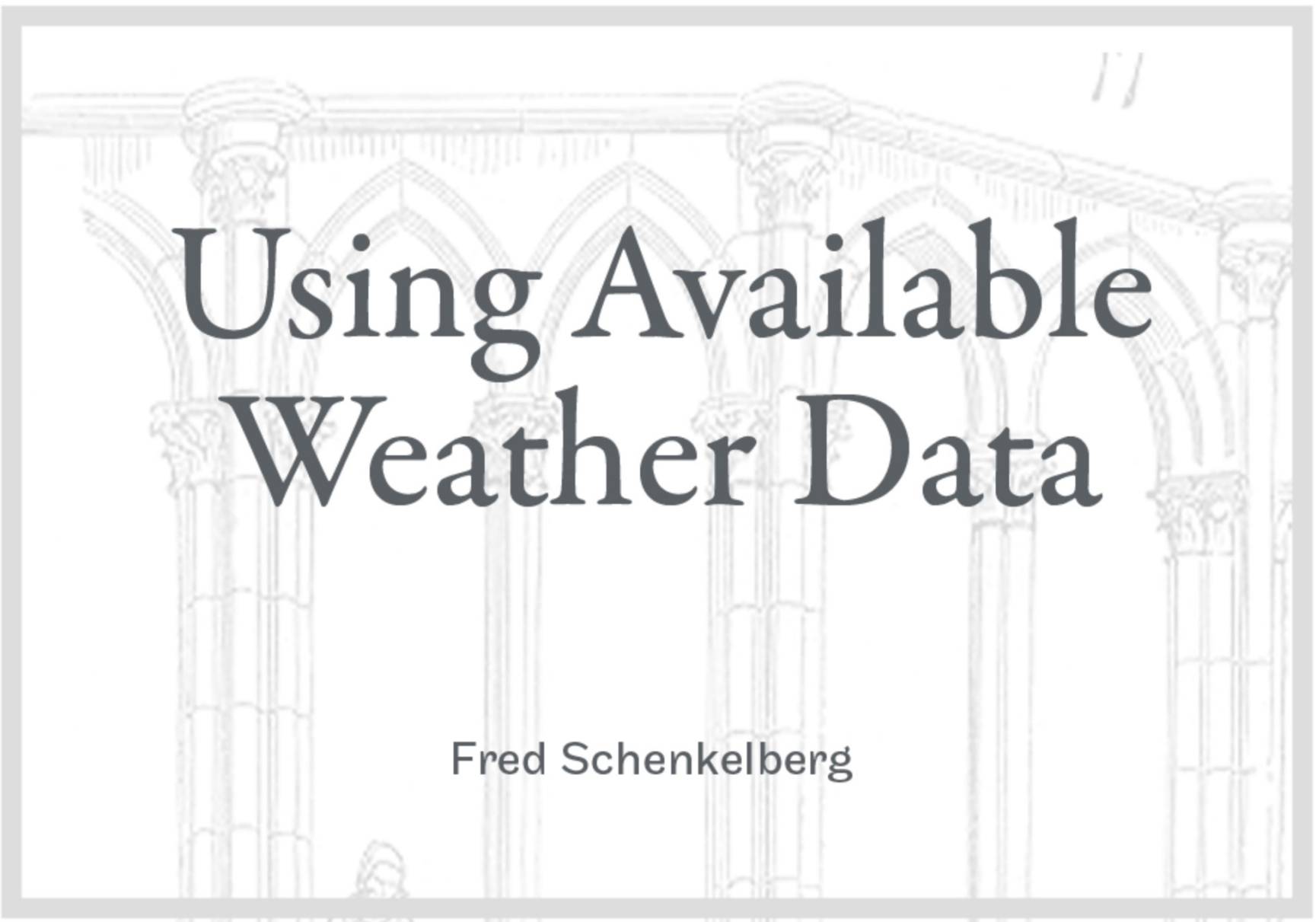




Using Available Weather Data

Fred Schenkelberg

Weather



It Varies





Limits

What weather does

your system
experience?

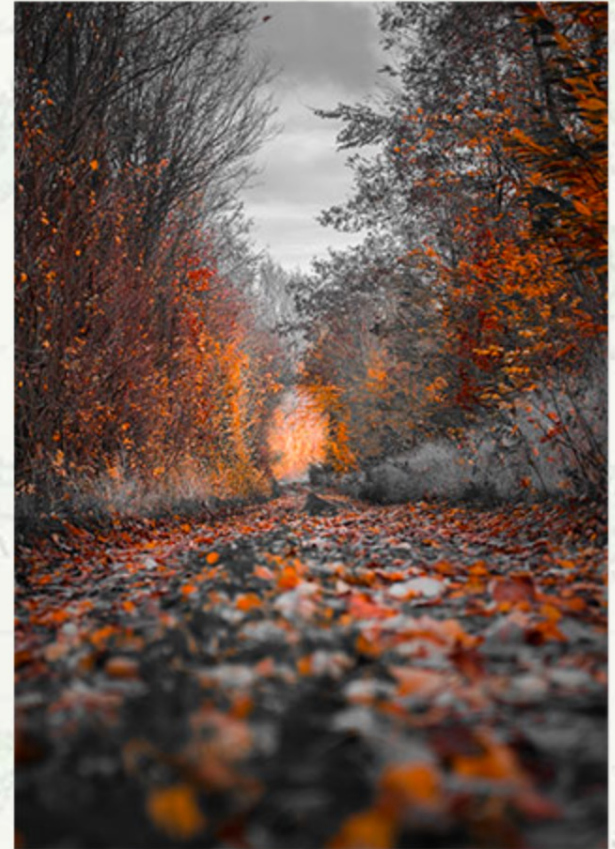
Weather Data



System



Local



Standards

System Sensors



becoming easier to do and
record

Advantages
most relevant
real time

Disadvantages
too late for design
tied to specific system

Local Ambient Weather

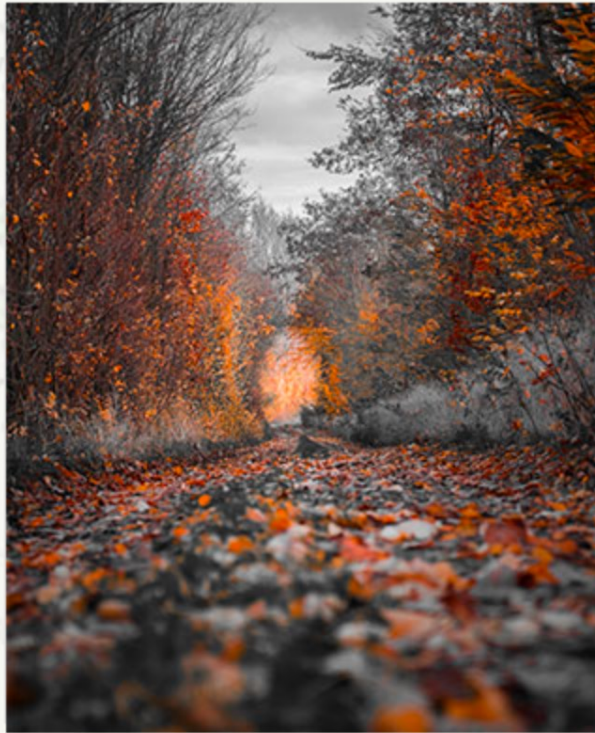


a big database at NOAA

Advantages
readily available
can go back decades

Disadvantages
may not correlate to system interior
does not account for micro climates

Published Standards



Generally do not reveal
source or assumptions

Advantages

- common values in industry
- easy to obtain

Disadvantages

- typically just limits or averages
- may be technology limited

What range of
temperatures

does your cell phone
experience?

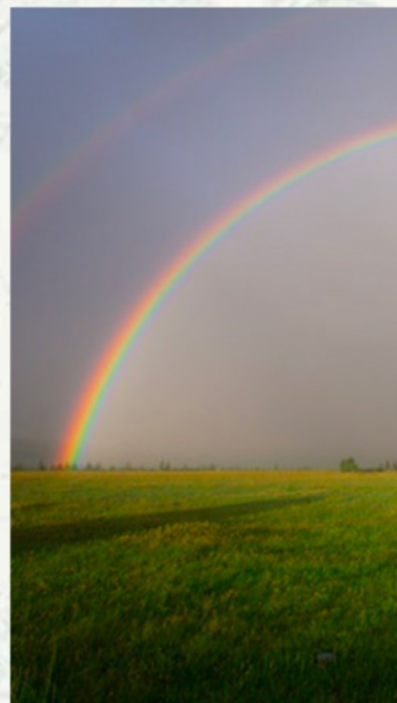
Using NOAA Data



Find



Download



Clean



Analyze

Find Weather Data

Start at the NOAA Climate Data Online Data Tools page

<https://www.ncdc.noaa.gov/cdo-web/datatools>



■ Climate Data Online Data Tools

The following tools allow alternative methods of accessing the data that is available within Climate Data Online. Some of these are visualization only, while others allow different options such as downloads. Each tool is specialized to a specific dataset or use case. Choose one of the data tools below for access.

Search Across Multiple Datasets

The following tools access data from multiple datasets at once for a unified look at the data available across a geographic region. Data may not be in a standardized format since the datasets available may not have similar formats.



Find a Station

Locate weather observing stations using a variety of parameters such as address, ZIP code, date, and data type with filters by observation type



Select a Location

Order data by weather observing stations or by geographic locations using a simplified drill-down interface with data from U.S. and other countries

Search Within a Single Dataset

The following search tools access data from within a specific dataset. Use these tools to view or order data from within each respective dataset. Data will be in a more standard format across stations or locations.



1981-2010 Normals

View temperature and precipitation Climate Normals for over 9,800 stations across the United States and a selection of other territories



Daily Weather Records

Access summaries of recent global and U.S. daily weather records with options to view monthly, annual, all-time or selected records



Local Climatological Data (LCD)

View and order hourly, daily, and monthly data from nearly 2400 locations within the U.S., surrounding territories, and other selected areas



Marine Data

View and order historical marine data which is comprised of ship, buoy, and platform observations from 1662 to present.

Select Local Climatological Data (LCD)



Local Climatological Data (LCD)

View and order hourly, daily, and monthly data from nearly 2400 locations within the U.S., surrounding territories, and other selected areas

We're looking for Albany, New York

■ Data Tools: Local Climatological Data (LCD)

Local Climatological Data (LCD) is only available for stations and locations within the United States and its territories. Select the state or territory, location, and time to view specific data. Click the station name to view details or click "ADD TO CART" to order that station's data.

Map Tool

Select a Location Type Select a State

Country	Nevada
US Territory	New Hampshire
State	New Jersey
County	New Mexico
Zip Code	New York
	North Carolina

Add Albany to Cart

Local Climatological Data > State > **New York**

1-25 of 41 Stations



STATION DETAILS

ALBANY INTERNATIONAL AIRPORT, NY US

[View Full Details](#) 

Station ID: WBAN:14735

Period of Record: 1945-01-01 to 2018-12-10

ADD TO CART

BINGHAMTON GREATER AP, NY US

[View Full Details](#) 

Station ID: WBAN:04725

Period of Record: 1948-01-01 to 2018-12-10

ADD TO CART

BUFFALO NIAGARA INTERNATIONAL, NY US

[View Full Details](#) 

Station ID: WBAN:14733

Period of Record: 1942-02-01 to 2018-12-10

ADD TO CART

Click on Cart



NOAA NATIONAL CENTERS FOR
ENVIRONMENTAL INFORMATION
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



[Home](#) [Climate Information](#) [Data Access](#) [Customer Support](#) [Contact](#) [About](#)

Search



[Home](#) > [Climate Data Online](#) > [Data Tools](#) > [Local Climatological Data \(LCD\)](#)

[Datasets](#) | [Search Tool](#) | [Mapping Tool](#) | [Data Tools](#) | [Help](#)

Cart (Free Data) 1 item

■ Data Tools: Local Climatological Data (LCD)

Local Climatological Data (LCD) is only available for stations and locations within the United States and its territories. Select the state or territory, location, and time to view specific data. Click the station name to view details or click "Add to Cart" to order that station's data.

Map Tool

Select a Location Type Select a State

Country	Nevada
US Territory	New Hampshire
State	New Jersey
County	New Mexico
Zip Code	New York
	North Carolina

Select LCD CSV & date range (up to 10 years)

Select the Output Format

Choose one option below to choose a type of format for download. Formats are a standard PDF format. Other formats are CSV (Comma Separated Value) and Text format, both of which can be opened with programs such as Microsoft Excel or OpenOffice Calc. Some formats have additional options which can be selected on the next page.



LCD PDF

[DOC Certification Option](#)

- ☒ Daily Output
- ☒ Hourly Output
- ☒ Hourly Precipitation Output
- ☐ Hourly Remarks Output (Expert Users)
- ☐ Documentation (Included in Certification)



LCD CSV



LCD Text

Select the Date Range

Click to choose the date range below.

2019-01-01 to 2019-03-09



Click 'View Full Details' for
preview, then select
Continue

Review the items in your cart

[\[CLEAR CART\]](#)

ALBANY INTERNATIONAL AIRPORT, NY US

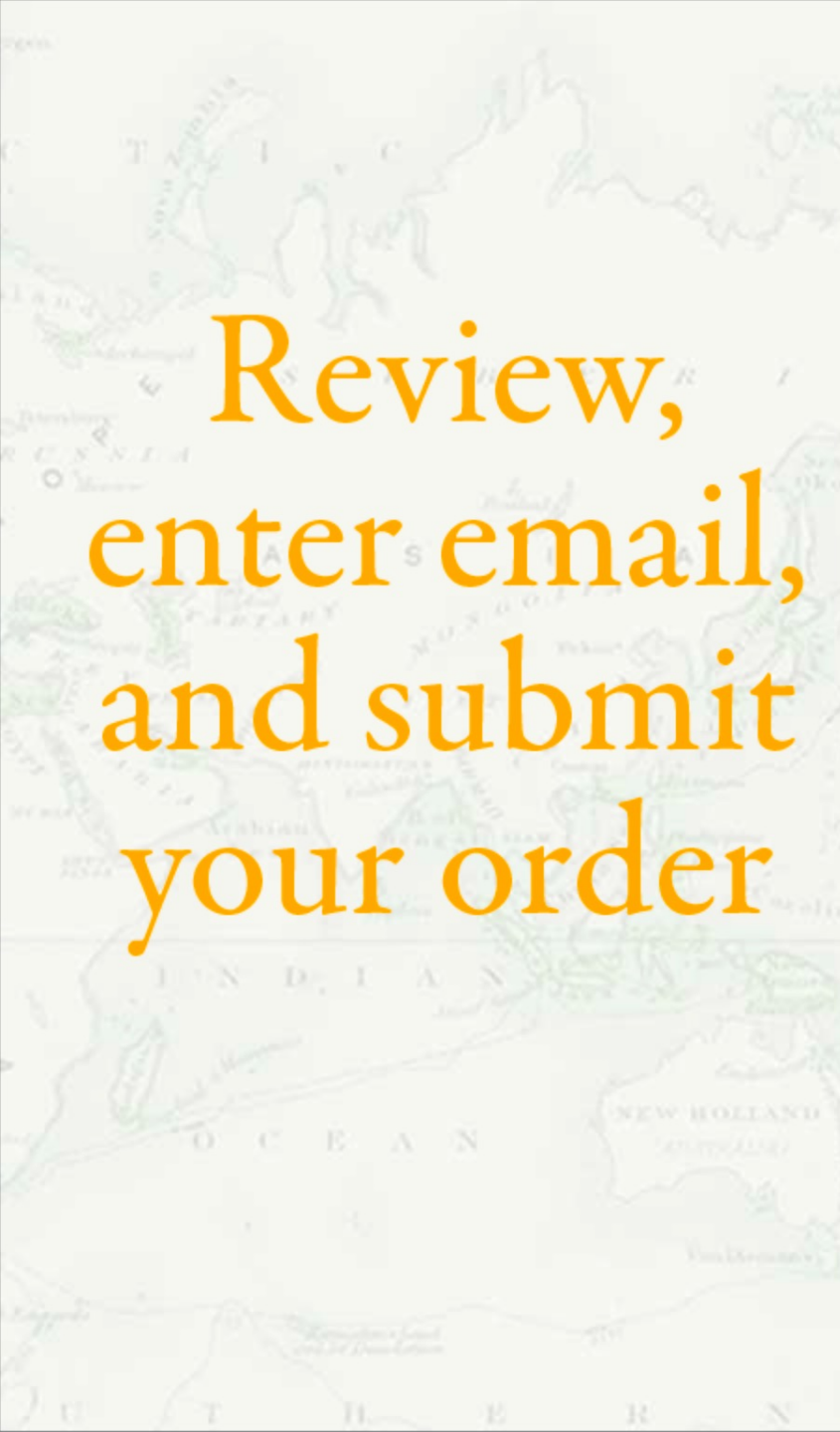
[View Full Details](#) 

Station ID: WBAN:14735

Period of Record: 1945-01-01 : 2019-03-09

Delete 

CONTINUE



Review,
enter email,
and submit
your order

REQUESTED DATA REVIEW

Dataset	Local Climatological Data
Order Start Date	2019-01-01 00:00
Order End Date	2019-03-09 23:59
Output Format	LCD PDF
LCD Pages	Daily Output, Hourly Output, Hourly Precipitation Output
Stations/Locations	ALBANY INTERNATIONAL AIRPORT, NY US (Station ID: WBAN:14735)

Enter email address

Please enter your email address. This is the address to which your data links and information regarding this order will be sent. Please read [NOAA's Privacy Policy](#) if you have any concerns.

Email Address

fms@fmsreliability.com



Verify Email Address

fms@fmsreliability.com



☒ Remember my email address

[Uncheck to forget]

NOAA will not share your email address with anyone. The email address will not be used for any purpose other than communicating the order status.

EDIT ORDER

SUBMIT ORDER

Questions?

what could go
wrong?

Download Weather Data

Confirmation email



NOAA NATIONAL CENTERS FOR
ENVIRONMENTAL INFORMATION
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Order submitted

Getting started

Thank you for using the NCEI data ordering services. Your order has been successfully submitted and will begin processing shortly. This is the first step of getting your data order processed. Once the data is added to the processing queue it will be processed as soon as possible and then an email will be sent when processing is complete.

Order details

Order #1649622 (LCD CSV)

Order #	1649622
Date Submitted	2019-03-11 12:43
Order Summary	View Summary
Documentation	View Documentation

What's next?

Most orders only take a very short while to process, but larger orders do take more time and are affected by the number of orders in the data request queue.

Download link email



NOAA

NATIONAL CENTERS FOR
ENVIRONMENTAL INFORMATION
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Order Complete

Your order has been processed and is ready for download. Use the links below to download the individual orders.

If any part of your order has certifiable data, a link will be supplied that will help you with the certification process.

Documentation for each dataset is linked from within the order for your convenience.

Order Details

Order #1649622 (LCD CSV)

File [Download](#) (Available until 2019-Mar-18)

Order ID [1649622](#)

Date Submitted 2019-03-11 12:43

Order Summary [View Summary](#)

Documentation [View Documentation](#)

Now we
got data!

repeat
for each
station
of
interest

"STATION", "DATE", "REPORT_TYPE", "SOURCE", "AWND", "BackupDirection", "BackupDistance", "BackupDistanceUnit", "BackupElements", "BackupElevation",
"BackupElevationUnit", "BackupEquipment", "BackupLatitude", "BackupLongitude", "BackupName", "CDSN", "CLDD", "DSNW", "DailyAverageDewPointTemperat
ure", "DailyAverageDryBulbTemperature", "DailyAverageRelativeHumidity", "DailyAverageSeaLevelPressure", "DailyAverageStationPressure", "DailyAv
erageWetBulbTemperature", "DailyAverageWindSpeed", "DailyCoolingDegreeDays", "DailyDepartureFromNormalAverageTemperature", "DailyHeatingDegree
Days", "DailyMaximumDryBulbTemperature", "DailyMinimumDryBulbTemperature", "DailyPeakWindDirection", "DailyPeakWindSpeed", "DailyPrecipitation",
"DailySnowDepth", "DailySnowfall", "DailySustainedWindDirection", "DailySustainedWindSpeed", "DailyWeather", "HDSO", "HTDD", "HeavyFog", "HourlyA
ltimeterSetting", "HourlyDewPointTemperature", "HourlyDryBulbTemperature", "HourlyPrecipitation", "HourlyPresentWeatherType", "HourlyPressureCh
ange", "HourlyPressureTendency", "HourlyRelativeHumidity", "HourlySeaLevelPressure", "HourlySkyConditions", "HourlyStationPressure", "HourlyVisibi
lity", "HourlyWetBulbTemperature", "HourlyWindDirection", "HourlyWindGustSpeed", "HourlyWindSpeed", "MonthlyAverageRH", "MonthlyDaysWithGT001P
recip", "MonthlyDaysWithGT010Precip", "MonthlyDaysWithGT32Temp", "MonthlyDaysWithGT90Temp", "MonthlyDaysWithLT0Temp", "MonthlyDaysWithLT32Temp",
"MonthlyDepartureFromNormalAverageTemperature", "MonthlyDepartureFromNormalCoolingDegreeDays", "MonthlyDepartureFromNormalHeatingDegreeDays",
"MonthlyDepartureFromNormalMaximumTemperature", "MonthlyDepartureFromNormalMinimumTemperature", "MonthlyDepartureFromNormalPrecipitation",
"MonthlyDewpointTemperature", "MonthlyGreatestPrecip", "MonthlyGreatestPrecipDate", "MonthlyGreatestSnowDepth", "MonthlyGreatestSnowDepthDate",
"MonthlyGreatestSnowfall", "MonthlyGreatestSnowfallDate", "MonthlyMaxSeaLevelPressureValue", "MonthlyMaxSeaLevelPressureValueDate", "MonthlyM
axSeaLevelPressureValueTime", "MonthlyMaximumTemperature", "MonthlyMeanTemperature", "MonthlyMinSeaLevelPressureValue", "MonthlyMinSeaLevelPre
ssureValueDate", "MonthlyMinSeaLevelPressureValueTime", "MonthlyMinimumTemperature", "MonthlySeaLevelPressure", "MonthlyStationPressure", "MonthlyT
otalLiquidPrecipitation", "MonthlyTotalSnowfall", "MonthlyWetBulb", "NormalsCoolingDegreeDay", "NormalsHeatingDegreeDay", "RSM", "REPORT_TYP
E", "SOURCE", "ShortDurationEndDate005", "ShortDurationEndDate010", "ShortDurationEndDate015", "ShortDurationEndDate020", "ShortDurationEndDate0
30", "ShortDurationEndDate045", "ShortDurationEndDate060", "ShortDurationEndDate080", "ShortDurationEndDate100", "ShortDurationEndDate120", "Sho
rtDurationEndDate150", "ShortDurationEndDate180", "ShortDurationPrecipitationValue005", "ShortDurationPrecipitationValue010", "ShortDurationPr
ecipitationValue015", "ShortDurationPrecipitationValue020", "ShortDurationPrecipitationValue030", "ShortDurationPrecipitationValue045", "Short
DurationPrecipitationValue060", "ShortDurationPrecipitationValue080", "ShortDurationPrecipitationValue100", "ShortDurationPrecipitationValue1
20", "ShortDurationPrecipitationValue150", "ShortDurationPrecipitationValue180", "Sunrise", "Sunset", "TStorms", "WindEquipmentChangeDate"
"72518014735", "2019-01-01T00:51:00", "FM-15", "7", "PRECIP", "259.8", "PLASTIC", "42.6918", "-73.8311", "NWS ALBANY,
NY", "29.66", "36", "41", "0.08", "-RA:02 |RA |RA", "+0.25", "8", "29.67", "BKN:07 8 OVC:08
25", "29.35", "5.00", "39", "160", "32", "22", "MET16301/01/19 00:51:02 METAR KALB 010551Z 16019G28KT 5SM -RA
BKN008 OVC025 05/02 A2966 RMX AO2 PK WND 16028/0545 PRESFR SLP046 P0007 60050 T00500022 10050 20039 58084 \$", "FM-
15", "7", "2006-09-08"
"72518014735", "2019-01-01T01:00:00", "FM-12", "4", "PRECIP", "259.8", "PLASTIC", "42.6918", "-73.8311", "NWS ALBANY,
NY", "36", "41", "0.25", "8", "82", "29.67", "8", "29.35", "4.97", "39", "160", "22", "2006-09-08"
"SYN09872518 11358 81619 10050 20022 39938 40046 58084 60131 761// 90551 333 10050 21005 91028 555 90106=", "FM-
12", "4", "2006-09-08"
"72518014735", "2019-01-01T01:51:00", "FM-15", "7", "PRECIP", "259.8", "PLASTIC", "42.6918", "-73.8311", "NWS ALBANY,
NY", "29.61", "37", "41", "0.01", "86", "29.61", "OVC:08
6", "29.30", "10.00", "39", "170", "26", "17", "MET12801/01/19 01:51:02 METAR KALB 010651Z 17015G23KT 10SM
OVC006 05/03 A2961 RMX AO2 PK WND 17028/0611 RAE12 SLP028 P0002 T00500028 \$", "FM-15", "7", "2006-09-08"
"72518014735", "2019-01-01T02:51:00", "FM-15", "7", "PRECIP", "259.8", "PLASTIC", "42.6918", "-73.8311", "NWS ALBANY,
NY", "29.58", "38", "42", "0.00", "85", "29.58", "OVC:08
6", "29.27", "9.00", "40", "160", "21", "14", "MET10401/01/19 02:51:02 METAR KALB 010751Z 16012G18KT 9SM
OVC006 06/03 A2958 RMX AO2 PRESFR SLP017 T00560033 \$", "FM-15", "7", "2006-09-08"
"72518014735", "2019-01-01T03:46:00", "FM-16", "7", "PRECIP", "259.8", "PLASTIC", "42.6918", "-73.8311", "NWS ALBANY,
NY", "29.51", "39", "43", "87", "OVC:08
4", "29.20", "10.00", "41", "170", "20", "13", "MET08101/01/19 03:46:02 SPECI KALB 010846Z 17011G17KT 10SM
OVC004 06/04 A2951 RMX AO2 \$", "FM-16", "7", "2006-09-08"
"72518014735", "2019-01-01T03:51:00", "FM-15", "7", "PRECIP", "259.8", "PLASTIC", "42.6918", "-73.8311", "NWS ALBANY,
NY", "29.50", "39", "43", "0.00", "40.10", "6", "86", "29.51", "OVC:08
4", "29.19", "10.00", "41", "180", "20", "14", "MET11701/01/19 03:51:02 METAR KALB 010851Z 18012G17KT 10SM
OVC004 06/04 A2950 RMX AO2 PRESFR SLP993 60002 T00610039 56034 \$", "FM-15", "7", "2006-09-08"
"72518014735", "2019-01-01T04:00:00", "FM-12", "4", "PRECIP", "259.8", "PLASTIC", "42.6918", "-73.8311", "NWS ALBANY,
NY", "39", "43", "0.10", "6", "86", "29.51", "5", "29.19", "9.94", "41", "180", "14", "2006-09-08"
"SYN08072518 12266 81812 10061 20039 39884 49993 56034 69957 90851 333 91017 555 90109=", "FM-12", "4", "2006-
09-08"
"72518014735", "2019-01-01T04:28:00", "FM-16", "7", "PRECIP", "259.8", "PLASTIC", "42.6918", "-73.8311", "NWS ALBANY,
NY", "29.48", "39", "43", "86", "OVC:08
5", "29.17", "10.00", "41", "180", "24", "16", "MET09101/01/19 04:28:02 SPECI KALB 010928Z 18014G21KT 10SM
OVC005 06/04 A2948 RMX AO2 T00610039 \$", "FM-16", "7", "2006-09-08"
"72518014735", "2019-01-01T04:51:00", "FM-15", "7", "PRECIP", "259.8", "PLASTIC", "42.6918", "-73.8311", "NWS ALBANY,
NY", "29.46a", "39", "43", "0.00", "86", "29.47a", "OVC:08
5", "29.15a", "10.00", "41", "170", "23", "15", "MET09501/01/19 04:51:02 METAR KALB 010951Z 17012KT 10SM OVC005
06/04 A2946 RMX AO2 SLP979 T00610039 \$", "FM-15", "7", "2006-09-08"
"72518014735", "2019-01-01T05:05:00", "FM-16", "7", "PRECIP", "259.8", "PLASTIC", "42.6918", "-73.8311", "NWS ALBANY,
NY", "29.46a", "40", "43", "89", "OVC:08
4", "29.15a", "10.00", "42", "170", "15", "MET08801/01/19 05:05:02 SPECI KALB 011005Z 17013KT 10SM OVC004
06/04 A2946 RMX AO2 T00610044 \$", "FM-16", "7", "2006-09-08"
"72518014735", "2019-01-01T05:22:00", "FM-16", "7", "PRECIP", "259.8", "PLASTIC", "42.6918", "-73.8311", "NWS ALBANY,
NY", "29.46a", "40", "44", "85", "OVC:08
5", "29.15a", "10.00", "42", "170", "23", "15", "MET09101/01/19 05:22:02 SPECI KALB 011022Z 17013G20KT 10SM
OVC005 07/04 A2946 RMX AO2 T00670044 \$", "FM-16", "7", "2006-09-08"
"72518014735", "2019-01-01T05:51:00", "FM-15", "7", "PRECIP", "259.8", "PLASTIC", "42.6918", "-73.8311", "NWS ALBANY,
NY", "29.47", "40", "45", "T", "-RA:02 |RA |RA", "83", "BKN:07 5 OVC:08
37", "10.00", "170", "16", "MET13101/01/19 05:51:02 METAR KALB 011051Z 17014KT 10SM -RA BKN005 OVC037
07/04 A2947 RMX AO2 RAB48 SLP983 PCPN VRY LGT P0000 T00720044 \$", "FM-15", "7", "2006-09-08"
"72518014735", "2019-01-01T05:59:00", "FM-16", "7", "PRECIP", "259.8", "PLASTIC", "42.6918", "-73.8311", "NWS ALBANY,
NY", "29.47", "41", "45", "T", "86", "SCT:04 6 OVC:08
37", "10.00", "170", "16", "MET10701/01/19 05:59:02 SPECI KALB 011059Z 17014KT 10SM SCT006 OVC037 07/05
A2947 RMX AO2 RAE57 P0000 T00720050 \$", "FM-16", "7", "2006-09-08"
"72518014735", "2019-01-01T06:51:00", "FM-15", "7", "PRECIP", "259.8", "PLASTIC", "42.6918", "-73.8311", "NWS ALBANY,
NY", "29.50", "42", "47", "0.00", "40.01", "5", "83", "FEW:02 15 BKN:07 36 OVC:08
48", "29.19", "10.00", "45", "170", "9", "MET16901/01/19 06:51:02 METAR KALB 011151Z 17008KT 10SM FEW015
BKN036 OVC048 08/06 A2950 RMX AO2 RAE1057 SLP991 PRESENT MX VCSH P0000 60002 70059 T00830056 10083 20050 55002 \$", "FM-

How can you make a
statistician happy?

Clean Weather Data

Copy to Exel

A1		STATION,STATION_NAME,ELEVATION,LATITUDE,LONGITUDE,DATE,REPORTTYPE,HOURLYSKYCONDITIONS,HOURLY							
	A	B	C	D	E	F	G	H	
1	STATION,STATION_NAME,ELEVATION,LATITUDE,LONGITUDE,DATE,REPORTTYPE,HOURLYSKYCONDITIONS,HOURLY								
2	WBAN:14732,LA GUARDIA AIRPORT NY US,3.4,40.7792,-73.88,2008-01-01 00:51,FM-15,,9.00,,38,3								
3	WBAN:14732,LA GUARDIA AIRPORT NY US,3.4,40.7792,-73.88,2008-01-01 01:00,FM-12,CLR:00,8.70								
4	WBAN:14732,LA GUARDIA AIRPORT NY US,3.4,40.7792,-73.88,2008-01-01 01:51,FM-15,,8.00,,35,1								
5	WBAN:14732,LA GUARDIA AIRPORT NY US,3.4,40.7792,-73.88,2008-01-01 02:51,FM-15,,9.00,,37,2								
6	WBAN:14732,LA GUARDIA AIRPORT NY US,3.4,40.7792,-73.88,2008-01-01 03:51,FM-15,,8.00,,36,2								
7	WBAN:14732,LA GUARDIA AIRPORT NY US,3.4,40.7792,-73.88,2008-01-01 04:00,FM-12,CLR:00,7.46								
8	WBAN:14732,LA GUARDIA AIRPORT NY US,3.4,40.7792,-73.88,2008-01-01 04:51,FM-15,SCT:04 36,8								
9	WBAN:14732,LA GUARDIA AIRPORT NY US,3.4,40.7792,-73.88,2008-01-01 05:51,FM-15,SCT:04 28,1								
10	WBAN:14732,LA GUARDIA AIRPORT NY US,3.4,40.7792,-73.88,2008-01-01 06:51,FM-15,FEW:02 27 S								
11	WBAN:14732,LA GUARDIA AIRPORT NY US,3.4,40.7792,-73.88,2008-01-01 07:00,FM-12,,9.94,,41,5								

The screenshot shows the 'Convert Text to Columns Wizard - Step 1 of 3' dialog box in Microsoft Excel. The 'Text to Columns' button in the ribbon is circled in orange. The wizard indicates the data is 'Fixed Width'. The 'Delimited' radio button is circled in orange. A data preview is shown at the bottom.

Original data type

Choose the file type that best describes your data:

- ☐ Delimited - Characters such as commas or tabs separate each field.
- ☒ Fixed width - Fields are aligned in columns with spaces between each field.

Data preview

Preview of selected data:

1	STATION, STATION_NAME, ELEVATION, LATITUDE, LONGITUDE, DATE, REPORTTYPE, HOURLYSK
2	WBAN:14732, LA GUARDIA AIRPORT NY US, 3.4, 40.7792, -73.88, 2008-01-01 00:51, FM
3	WBAN:14732, LA GUARDIA AIRPORT NY US, 3.4, 40.7792, -73.88, 2008-01-01 01:00, FM
4	WBAN:14732, LA GUARDIA AIRPORT NY US, 3.4, 40.7792, -73.88, 2008-01-01 01:51, FM
5	WBAN:14732, LA GUARDIA AIRPORT NY US, 3.4, 40.7792, -73.88, 2008-01-01 02:51, FM
6	WBAN:14732, LA GUARDIA AIRPORT NY US, 3.4, 40.7792, -73.88, 2008-01-01 03:51, FM

If this is correct, choose Next, or choose the Data Type that best describes your data.

Original data type

Choose the file type that best describes your data:

- ☐ Delimited - Characters such as commas or tabs separate each field.
- ☒ Fixed width - Fields are aligned in columns with spaces between each field.

Data preview

Preview of selected data:

1	STATION	STATION_NAME	ELEVATION	LATITUDE	LONGITUDE	DATE	REPORTTYPE	HOURLYSK
2	WBAN:14732,LA	GUARDIA AIRPORT	NY US,3.4,40.7792,-73.88	2008-01-01	00:51	FM		
3	WBAN:14732,LA	GUARDIA AIRPORT	NY US,3.4,40.7792,-73.88	2008-01-01	01:00	FM		
4	WBAN:14732,LA	GUARDIA AIRPORT	NY US,3.4,40.7792,-73.88	2008-01-01	01:51	FM		
5	WBAN:14732,LA	GUARDIA AIRPORT	NY US,3.4,40.7792,-73.88	2008-01-01	02:51	FM		
6	WBAN:14732,LA	GUARDIA AIRPORT	NY US,3.4,40.7792,-73.88	2008-01-01	03:51	FM		

Cancel

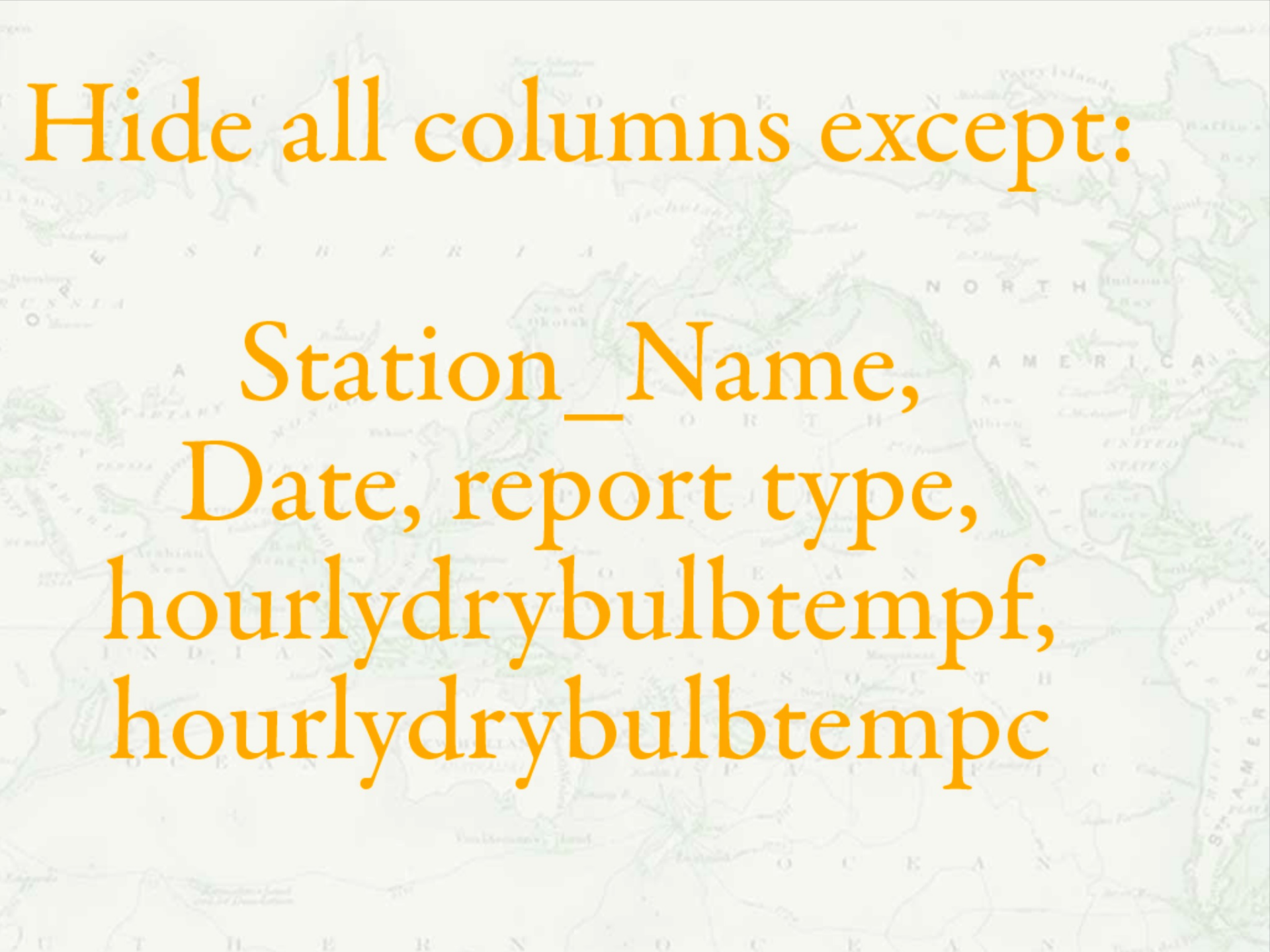
[< Back](#)

Next >

Finish

A Few More Steps

STATION											
A	B	C	D	E	F	G	H	I	J	K	L
STATION	STATION_NAME	ELEVATION	LATITUDE	LONGITUDE	DATE	REPORTTYPE	HOURLYSKYC	HOURLYVISIB	HOURLYPRSE	HOURLYDRY	HOURLYHUM
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 0:53	FM-15	SCT:04 65	8		24	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 1:00	FM-12		7.46		24	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 1:53	FM-15		9		25	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 2:53	FM-15		9		26	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 3:53	FM-15		10		28	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 4:17	FM-16	BKN:07 25	10		28	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 4:53	FM-15	OVC:08 23	9		29	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 5:43	FM-16	OVC:08 19	1.75	-SN:03 BR:1	30	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 5:53	FM-15		1		30	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 6:03	FM-16		0.75		30	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 6:16	FM-16		0.5	FG:48	30	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 6:48	FM-16		1		30	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 6:53	FM-15		1		30	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 7:00	FM-12		0.99		30	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 7:04	FM-16		0.75		30	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 7:12	FM-16		1		30	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 7:51	FM-16		0.75			
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 7:53	FM-15		0.5	FG:48	30	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 8:29	FM-16	BKN:07 2 OV	1.5	-SN:03 BR:1	32	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 8:53	FM-15	BKN:07 4 BKN	1.5		32	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 9:10	FM-16	BKN:07 6 BKN	1.5		34	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 9:53	FM-15	SCT:04 6 BKN	1.5		33	
WBAN:04725	BINGHAMTO	486.2	42.2068	-75.98	1/1/08 10:09	FM-16	BKN:07 8 BKN	10		34	

A faint, stylized map of the Pacific Ocean and surrounding continents (North America, South America, Africa, Asia, Australia) serves as the background. The text is overlaid in a large, orange, serif font.

Hide all columns except:

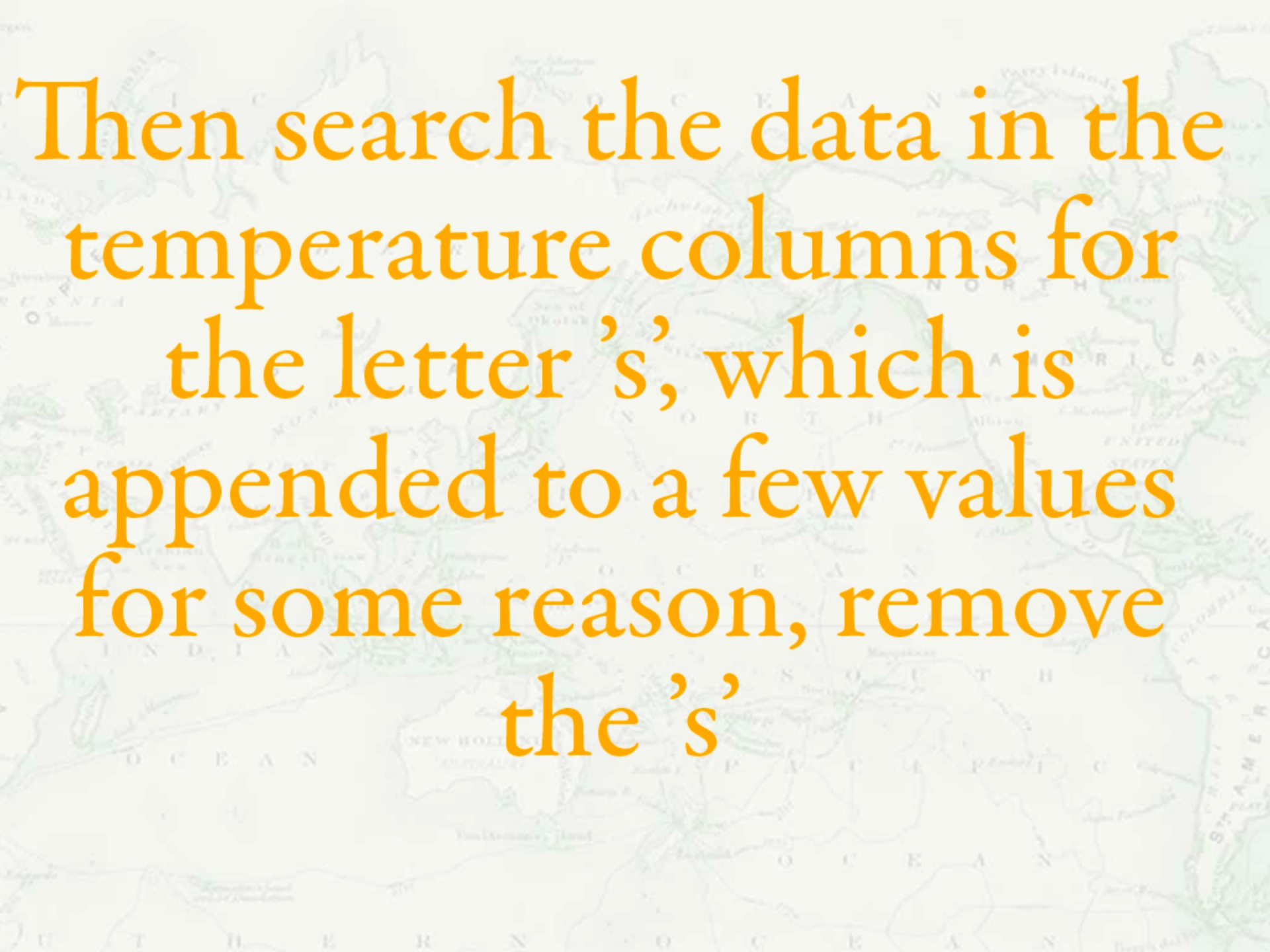
Station_Name,
Date, report type,
hourlydrybulbtempf,
hourlydrybulbtempc

Filter on REPORTTYPE for FM-15

	A	B	C	D	E	F	
1	STATION_NAME	DATE	REPORTTYPE	HOURLYDRYBULBTEMP	HOURLYDRYBULBTEMP		
2	ALBANY INTL	1/1/08 0:51	FM-15	21	-6.1		
3	ALBANY INTL	1/1/08 1:51	FM-15	20	-6.7		
4	ALBANY INTL	1/1/08 2:51	FM-15	21	-6.1		
5	ALBANY INTL	1/1/08 3:51	FM-15	20	-6.7		
6	ALBANY INTL	1/1/08 4:51	FM-15	19	-7.2		
7	ALBANY INTL	1/1/08 5:51	FM-15	21	-6.1		
8	ALBANY INTL	1/1/08 6:51	FM-15	22	-5.6		
9	ALBANY INTL	1/1/08 7:51	FM-15	24	-4.4		
10	ALBANY INTL	1/1/08 8:51	FM-15	25	-3.9		
11	ALBANY INTL	1/1/08 9:51	FM-15	26	-3.3		
12	ALBANY INTL	1/1/08 10:51	FM-15	26	-3.3		
13	ALBANY INTL	1/1/08 11:51	FM-15	28	-2.2		
14	ALBANY INTL	1/1/08 12:51	FM-15	29	-1.7		



Copy result to new
spreadsheet
(save with new name)

A faint, light green map of the world serves as the background. It shows the outlines of continents and the names of major oceans and seas in a serif font. The text is overlaid on this map.

Then search the data in the
temperature columns for
the letter 's', which is
appended to a few values
for some reason, remove
the 's'



save your
work

Questions?

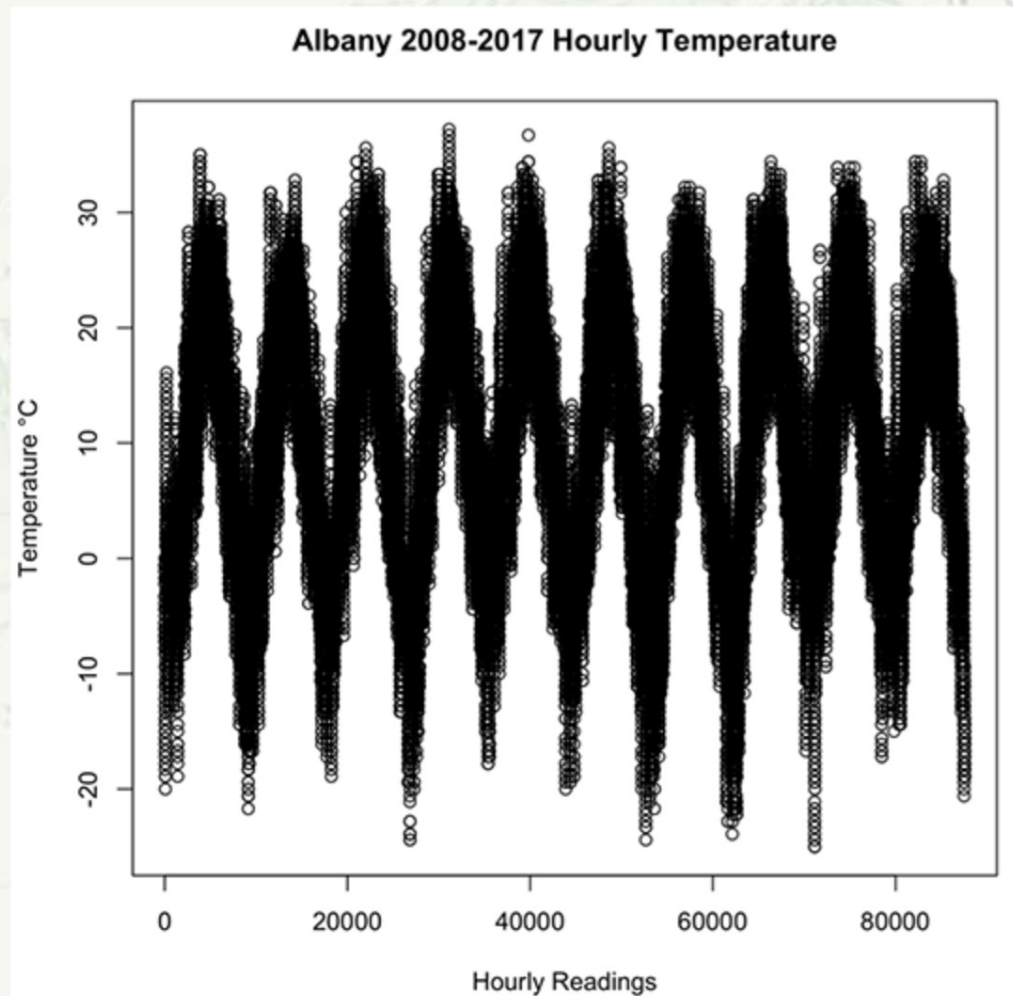
I kept notes as I went

Analyze Weather Data

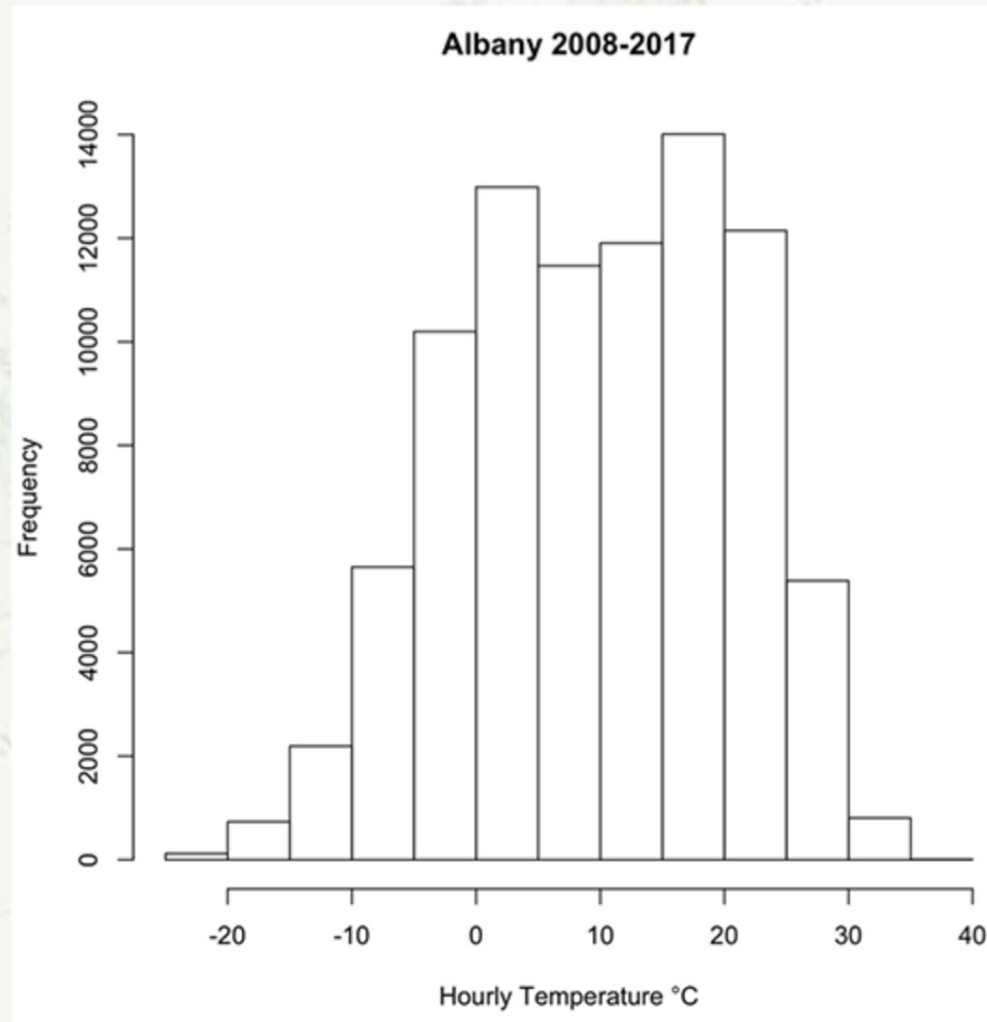
Import data into R

```
albany_hourly<-read.csv("~/weather data/LCD hourly  
dry bulb temperatures/LaGuardia-2008-2017-hourly  
temperatures.csv",  
colClasses=c('character','character','character','numeric','n  
umeric'))
```

```
plot(laguardia_hourly$HOURLYDRYBULBTEMP  
,main="La Guardia 2008-2017 Hourly Temperature",  
xlab="Hourly Readings", ylab="Temperature °C")
```



```
hist(albany_hourly$HOURLYDRYBULBTEMP,
     main="Albany 2008-2017",
     xlab="Hourly Temperature °C")
```

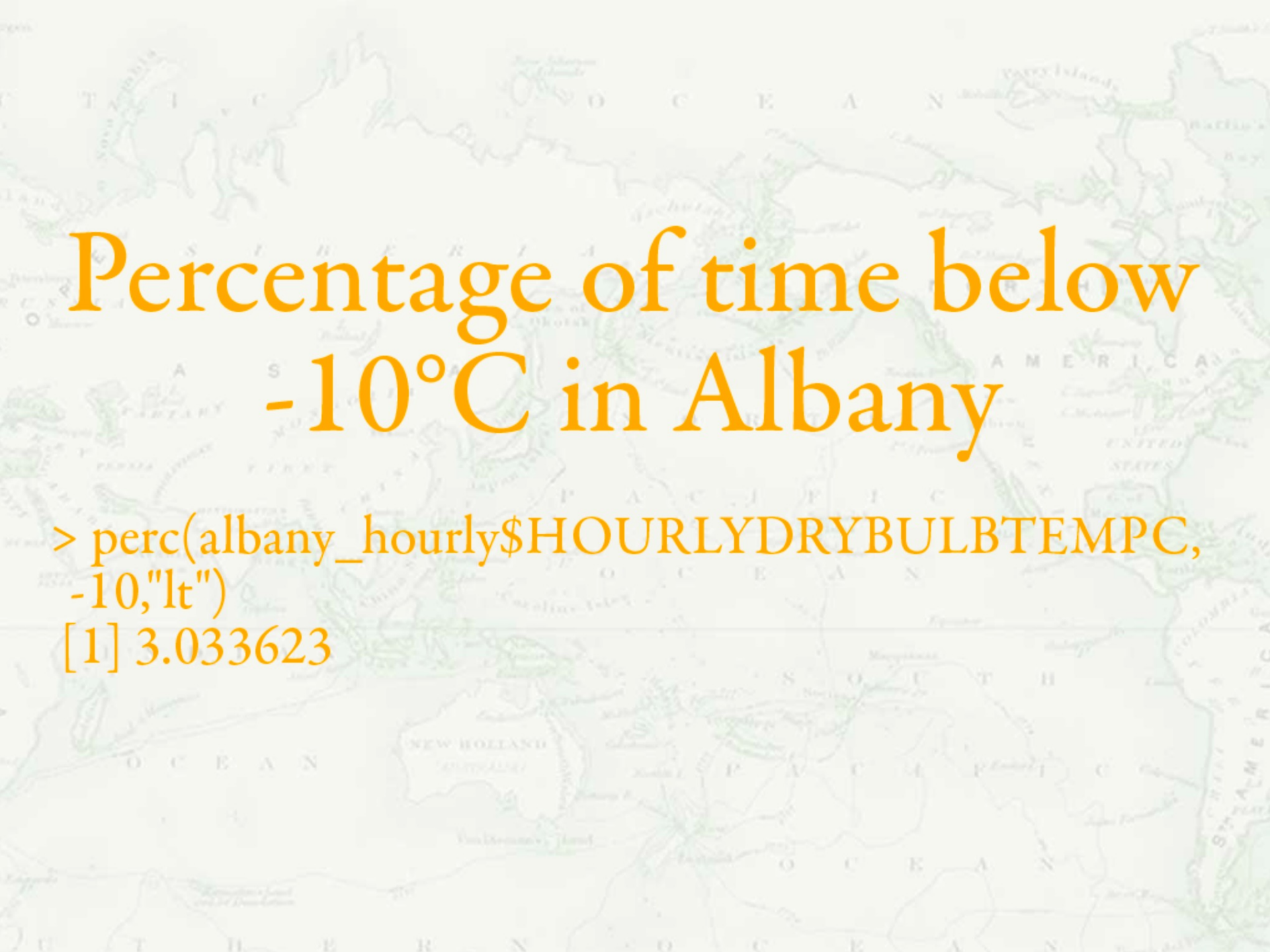


Load the FSA package

R Package Manager		
< Back		Fwd >
		Refresh List
Status	Package	Description
☐ not loaded	colorspace	Color Space Manipulation
☐ not loaded	compiler	The R Compiler Package
☒ loaded	datasets	The R Datasets Package
☐ not loaded	digest	Create Cryptographic Hash Digests of R Objects
☐ not loaded	flexmix	Flexible Mixture Modeling
☐ not loaded	foreign	Read Data Stored by Minitab, S, SAS, SPSS, Stata, Systat, Weka,
☒ loaded	FSA	Functions for Simple Fisheries Stock Assessment Methods
☐ not loaded	gdata	Various R programming tools for data manipulation
☐ not loaded	gee	Generalized Estimation Equation Solver
☐ not loaded	ggplot2	An implementation of the Grammar of Graphics

Functions for Simple Fisheries Stock Assessment Methods



A faint, stylized map of the Pacific Ocean and surrounding landmasses, including North America, South America, and parts of Asia and Australia. The map is in a light green and blue color scheme.

Percentage of time below -10°C in Albany

```
> perc(albany_hourly$HOURLYDRYBULBTEMP,
-10,"lt")
[1] 3.033623
```

A faint, light-colored map of the Pacific Ocean and surrounding continents (North America, South America, Africa, and Australia) serves as the background for the text.

```
length(albany_hourly$HOURLYDRYBULBTEMPC)-1  
[1] 87605
```

readings per year in this dataset of 10 years is 8760.5

Number of hours per year below specific value

```
perc(albany_hourly$HOURLYDRYBULBTEMPC,-10,  
"lt")*8760.5/1000  
[1] 265.797
```

265.797 hours of time per year below -10°C in Albany, NY

Questions?

Is 10 years of data
good enough?

In Summary

You know something



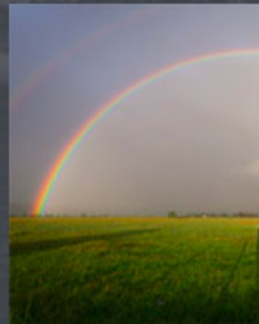
Focus on what they need



Some else wants to know what you know



Teachable Moment



More Information

Visit [AccendoReliability.com](https://www.AccendoReliability.com)

Let me know if you have any questions.

Check out the reliability engineering podcast network at [Reliability.FM](https://www.Reliability.FM)

Let's only use useful reliability standards.