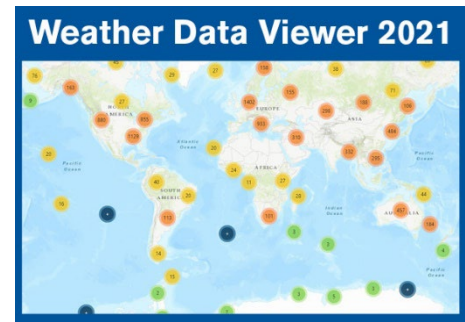


# Weather Data Viewer 2021 FAQ

for *Basic Subscription*  
and *Enterprise License*



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- What is the Weather Data Viewer 2021 Basic Subscription?
  - What is the Weather Data Viewer 2021 Enterprise License?
  - How do I purchase or renew the Weather Data Viewer 2021 Basic Subscription?
  - How do I purchase the Weather Data Viewer 2021 Enterprise License?
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  - Does Weather Data Viewer 2021 provide typical meteorological year (TMY) data for the weather stations?
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  - Can I get a .csv file of the Weather Data Viewer 2021 Enterprise License frequency or bin data?
  - Will the Excel macro that converted the .wdv files supplied with the purchase of a license to use the raw data of previous versions of Weather Data Viewer work with the Weather Data Viewer 2021 .wdv files, or is there a new macro available?

The previous versions of Weather Data Viewer on CD or DVD included a bin generator – does the online Weather Data Viewer 2021 provide this functionality?

What are the hourly bin data included in the Basic Subscription?

How do I find the weather bin data for a location for the number of hours between, for example, 40°F and 50°F, then the hours below 40°F for an entire year?

What are the available weather stations?

How do I find the nearest weather station for a given latitude and longitude?

Is there any way to extract frequency matrices from the raw data zip file provided as part of the Weather Data Viewer 2021 Enterprise License without using programming?

What exactly are the .tbl and .wdv files provided to purchasers of the Weather Data Viewer 2021 Enterprise License?

What information is included on the spreadsheets available to purchasers of the Enterprise License?



**Q: What is the Weather Data Viewer 2021 Basic Subscription?**

**A:** The Weather Data Viewer 2021 Basic Subscription is a single-user annual subscription that gives users cloud-based access to climatic design information for 9,237 weather stations worldwide. It provides outputs per user inputs for one station at a time.

More information is provided [in the ASHRAE Bookstore](#) and in the product’s [preview file](#).

The Basic Subscription is best suited for customers who want access to climatic data station by station.



**Q: What is the Weather Data Viewer 2021 Enterprise License?**

**A:** The Weather Data Viewer 2021 Enterprise License makes the raw climatic data for 9,237 weather stations available to developers who wish to include some of the data in their own software/apps. It provides the data in Microsoft® Excel® spreadsheets (with each row representing a station [9237 rows] and each column representing a climatic design condition [603 columns]) – one each in I-P units and SI units – that users obtain via download, as well as downloads of individual .tbl files and .wdv files, an example C++ WDV file parser, a Makefile (GCC/Linux) for tblxpcand, and a base92.py (Python) library to parse WDV files.

More information is provided in the product’s [preview file](#). The terms of the license are available via [the product’s page in the ASHRAE Bookstore](#).

The Enterprise License is best suited for customers who want the raw data to use in their own tool.



**Q: How do I purchase or renew the Weather Data Viewer 2021 Basic Subscription?**

**A:** You can purchase or renew your annual subscription to the Weather Data Viewer 2021 Basic Subscription via [the ASHRAE Bookstore](#).

Weather Data Viewer 2021 is also available as part of an [ASHRAE Handbook Online](#) annual subscription. Users access Weather Data Viewer in ASHRAE Handbook Online under 2021 *ASHRAE Handbook—Fundamentals* on the Additional Features tab of the Homepage or from the Contents or Additional Features tabs of Chapter 14 of 2021 *ASHRAE Handbook—Fundamentals*.



**Q: How do I purchase the Weather Data Viewer 2021 Enterprise License?**

**A:** You can purchase or renew your four-year Weather Data Viewer 2021 Enterprise License via [the ASHRAE Bookstore](#).



**Q:** Do I need to renew my Enterprise License every year?

**A:** No, the Weather Data Viewer 2021 Enterprise License is not an annual subscription. The license is valid until the Weather Data Viewer 2025 product becomes available.

The Weather Data Viewer climatic data are updated every four years, so every four years it is a new product. The Enterprise License covers the four years of the 2021 product (2021, 2022, 2023, and 2024), so if you purchase the license in 2021 you can use the 2021 data until 2025 and if you purchase the license in 2023 you can still only use the 2021 data until 2025, because 2025 is when it will be replaced with the Weather Data Viewer 2025 product.



**Q:** Does my purchase of the Enterprise License include access to the online Weather Data Viewer 2021 app via the Basic Subscription?

**A:** No, the Enterprise License does not include access to the online Weather Data Viewer app.

With the previous versions of Weather Data Viewer on CD or DVD, the license stated, “The licensing fee does not include the Weather Data Viewer CD or DVD, which can be purchased through the online ASHRAE Bookstore.” The license terms for the 2021 Enterprise License similarly state that the “Enterprise License is not the annual subscription access to the online Weather Data Viewer 2021. Instead, it is special, licensed permission for software developers who want to use the data from the Weather Data Viewer 2021 in software.”



**Q:** Is an API available for Weather Data Viewer 2021?

**A:** No, API functionality is not available for Weather Data Viewer 2021, but we do hope to make it available for Weather Data Viewer 2025!



**Q:** Does Weather Data Viewer 2021 provide typical meteorological year (TMY) data for the weather stations?

**A:** No, Weather Data Viewer does not include this information.



**Q:** Can I obtain an example PDF of the design conditions for a weather station?

**A:** Absolutely! An example single-page PDF representing those available for each station via the Weather Data Viewer 2021 Basic Subscription is available [here](#).



**Q:** How often are the climatic data in Weather Data Viewer updated?

**A:** The Weather Data Viewer climatic data are updated every four years. This coincides with the publication of the updated climatic data in every new edition of *ASHRAE Handbook—Fundamentals*.



**Q:** Will the data I have access to via the 2021 Enterprise License disappear when the new Weather Data Viewer comes out in 2025?

**A:** No, your 2021 data do not disappear. If you choose not to purchase a 2025 license, you will still have the 2021 data that you downloaded to use for your purposes.



**Q:** If I have purchased the 2021 license and later purchase the 2025 license, how will I receive my update?

**A:** Each Weather Data Viewer update (every four years) is a new product and a new data download for the Enterprise License. If you have purchased a 2021 license and choose to purchase a 2025 license, you will need to download the new 2025 data for all of the stations – there is no update that includes only the new stations.



**Q:** Can I still obtain Weather Data Viewer as an Excel-based product?

**A:** No, Weather Data Viewer is an online product now and going forward. It was becoming increasingly difficult to maintain a spreadsheet version of Weather Data Viewer that worked in the various editions and combinations of Microsoft® Windows® and Microsoft® Excel®.

The climatic design conditions that were available via the Microsoft® Excel®-based product can be found in the single-page PDFs downloadable via the Weather Data Viewer 2021 Basic Subscription or in the .tbl files downloadable via the Weather Data Viewer 2021 Enterprise License.



**Q:** Can I get a .csv file of the Weather Data Viewer 2021 Enterprise License frequency or bin data?

**A:** No, there is not a .csv file of the frequency or bin data for the Weather Data Viewer 2021 Enterprise License. Creating such a file by extracting all the required files would result in having to share millions of .csv files for each station/variable combination, which would take much time and effort to produce.

Users are encouraged to check with their company's staff engineers, who may have the background or ability to work with the provided tblxpan software or perhaps Python code to do what is needed.

It is also possible to save the .xls file available with the Weather Data Viewer 2021 Enterprise License as a .csv file, which users can then use to extract the information they need.



**Q:** Will the Excel macro that converted the .wdv files supplied with the purchase of a license to use the raw data of previous versions of Weather Data Viewer work with the Weather Data Viewer 2021 .wdv files, or is there a new macro available?

**A:** That old macro will not work with the Weather Data Viewer 2021 files, and there is no new macro because the former Microsoft® Excel® version of Weather Data Viewer is no longer supported.

Options available for converting the data in the .wdv files include the following:

- The provided C++ file tblxpan.cpp provides an example on how to decode .wdv files. Your company's programmers will need to adapt the logic or incorporate the code into their workflows.
- The provided Python-based example library base92.py decodes .wdv files as an alternative to C++.
- The Weather Data Viewer 2021 Basic Subscription provides access to the .wdv files through a download CSV option, but obtaining the information this way would be a large manual operation, as these data are provided station by station only.



**Q:** The previous versions of Weather Data Viewer on CD or DVD included a bin generator – does the online Weather Data Viewer 2021 provide this functionality?

**A:** No, Weather Data Viewer 2021 does not include a bin generator.

This functionality was removed because it was based on a faulty premise – i.e., it is a misleading product. To do it properly, you would need to form the joint binned data for hourly x dry bulb x dew point. That is, to calculate the hourly dry-bulb and mean coincident wet-bulb temperatures over a subset/span of hours, you would need a 3D joint binning of hour, dry bulb, and wet bulb. The widget, however, was calculated based on two separate 2D bins of (dry-bulb, hour) and (dry-bulb, wet-bulb), which is wrong.

Users can download the individual binned datasets and replicate how they used this data in the past.



**Q:** What are the hourly bin data included in the Basic Subscription?

**A:** The binned data available to users via the Weather Data Viewer 2021 Basic Subscription consist of the following:

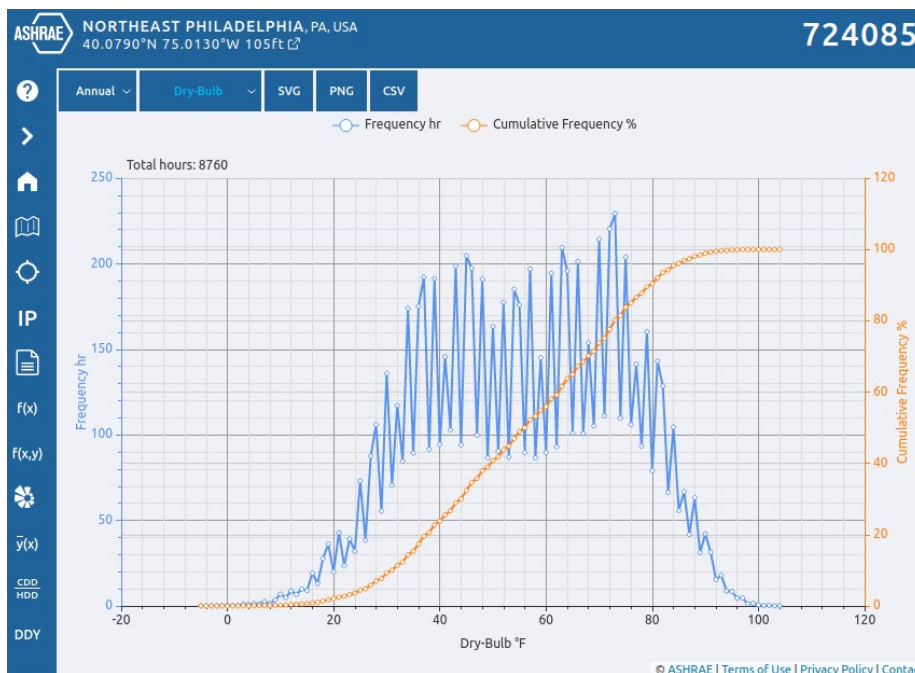
- Dry-bulb v. wet-bulb temperature
- Dry-bulb v. dew-point temperature
- Dry-bulb temperature v. enthalpy
- Dry-bulb temperature v. wind speed
- Dry-bulb temperature v. wind direction
- Dry-bulb temperature v. hour
- Wind speed v. wind direction



**Q:** How do I find the weather bin data for a location for the number of hours between, for example, 40°F and 50°F, then the hours below 40°F for an entire year?

**A:** Using Northeast Philadelphia as an example (see diagram below), you can take the following steps:

- Hover over the 50°F line and record the cumulative frequency = 40.80%. This represents the percentage of hours below 50°F.
- Hover over the 40°F line and record the cumulative frequency = 23.85%. Multiply this by 8760 (hours in a year) to get the number of hours below 40°F = 2089 hours. This answers the second part of the question.
- Subtract  $40.80 - 23.85 = 16.95\%$  and multiply this by 8760 to get the number of hours between 40°F and 50°F = 1485 hours. This answers the first part of the question.
- Users can also download the .csv file for this diagram and do the same thing in Excel.





**Q:** What are the available weather stations?

**A:** Weather Data Viewer 2021 Basic Subscription includes access to a map of weather stations worldwide. Users can zoom in on specific areas to see all of the weather stations available or search using city, country, state, province, station name, or station WMO number.

To find out if a weather station is available in a specific area before purchasing Weather Data Viewer, users can search stations on a map by name or geographic location using [StationFinder](#), a free online map of the weather stations as published in the 2013, 2017, or 2021 *ASHRAE Handbook—Fundamentals*.



**Q:** How do I find the nearest weather station for a given latitude and longitude?

**A:** The specific steps to achieve this depend on the programming language or software being used, but a general brute force procedure is:

1. Calculate the [great circle distance](#) using the [Haversine](#) distance between your address and all 9,237 stations.
2. Take the minimum distance station.

Information on using Microsoft® Excel® to complete the Haversine equation is available in [this article](#).



**Q:** Is there any way to extract frequency matrices from the raw data zip file provided as part of the Weather Data Viewer 2021 Enterprise License without using programming?

**A:** The short answer is: not really. Typically, purchasers of the license are able to extract the information from the .wdv files as necessary using the provided tblxpan software as a guide. *In theory*, someone could extract all the information into a .csv file format, but this would be millions of files and would be enormous in size and would require much time and effort.



**Q:** What exactly are the .tbl and .wdv files provided to purchasers of the Weather Data Viewer 2021 Enterprise License?

**A:** A .tbl file represents the output of the processing program and is a tab-delimited version of the climate design data one-page PDF for each station downloadable via the Weather Data Viewer 2021 Basic Subscription.

A .wdv file represents a compressed version of the frequency binned histograms (1D and 2D), which are used to generate the various design percentiles. An example C++ program and a Python library are also provided to purchasers for guidance on how to decode the base-92 compressed .wdv files.





**Q:** **What information is included on the spreadsheets available to purchasers of the Enterprise License?**

**A:** The following pages show the column headings of the information included on the I-P and SI spreadsheets provided to purchasers of a Weather Data Viewer 2021 Enterprise License.

(Note: There are 603 columns of data available for each station – the green bars indicate the topmost row over all 603 columns. The columns in the spreadsheet are in order of the values in the single-page PDFs generated per station via the Weather Data Viewer 2021 Basic Subscription.

Specific data can also be obtained on a station-by-station basis from the .tbl files available to purchasers of the Enterprise License. The .tbl files are tab-delimited versions of the single-page PDFs generated per station via Weather Data Viewer 2021 Basic Subscription.



Station Information							
Region	Country	Prov State	Station Name		WMO	WBAN	Lat

							Annual Heating and Humidification		
Lon	Elev	StdP	TZ Offset	TZ Code	Period	Climate Zone	Coldest Month	Heating DB	
							99.6%	99.0%	

Humidification Design Conditions									
Humidification DP/MCDB and HR					Coldest Month WS/MCDB				
99.6%			99.0%		0.4%		1%		
DP	HR	MCDB	DP	HR	MCDB	WS	MCDB	WS	MCDB

Annual Cooling, Dehumidification, and Enthalpy Design Conditions									
MCWS/PCWD to 99.6% DB		Wind Shelter Factor	Hottest Month	Hottest Month DB Range	Cooling DB/MCWB				
MCWS	PCWD				0.4%		1%		2%
DB	MCWB	DB	MCWB	DB	MCWB	DB	MCWB	DB	MCWB

Evaporation Design Conditions									
Evaporation WB/MCDB					MCWS/PCWD to 0.4% DB				
0.4%		1%		2%		0.4%			
MCWB	WB	MCDB	WB	MCDB	WB	MCDB	MCWS	PCWD	DP

Dehumidification Design Conditions									
0.4%			1%		2%		0.4%		
HR	MCDB	DP	HR	MCDB	DP	HR	MCDB	Enth	MCDB

Extreme Annual Design Conditions									
Enthalpy/MCDB				Extreme Max WB	Extreme Annual WS			Extreme Annual DB	
1%		2%			1%	2.5%	5%	Min	Max
Enth	MCDB	Enth	MCDB						

Annual DB		n-Year Return Period Values of Extreme DB							
Standard Deviation		n=5 years		n=10 years		n=20 years		n=50 years	
Min	Max	Min	Max	Min	Max	Min	Max	Min	Max

Extreme Annual WB				n-Year Return Period Values of Extreme WB					
Mean		Standard Deviation		n=5 years		n=10 years		n=20 years	
Min	Max	Min	Max	Min	Max	Min	Max	Min	Max

Temperatures, Degree-Days, and Degree-Hours									
n=50 years		Average Daily Temperature							
Min	Max	Annual	Jan	Feb	Mar	Apr	May	Jun	Jul

					Standard Deviation of Average Daily Temperature				
Aug	Sep	Oct	Nov	Dec	Annual	Jan	Feb	Mar	Apr

Standard Deviation of Average Daily Temperature									
May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Jan

Heating Degree Days 10°C (HDD10.0)									
Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov

Heating Degree Days 18.3°C (HDD18.3)									
Dec	Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

					Cooling Degree Days 10°C (CDD10.0)				
Sep	Oct	Nov	Dec	Annual	Jan	Feb	Mar	Apr	May

							Cooling Degree Days 18.3°C (CDD18.3)		
Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Jan	Feb

Cooling Degree Hours 23.3°C (CDH23.3)									
Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Cooling Degree Hours 26.7°C (CDH26.7)									
Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep

			Wind Speed						
Oct	Nov	Dec	Annual	Jan	Feb	Mar	Apr	May	Jun

Average Wind Speed						Precipitation			
Jul	Aug	Sep	Oct	Nov	Dec	Annual	Jan	Feb	Mar

Average Precipitation									
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual

Maximum Precipitation									
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct

		Minimum Precipitation							
Nov	Dec	Annual	Jan	Feb	Mar	Apr	May	Jun	Jul

					Standard Deviation of Precipitation				
Aug	Sep	Oct	Nov	Dec	Annual	Jan	Feb	Mar	Apr

								Standard Deviation of Precipitation	
May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Jan

Standard Deviation of Precipitation									
Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov

Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures									
0.4% Monthly Design Dry Bulb Temperature									
Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean Wet Bulb Coincident with 0.4% Monthly Design Dry Bulb Temperature									
Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
2% Monthly Design Dry Bulb Temperature									
Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Mean Wet Bulb Coincident with 2% Monthly Design Dry Bulb Temperature									
Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
5% Monthly Design Dry Bulb Temperature									
Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Mean Wet Bulb Coincident with 5% Monthly Design Dry Bulb Temperature									
Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
10% Monthly Design Dry Bulb Temperature									
Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Mean Wet Bulb Coincident with 10% Monthly Design Dry Bulb Temperature									
Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures									
0.4% Monthly Design Wet Bulb Temperature									
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Mean Dry Bulb Coincident with 0.4% Monthly Design Wet Bulb Temperature									
Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
2% Monthly Design Wet Bulb Temperature									
Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep



Irradiance (taud)					Clear-Sky Opti				
Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May

Clear-Sky Depth for Diffuse Irradiance (taud)									
Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar

Clear-Sky Noon Beam Normal Irradiance on 21st Day									
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan

Clear-Sky Noon Diffuse Horizontal Irradiance on 21st Day									
Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov

<b>All-Sky Solar Radiation</b>									
All-Sky Average Monthly Global Horizontal Radiation									
Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep

All-Sky Standard Deviation of Monthly Globa									
Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul

					<b>Historical Trends</b>				
Global Horizontal Radiation									Station
					DBAvg	Heating		Cooling	
Aug	Sep	Oct	Nov	Dec		99% DB	99% DP	1% DB	1% WB

n Only									
Degree-Days									Station
					DBAvg	Heating		Cooling	
1% DP	HDD10.0	HDD18.3	CDD10.0	CDD18.3		99% DB	99% DP	1% DB	1% WB

Regional									
Degree-Days									
1% DP	HDD10.0	HDD18.3	CDD10.0	CDD18.3	Neighbors				