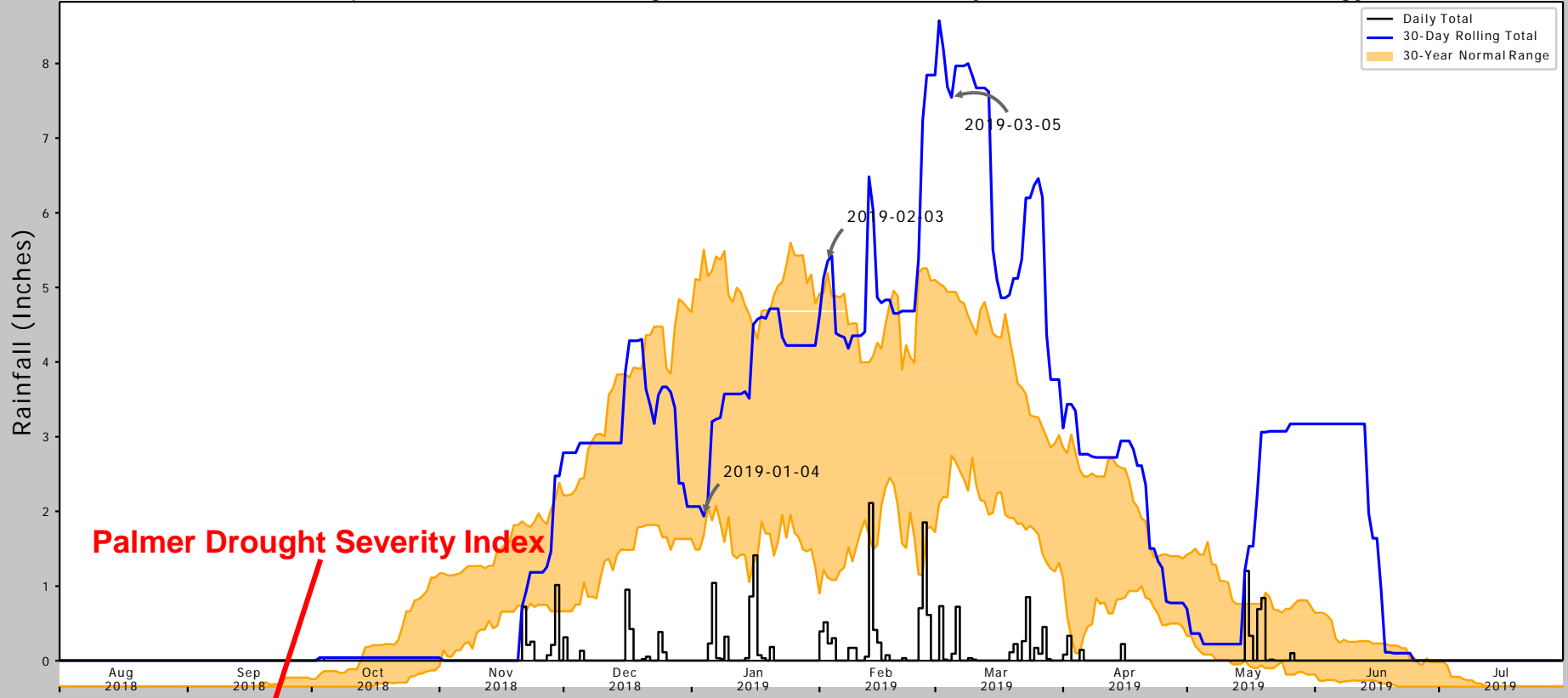
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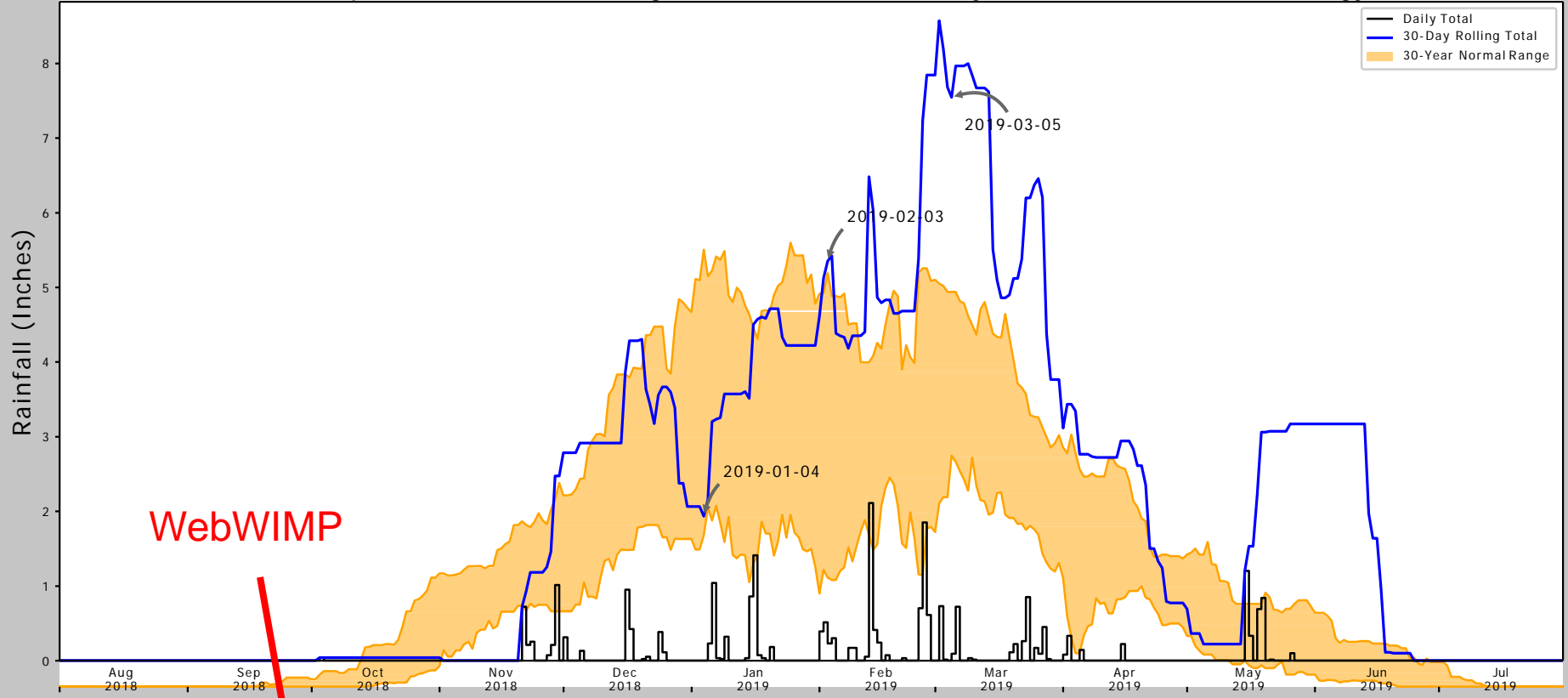
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WebWIMP

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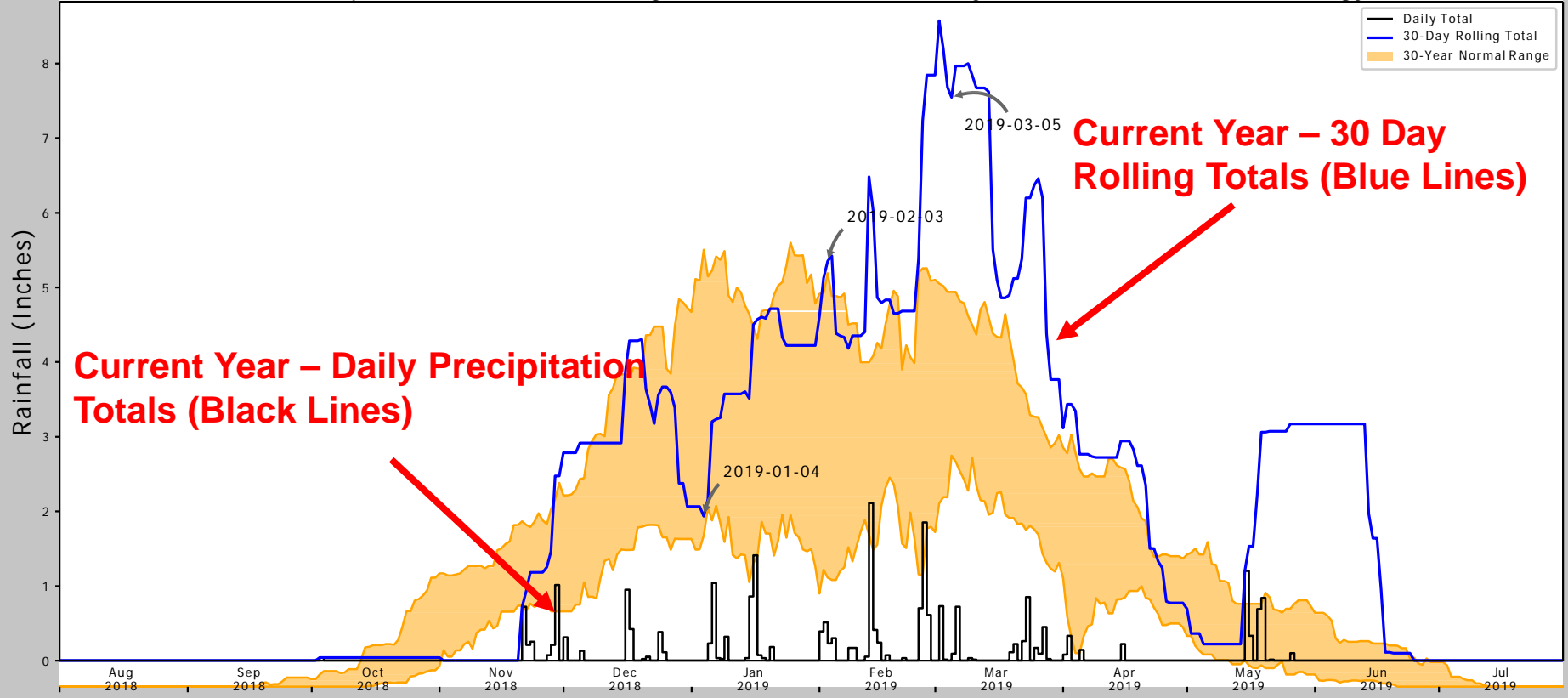
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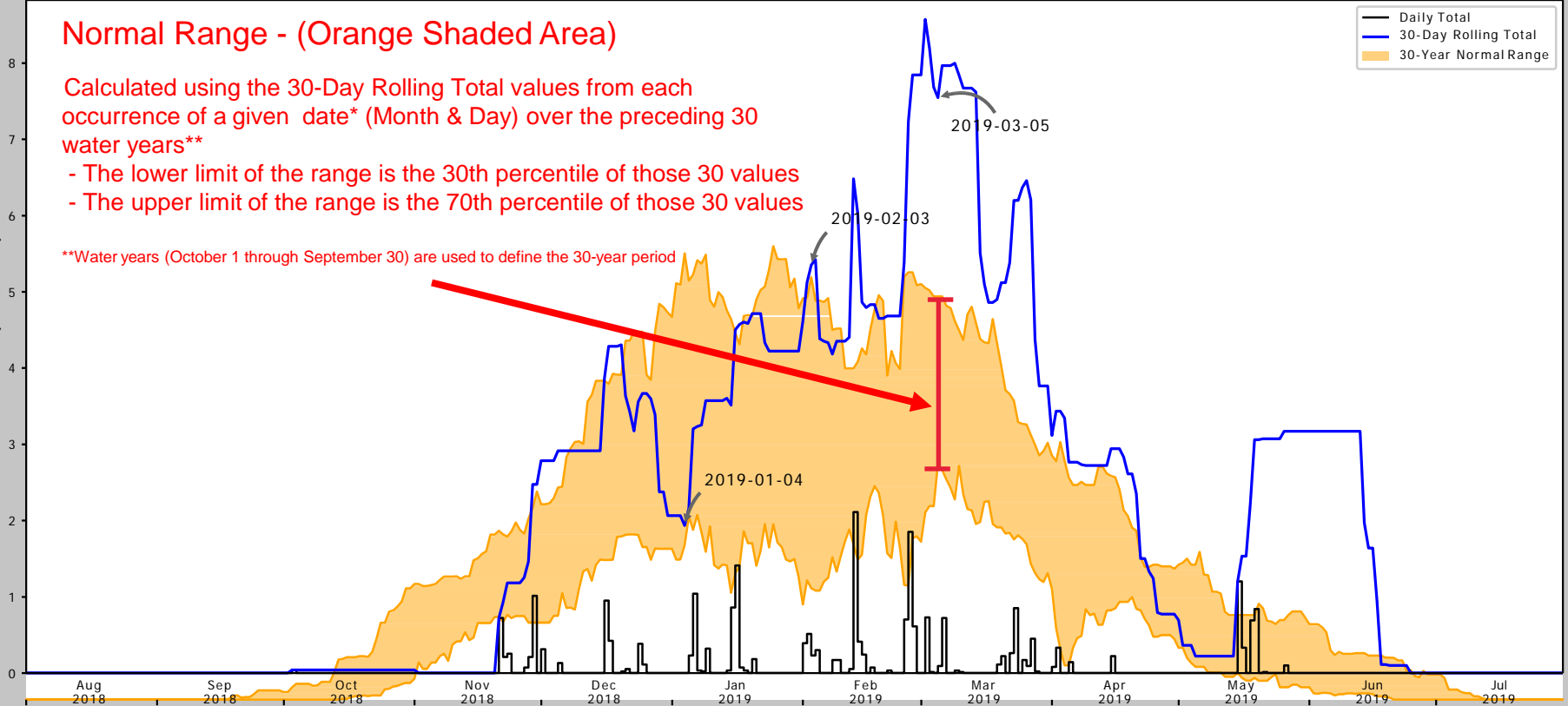
Normal Range - (Orange Shaded Area)

Calculated using the 30-Day Rolling Total values from each occurrence of a given date* (Month & Day) over the preceding 30 water years**

- The lower limit of the range is the 30th percentile of those 30 values
- The upper limit of the range is the 70th percentile of those 30 values

**Water years (October 1 through September 30) are used to define the 30-year period

Rainfall (Inches)



— Daily Total
— 30-Day Rolling Total
 30-Year Normal Range

Coordinates	38.5, -121.5
Observation Date	2019-03-05
Elevation (ft)	7.14
Drought Index (PDSI)	Moderate wetness
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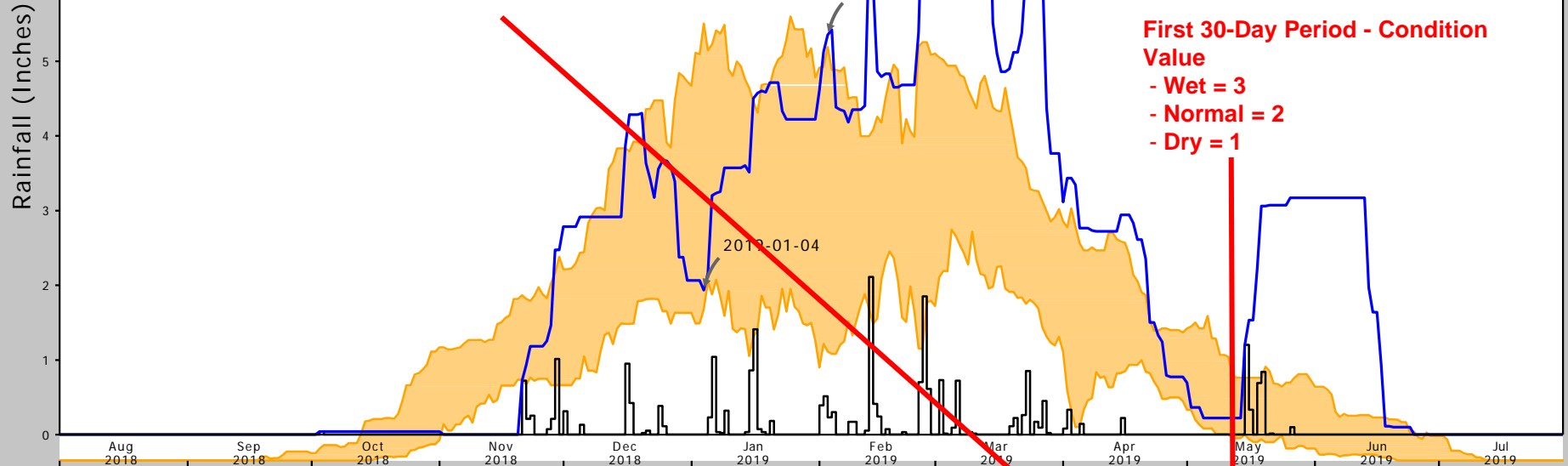
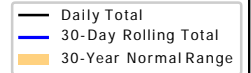
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Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network

Antecedent Condition Calculation

First 30-Day Period - Wetness Condition

- Wet = Observed value above 30-Year Normal Range (70th percentile)
- Normal = Observed value within 30-Year Normal Range (30th & 70th percentiles)
- Dry = Observed value below 30-Year Normal Range (30th percentile)



Antecedent Condition Calculation

First 30-Day Period - Condition Value

- Wet = 3
- Normal = 2
- Dry = 1

Coordinates	38.5, -121.5
Observation Date	2019-03-05
Elevation (ft)	7.14
Drought Index (PDSI)	Moderate wetness
WebWIMP H ₂ O Balance	Wet Season

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Figure generated using the Antecedent Rainfall Calculator

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Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network

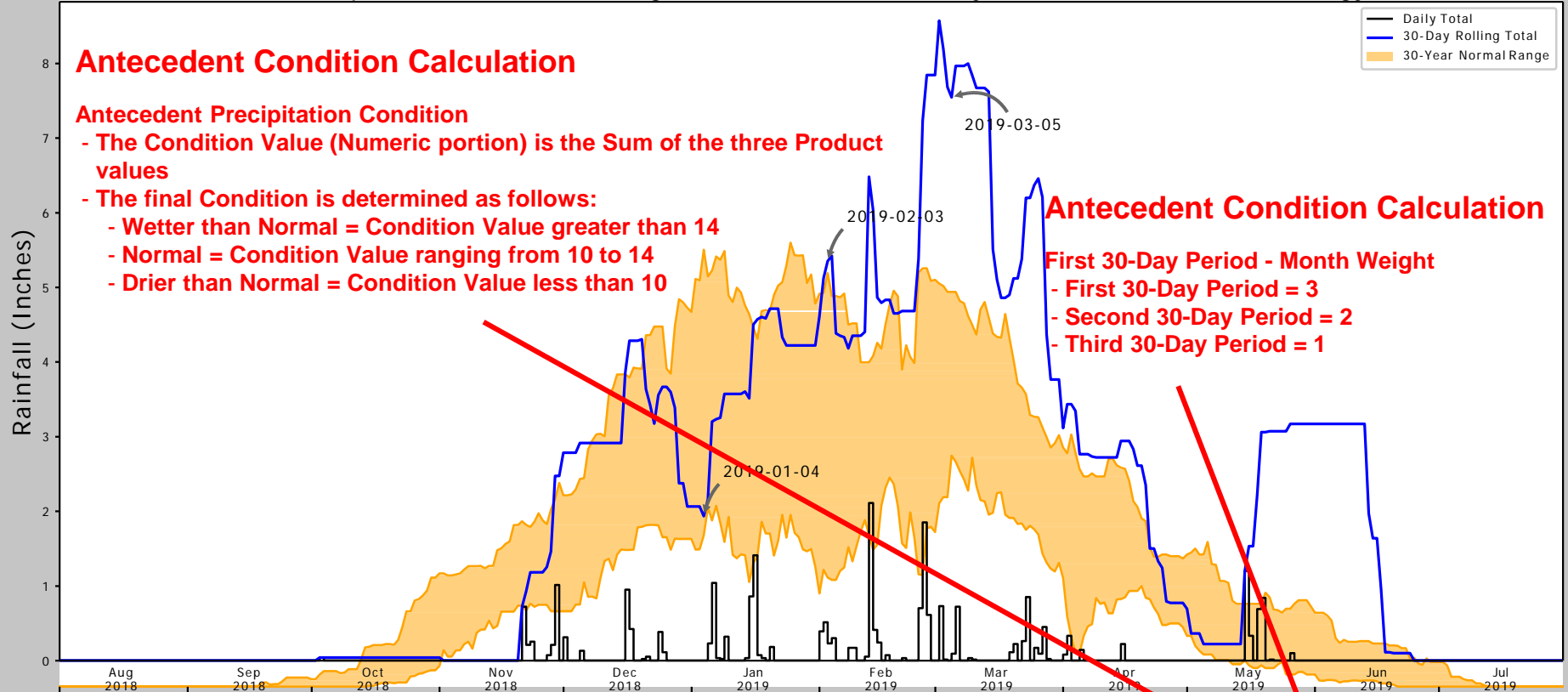
Antecedent Condition Calculation

Antecedent Precipitation Condition

- The Condition Value (Numeric portion) is the Sum of the three Product values
- The final Condition is determined as follows:
 - Wetter than Normal = Condition Value greater than 14
 - Normal = Condition Value ranging from 10 to 14
 - Drier than Normal = Condition Value less than 10

Antecedent Condition Calculation

- First 30-Day Period - Month Weight
 - First 30-Day Period = 3
 - Second 30-Day Period = 2
 - Third 30-Day Period = 1



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WebWIMP H ₂ O Balance	Wet Season

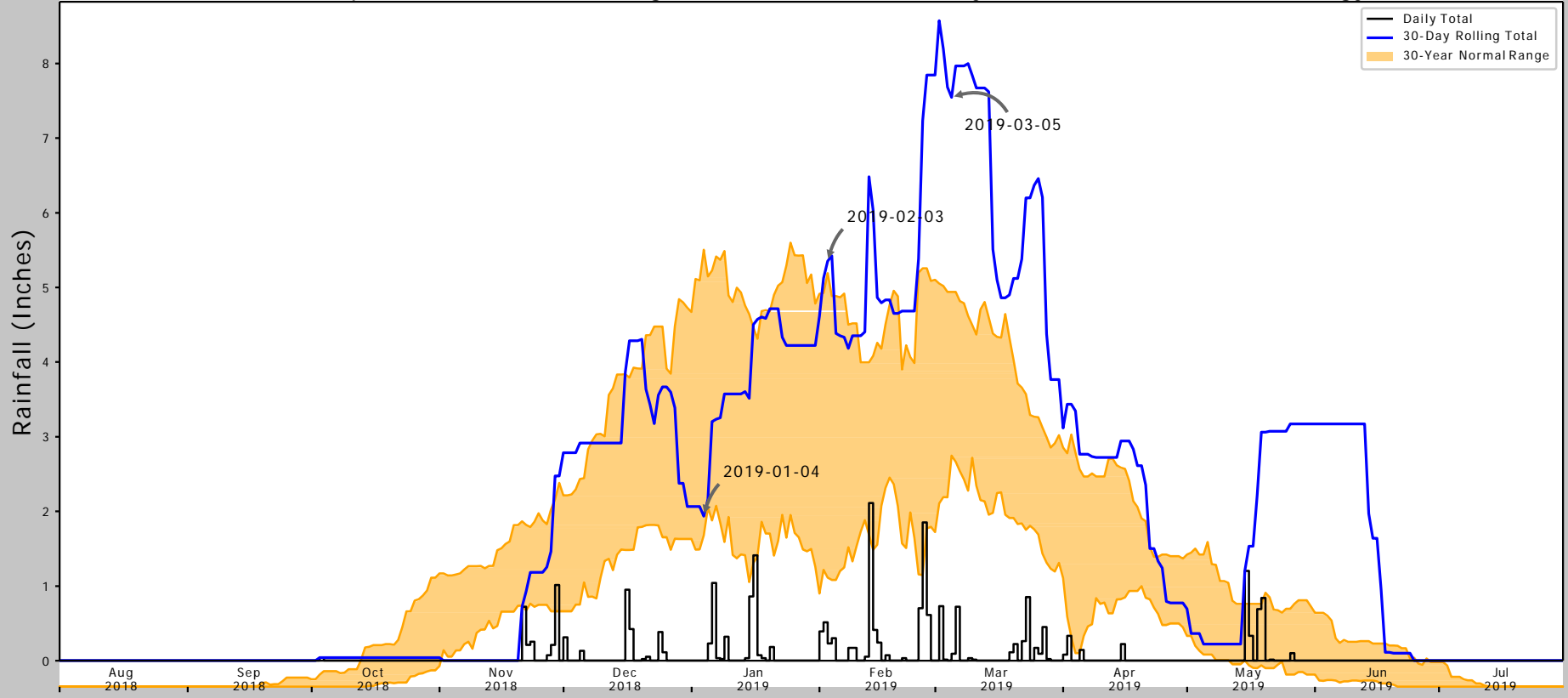
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Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	38.5, -121.5
Observation Date	2019-03-05
Elevation (ft)	7.14
Drought Index (PDSI)	Moderate wetness
WebWIMP H ₂ O Balance	Wet Season

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Weather Station Table

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“Typical Year” Tools and Resources

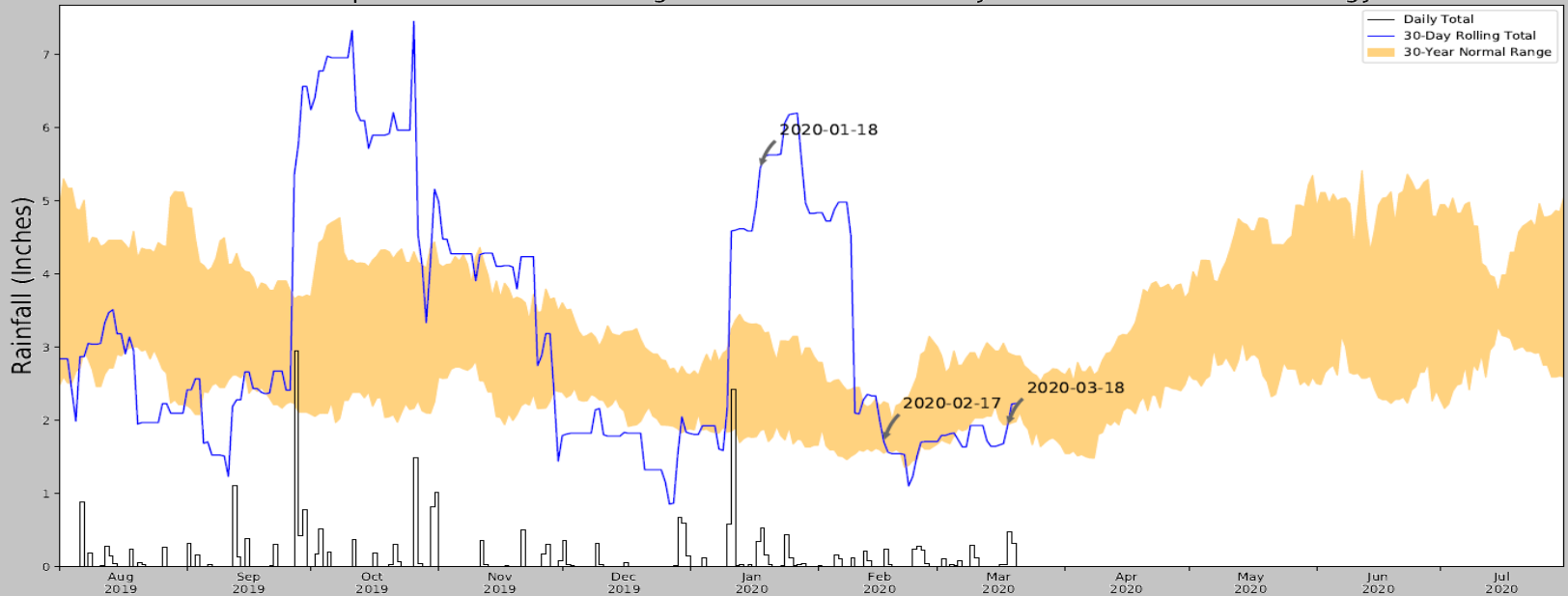
Antecedent Precipitation Tool (APT)



“Typical Year” Tools and Resources

Antecedent Precipitation Tool (APT)

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	41.637563, -86.146463
Observation Date	2020-03-18
Elevation (ft)	751.87
Drought Index (PDSI)	Mild wetness (2020-02)
WebWIMP H ₂ O Balance	Wet Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2020-03-18	1.934646	2.922047	1.917323	Dry	1	3	3
2020-02-17	1.545669	2.249213	1.700787	Normal	2	2	4
2020-01-18	1.854724	3.28937	5.440945	Wet	3	1	3
Result							Normal Conditions - 10

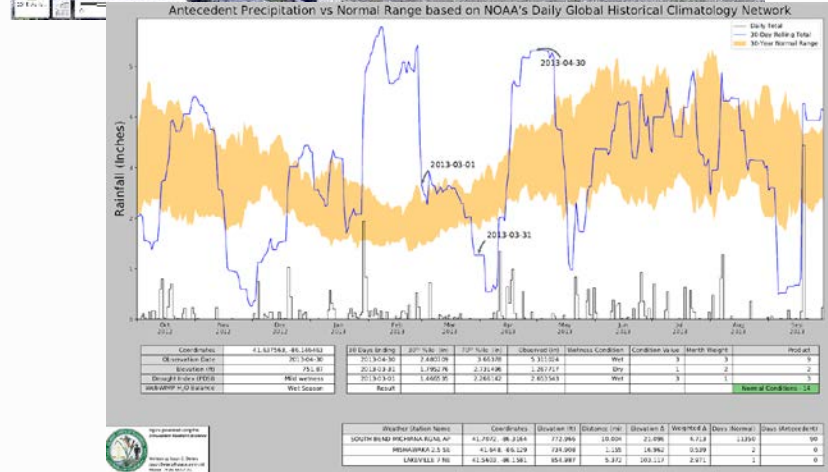
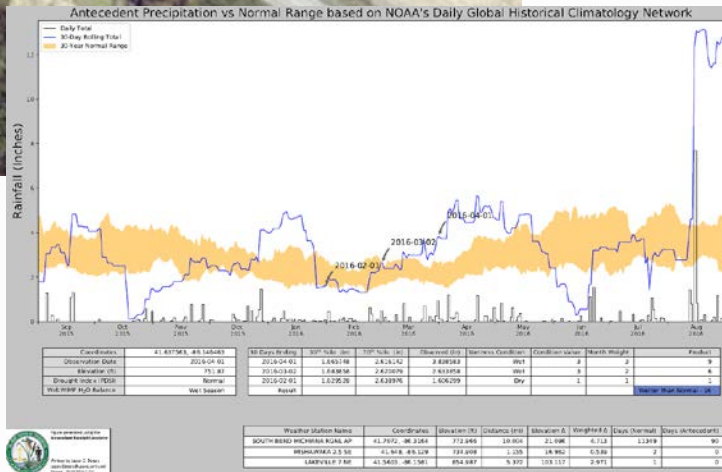


Figure generated using the Antecedent Rainfall Calculator

Written by Jason C. Deiers
Jason Deiers @ JasonCDeiers
Phone: (316) 557-7152

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days (Normal)	Days (Antecedent)
SOUTH BEND MICHIANA RGNL AP	41.7072, -86.3164	772.966	10.004	21.096	4.713	11349	90
MISHAWAKA 2.5 SE	41.648, -86.129	734.908	1.155	16.962	0.539	2	0
LAKEVILLE 7 NE	41.5603, -86.1581	854.987	5.372	103.117	2.971	1	0

“Typical Year” Tools and Resources



“Typical Year” Tools and Resources

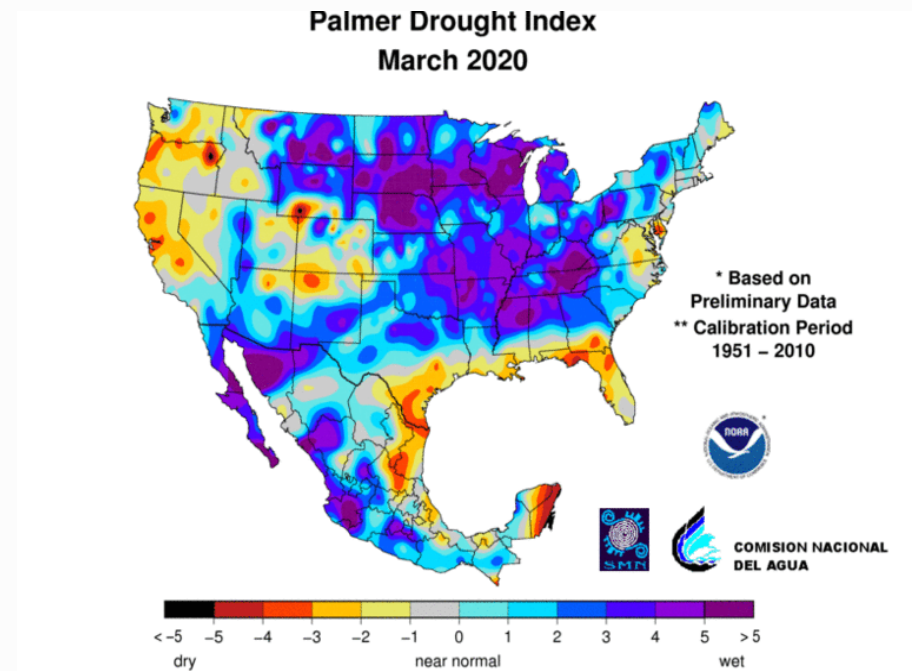
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5. NRCS Snow Telemetry – <https://www.wcc.nrcs.usda.gov>
6. Standard Precipitation Index - <https://www.ncdc.noaa.gov/temp-and-precip/drought/nadm/indices>
7. NOAA/National Weather Service Meteorological Stations
8. WETS tables - https://www.wcc.nrcs.usda.gov/climate/wets_doc.html
9. Continuous flow models
10. Hydrologic models
11. Familiar resources (aerials, topographic maps, soil surveys, etc...)
12. Physical and biological field indicators
 - *Tools already included in the APT

“Typical Year” Tools and Resources

Palmer Drought Severity Index (PDSI)

- Data are current, updated monthly.
- Integrates precipitation, soil moisture, and evapotranspiration.
- Sensitive to climatic patterns over a longer time period (e.g., months).

*Included in the APT.

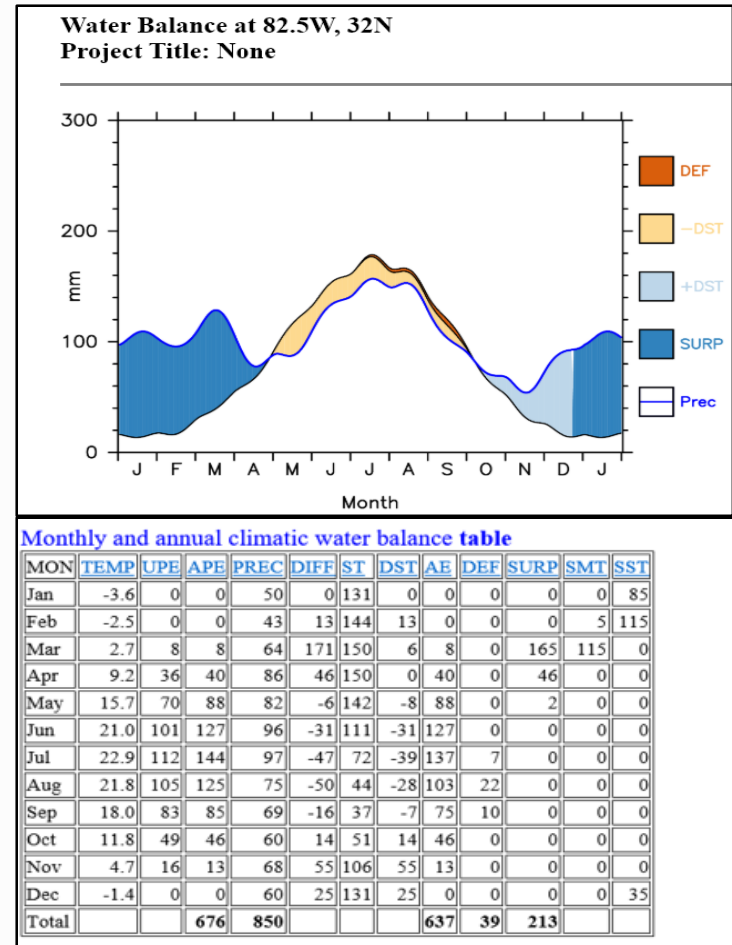


“Typical Year” Tools and Resources

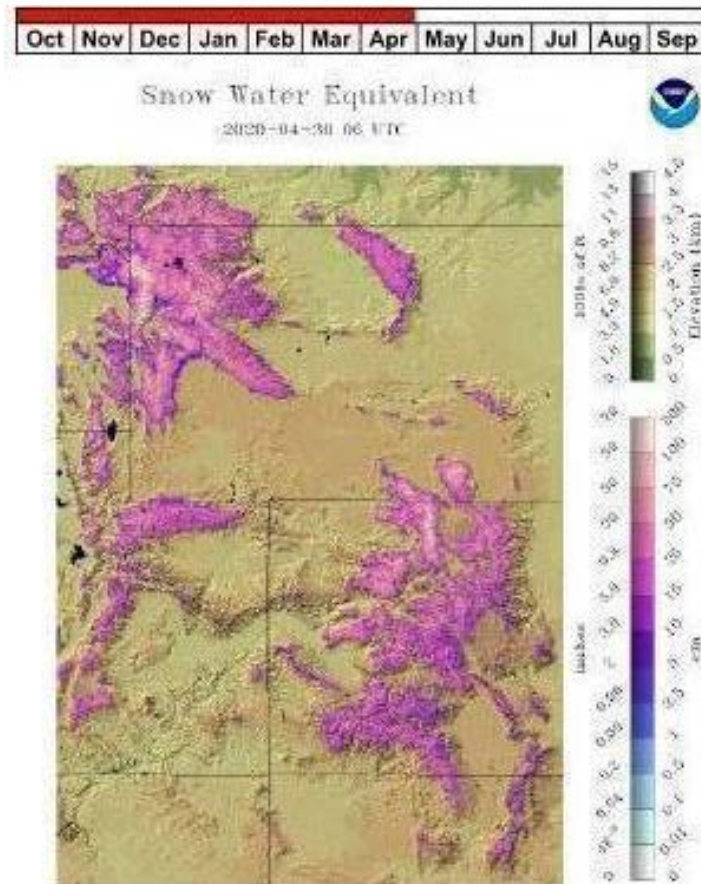
WebWIMP

- Designed to evaluate monthly water balance.
- Provides a reasonable expectation of when a time of year may be a wet or dry period.
- Not site specific.
- Based on averages.

*Included in the APT.



“Typical Year” Tools and Resources



NOAA National Snow Analysis Maps

- Displays current snow pack conditions graphically on a map.
- Provides information if snow pack is normal, above normal, or below normal.
- Provides what the water equivalent of the snow is.

“Typical Year” Tools and Resources

Colorado SNOTEL Snow/Precipitation Update Report							
Based on Mountain Data from NRCS SNOTEL Sites							
Provisional data, subject to revision							
Data based on the first reading of the day (typically 00:00) for Thursday, April 30, 2020							
Basin Site Name	Elev (ft)	Snow Water Equivalent			Water Year-to-Date Precipitation		
		Current (in)	Median (in)	Pct of Median	Current (in)	Average (in)	Pct of Average
GUNNISON RIVER BASIN							
Butte	10160	9.0	10.5	86	13.5	18.0	75
Cochetopa Pass	10020	0.0	0.0 _R	*	7.4	8.8 _R	84
Columbine Pass	9400	0.2	4.3	5	18.3	25.7	71
Idarado	9800	6.6	8.8	75	16.8	21.6	78
Mc Clure Pass	9500	6.7	10.3	65	19.2	23.5	82
Mesa Lakes	10000	7.8	15.3	51	15.9	24.3	65
Overland Res.	9840	5.0	7.5	67	13.3	18.7	71
Park Cone	9600	6.9	5.7	121	11.3	13.6	83
Park Reservoir	9960	19.5	27.3	71	21.1	30.8	69
Porphyry Creek	10760	15.1	13.7	110	18.0	18.1	99
Red Mountain Pass	11200	22.4	24.2	93	25.9	29.8	87
Sergents Mesa	11530	11.4	N/A	*	14.2	N/A	*
Schofield Pass	10700	29.3	31.4	93	25.3	36.2	70
Slumgullion	11560	13.0	13.9	94	14.0	15.8	89
Upper Taylor	10640	9.2	N/A	*	16.5	N/A	*
Wager Gulch	11100	7.4	N/A	*	13.4	N/A	*
Basin Index (%)				82			77

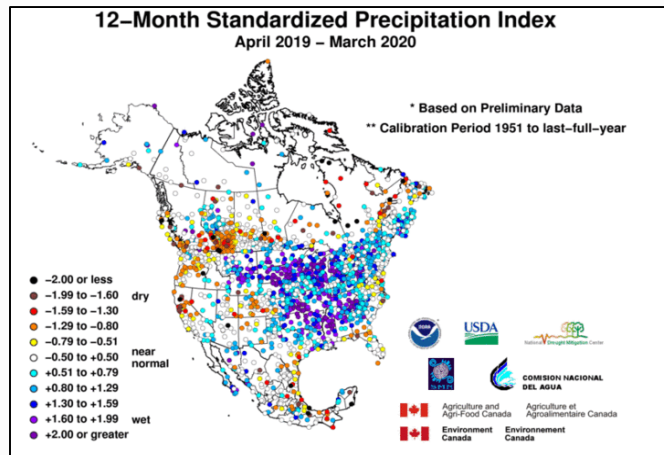
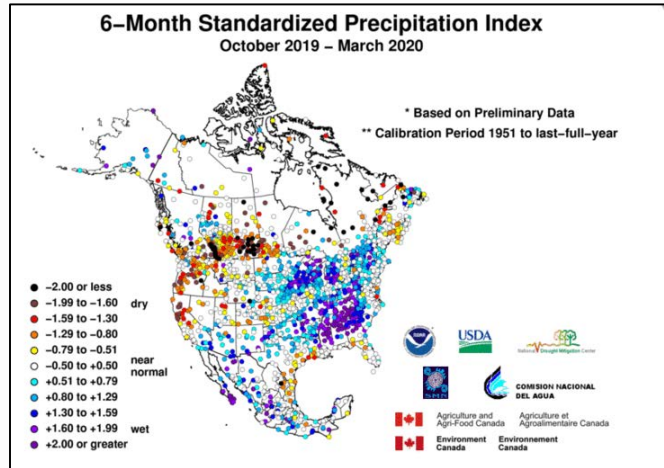
NRCS Snow Telemetry

- Similar to the NOAA National Snow Analysis map.
- A region and a given date can be selected to compare to the average for snowpack accumulation.
- Compare the current snow water equivalent to average.

“Typical Year” Tools and Resources

Standardized Precipitation Index

- Can characterize drought or abnormal wetness at different time scales (1 to 36 months).
- Regional patterns of drought or excess wetness can be quickly observed.
- Only analyzes precipitation.
- Not site specific.

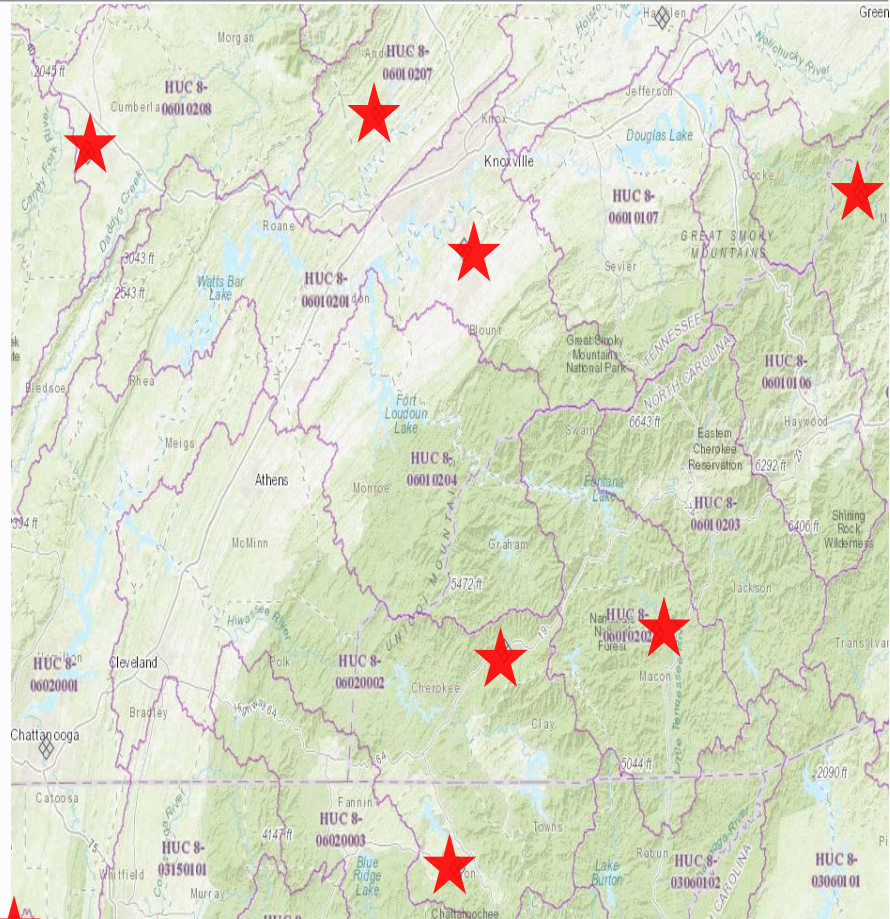


“Typical Year” Tools and Resources

NOAA Weather Stations

- One of two ways:
 1. GIS Data Layer
 2. NOAA Website
- Click on the station to display information available.
- Helpful in determining geographic area.

*APT uses data from nearby weather stations.



★ Weather Stations

Summary of “Typical Year”

- The typical year concept ensures that the hydrologic flows and surface water connections necessary to establish jurisdiction under the NWPR are characterized based on normal conditions to avoid making erroneous jurisdictional calls.
- In addition to normal precipitation, other climate variables and data sources such as drought indices, water-budget models, or snow telemetry data, may inform evaluations of flow conditions.
- When observations of flow occur under atypical conditions the agencies may rely more heavily on previous observations of flow or remote data that were collected under normal conditions.
- The agencies will use the best available sources of information and a weight of evidence approach to evaluate flow in a typical year.

For Further Information

Visit <https://www.epa.gov/nwpr> for more information about the final rule, including the *Federal Register* notice of the final rule, supporting analyses, and fact sheets.

View the public webcast at -

https://www.youtube.com/watch?v=dt_OoxYU0-M&feature=youtu.be

Additional questions may be directed to the EPA at:

CWAwotus@epa.gov or to the Corps at:

USACE_CWA_Rule@usace.army.mil.

Questions and Answers

Thank You
