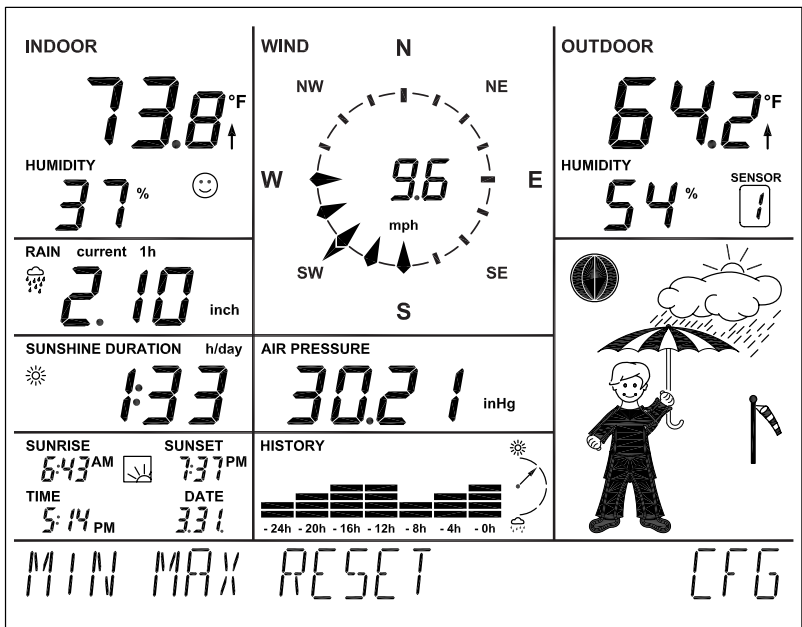


TouchScreen Wireless Weather Station WS 550 US

Operating Instructions



La Crosse Technology

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1. English Edition 3/2007

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1. General aspects and Function

The TouchScreen Wireless Weather Station WS 550 US is a high-quality, highly comfortable universal weather measurement system that can record, process and display data from a maximum of 8 (currently not available) additional wireless temperature and humidity sensors as well as a combi-sensor up to a distance of 400 ft. (outdoor range).

The combination sensor TX 550 US belonging to the weather station is meant for outdoor use and captures the following:

Temperature, humidity, direction of wind, wind velocity, set in of rain, rain quantity and duration of sunshine.

The weather sensors for inside temperature, indoor humidity and air pressure are already located inside the weather station; hence no external sensor is required for these measurements.

The operating concept is the most excellent feature of the weather station. It does not have any traditional operating elements; it is operated only with the help of a highly sensitive TouchScreen and simple menu structures. Even the weather sensors can be easily logged into the system.

Weather data from the combi-sensor can be queried in real time; in "live mode" touching the respective display field triggers a data query (bi-directional wireless technology). Hence, the latest data is always available. Further, the combi-sensor can also be prompted in "live mode" to send its measurement data for 20 seconds at 2 seconds intervals. You can track in real time the wind direction and the wind velocity for 20 seconds. The display can be illuminated permanently or with time controls; thus the display is legible under almost all light conditions. The glass foot and the transparent design frame of the device are also illuminated.

As the weather station has a large internal memory it is best suited for observation over long periods - a total of 3000 records can be stored in the internal memory.

Please read this Operating Instructions manual carefully and in full to avoid functional disturbances and wrong operations. Please store this manual for future reference.

Please follow the assembling and calibration instructions for the measurement recorders.

Overview of the display and operating options of WS 550 US:

Display the inside temperature and humidity

- Switch to displaying the dewpoint
- Save the minimum and maximum temperature with time/date of occurrence
- Save the minimum and maximum humidity with time/date of occurrence
- Comfort zone indicator
- Graphical trend display of the last 24 h (only for temperature)

Display's outdoor temperature/humidity from Combi Sensor.

- Can be switched: Display the dewpoint or wind-chill temperature
- Save the minimum and maximum temperature with time/date of occurrence
- Save the minimum and maximum humidity with time/date of occurrence
- Graphical trend display of the last 24 h (only for temperature)
- Frost warning (in "Oscar Outlook" display)

Display the wind velocity with wind direction and fluctuation range

- Units for selection: : km/h, m/s, mph
- Save the maximum wind intensity with time/date
- Display wind direction with fluctuation range as wind rose and in numeric format
- Wind-sack symbol for prominent signaling of various wind intensities

Display the rainfall quantity in mm, inch or l/m² for:

- Total quantity since the last reset / last hour / current hour / last 24 h / current 24 h (storage for hour: always at xx:30 hours; storage for day: always at 7:30 a. m.)
- Save the maximum quantity per hour and per day
- Additional display when it starts raining (Immediate rain display)

Display the air pressure progress/ air pressure trend display:

- Graphical display of the progress in the last 24 h
- Display the air pressure trend in 5 stages: heavily increasing, increasing, uniform, decreasing, heavily decreasing

Display symbols of the weather forecast: rainy, cloudy, bright, sunny

Weather display "Oscar Outlook"

Similar to the almost forgotten weather "house" where a person came out of the door with an umbrella if the weather was bad and wore light clothes if it was good, WS 550 US has "Oscar Outlook".

The behavior of this character is based on various weather factors; hence it is immediately possible to know the type of clothing one would need outdoors. Not only the current measured values for outside temperature, humidity, wind and rain are evaluated for this display.

The weather forecast also plays an equally important role. So "Oscar Outlook" has different displays and clothing depending on the weather situation.

You will find a detailed description of the evaluation criteria in chapter 3.4 of this Operating Instructions manual.

Display the sunrise and sunset time

- Calculation can be done in the latitude range of -60° to $+60^{\circ}$ N depending on the location data that is to be entered.

Moon phase display

- Display the current moon phase: New moon, waxing moon, waning moon

Display the total duration of sunshine or of the current day

- Save the minimum and maximum duration per day with time/date of occurrence
- Sun symbol if there is sunshine

Data logging function

- Data logger can collect maximum 3000 records at programmable intervals; these can then be read via an USB interface using "WeatherProfessional" software.
- If the data logger memory is full, the system displays a timely message prompting you to download the data.

Miscellaneous

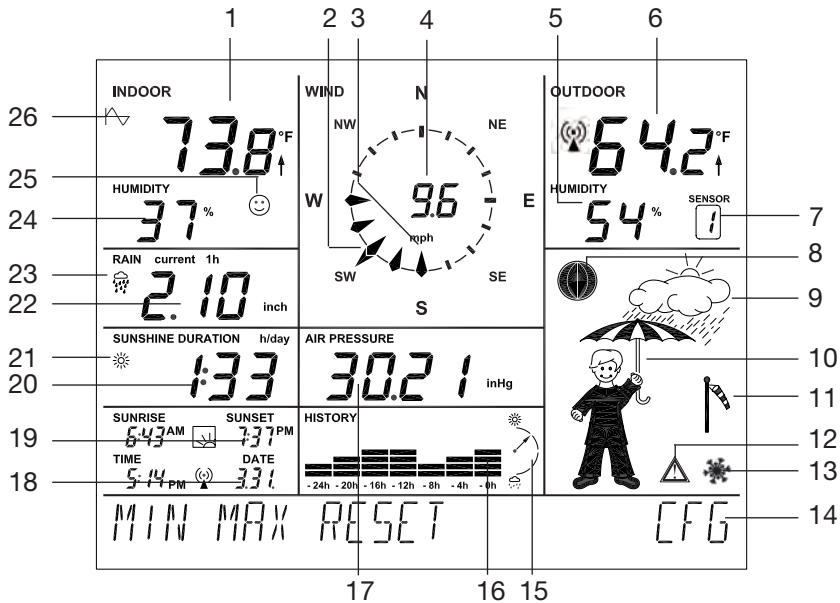
- Very simple set up menu
- An acknowledgement beep can be switched on / off as required
- Depending on the need, the device can be installed on the table or mounted on the wall
- Switching time of the display lighting can be programmed

All important weather information appears simultaneously on the display so that it is not necessary to operate the device to capture the data.

Multiple basic units can be operated simultaneously; hence the data of the sensors can be simultaneously displayed at multiple locations.

The external sensor system of WS 550 US works exclusively on wireless data transfer. You can thus install or mount the sensors at a maximum distance of 400 ft. (depending on the local conditions, see section "Range") from the base station.

Quick overview of the display fields



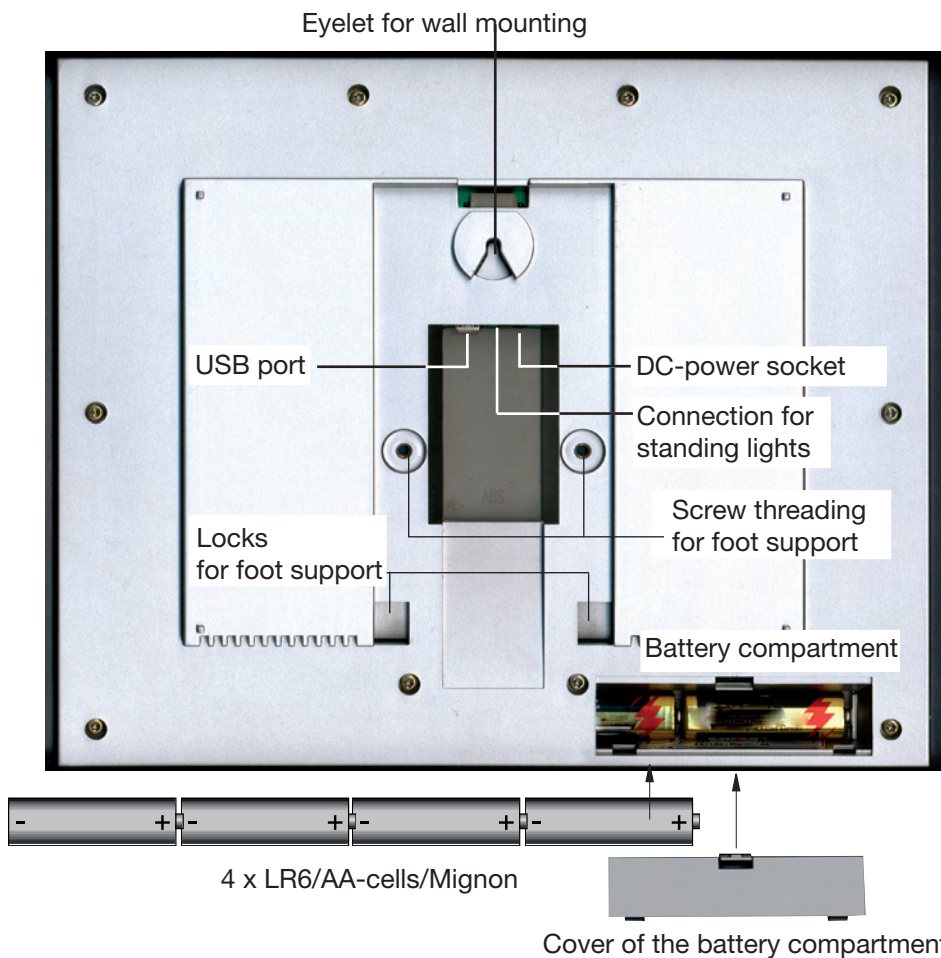
1. Current indoor temperature with temperature trend
2. Displays the current direction of the wind (main wind direction)
3. Display the fluctuation range when wind direction is changing
4. Displays the speed of the wind
5. Current humidity of the selected outdoor sensor
6. Current temperature of the selected outdoor sensor with temperature trend and reception display
7. Displays the currently selected outdoor sensor (no display if you select TX 550 US)
8. Moon phase display
9. Displays the weather forecast (sunny, bright, cloudy, rainy)
10. Animated multiple weather display "Oscar Outlook"
11. Displays speed of wind (mild, medium, strong)
12. Warning against turbulent weather
13. Frost warning
14. Menu bar
15. Trend display for air pressure: strongly increasing, slightly increasing, constant, slightly decreasing, heavily decreasing; for further details please refer concept definitions
16. History display, always with reference to the current value, also see 26.
17. Display the current air pressure
18. Time and Date display
19. Displays the sunrise and sunset time
20. Displays duration of sunshine
21. Sun symbol if the sun is currently shining, otherwise cloud symbol
22. Display the rain quantity
23. Display of set in of rain
24. Current indoor humidity level
25. Comfort zone indicator for displaying comfortable / uncomfortable climate
26. Symbol is displayed for the weather factor whose history is currently being displayed (indoor or outdoor temperature); if this symbol is not displayed, then the air pressure history is displayed

2.1. Preparing the weather station

The weather station is exclusively operated via the plug-in mains adapter that is delivered. Battery operations are possible with 4 AA cells (1.5 V, alkaline type) in an emergency mode. The functions of the weather station are then available only in a restricted manner (e. g. no background lighting, no live mode available).

The following image shows the rear of the station with battery compartment, correct insertion of the batteries, assembling points for foot support and hanging.

Connecting to the mains



First insert the round DC-plug of the AC adapter into the DC-power socket on the rear side of the device and then the AC adapter in a mains socket.

Any batteries that have been inserted will get switched off.

Inserting batteries

Remove the cover of the battery compartment and insert four 1.5 V AA-cells, (alkaline type LR6) according to the correct poles into the battery compartment. Close the battery compartment again.

PC-connection

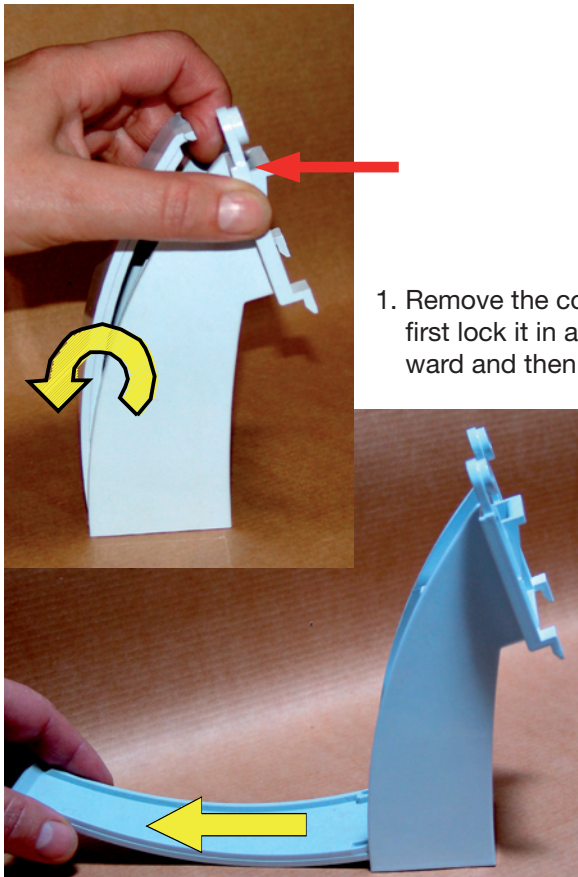
To connect the station to a PC, use the USB cable to connect the mini USB jack to the USB port of WS 550 US. The plug at the other end of the cable is connected to the USB port of a PC (also see chapter 9.)

Installing / Mounting

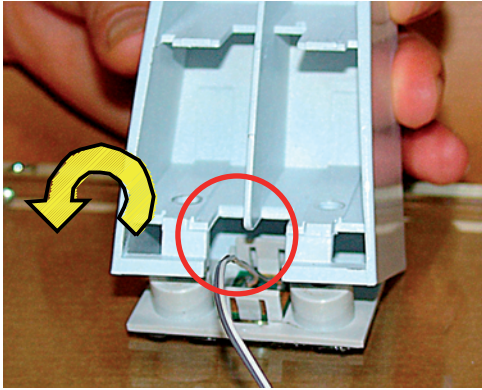
Depending on the requirement, the weather station can be mounted on a vertical surface (such as a wall) using a hanging eye or installed on an horizontal surface using a table-stand.

The table-stands are mounted using the Allen screws and Allen key according to the following description:

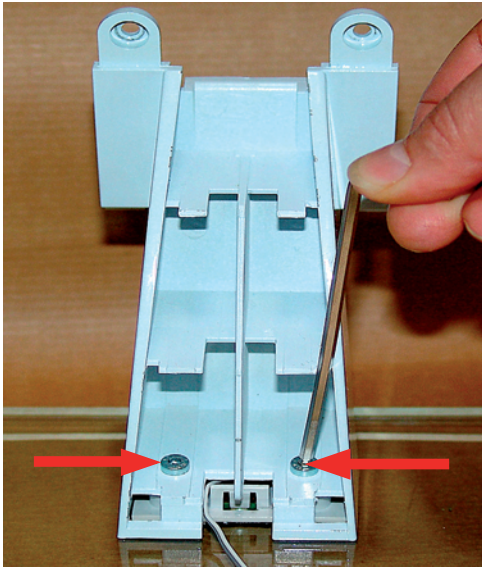
Start-up (base station)



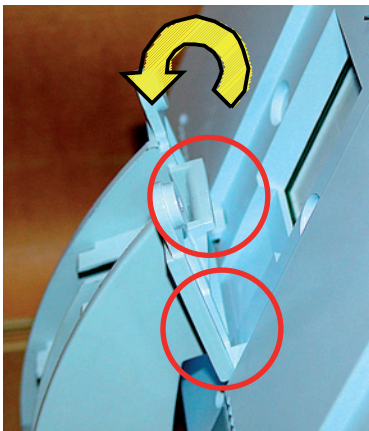
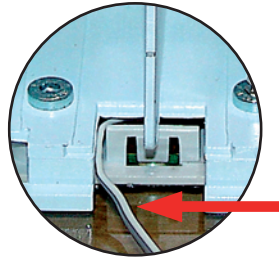
1. Remove the cover of the foot support: first lock it in at the top, then fold it fully downward and then remove it.



2. Lock in the foot support in the locking nose of the glass foot and place it on the two screw domes.



3. Screw the enclosed Allen key and 2 Allen screws on the glass foot. Please note that the lighting cable of the device foot is guided in from the side as shown in the picture so that it does not get crushed.

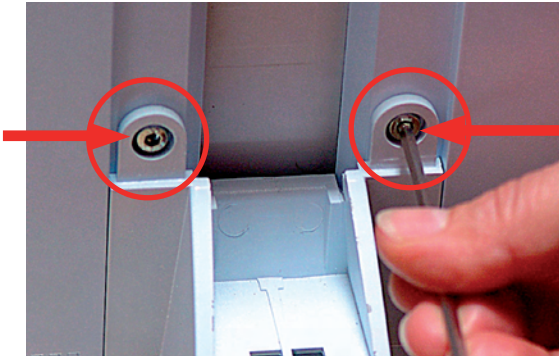


4. Place the weather station at the locking nose of the foot support and tilt it on the foot support till the screw dome neatly grips into the corresponding intakes of the weather station.

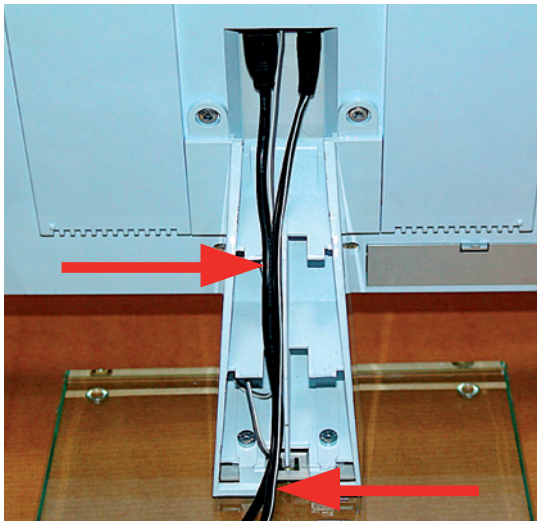
Note!

Do not let go of the weather station till both the Allen screws have been fixed in (see next step)!

Please do not press the display when you hold the weather station. Hold the weather station only at the frame!



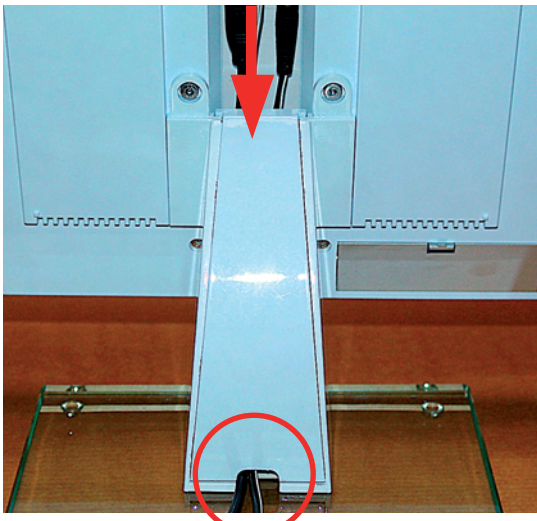
5. Screw the foot support on to the weather station using the enclosed Allen key and 2 Allen screws.



6. The cables are thus connected, inserted into the foot support and guided. Please note that the cable lies exactly in the center as shown so that it will not prevent the lid from subsequently locking in.

Note!

The cable for lighting the support foot and the USB cable can only be inserted in one direction! Do not insert it using force! Stow away excessive cable in a chamber of the support.

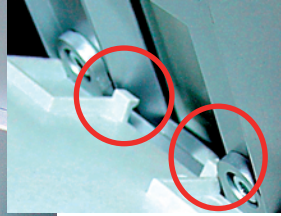
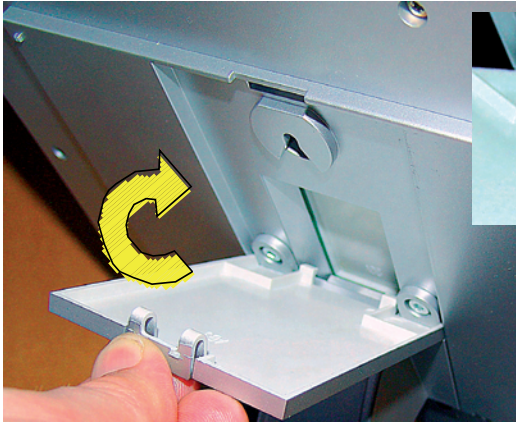


7. Now place the cover for the foot support:
Insert it flat into the support intake (also see 1.), fold it upward and lock it in.

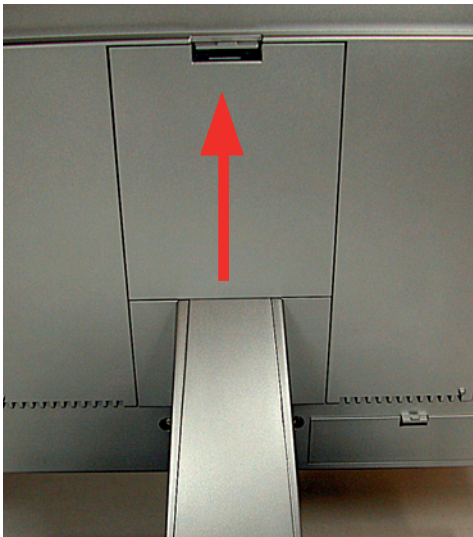
Note!

The cover should fold up easily without any resistance; otherwise, it means the cover has not been placed properly or the cable is not laid correctly in the guide!

You can see the correct guiding of the cable.



8. At the end, the cover is inserted in the corresponding locks of the cable shaft (see detailed picture above), tilted upward and locked in at the top (see lower picture).

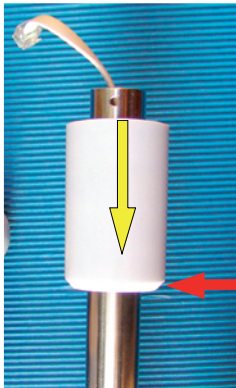


- After connecting the plug-in AC adapter, the system will run a short test of all display segments in the display (all segments will be displayed).
- You will then hear a short beep and the version number of the weather station will be displayed.
- Finally, the inside temperature and the humidity as well as the air pressure will be displayed. The corresponding sensors are directly built in the base station.
- Now the external sensors need to be started up.

2.2. Combi-sensor TX 550 US

The combi-sensor is delivered as single parts and needs to be assembled before start-up (for further information please refer to the TX 550 US operating instructions).

- Remove the wind meter and base of the wind meter (small white cylinder), the combi-sensor and the mounting pipes from the packaging.
- Mount the weather cock according to the following description:
- Put together the pipes of the insertion mast. The sensor-holder is mounted on the



Conical
side below



1. Mount the base of the wind meter on the free end of the pipe of the combi-sensor holder as shown in the diagram

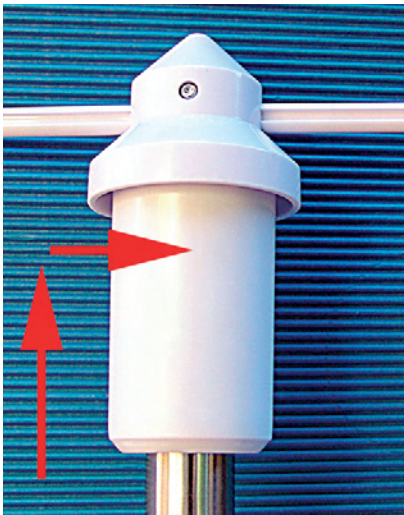
2. Put cable through the foot of the windcock



3. Insert the foot into the pipe and rotate it in such a way that it can be locked in the respective holes in the pipe using the two screws



4. Insert the plug into the socket of the wind meter



5. Push up the base and then lock it by turning it to the right

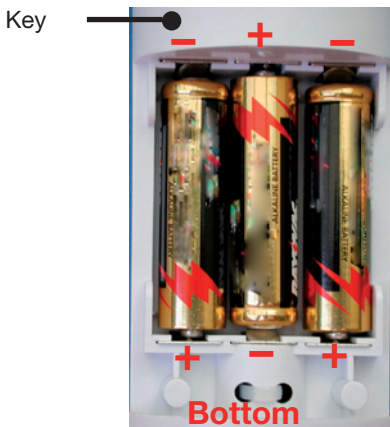
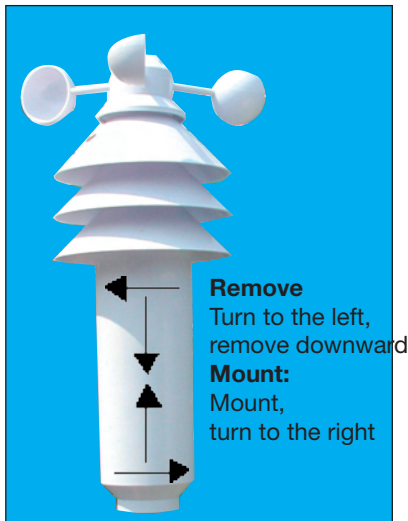
pipe-end that is marked with a sticker.

- Install the fully mounted sensor within the possible transmitter radius (max. 400 ft. free field; take into account the dampening due to building walls, etc.) so that it stands in open space - the rain can thus fall directly into the rain sensor and the wind measurement is not hampered by adjacent buildings or trees - 50 ft. clearance.

A sunny location is possible because the temperature sensor is located in a shaded and ventilated part of the housing.

- Bury the pressed end of the mast deep into the soil so that it stands securely (approx. 15 inch depending on the condition of the soil). If the combi-sensor tilts and falls, it can cause injury to persons and damage to vehicles and other objects. Please note that the manufacturer is not responsible for injury or damage.
- Once the sensor is mounted, begin start up, and point the peak of the wind meter towards the North to align the sensor. Lock, if required, the wind meter in this position on the casing with the help of an adhesive tape.

- Open the sensor housing by rotating it towards the left and pulling down the casing (see picture below).
- Use a pointed object to press the key above the battery compartment and insert three AA Alkaline batteries according to the polarity marking in the battery compartment. Release the switch and then remove any adhesive tape that you may used to secure the wind meter.
- Bring the respective receiving station in the receiving mode according to the instructions of the corresponding Operating Instructions (also see chapter 3.1).
- Use a pointed object again to press the switch on the sensor. The receiving station should now register the data from the sensor.
- Close the casing again by pushing it upward and turning it to the right till it locks in.



Insert batteries, position of the key

The fully mounted TX 550 US

3. Operations

The wireless sensor data is not shown on the display immediately after installing the wireless sensors and starting up the base device. As each sensor has an internal individual serial number, which is automatically logged into the base station during start up.

The advantage here is that data is individually recorded only for those sensors that are logged in and not for other sensors, say of neighboring systems, and also not after a restart.

Please note!

If no input field is touched on entering data in the menu row for approx. 5 seconds, then the device automatically goes back to the main menu (after including/saving any settings that have been done). Hence wait for the main menu to be displayed after you have entered data. You can thus quit each menu after making the settings.

Only touch the respective input fields slightly - do not press them! Do not press or hit using any object!

The values can be set faster if you touch a setting field for a longer time; the values are then forwarded faster and you do not have to keep touching the setup fields.

3.1. Log in/delete external sensors

A total of 9 external sensors of the types TX 550 US (1x), ASH 550-US, ASH 550-I US and S 550 IA-US can be logged in. (Note: The ASH 550-US, ASH 550-I US and S 550 IA-US are not currently available for purchase.)

The memory slots 1..8 are reserved for ASH 550-US (I) and S 550 IA-US.

The memory slot 9 has been reserved for the combi-sensor TX 550 US.

For unique sensor assignment in case of multiple sensors of types ASH 550-US (I), or S 500 IA-US we recommend that you first remove the batteries from all the sensors.

Logging in

- Touch the "CFG" field in the menu row.
- You will see:

NEXT	CLEANING	ENTER
-------------	-----------------	--------------

- Touch the "NEXT" field, the display is:

NEXT	SENSOR	ENTER
-------------	---------------	--------------

- Touch the "ENTER" field, the display is:

SENSOR	NO 1	ADD	DEL
---------------	-------------	------------	------------

- Repeatedly touch the "SENSOR" field and select the memory slot where you want to store the particular sensor. Please note that TX 550 US can only be stored in slot 9.

- Then select "ADD"; the display is (for e.g. for sensor 9: TX 550 US):

SENSOR	NO 9 - - SYNC	ADD	DEL
---------------	----------------------	------------	------------

- The particular sensor is now taught to the system. Insert the batteries in the respective sensor and press its key to teach. Please also read chapter 2.2 for starting up TX 550 US and the operating instructions of the other sensor types. The TX 550 US data is then displayed automatically (after max. 6 minutes) in the corresponding fields of the display - that of the remaining sensors after selecting the memory slot ("sensor" field) in the "OUTDOOR" display field.

Marking the populated memory slots

Memory slots that have already been populated are marked as "**USED**" behind the memory slot number.

However, this does not indicate whether the respective sensor is actually active. You can identify it only from the missing or outdated data when you select the sensor and from the active reception indicator in the "OUTDOOR" field.

Deleting a sensor assignment

The serial number of a sensor can be deleted from the sensor memory, if required.

- First proceed according to the instructions given under "Logging in"; select the desired sensor and then select the "**DEL**" option instead of the "ADD" option.

- The "USED" lettering of the sensor number is deleted and the memory slot is thus released again for logging in a sensor.

Tip for initial sensor set-up

To ensure proper set-up, please have the sensors and the receiving station 3 to 5 feet apart. Note: The distance should not be less than 3 feet (1 m) apart.

3.2. Operations

As all important data is displayed simultaneously in the display, operations are basically restricted to selecting other sensors or some other weather data by slightly touching the corresponding display field.

The display is divided into display field and menu row. In the normal mode (device is in the main menu):

MIN MAX	RESET	CFG
----------------	--------------	------------

are accessible by touching the respective fields of the display for the following functions:

INDOOR:	Switching between temperature and dewpoint display ("DEWPOINT")
OUTDOOR:	Switching between temperature and dewpoint display ("DEWPOINT") and windchill display
HUMIDITY:	No function
SENSOR:	Switching between the external sensors: 1...8: Additional sensors not available for purchase. No display: TX 550-US
RAIN:	Switching between total rain quantity since the last reset ("total"), current hour ("current 1h"), last hour ("1h"), current day ("current 24h") and last day ("24h"). (Storage for hour: always at xx:30 hours; storage for day: always at 7:30 a. m.)
SUNSHINE DURATION:	Switch between the sunshine duration of the current day ("h/day") and total sunshine duration since the last reset ("h")
TIME/DATE:	No Function
WIND:	Switch the numeric display between wind velocity in km/h, m/s, mph and wind direction in degrees
AIR PRESSURE:	Switch the air pressure display between the pressure measured on site ("absolute") and the pressure scaled down to sea level ("relative")
HISTORY:	Switch the trend display of the last 24 hours between air pressure, inside temperature and outside temperature (of the displayed sensors), also see point 26 on page 7
Weather icon:	No function

Main Menu Functions

MIN: Call up the minimum values

After touching the "MIN" area, the minimum values of the respective data are displayed. When you touch the corresponding field (temperature, air pressure, etc.), the corresponding time-stamp (date, time) of the occurrence of the extreme value are displayed.

You will go to the main menu and normal data display if your press "MIN" again.

MAX: Call up the maximum values

After touching the "MAX" area, the maximum values of the respective data are displayed. When you touch the corresponding field (temperature, air pressure, etc.), the corresponding time-stamp (date, time) of the occurrence of the extreme value are displayed.

You will go to the main menu and normal data display if your press "MAX" again.

RESET: Reset certain values

This menu has three sub-menus for resetting the cumulated sunshine duration ("SUN"), rain quantity ("RAIN") or MIN-MAX-memory ("MIN-MAX"): Activate "RESET". The first RESET menu is displayed:

RESET RAIN	OK
--------------------------	-----------

Repeatedly activate the "RESET" area and select the desired option and then confirm by touching "OK". The corresponding data is now deleted and the system automatically returns to the main menu and normal data display.

However, if you do not want to delete data, then wait till the device returns to the main menu. No data will be deleted.

CFG: Calling up the Configuration Menu

3.3. Configuration

The weather station is delivered in such a state that its basic functions (except moon phase, sunrise, sunset, date, time, min./max. display) are ready to use without doing any settings. However, another configuration would be needed to use the additional functions and the time-related functions.

- Touch "CFG" field to open the configuration menu.
- Repeatedly touch "NEXT" to go to the respective next main menu point of the configuration menu. You will find in the appendix a quick reference guide to access the different menus.

3.3.1. "SENSOR" menu, Login/ Delete sensors

see 3.1.

3.3.2. "TIME/DATE" menu, Set the time and date

- Select "TIME/DATE" menu:

NEXT	TIME/DATE	ENTER
-------------	------------------	--------------

- Touch the "ENTER" field, the display is:

TIME	24H
-------------	------------

- Touch the "24H" area to select between time display in 12 and 24 hour format.
- Touch the "TIME" field, the display is:

YEAR	+ 2006 -
-------------	-----------------

- Touch the "+" or "-" areas to set the year.
- Touch the "YEAR" field, the display is:

MONTH	+ 07 -
--------------	---------------

- Touch the "+" or "-" areas to set the month.
- Touch the "MONTH" field, the display is:

DAY	+ 01 -
------------	---------------

- Touch the "+" or "-" fields till today's date (system date) is set.
- Touch the "DAY" field, the display is:

WEEKDAY

+ MON -

- Touch the "+" or "-" areas to set the day of the week.
- Touch the "WEEKDAY" field, the display is:

HOURL

+ 01 -

- Touch the "+" or "-" areas to set the hour.
- Touch the "HOURL" field, the display is:

MINUTE

+ 01 -

- Touch the "+" or "-" areas to set the minute.
- Wait for a few seconds, then the time and date along with sunrise and sunset times for the factory setting (39.8/-77.0 degrees, Washington D.C.) and the current moon phase will appear on the display.

3.3.3. "UNITS" menu, Set the display units

- Select the "UNITS" menu:

NEXT

UNITS

ENTER

- Touch the "ENTER" field, the display is:

TEMPERATURE

DEG C

- Touch the "DEG" field to switch the display between degrees Celsius (C) or Fahrenheit (F).
- Touch the "TEMPERATURE" field, the display is:

PRESSURE

HPA

- Touch the "HPA" field to switch the air pressure display between hPa (HPA), mmHg (MMHG) and inHg (INHG).
- Touch the "PRESSURE" field, the display is:

RAIN

MM

- Touch the "MM" field to switch between rain quantity display in mm (MM), inch (INCH) or l/m² (L/M2).
- Wait for a few seconds; the data will then be displayed in the units that have been set earlier.

3.3.4. "POSITION" menu, Set position

The position details of the weather station location are needed to calculate the sunrise and sunset times. You can enter the latitude in a range between -60.0° and $+60.0^{\circ}$ and the longitude between -180.0° and $+180.0^{\circ}$.

You can determine your position in different ways:

- The Appendix B contains a table with the coordinates for many US counties. You can select a place in your vicinity and then enter its coordinates
 - If you have a GPS navigation system in the car or a mobile device you can take over the position details and you will thus have the exact location.
 - You can also find out the exact coordinates from the Internet.
- Select the "POSITION" menu:

NEXT	POSITION	ENTER
-------------	-----------------	--------------

- Touch the "ENTER" field, the display is:

LATITUDE	+ 38.9 -
-----------------	-----------------

- Touch the "+" or "-" areas to set the latitude.
- Touch the "LATITUDE" field, the display is:

LONGITUDE	+ -77.0 -
------------------	------------------

- Touch the "+" or "-" areas to set the longitude.
- Wait a few seconds; you will then see the corrected day for sunrise and sunset in the display.

Please note that the sunrise and sunset details will really be correct at the sea or for a location on the plains. Mountains, high forests can really cut short the actual day. The details can deviate slightly even for the ideal location because an approximation formula is used for the calculations.

3.3.5. "TIMEZONE" menu, Set time zone

The time zone details are required for calculating the sunrise and sunset times. Enter the current difference to UTC (Coordinated Universal Time).

The Appendix C contains a table with the time zone difference from UTC for the US.

- Select the "TIMEZONE" menu:

NEXT	TIMEZONE	ENTER
------	----------	-------

- Touch the "ENTER" field, the display is:

TIMEZONE	+ - 05 -
----------	----------

- Touch the "+" or "-" areas to set the longitude.
- Wait a few seconds; you will then see the corrected day for sunrise and sunset in the display.

3.3.6. "LIGHTING" menu, time setting for the background lighting and regulating the brightness of the lightening

In this menu you can set the switching time for the background lighting that automatically switches on when you touch the screen and switches off after a set period. This can range from "OFF" (lighting never switches on), to periods between 5 seconds and 10 minutes till permanent lighting (ON). Further, you can also set the times when the lighting should permanently be on.

You can also activate/deactivate an automatic adjustment to the surrounding brightness so that the display is optimally legible under all surrounding conditions.

The background lighting can only be used if you are connected to the AC adapter!

- Select the "LIGHTING" menu:

NEXT	LIGHTING	ENTER
------	----------	-------

- Touch the "ENTER" field, the display is:

LIGHTING	+ 10 SEC -
----------	------------

- Touch the "+" or "-" areas to set the switch-on time.
- Touch the "LIGHTING" field, the display is:

BRIGHT CTRL	ON
--------------------	-----------

- Touch the "ON" field to switch between "Automatic Brightness Control" being active (ON) or deactive (OFF).
- Touch the "BRIGHT CTRL" field, the display is:

BEGIN	+04.00 PM-
--------------	-------------------

- Touch the "+" or "-" fields to set the switching-on time of the lighting (permanent lighting).
- Touch the "BEGIN" field, the display is:

END	+11.45 PM-
------------	-------------------

- Touch the "+" or "-" fields to set the switching-off time of the lighting (permanent lighting).
- Wait for a few seconds, the device switches back to the normal mode and the data that has just been set gets activated.

3.3.7. "SYSTEM" menu, System settings

In this menu you can do the settings for automatic daylight saving time switching (DST, also see Appendix), for activating the beep (BEEP), for data recording interval of the data logger (INTERVALL), for location altitude (ALTITUDE) and for comparing the rain sensor (RAIN CAL) and for comparing the brightness threshold for the sunshine duration (SUN CAL).

Activate/deactivate Beep

- Select the "SYSTEM" menu:

NEXT	SYSTEM	ENTER
-------------	---------------	--------------

- Touch the "ENTER" field, the display is:

BEEP	ON
-------------	-----------

- Touch the "ON" field to switch between "Beep" being activated (ON) or deactivated (OFF).

Activate/ deactivate the daylight saving time switching

- Select the "SYSTEM" menu and then the "DST" option (via BEEP); the display is:

DST	ON
------------	-----------

- Touch the "ON" field to switch between "daylight saving time switching" being activated (ON) or deactivated (OFF).

Set the data recording interval for the data logger

The data recording interval for the data logger defines the intervals at which the integrated data logger records are to be recorded. If you select a shorter interval, then the recording time is also short and the record will be a detailed one. If the intervals are longer, then the possible recording time is also longer and the resolution of the weather data is lesser.

- Select the "SYSTEM" menu and then the "INTERVALL" option (via BEEP, and DST); the display is:

INTERVALL	+ 05 -
------------------	---------------

- Touch the "+" or "-" fields to set the interval time (OFF (data logger is off), 5 minutes to 60 minutes). You will find in the following section a few examples for the relationship between interval time and recording time

Interval time	Max. Recording time
5 minutes	10.4 days (250 hours)
10 minutes	20.8 days (500 hours)
30 minutes	62.5 days (1500 hours)
60 minutes	125 days (3000 hours)

"ALTITUDE", Adjust the location height above sea level

The standard altitude is used for calculating the relative air pressure at sea level with reference to the absolute air pressure at the location. This relative value is important as a reference for correctly interpreting the weather reports that refer to the relative air pressure.

- Select the "SYSTEM" menu and then the "ALTITUDE" option (via BEEP, DST and INTERVALL), the display is:

You can determine your height above sea level in different ways:

- You can find the height in a topographic map or ask your local land registry office.
- If you have a GPS navigation system in the car or a mobile device you can take over the position details and you will thus have the exact location.
- You can also find out the height above sea level from the Internet.

ALTITUDE	ENTER
----------	-------

- Touch the "ENTER" field, the display is:

ALTITUDE	+ 0000 -
----------	----------

- Touch the "+" or "-" fields to set the geographical altitude of this location above sea level (height above sea level)
- Wait for a few seconds; the corrected data for the relative air pressure will then appear on the display.

Alternatively, the value can also be entered via the optional PC program.

"RAIN CAL", Enter the comparison value for the rain sensor

The rain quantity measurement system has a high level of accuracy when it leaves the factory; so normally, no adjustments are required.

The comparison value must first be determined in the normal mode according to the steps described in "Calibrating the rainfall measurement recorder".

- Select the "SYSTEM" menu and then the "RAIN CAL" option (via BEEP, DST, INTERVALL, ALTITUDE); the display is:

RAIN CAL	ENTER
----------	-------

- Touch the "ENTER" field, the display is:

RAIN CAL	+ 295 -
----------	---------

- Touch the "+" or "-" fields to set the value that has been calculated earlier.
- Wait for a few seconds; the device will then go back to the normal mode.

Alternatively, the value can also be entered via the PC program.

"SUN CAL", Configure brightness threshold value for duration of sunshine

The weather station WS 550 US finds out the sunshine duration along with the combi-sensor TX 550 US. The threshold value is set at the base station and transferred to the combi-sensor. The latter performs the data evaluation:

*Received brightness is higher than the threshold value → Sun is shining
Received brightness is lesser than the threshold value → Sun does not shine*

The brightness limit can be used to customize the sensor to the local conditions. The threshold value should be defined at the start and end of sunshine so that the current brightness value can be referred to the threshold.

- Select the "SYSTEM" menu and then the "SUN CAL" option (via BEEP, DST, INTERVALL, ALTITUDE, RAIN CAL), the display is:

SUN CAL	ENTER
----------------	--------------

- Touch the "ENTER" field, the display is:

SUN CAL	131	+	085	-
----------------	------------	----------	------------	----------

Reduce the threshold value

Currently set threshold value

Increase the threshold value

Current brightness value¹

- Touch the "+" or "-" areas to set the threshold value. The setting area ranges from 0 to 255.
- Wait a few seconds; the device switches back to the normal mode.

¹ You cannot directly convert to the brightness intensity unit Lux.

3.3.8. "CLEANING", menu, Cleaning mode

As the display gets dirty due to touching, it needs to be cleaned now and then using a dry soft cloth (the best option is to use a spectacles cleaning cloth; however, do not use any cleaning liquids as they can damage the display). To prevent the station from getting displaced while cleaning, there is a cleaning mode where all the touch fields are locked for approx. 20 seconds.

- Select the "CLEANING" menu:

NEXT	CLEANING	ENTER
-------------	-----------------	--------------

- Touch the "ENTER" field, the display is:

CLEANING	START
-----------------	--------------

- Touch the "START" field, the display is:

CLEANING	WAIT
-----------------	-------------

- The display can now be cleaned. Normal display resumes after 20 seconds.

3.3.9. "LIVE MODE" menu, call up the current weather data flow

In this mode, another key of the combi-sensor can be prompted to send its measurement data for 20 seconds at 2 seconds interval. Thus, at the press of a key one has the latest weather data and can thus follow the wind direction and the trend of wind velocity for say 20 seconds.

As the combi-sensor frequently goes into the receive mode when the "LIVE MODE" is activated, its power consumption increases and this has an effect on the life of the battery. Hence you can use the "LIVE MODE" to set a period for which the "LIVE MODE" should be activated.

In this period, the main menu bar will show the additional "REQ" key that was used to query the above-mentioned live data.

- Select the "LIVE MODE" menu:

NEXT	LIVE MODE	ENTER
-------------	------------------	--------------

- Touch the "ENTER" field, the display is:

BEGIN	+04.00 PM-
--------------	-------------------

- Touch the "+" or "-" fields to set the switching-on time of the "LIVE MODE".
- Touch the "BEGIN" field, the display is:

END	+11.45 PM-
------------	-------------------

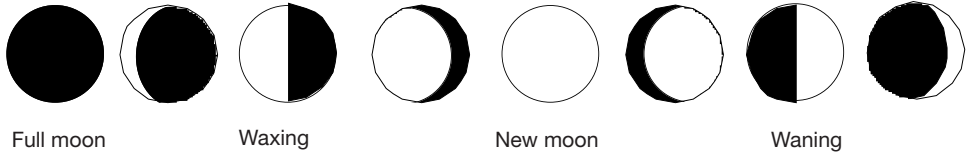
- Touch the "+" or "-" fields to set the switching-off time of the "LIVE MODE".
- Wait for a few seconds, the device switches back to the normal mode and the data that has just been set gets activated.
- In the menu bar, data transfer to the combi-sensor is indicated with the message: **"WAIT FOR TRANSMISSION"**. The weather station cannot be operated till this display is on.
- The REQ key for calling data appears in the menu when the "LIVE MODE" is activated:

MIN	MAX	RESET	REQ	CFG
------------	------------	--------------	------------	------------

3.4. Other Functions and Displays

Display moon phases

The moon phases are displayed using the following symbols:



Moon phase may vary from your calendar by 1-2 days. Also keep in mind that the moon display will be blank during a new moon and dark during a full moon.

Oscar Outlook

Oscar Outlook is an animated figure that simultaneously displays multiple weather factors:

Outside temperature (only combi-sensor)

- The clothing status is based on how high the temperature is on the combi-sensor.

Rain

- If the weather forecast has announced rain, then the figure holds a closed umbrella.
- The figure carries an opened umbrella when it starts raining.

Wind velocity

- If the wind velocity is higher than 12.4 mph (20 km/h, medium wind) Oscar Outlook's hair starts fluttering. At the same time, if the temperature is below 57.2 °F (14 °C), then even the scarf he is wearing starts fluttering.

Weather forecast

- The weather forecast symbols indicate the following forecasts:

- Clouds with rain → Rainy
- Clouds → Cloudy
- Clouds with sun → Bright
- Sun → Sunny

Wind symbol display (wind sock)

- The wind sock symbol in the forecast display field shows at a glance whether the wind is currently mild, medium or strong:

- Wind sock is hanging down → mild wind (<6.2 mph)
- Wind sock is raised half → medium wind (6.2 to 12.4 mph)
- Wind sock is horizontal → strong wind (>12.4 mph)

Immediate Rain Display

- The onset of rain is notified to the base station during the next wireless data transmission and is indicated through a cloud in the "RAIN" field and through the opened umbrella of "Oscar Outlook".

Comfort Indicator

- The **Comfort Indicator** (☹️😐😊) reflects the climate in the room (ratio of temperature to humidity). The Appendix contains a value table for the display areas.

History

- The bar diagram shows the history of air pressure, outside or inside temperature for the last 24 hours. The individual columns are not an absolute value but only the difference to the currently measured value (0h column). This reference point is always located in the center (4 bars) so that the trend is visible at a single glance (see also page 18).

Data memory

- If the data memory is almost full, the menu bar displays the message:

MEMORY ALMOST FULL

OK

- Touch and confirm this input field and download the collected data using the PC.

Data transfer to the combi-sensor "WAIT FOR TRANSMISSION"

- When the "WAIT FOR TRANSMISSION" message is displayed in the menu bar, the weather station transfers data to the combi-sensor, i.e. it activates the live mode or the configuration data of the sunshine duration.
This transaction can take a few minutes; the weather station cannot be operated during this period.

Temperature trend display

- On the right, next to the temperature display, a trend arrow is displayed next to the display fields "Indoor" and "Outdoor" if the temperature in the last transmission interval has increased (upward arrow) or decreased (downward arrow).

Sensor Status Display

- In the outdoor sensor display field ("Outdoor") there is a small reception indicator to indicate the sensor status:
 - Reception indicator is displayed → Sensor data is being received constantly
 - Reception indicator is blinking → Sensor data is not being received since the last 40 min.
 - Reception indicator is missing → Sensor does not exist, permanently out of order or defect

Warning against turbulent weather


- When a low pressure area is suddenly formed, there is a warning symbol in the display field of the weather forecast. This is an indicator of an upcoming storm or thunderstorm.

Frost warning

- A snow-flake symbol is displayed in the weather forecast field if the temperature measured at the combi-sensor falls below 39.2 °F (4 °C).

4. Changing the batteries

Base station

When the battery empty symbol appears in the INDOOR display area () , then all batteries are to be replaced according to the instructions in section 2.1 with those of the same type.


Always change all the 4 batteries and use only high-quality alkaline batteries. Leave the AC adapter connected when you are changing the batteries so as to avoid data loss.

This Display Unit is designed to run on a/c power. Due to the power requirements of the Display Unit, it is not recommended to use batteries only for more than a few hours. It is possible to lose connection with the Combi Sensor if using batteries only.

Please note!

The data memory is deleted if you do not connect the AC adapter while replacing the batteries.

Wireless sensors

The batteries in these sensors have a lifetime of max. 2 years (alkaline batteries). They are to be replaced when a 'battery empty' symbol () is displayed when you select the corresponding sensor in the "OUTDOOR" display area. Batteries are replaced in TX 550 US according to the instructions in section 2.2.; the instructions for the other sensors are to be found in the respective operating instruction manuals.

Please follow the battery disposal regulations!

Do not dispose of disposable and rechargeable batteries as part of household garbage!

5. Troubleshooting

Possible disruptions that can hamper proper display of the transmitted measured values are:

No reception - the distance between the transmitter and receiver is too much or too less (<3 ft., 1 m).

Reduce or increase the distance between the transmitter / receiver.

No reception - there are highly resistant materials (thick walls, steel concrete, ...) located between the transmitter and the receiver

Relocate the transmitter or receiver. Also see chapter 6 ("Range").

No reception - transmitter batteries are empty.

Replace batteries.

No reception - transmitter is covered by the disturbance source

(Wireless device, wireless headphone/ loudspeaker)

Remove the source of the fault and look for another position for the transmitter and receiver. Such disturbances are only for a short period (wireless traffic) or can be rectified in a very simple manner. Any wireless headphones, wireless baby phones or similar devices are operated at a frequency of 916.5 MHz in your house or in the vicinity only for a short duration. Most of these devices are enabled for exchanging signals at an interruption-free frequency. Such a measure can effectively fade out all interruptions.

No reception – Log in of sensor was not successful.

Execute log in procedure again. Refer page 13 of the manual and follow the instructions of the receiver station.

Inaccurate rain

Be sure rain gauge is assembled correctly, with drain holes aligned.

Check that sensor assembly is not tipped, but straight into ground.

Check rain gauge for debris that may be blocking the funnel, rocker (pointer) or drain hole.

Check that the rocker (pointer) is set properly.

Is the rain measurement unit correct? Ex: mm, inch or l/m².

Check the calibration of the rain sensor according 6.2.

Inaccurate wind

Check that sensor assembly is not tipped, but straight into ground.

Are surrounding areas clear of trees, buildings and other obstructions?

Check that the cups spin freely.

Is the wind measurement unit correct? Ex: mph, m/s or km/h.

No sunshine duration

Check that sensor assembly is not tipped, but straight into ground.

Check for debris in vented cap.

If possible: Adjust sunshine calibration. Follow the instructions of the receiver station.

No Min/Max display

Has time and date been set?

Sunrise/set time wrong

Has time and date been set?

Has latitude and longitude been set?

Has time zone been set?

Wireless sensor is disrupting the functioning of other devices in the 916 MHz band.

The transmission of the wireless outdoor sensor can be briefly interrupt (every 2-3 minutes for approx. 100 ms) the functioning of other devices on the same channel.

Other instructions for start-up or troubleshooting

Turn the receiving weather station slightly; if there is no reception, mount it away from electrical motors, electrical machines, televisions, computer monitors and large metal surfaces. Also see chapter 13 (FCC Information)

To simplify start-up, you can also bring the sensors first close to the base station (min. 3 ft. distance). You can then properly control the data transmission from the sensor.

6. Range

The free-field range for visual contact between transmitter and receiver is 400 ft. (120 m) under optimal conditions. Walls and even steel concrete structures may be penetrated; however, the range is then reduced accordingly. Reduced range can be caused by the following:

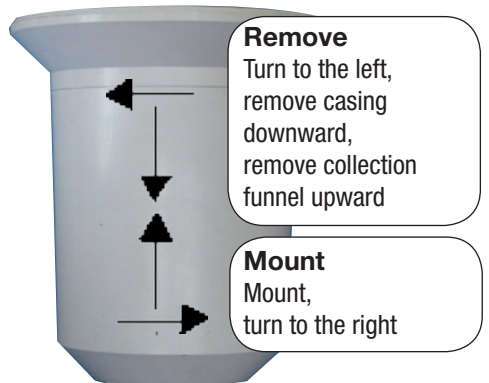
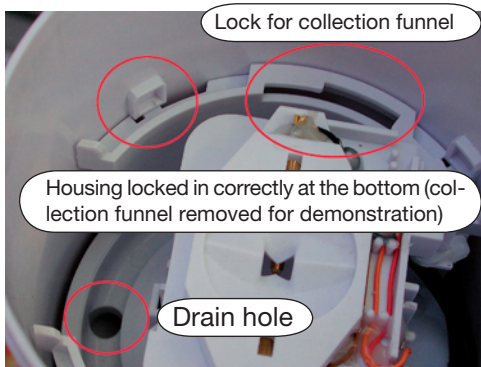
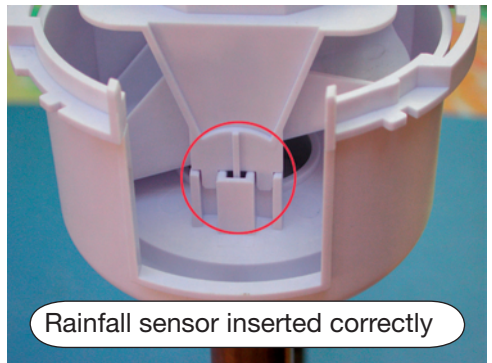
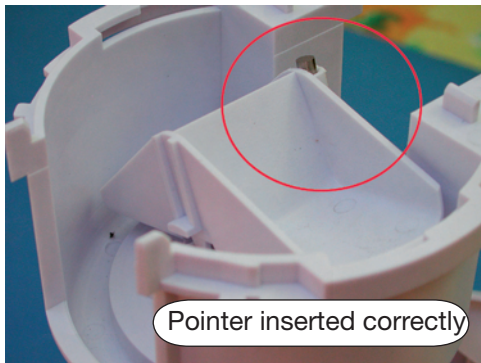
- High frequency disturbances of all types
- All types of structures or vegetation
- The distance between the sensor and the receiver to the conducting areas or objects (and even to the human body or the earth) has an effect on the transmission properties and in turn the range.
- Broadband disruptions in city areas can reach levels that reduce the signal-noise distance in the entire frequency range and in turn reduce the range.
- Devices with adjoining working frequencies can also have an effect on the receiver.
- PCs with poor shielding can interfere with the receiver and reduce the range.

7. Instructions for Maintenance and Care

- Protect the base station against dust and moisture. Never clean it with chemical detergents; just use a soft dry piece of linen. Do not put any pressure on the display.
- The outdoor sensor is to be cleaned from time to time to remove the dirt and dust that has settled on it. Check easy accessibility of the wind sensors and ensure that the sensors are fitting tight on the holder.

7.1. Cleaning the rain quantity sensor

- Depending on the location, leaves, dirt, sand and branches blown by the wind get collected in the collection funnel of the rain quantity sensor. Larger parts can block the passage. Sand can also accumulate on the pointer; large deposits of it can hamper the measurement result.
- Hence the rain quantity sensor is to be cleaned from time to time - at least once a year. The pictures shown below are a guideline for installing / dismantling.
- For cleaning the sensor, just remove the sensor housing by slightly turning it to the left.
- Further, the collection funnel can also be removed by turning it to the left.
- The rainfall sensor is now moved upward, folded towards the cable side and you can now remove the pointer.
- Clean the collection funnel, contacts, counter and the drain-hole in the housing and remove all residues.
- Place the counter back in its holder. The magnet of the counter should be on the side that faces the cable.



- Insert the rain sensor in its holder. It will also automatically hold the pointer. The rain sensor cable and the magnet of the pointer must be located on the same side.
- Now place the collection funnel from the top on to the sensor-holder and lock it in by turning it to the right.
- Now reinstall the casing and lock it by turning it to the right in the sensor-holder till it locks in. Ensure that the drain-holes of the casing and the sensor-holder match (drain-hole of the casing points outwards).

7.2. Setting the rain sensor

The rain quantity measurement system has a high level of accuracy when it leaves the factory; so normally, no adjustments are required.

Adjustments would be necessary only if the accuracy requirements are very high.

Before you start calibrating the rain water measurement recorder, you need to reset to zero the rainfall quantity value that has already been totaled up (see chapter 3.2. "RESET"), total rain quantity display stands at zero). Further, the rainfall quantity for adjustments must be displayed in "inch".

Proceed as follows for exact calibration:

1. Slowly pour 3.38 fl. oz. (100 ml) water over a period of 10 minutes in the rain sensor collection funnel.

Note!

Quick pouring will give wrong measurement results! Pour the water so slowly into the funnel that there is a even passage of water and there is no water in the funnel at any point of time.

2. The displayed total quantity should now be 0.26 inch (6.5 l/m²).
3. If a different value is shown, then the calibration value that is mentioned is to be recalculated as follows:

$$\text{New calibration value} = \frac{0.26 \times \text{Current calibration value}}{\text{Actual value (Display reading after filling in the water)}}$$

The new calibration value must now be entered in the configuration menu (see 3.3.7., System menu/RAIN CAL).

The factory setting is 295/pointer stroke.

8. Technical Specifications

Measurement interval for outdoor sensors	2-3 min
Measurement interval for indoor sensor (Temperature, humidity)	3 min
Interval for measuring air pressure	15 min
Transmission frequency	916.5 MHz
Outdoor range:	max. 400 ft. (120 m)
Indoor temperature range:	32 °F to 140 °F (0 °C to 60 °C)
Resolution:	0.1 °F
Accuracy:	±1.8 °F (59 °F to 104 °F)
Outdoor temperature range (TX 550 US):... ..	-20 °F to 175.8 °F (-29 °C to 79.9 °C)
Resolution:	0.1 °F
Accuracy:	±1.4 °F (50 °F to 104 °F)
Measurement range rel. humidity (inside/outside)	1% rH - 99 % rH
Resolution:	1 % rH
Accuracy:	± 5 % rH (30-70 % rH)
Rain quantity display:	0 to 39.3 inch (0 to 999 mm)
Evaluation interval:	last hour: at xx:30 hrs day: at 7:30 a. m.
Resolution:	up to 10 inch: 0.01 inch above 10 inch: 0.1 inch
Wind velocity:	0 to 124 mph (0 to 200 kph)
Resolution:	up to 100 mph: 0.1mph above 100 mph: 1 mph
Wind direction:	0° to 355°
Resolution:	5°
variation range:	±0°; ±22.5°; ±45°; ±67.5°
Voltage supply:	
Base station (Main power supply):	7.5 V DC via plug-in mains adapter
Base station (back-up power supply):	4 x Battery AA cells
TX 550 US:	3 x Battery AA cells
Dimensions Base station without foot (W x H x D):	10.2 x 8.5 x 1.3 inch (260 x 215 x 32 mm)

Instructions for disposal

Do not dispose of the device as part of household garbage!

9. PC connection - Software Installation

The following are the system requirements for operating the "WeatherProfessional" software:

- Operating system Windows 2000/XP VISTA
- Min. 1 GHz Processor cycle frequency, min. 256 MB RAM
- Approx. 150 MB available hard disk space for the program
- Approx. 100 MB available hard disk space for the database
- The file system must be formatted in NTFS (Standard Option)
- Windows Installer Service must have been installed (Standard Option)

The enclosed USB cable with type A connector and mini type B connector is required for connecting to the USB port.

- Connect the weather station via the USB cable to the USB port of the computer.
- After a short period, the PC detects a new USB device and then asks for its driver.

The installation wizard is displayed.

- Please insert the enclosed CD-ROM and wait till the "Welcome" screen is displayed.
- Then go back to the "Installation Wizard" and select the "Automatic Search" option.
- Then follow the instructions of the "Installation Wizard" till you finish installing the driver.
- Then go back to the WeatherProfessional that describes the four steps for the setup. Start here at point 2.
- Follow the instructions step-by-step till you complete the installation. You can then start the "WeatherProfessional" program via the desktop or the program menu.
- You will find the program description in the Help menu under "Manual".

Firmware Update

You can update the firmware of the WS 550 US main controller via the USB port of WS 550 US using the software delivered along with the device.

- Start the update program of "WeatherProfessional" software (Menu "Tools", "Firmware Update") and follow the instructions of the program.

Note:

If you have started the update procedure by mistake, then the same can be cancelled at any time up to step 5. If the update mode has also been activated in the device according to the software instructions, then disconnect the weather station for a few seconds from the USB and the plug-in mains adapter and remove the batteries from the device. This will not hamper the functioning of the device; it will continue to work further with the existing firmware when you restart.

10. Appendix

Dewpoint - Temperature point that is independent of the interaction between a specific air pressure level, a specific temperature and a certain level of humidity. The humidity in the air starts to condense at this point, the so-called dew; the humidity condenses and precipitates as liquid (mist, vapor). If the dewpoint for water vapor is below 32 °F (0 °C), then there is condensation in the form of snow or hoar frost.

Weather forecast - Forecast about weather symbols calculated from the increasing or decreasing speed of air pressure (trend).

These changes in the air pressure speed is the most decisive dimension for the forthcoming weather; the absolute value has a lesser role to play. One can generally say that the increasing air pressure would mean better weather and falling air pressure would then be a sign of bad weather.

Windchill-Equivalent-Temperature - A fictional temperature that is felt by human beings under certain conditions instead of the measured temperature and which can be taken into account during low temperatures (for e.g. under 44 °F) to find out how one would feel at certain temperatures, wind velocities and corresponding clothing. These conditions are a temperature below 91.4 °F (33 °C) and a wind velocity above 5.8 mph (2.6 m/s). Windchill is defined as the cooling effect of the naked skin at assumed constant 91.4 °F (33 °C) skin surface temperature.

The higher the wind velocity and the lower the actual temperature, the stronger is then the windchill effect.

The "felt" temperature is an approximation that can be compared to the so-called feeling about the temperature and is taken into account along with the effect of the emission effects of the sun, light reflection of the clouds, the light wave length, etc.

Wind strength table (Beaufort)

Beaufort	Wind velocity km/h	Wind velocity mph	Description
0	0 - 0.7 km/h	0 - 0.4 mph	calm
1	0.7 - 5.4 km/h	0.5 - 3.6 mph	light air
2	5.5 - 11.9 km/h	3.7 - 7.4 mph	light breeze
3	12.0 - 19.4 km/h	7.5 - 12.1 mph	gentle breeze
4	19.5 - 28.5 km/h	12.2 - 17.7 mph	moderate breeze
5	28.6 - 38.7 km/h	17.8 - 24.0 mph	resh breeze
6	38.8 - 49.8 km/h	24.1 - 30.9 mph	strong breeze
7	49.9 - 61.7 km/h	31.0 - 38.3 mph	near gale
8	61.8 - 74.6 km/h	38.4 - 46.4 mph	gale
9	74.7 - 88.9 km/h	46.5 - 55.2 mph	strong gale
10	89.0 - 102.4 km/h	55.3 - 63.6 mph	storm
11	102.5 - 117.4 km/h	63.7 - 72.9 mph	violent storm
12	> 117.4 km/h	> 72.9 mph	hurricane

Comfort indicator

The symbol of the comfort indicator (the three different "smiles" 😊 😐 😞) reflect the room climate whereby the weather station works according to the following table:

Temperature	air humidity									
	20%	30%	35%	40%	45%	50%	55%	60%	65%	70%
<64.4 °F	😞	😞	😞	😞	😞	😞	😞	😞	😞	😞
64.4 - 67.8 °F	😞	😞	😞	😐	😐	😐	😐	😐	😐	😞
67.9 - 71.4 °F	😞	😞	😞	😐	😊	😊	😊	😊	😐	😞
71.5 - 75.0 °F	😞	😞	😐	😊	😊	😊	😊	😐	😞	😞
75.1 - 78.6 °F	😞	😐	😊	😊	😊	😊	😐	😞	😞	😞
78.7 - 82.2 °F	😞	😐	😐	😐	😐	😐	😐	😞	😞	😞
over 82.2 °F	😞	😞	😞	😞	😞	😞	😞	😞	😞	😞

One can thus see that depending on the relationship of the temperature to humidity, there are certain marked ranges that can be defined as comfortable or uncomfortable climate. One would thus feel that at a temperature of 77 °F (25 °C) and a humidity of less than 30% is very dry (for e.g. air from the heaters) and one above 60% as sultry.

Daylight saving time switching

The integrated clock implements an automatic daylight saving time switching according to the regulations of the "Energy Policy Act of 2005".

11. Proper use, Exclusion of warranty, Safety instructions

- This weather station is meant for personal use as an indicator of the forthcoming weather. The forecasts or predictions made by this device are more for orientation and are not to be construed as absolute forecasts.
- The manufacturer of the weather station does not assume any liability for incorrectly measured values and consequences that can result from it.
- This weather station is not meant for medical purposes or for informing the public.
- The components of this weather station are not a toy; they contain many fragile, glass and small parts. Please install all the components out of the reach of children.



BidCoS (Bidirectional Communication Standard) is a new wireless standard that has been specially developed for wireless control of sensors and actors for house automation. It allows you to build an entire house controlling system with compatible components: switch/dim lights and other electrical appliances, air-conditioners (heating, cooling, airing, weather measuring technology, energy management, access control, protection against burglary, safety devices, etc.). Speedy bi-directional communication (wireless signals that are sent are confirmed by the receiver) increases the functional safety and thus form the basis for a multitude of options for remote control / remote monitoring. Bi-directional data transfer of WS 550 US to TX 550 and all additional sensors works according to BidCoS Standard.

13. FCC Information

Contains FCC ID: RNT-TRX916

Changes or modifications not expressly approved in writing by La Crosse Technology may void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The internal antenna used for this mobile transmitter must provide a separation distance of at least 7.874 in (20 cm) from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

DoC Statement

This device, trade name La Crosse, model number WS 550 US complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

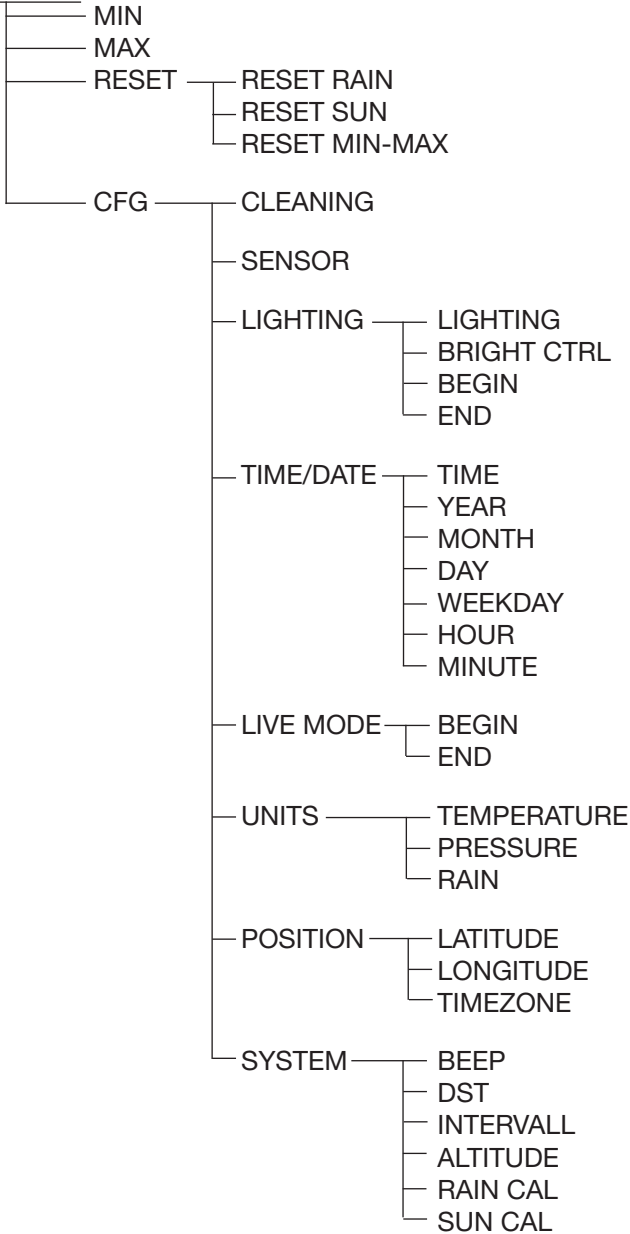
- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation

The responsible party for this device compliance is:

La Crosse Technology
2809 Losey Blvd South
La Crosse, WI 54601, USA
(001) 608-782-1982

Appendix A: Menu Overview WS 550 US

Main menu



Appendix B: Table of latitude/longitude of US counties.

State	County	Latitude	Longitude	AK	Prince of Wales	55.6	-132.6
AL	Autauga County	32.5	-86.6	AK	Sitka City and Borough	57.1	-135.3
AL	Baldwin County	30.6	-87.7	AK	Skagway-Hoonah-Angoon	58.3	-135.5
AL	Barbour County	31.9	-85.3	AK	Southeast Fairbanks	63.6	-143.9
AL	Bibb County	33.0	-87.1	AK	Valdez-Cordova	61.5	-145.3
AL	Blount County	34.0	-86.6	AK	Wade Hampton	62.1	-163.7
AL	Bullock County	32.1	-85.7	AK	Wrangell-Petersburg	56.7	-133.1
AL	Butler County	31.7	-86.7	AK	Yakutat City and Borough	59.8	-140.3
AL	Calhoun County	33.7	-85.8	AK	Yukon-Koyukuk	65.1	-151.9
AL	Chambers County	32.9	-85.3	AZ	Apache County	35.6	-109.4
AL	Cherokee County	34.2	-85.6	AZ	Cochise County	31.8	-109.9
AL	Chilton County	32.9	-86.7	AZ	Cocconino County	35.8	-111.5
AL	Choctaw County	32.0	-88.3	AZ	Gila County	33.7	-111.0
AL	Clarke County	31.7	-87.8	AZ	Graham County	32.9	-109.8
AL	Clay County	33.3	-85.8	AZ	Greenlee County	33.1	-109.3
AL	Cleburne County	33.6	-85.5	AZ	La Paz County	33.9	-114.0
AL	Coffee County	31.4	-86.0	AZ	Maricopa County	33.5	-112.1
AL	Colbert County	34.7	-87.7	AZ	Mohave County	35.3	-114.1
AL	Conecuh County	31.4	-87.0	AZ	Navajo County	35.4	-110.3
AL	Coosa County	33.0	-86.2	AZ	Pima County	32.2	-111.1
AL	Covington County	31.3	-86.4	AZ	Pinal County	33.0	-111.5
AL	Crenshaw County	31.7	-86.3	AZ	Santa Cruz County	31.5	-110.9
AL	Cullman County	34.2	-86.8	AZ	Yavapai County	34.7	-112.4
AL	Dale County	31.4	-85.6	AZ	Yuma County	32.7	-114.4
AL	Dallas County	32.4	-87.1	AR	Arkansas County	34.4	-91.4
AL	DeKalb County	34.5	-85.8	AR	Ashley County	33.2	-91.8
AL	Elmore County	32.6	-86.2	AR	Baxter County	36.3	-92.4
AL	Escambia County	31.1	-87.2	AR	Benton County	36.4	-94.2
AL	Etowah County	34.0	-86.0	AR	Boone County	36.3	-93.1
AL	Fayette County	33.7	-87.8	AR	Bradley County	33.5	-92.1
AL	Franklin County	34.5	-87.8	AR	Calhoun County	33.6	-92.5
AL	Geneva County	31.1	-85.8	AR	Carroll County	36.4	-93.6
AL	Greene County	32.8	-88.0	AR	Chicot County	33.3	-91.3
AL	Hale County	32.8	-87.6	AR	Clark County	34.1	-93.2
AL	Henry County	31.5	-85.3	AR	Clay County	36.4	-90.4
AL	Houston County	31.2	-85.4	AR	Cleburne County	35.5	-92.1
AL	Jackson County	34.8	-85.9	AR	Cleveland County	33.9	-92.2
AL	Jefferson County	33.5	-86.8	AR	Columbia County	33.2	-93.2
AL	Lamar County	33.8	-88.1	AR	Conway County	35.2	-92.7
AL	Lauderdale County	34.9	-87.6	AR	Craighead County	35.8	-90.6
AL	Lawrence County	34.6	-87.3	AR	Crawford County	35.5	-94.3
AL	Lee County	32.6	-85.3	AR	Crittenden County	35.2	-90.3
AL	Limestone County	34.8	-87.0	AR	Cross County	35.3	-90.8
AL	Lowndes County	32.2	-86.7	AR	Dallas County	33.9	-92.6
AL	Macon County	32.4	-85.7	AR	Desha County	33.8	-91.4
AL	Madison County	34.7	-86.6	AR	Drew County	33.6	-91.7
AL	Marengo County	32.3	-87.8	AR	Faulkner County	35.1	-92.4
AL	Marion County	34.1	-87.9	AR	Franklin County	35.5	-93.9
AL	Marshall County	34.3	-86.3	AR	Fulton County	36.4	-91.7
AL	Mobile County	30.7	-88.1	AR	Garland County	34.5	-93.1
AL	Monroe County	31.6	-87.4	AR	Grant County	34.3	-92.5
AL	Montgomery County	32.3	-86.3	AR	Greene County	36.1	-90.5
AL	Morgan County	34.5	-86.9	AR	Hempstead County	33.7	-93.6
AL	Perry County	32.6	-87.3	AR	Hot Spring County	34.3	-92.9
AL	Pickens County	33.3	-88.1	AR	Howard County	34.1	-94.0
AL	Pike County	31.8	-85.9	AR	Independence County	35.8	-91.6
AL	Randolph County	33.3	-85.4	AR	Izard County	36.1	-91.9
AL	Russell County	32.4	-85.1	AR	Jackson County	35.6	-91.2
AL	St. Clair County	33.7	-86.3	AR	Jefferson County	34.2	-92.0
AL	Shelby County	33.3	-86.7	AR	Johnson County	35.5	-93.5
AL	Sumter County	32.6	-88.2	AR	Lafayette County	33.3	-93.6
AL	Talladega County	33.4	-86.2	AR	Lawrence County	36.1	-91.1
AL	Tallapoosa County	32.9	-85.8	AR	Lee County	34.8	-90.8
AL	Tuscaloosa County	33.2	-87.5	AR	Lincoln County	34.0	-91.7
AL	Walker County	33.8	-87.3	AR	Little River County	33.7	-94.2
AL	Washington County	31.4	-88.2	AR	Logan County	35.2	-93.8
AL	Wilcox County	32.0	-87.3	AR	Lonoke County	34.8	-91.9
AL	Winston County	34.2	-87.4	AR	Madison County	36.0	-93.7
AK	Aleutians East Borough	55.1	-162.0	AR	Marion County	36.3	-92.7
AK	Aleutians West	52.3	-172.5	AR	Miller County	33.4	-94.0
AK	Anchorage Municipality	61.2	-149.8	AR	Mississippi County	35.8	-90.0
AK	Bethel	60.9	-161.2	AR	Monroe County	34.7	-91.2
AK	Bristol Bay Borough	58.7	-156.8	AR	Montgomery County	34.6	-93.6
AK	Denali Borough	63.9	-149.1	AR	Nevada County	33.7	-93.3
AK	Dillingham	59.2	-158.6	AR	Newton County	36.0	-93.2
AK	Fairbanks North Star Borough	64.8	-147.6	AR	Ouachita County	33.6	-92.9
AK	Haines Borough	59.2	-135.5	AR	Perry County	35.0	-92.9
AK	Juneau City and Borough	58.4	-134.5	AR	Phillips County	34.5	-90.8
AK	Kenai Peninsula Borough	60.3	-151.0	AR	Pike County	34.2	-93.7
AK	Ketchikan Gateway Borough	55.4	-131.6	AR	Poinsett County	35.6	-90.6
AK	Kodiak Island Borough	57.7	-152.7	AR	Polk County	34.5	-94.3
AK	Lake and Peninsula Borough	58.6	-156.4	AR	Pope County	35.3	-93.1
AK	Matanuska-Susitna Borough	61.8	-149.5	AR	Prairie County	34.8	-91.5
AK	Nome Census Area	64.8	-164.3	AR	Pulaski County	34.8	-92.3
AK	North Slope Borough	70.6	-153.9	AR	Randolph County	36.3	-91.0
AK	Northwest Arctic Borough	66.8	-160.6	AR	St. Francis County	35.0	-90.7

AR	Saline County	34.6	-92.6	CO	Elbert County	39.3	-104.3
AR	Scott County	34.9	-94.1	CO	El Paso County	38.9	-104.7
AR	Searcy County	35.9	-92.7	CO	Fremont County	38.4	-105.3
AR	Sebastian County	35.3	-94.4	CO	Garfield County	39.5	-107.7
AR	Sevier County	34.0	-94.3	CO	Gilpin County	39.8	-105.5
AR	Sharp County	36.2	-91.5	CO	Grand County	40.1	-106.1
AR	Stone County	35.9	-92.2	CO	Gunnison County	38.6	-107.0
AR	Union County	33.2	-92.6	CO	Hinsdale County	37.8	-107.3
AR	Van Buren County	35.6	-92.4	CO	Huerfano County	37.6	-105.0
AR	Washington County	36.1	-94.2	CO	Jackson County	40.6	-106.3
AR	White County	35.3	-91.7	CO	Jefferson County	39.7	-105.1
AR	Woodruff County	35.2	-91.2	CO	Kiowa County	38.4	-102.6
AR	Yell County	35.0	-93.4	CO	Kit Carson County	39.3	-102.5
CA	Alameda County	37.7	-122.1	CO	Lake County	39.2	-106.3
CA	Alpine County	38.6	-119.9	CO	La Plata County	37.3	-107.8
CA	Amador County	38.4	-120.7	CO	Larimer County	40.5	-105.2
CA	Butte County	39.6	-121.6	CO	Las Animas County	37.2	-104.4
CA	Calaveras County	38.2	-120.6	CO	Lincoln County	39.1	-103.6
CA	Colusa County	39.2	-122.2	CO	Logan County	40.7	-103.1
CA	Contra Costa County	37.9	-122.1	CO	Mesa County	39.1	-108.5
CA	Del Norte County	41.7	-124.1	CO	Mineral County	37.7	-106.9
CA	El Dorado County	38.8	-120.6	CO	Moffat County	40.6	-108.1
CA	Fresno County	36.6	-119.9	CO	Montezuma County	37.4	-108.6
CA	Glenn County	39.6	-122.3	CO	Montrose County	38.4	-108.2
CA	Humboldt County	40.7	-124.0	CO	Morgan County	40.3	-103.8
CA	Imperial County	33.0	-115.5	CO	Otero County	38.0	-103.7
CA	Inyo County	36.7	-117.7	CO	Ouray County	38.1	-107.8
CA	Kern County	35.3	-118.7	CO	Park County	39.2	-105.7
CA	Kings County	36.2	-119.8	CO	Phillips County	40.6	-102.4
CA	Lake County	39.0	-122.8	CO	Pitkin County	39.2	-106.9
CA	Lassen County	40.6	-120.7	CO	Prowers County	38.1	-102.4
CA	Los Angeles County	34.1	-118.2	CO	Pueblo County	38.2	-104.6
CA	Madera County	37.0	-120.0	CO	Rio Blanco County	40.0	-108.3
CA	Marin County	38.0	-122.6	CO	Rio Grande County	37.6	-106.3
CA	Mariposa County	37.6	-120.0	CO	Routt County	40.5	-106.9
CA	Mendocino County	39.4	-123.4	CO	Saguache County	38.1	-106.2
CA	Merced County	37.2	-120.7	CO	San Juan County	37.8	-107.7
CA	Modoc County	41.5	-120.8	CO	San Miguel County	38.0	-108.4
CA	Mono County	37.9	-119.0	CO	Sedgwick County	40.9	-102.3
CA	Monterey County	36.5	-121.5	CO	Summit County	39.6	-106.1
CA	Napa County	38.4	-122.3	CO	Teller County	38.9	-105.2
CA	Nevada County	39.3	-120.8	CO	Washington County	40.1	-103.1
CA	Orange County	33.7	-117.9	CO	Weld County	40.3	-104.7
CA	Placer County	39.0	-120.9	CO	Yuma County	40.0	-102.5
CA	Plumas County	40.0	-120.9	CT	Fairfield County	41.2	-73.4
CA	Riverside County	33.8	-116.8	CT	Hartford County	41.8	-72.7
CA	Sacramento County	38.6	-121.4	CT	Litchfield County	41.8	-73.2
CA	San Benito County	36.7	-121.3	CT	Middlesex County	41.4	-72.5
CA	San Bernardino County	34.4	-117.0	CT	New Haven County	41.4	-72.9
CA	San Diego County	32.9	-117.1	CT	New London County	41.4	-72.1
CA	San Francisco County	37.8	-122.4	CT	Tolland County	41.9	-72.4
CA	San Joaquin County	37.9	-121.3	CT	Windham County	41.8	-72.0
CA	San Luis Obispo County	35.4	-120.6	DE	Kent County	39.1	-75.6
CA	San Mateo County	37.5	-122.3	DE	New Castle County	39.7	-75.6
CA	Santa Barbara County	34.6	-120.1	DE	Sussex County	38.7	-75.3
CA	Santa Clara County	37.3	-121.9	DC	District of Columbia	38.9	-77.0
CA	Santa Cruz County	37.0	-122.0	FL	Alachua County	29.7	-82.4
CA	Shasta County	40.7	-122.1	FL	Baker County	30.3	-82.2
CA	Sierra County	39.6	-120.5	FL	Bay County	30.2	-85.6
CA	Siskiyou County	41.6	-122.5	FL	Bradford County	29.9	-82.1
CA	Solano County	38.2	-122.1	FL	Brevard County	28.2	-80.7
CA	Sonoma County	38.4	-122.8	FL	Broward County	26.1	-80.2
CA	Stanislaus County	37.6	-121.0	FL	Calhoun County	30.4	-85.2
CA	Sutter County	39.1	-121.7	FL	Charlotte County	27.0	-82.1
CA	Tehama County	40.1	-122.1	FL	Citrus County	28.9	-82.5
CA	Trinity County	40.7	-123.1	FL	Clay County	30.0	-81.8
CA	Tulare County	36.2	-119.2	FL	Collier County	26.2	-81.7
CA	Tuolumne County	38.0	-120.2	FL	Columbia County	30.2	-82.6
CA	Ventura County	34.3	-119.0	FL	DeSoto County	27.2	-81.9
CA	Yolo County	38.6	-121.8	FL	Dixie County	29.6	-83.1
CA	Yuba County	39.2	-121.4	FL	Duval County	30.3	-81.6
CO	Adams County	39.9	-104.9	FL	Escambia County	30.5	-87.3
CO	Alamosa County	37.5	-105.8	FL	Flagler County	29.5	-81.2
CO	Arapahoe County	39.6	-104.8	FL	Franklin County	29.8	-84.8
CO	Archuleta County	37.2	-107.1	FL	Gadsden County	30.6	-84.6
CO	Baca County	37.3	-102.5	FL	Gilchrist County	29.7	-82.8
CO	Bent County	38.1	-103.1	FL	Glades County	26.9	-81.2
CO	Boulder County	40.1	-105.2	FL	Gulf County	29.9	-85.3
CO	Chaffee County	38.7	-106.1	FL	Hamilton County	30.5	-82.9
CO	Cheyenne County	38.8	-102.5	FL	Hardee County	27.5	-81.8
CO	Clear Creek County	39.7	-105.6	FL	Hardy County	26.7	-81.2
CO	Conejos County	37.2	-106.1	FL	Hernando County	28.5	-82.5
CO	Costilla County	37.3	-105.5	FL	Highlands County	27.4	-81.4
CO	Crowley County	38.2	-103.8	FL	Hillsborough County	28.0	-82.4
CO	Custer County	38.1	-105.4	FL	Holmes County	30.9	-85.8
CO	Delta County	38.8	-107.9	FL	Indian River County	27.7	-80.5
CO	Denver County	39.7	-105.0	FL	Jackson County	30.8	-85.2
CO	Dolores County	37.8	-108.6	FL	Jefferson County	30.5	-83.9
CO	Douglas County	39.5	-104.9	FL	Lafayette County	30.0	-83.2
CO	Eagle County	39.6	-106.7	FL	Lake County	28.8	-81.7

FL	Lee County	26.6	-81.8	GA	Forsyth County	34.2	-84.1
FL	Leon County	30.5	-84.3	GA	Franklin County	34.4	-83.2
FL	Levy County	29.3	-82.7	GA	Fulton County	33.8	-84.4
FL	Liberty County	30.3	-84.9	GA	Gilmer County	34.7	-84.5
FL	Madison County	30.4	-83.4	GA	Glascocock County	33.2	-82.6
FL	Manatee County	27.5	-82.5	GA	Glynn County	31.2	-81.5
FL	Marion County	29.1	-82.1	GA	Gordon County	34.5	-84.9
FL	Martin County	27.1	-80.3	GA	Grady County	30.9	-84.2
FL	Miami-Dade County	25.8	-80.3	GA	Greene County	33.6	-83.2
FL	Monroe County	24.8	-81.2	GA	Gwinnett County	34.0	-84.1
FL	Nassau County	30.6	-81.7	GA	Habersham County	34.6	-83.5
FL	Okaloosa County	30.6	-86.6	GA	Hall County	34.3	-83.8
FL	Okeechobee County	27.3	-80.9	GA	Hancock County	33.3	-83.0
FL	Orange County	28.5	-81.4	GA	Haralson County	33.8	-85.2
FL	Osceola County	28.2	-81.3	GA	Harris County	32.7	-84.9
FL	Palm Beach County	26.6	-80.2	GA	Hart County	34.4	-83.0
FL	Pasco County	28.3	-82.5	GA	Hard County	33.3	-85.1
FL	Pinellas County	27.9	-82.7	GA	Henry County	33.5	-84.2
FL	Polk County	28.0	-81.8	GA	Houston County	32.6	-83.7
FL	Putnam County	29.6	-81.8	GA	Irwin County	31.6	-83.3
FL	St. Johns County	29.9	-81.4	GA	Jackson County	34.1	-83.6
FL	St. Lucie County	27.3	-80.4	GA	Jasper County	33.3	-83.7
FL	Santa Rosa County	30.6	-87.0	GA	Jeff Davis County	31.8	-82.6
FL	Sarasota County	27.2	-82.4	GA	Jefferson County	33.1	-82.4
FL	Seminole County	28.7	-81.3	GA	Jenkins County	32.8	-82.0
FL	Sumter County	28.8	-82.1	GA	Johnson County	32.7	-82.7
FL	Suwannee County	30.2	-83.0	GA	Jones County	33.0	-83.5
FL	Taylor County	30.1	-83.6	GA	Lamar County	33.1	-84.2
FL	Union County	30.0	-82.4	GA	Lanier County	31.0	-83.1
FL	Volusia County	29.0	-81.1	GA	Laurens County	32.5	-82.9
FL	Wakulla County	30.1	-84.4	GA	Lee County	31.7	-84.2
FL	Walton County	30.6	-86.2	GA	Liberty County	31.8	-81.5
FL	Washington County	30.6	-85.6	GA	Lincoln County	33.8	-82.5
GA	Appling County	31.7	-82.3	GA	Long County	31.8	-81.8
GA	Atkinson County	31.3	-82.9	GA	Lowndes County	30.8	-83.3
GA	Bacon County	31.6	-82.5	GA	Lumpkin County	34.5	-84.0
GA	Baker County	31.3	-84.4	GA	McDuffie County	33.5	-82.5
GA	Baldwin County	33.1	-83.2	GA	McIntosh County	31.5	-81.4
GA	Banks County	34.3	-83.5	GA	Macon County	32.4	-84.0
GA	Barrow County	34.0	-83.7	GA	Madison County	34.1	-83.2
GA	Bartow County	34.2	-84.8	GA	Marion County	32.4	-84.5
GA	Ben Hill County	31.7	-83.3	GA	Meriwether County	33.0	-84.7
GA	Berrien County	31.2	-83.2	GA	Miller County	31.2	-84.2
GA	Bibb County	32.8	-83.7	GA	Mitchell County	31.2	-84.2
GA	Bleckley County	32.4	-83.3	GA	Monroe County	33.0	-83.9
GA	Brantley County	31.2	-82.0	GA	Montgomery County	32.2	-82.5
GA	Brooks County	30.9	-83.6	GA	Morgan County	33.6	-83.5
GA	Bryan County	32.1	-81.4	GA	Murray County	34.8	-84.8
GA	Bulloch County	32.4	-81.8	GA	Muscogee County	32.5	-84.9
GA	Burke County	33.1	-82.0	GA	Newton County	33.6	-83.9
GA	Butts County	33.3	-84.0	GA	Oconee County	33.9	-83.4
GA	Calhoun County	31.5	-84.7	GA	Oglethorpe County	33.9	-83.1
GA	Camden County	30.9	-81.7	GA	Paulding County	33.9	-84.8
GA	Candler County	32.4	-82.1	GA	Peach County	32.6	-83.8
GA	Carroll County	33.6	-85.1	GA	Pickens County	34.5	-84.4
GA	Catoosa County	34.9	-85.2	GA	Pierce County	31.3	-82.2
GA	Charlton County	30.8	-82.1	GA	Pike County	33.1	-84.4
GA	Chatham County	32.0	-81.1	GA	Polk County	34.0	-85.2
GA	Chattahoochee County	32.3	-84.8	GA	Pulaski County	32.2	-83.5
GA	Chattoga County	34.5	-85.4	GA	Putnam County	33.3	-83.4
GA	Cherokee County	34.2	-84.5	GA	Quitman County	31.9	-85.0
GA	Clarke County	34.0	-83.4	GA	Rabun County	34.9	-83.4
GA	Clay County	31.6	-85.0	GA	Randolph County	31.8	-84.7
GA	Clayton County	33.6	-84.4	GA	Richmond County	33.4	-82.0
GA	Clinch County	30.9	-82.7	GA	Rockdale County	33.7	-84.0
GA	Cobb County	33.9	-84.6	GA	Schley County	32.2	-84.3
GA	Coffee County	31.5	-82.8	GA	Screven County	32.7	-81.6
GA	Colquitt County	31.2	-83.8	GA	Seminole County	31.0	-84.9
GA	Columbia County	33.5	-82.2	GA	Spalding County	33.3	-84.3
GA	Cook County	31.2	-83.4	GA	Stephens County	34.6	-83.3
GA	Coweta County	33.4	-84.8	GA	Stewart County	32.1	-84.8
GA	Crawford County	32.7	-84.0	GA	Sumter County	32.1	-84.2
GA	Crisp County	31.9	-83.8	GA	Talbot County	32.7	-84.5
GA	Dade County	34.9	-85.5	GA	Taliaferro County	33.6	-82.9
GA	Dawson County	34.4	-84.1	GA	Tattnall County	32.0	-82.0
GA	Decatur County	30.9	-84.6	GA	Taylor County	32.5	-84.2
GA	DeKalb County	33.8	-84.3	GA	Telfair County	32.0	-82.9
GA	Dodge County	32.2	-83.2	GA	Terrell County	31.8	-84.4
GA	Dooly County	32.2	-83.8	GA	Thomas County	30.9	-83.9
GA	Dougherty County	31.6	-84.2	GA	Tift County	31.5	-83.5
GA	Douglas County	33.7	-84.7	GA	Toombs County	32.2	-82.4
GA	Early County	31.3	-84.9	GA	Towns County	34.9	-83.8
GA	Echols County	30.7	-82.9	GA	Treutlen County	32.4	-82.6
GA	Effingham County	32.3	-81.3	GA	Troup County	33.0	-85.0
GA	Elbert County	34.1	-82.9	GA	Turner County	31.7	-83.6
GA	Emanuel County	32.6	-82.3	GA	Twiggs County	32.7	-83.4
GA	Evans County	32.2	-81.9	GA	Union County	34.9	-84.0
GA	Fannin County	34.9	-84.3	GA	Upson County	32.9	-84.3
GA	Fayette County	33.4	-84.5	GA	Walker County	34.8	-85.3
GA	Floyd County	34.3	-85.2	GA	Walton County	33.8	-83.7

GA	Ware County	31.2	-82.4	IL	Gallatin County	37.8	-88.2
GA	Warren County	33.4	-82.7	IL	Greene County	39.4	-90.4
GA	Washington County	32.9	-82.8	IL	Grundy County	41.3	-88.4
GA	Wayne County	31.6	-81.9	IL	Hamilton County	38.1	-88.5
GA	Webster County	32.0	-84.6	IL	Hancock County	40.4	-91.2
GA	Wheeler County	32.1	-82.7	IL	Hardin County	37.5	-88.3
GA	White County	34.6	-83.7	IL	Henderson County	40.8	-90.9
GA	Whitfield County	34.8	-85.0	IL	Henry County	41.4	-90.1
GA	Wilcox County	32.0	-83.5	IL	Iroquois County	40.7	-87.8
GA	Wilkes County	33.8	-82.7	IL	Jackson County	37.8	-89.3
GA	Wilkinson County	32.8	-83.2	IL	Jasper County	39.0	-88.1
GA	Worth County	31.6	-83.8	IL	Jefferson County	38.3	-88.9
HI	Hawaii County	19.7	-155.4	IL	Jersey County	39.1	-90.3
HI	Honolulu County	21.4	-158.0	IL	Jo Daviess County	42.4	-90.2
HI	Kalawao County	21.2	-157.0	IL	Johnson County	37.5	-88.9
HI	Kauai County	22.0	-159.5	IL	Kane County	41.9	-88.3
HI	Maui County	20.9	-156.6	IL	Kankakee County	41.1	-87.8
ID	Ada County	43.6	-116.3	IL	Kendall County	41.6	-88.4
ID	Adams County	44.9	-116.4	IL	Knox County	40.9	-90.3
ID	Bannock County	42.8	-112.3	IL	Lake County	42.3	-88.0
ID	Bear Lake County	42.3	-111.4	IL	La Salle County	41.3	-88.9
ID	Benewah County	47.2	-116.6	IL	Lawrence County	38.7	-87.7
ID	Bingham County	43.2	-112.4	IL	Lee County	41.8	-89.4
ID	Blaine County	43.4	-114.2	IL	Livingston County	40.9	-88.6
ID	Boise County	44.0	-115.9	IL	Logan County	40.1	-89.4
ID	Bonner County	48.3	-116.7	IL	McDonough County	40.5	-90.7
ID	Bonneville County	43.5	-111.9	IL	McHenry County	42.3	-88.4
ID	Boundary County	48.8	-116.4	IL	McLean County	40.5	-88.9
ID	Butte County	43.7	-113.2	IL	Macon County	39.9	-89.0
ID	Camas County	43.4	-114.8	IL	Macoupin County	39.2	-89.9
ID	Canyon County	43.6	-116.7	IL	Madison County	38.8	-90.0
ID	Caribou County	42.7	-111.7	IL	Marion County	38.6	-89.0
ID	Cassia County	42.4	-113.6	IL	Marshall County	41.0	-89.3
ID	Clark County	44.2	-112.3	IL	Mason County	40.3	-89.9
ID	Clearwater County	46.7	-115.9	IL	Massac County	37.2	-88.7
ID	Custer County	44.2	-114.1	IL	Menard County	40.0	-89.8
ID	Elmore County	43.1	-115.5	IL	Mercer County	41.2	-90.7
ID	Franklin County	42.2	-111.9	IL	Monroe County	38.3	-90.2
ID	Fremont County	44.2	-111.5	IL	Montgomery County	39.2	-89.5
ID	Gem County	44.0	-116.5	IL	Morgan County	39.7	-90.2
ID	Gooding County	42.9	-114.8	IL	Moultrie County	39.6	-88.6
ID	Idaho County	45.9	-115.9	IL	Ogle County	42.0	-89.3
ID	Jefferson County	43.8	-112.1	IL	Peoria County	40.8	-89.7
ID	Jerome County	42.7	-114.3	IL	Perry County	38.1	-89.3
ID	Kootenai County	47.7	-116.8	IL	Platt County	40.0	-88.6
ID	Latah County	46.8	-116.8	IL	Pike County	39.6	-90.9
ID	Lemhi County	44.9	-113.8	IL	Pope County	37.4	-88.6
ID	Lewis County	46.2	-116.4	IL	Pulaski County	37.2	-89.1
ID	Lincoln County	43.0	-114.2	IL	Putnam County	41.2	-89.3
ID	Madison County	43.8	-111.7	IL	Randolph County	38.1	-89.8
ID	Minidoka County	42.7	-113.7	IL	Richland County	38.7	-88.1
ID	Nez Perce County	46.4	-116.9	IL	Rock Island County	41.5	-90.5
ID	Oneida County	42.2	-112.4	IL	St. Clair County	38.5	-90.0
ID	Owyhee County	42.8	-116.2	IL	Saline County	37.8	-88.5
ID	Payette County	44.0	-116.9	IL	Sangamon County	39.8	-89.6
ID	Power County	42.8	-112.8	IL	Schuyler County	40.1	-90.6
ID	Shoshone County	47.4	-116.0	IL	Scott County	39.6	-90.5
ID	Teton County	43.7	-111.1	IL	Shelby County	39.4	-88.8
ID	Twin Falls County	42.5	-114.6	IL	Stark County	41.1	-89.8
ID	Valley County	44.7	-115.9	IL	Stephenson County	42.3	-89.6
ID	Washington County	44.4	-116.9	IL	Tazewell County	40.6	-89.5
IL	Adams County	40.0	-91.3	IL	Union County	37.5	-89.2
IL	Alexander County	37.1	-89.3	IL	Vermilion County	40.2	-87.7
IL	Bond County	38.9	-89.4	IL	Wabash County	38.4	-87.8
IL	Boone County	42.3	-88.8	IL	Warren County	40.9	-90.6
IL	Brown County	40.0	-90.7	IL	Washington County	38.4	-89.4
IL	Bureau County	41.4	-89.5	IL	Wayne County	38.4	-88.4
IL	Calhoun County	39.2	-90.7	IL	White County	38.1	-88.2
IL	Carroll County	42.1	-90.0	IL	Whiteside County	41.8	-89.9
IL	Cass County	40.0	-90.3	IL	Will County	41.5	-88.0
IL	Champaign County	40.1	-88.2	IL	Williamson County	37.7	-89.0
IL	Christian County	39.5	-89.3	IL	Winnebago County	42.3	-89.1
IL	Clark County	39.3	-87.8	IL	Woodford County	40.8	-89.2
IL	Clay County	38.7	-88.5	IN	Adams County	40.7	-84.9
IL	Clinton County	38.6	-89.4	IN	Allen County	41.1	-85.1
IL	Coles County	39.5	-88.3	IN	Bartholomew County	39.2	-85.9
IL	Cook County	41.8	-87.8	IN	Benton County	40.6	-87.3
IL	Crawford County	39.0	-87.8	IN	Blackford County	40.5	-85.3
IL	Cumberland County	39.3	-88.3	IN	Boone County	40.0	-86.5
IL	DeKalb County	41.9	-88.7	IN	Brown County	39.2	-86.2
IL	De Witt County	40.2	-88.9	IN	Carroll County	40.6	-86.6
IL	Douglas County	39.8	-88.2	IN	Cass County	40.7	-86.3
IL	DuPage County	41.9	-88.1	IN	Clark County	38.4	-85.7
IL	Edgar County	39.7	-87.7	IN	Clay County	39.4	-87.1
IL	Edwards County	38.4	-88.0	IN	Clinton County	40.3	-86.5
IL	Effingham County	39.1	-88.6	IN	Crawford County	38.3	-86.4
IL	Fayette County	39.0	-89.0	IN	Daviess County	38.7	-87.1
IL	Ford County	40.6	-88.2	IN	Dearborn County	39.1	-84.9
IL	Franklin County	38.0	-89.0	IN	Decatur County	39.3	-85.5
IL	Fulton County	40.5	-90.2	IN	DeKalb County	41.4	-85.0

IN	Delaware County	40.2	-85.4	IA	Cedar County	41.8	-91.1
IN	Dubois County	38.4	-86.9	IA	Cerro Gordo County	43.1	-93.3
IN	Elkhart County	41.6	-85.9	IA	Cherokee County	42.7	-95.6
IN	Fayette County	39.6	-85.2	IA	Chickasaw County	43.1	-92.3
IN	Floyd County	38.3	-85.9	IA	Clarke County	41.0	-93.8
IN	Fountain County	40.1	-87.3	IA	Clay County	43.1	-95.2
IN	Franklin County	39.4	-85.1	IA	Clayton County	42.9	-91.3
IN	Fulton County	41.1	-86.2	IA	Clinton County	41.9	-90.4
IN	Gibson County	38.3	-87.6	IA	Crawford County	42.0	-95.4
IN	Grant County	40.5	-85.6	IA	Dallas County	41.7	-94.0
IN	Greene County	39.1	-87.0	IA	Davis County	40.7	-92.4
IN	Hamilton County	40.0	-86.1	IA	Decatur County	40.7	-93.8
IN	Hancock County	39.8	-85.8	IA	Delaware County	42.5	-91.4
IN	Harrison County	38.2	-86.1	IA	Des Moines County	40.9	-91.2
IN	Hendricks County	39.8	-86.5	IA	Dickinson County	43.4	-95.1
IN	Henry County	39.9	-85.4	IA	Dubuque County	42.5	-90.8
IN	Howard County	40.5	-86.1	IA	Emmet County	43.4	-94.7
IN	Huntington County	40.8	-85.5	IA	Fayette County	42.8	-91.9
IN	Jackson County	38.9	-86.0	IA	Floyd County	43.1	-92.8
IN	Jasper County	41.0	-87.1	IA	Franklin County	42.7	-93.2
IN	Jay County	40.4	-85.0	IA	Fremont County	40.7	-95.6
IN	Jefferson County	38.8	-85.4	IA	Greene County	42.0	-94.4
IN	Jennings County	39.0	-85.6	IA	Grundy County	42.4	-92.8
IN	Johnson County	39.5	-86.1	IA	Guthrie County	41.7	-94.5
IN	Knox County	38.7	-87.4	IA	Hamilton County	42.4	-93.7
IN	Kosciusko County	41.3	-85.8	IA	Hancock County	43.1	-93.7
IN	LaGrange County	41.6	-85.4	IA	Hardin County	42.4	-93.2
IN	Lake County	41.5	-87.4	IA	Harrison County	41.7	-95.8
IN	LaPorte County	41.6	-86.8	IA	Henry County	41.0	-91.5
IN	Lawrence County	38.8	-86.5	IA	Howard County	43.4	-92.3
IN	Madison County	40.1	-85.7	IA	Humboldt County	42.8	-94.2
IN	Marion County	39.8	-86.1	IA	Ida County	42.4	-95.5
IN	Marshall County	41.3	-86.3	IA	Iowa County	41.7	-92.1
IN	Martin County	38.7	-86.8	IA	Jackson County	42.2	-90.6
IN	Miami County	40.8	-86.1	IA	Jasper County	41.7	-93.1
IN	Monroe County	39.2	-86.5	IA	Jefferson County	41.0	-92.0
IN	Montgomery County	40.0	-86.9	IA	Johnson County	41.7	-91.6
IN	Morgan County	39.5	-86.4	IA	Jones County	42.1	-91.2
IN	Newton County	41.0	-87.4	IA	Keokuk County	41.3	-92.2
IN	Noble County	41.4	-85.4	IA	Kossuth County	43.2	-94.2
IN	Ohio County	38.9	-84.9	IA	Lee County	40.6	-91.4
IN	Orange County	38.6	-86.5	IA	Linn County	42.0	-91.6
IN	Owen County	39.3	-86.8	IA	Louisa County	41.2	-91.3
IN	Parke County	39.8	-87.2	IA	Lucas County	41.0	-93.3
IN	Perry County	38.0	-86.7	IA	Lyon County	43.4	-96.2
IN	Pike County	38.4	-87.2	IA	Madison County	41.3	-94.0
IN	Porter County	41.5	-87.1	IA	Mahaska County	41.3	-92.6
IN	Posey County	38.0	-87.8	IA	Marion County	41.3	-93.1
IN	Pulaski County	41.0	-86.7	IA	Marshall County	42.0	-93.0
IN	Putnam County	39.7	-86.8	IA	Mills County	41.0	-95.6
IN	Randolph County	40.2	-85.0	IA	Mitchell County	43.3	-92.8
IN	Ripley County	39.2	-85.2	IA	Monona County	42.1	-96.0
IN	Rush County	39.6	-85.5	IA	Monroe County	41.0	-92.8
IN	St. Joseph County	41.7	-86.2	IA	Montgomery County	41.0	-95.2
IN	Scott County	38.7	-85.8	IA	Muscatine County	41.5	-91.1
IN	Shelby County	39.5	-85.8	IA	O'Brien County	43.1	-95.6
IN	Spencer County	38.0	-87.0	IA	Osceola County	43.4	-95.6
IN	Starke County	41.3	-86.7	IA	Page County	40.7	-95.2
IN	Steuben County	41.7	-85.0	IA	Palo Alto County	43.1	-94.7
IN	Sullivan County	39.1	-87.4	IA	Plymouth County	42.8	-96.2
IN	Switzerland County	38.8	-85.0	IA	Pocahontas County	42.7	-94.7
IN	Tippecanoe County	40.4	-86.9	IA	Polk County	41.6	-93.6
IN	Tipton County	40.3	-86.0	IA	Pottawattamie County	41.3	-95.7
IN	Union County	39.6	-84.9	IA	Poweshiek County	41.7	-92.5
IN	Vanderburgh County	38.0	-87.6	IA	Ringgold County	40.7	-94.2
IN	Vermillion County	39.8	-87.4	IA	Sac County	42.4	-95.1
IN	Vigo County	39.5	-87.4	IA	Scott County	41.6	-90.6
IN	Wabash County	40.9	-85.8	IA	Shelby County	41.7	-95.3
IN	Warren County	40.3	-87.4	IA	Sioux County	43.1	-96.2
IN	Warrick County	38.0	-87.3	IA	Story County	42.0	-93.5
IN	Washington County	38.6	-86.1	IA	Tama County	42.1	-92.5
IN	Wayne County	39.8	-85.0	IA	Taylor County	40.7	-94.7
IN	Wells County	40.7	-85.2	IA	Union County	41.0	-94.3
IN	White County	40.7	-86.8	IA	Van Buren County	40.7	-91.9
IN	Whitley County	41.2	-85.5	IA	Wapello County	41.0	-92.4
IA	Adair County	41.3	-94.5	IA	Warren County	41.4	-93.6
IA	Adams County	41.0	-94.7	IA	Washington County	41.3	-91.7
IA	Allamakee County	43.3	-91.4	IA	Wayne County	40.7	-93.3
IA	Appanoose County	40.8	-92.9	IA	Webster County	42.4	-94.2
IA	Audubon County	41.7	-94.9	IA	Winnebago County	43.4	-93.7
IA	Benton County	42.1	-92.1	IA	Winneshiok County	43.3	-91.8
IA	Black Hawk County	42.5	-92.3	IA	Woodbury County	42.4	-96.2
IA	Boone County	42.0	-93.9	IA	Worth County	43.4	-93.3
IA	Bremer County	42.8	-92.3	IA	Wright County	42.7	-93.8
IA	Buchanan County	42.5	-91.9	KS	Allen County	37.9	-95.3
IA	Buena Vista County	42.7	-95.2	KS	Anderson County	38.2	-95.3
IA	Butler County	42.7	-92.8	KS	Atchison County	39.5	-95.3
IA	Calhoun County	42.4	-94.6	KS	Barber County	37.2	-98.6
IA	Carroll County	42.0	-94.9	KS	Barton County	38.4	-98.8
IA	Cass County	41.4	-95.0	KS	Bourbon County	37.9	-94.8

KS	Brown County	39.8	-95.6	KS	Thomas County	39.4	-101.0
KS	Butler County	37.8	-96.9	KS	Trego County	38.9	-99.8
KS	Chase County	38.3	-96.6	KS	Wabunsee County	39.0	-96.2
KS	Chautauqua County	37.1	-96.3	KS	Wallace County	38.9	-101.8
KS	Cherokee County	37.1	-94.8	KS	Washington County	39.8	-97.1
KS	Cheyenne County	39.8	-101.7	KS	Wichita County	38.5	-101.4
KS	Clark County	37.2	-99.8	KS	Wilson County	37.5	-95.8
KS	Clay County	39.4	-97.1	KS	Woodson County	37.9	-95.7
KS	Cloud County	39.5	-97.7	KS	Wyandotte County	39.1	-94.7
KS	Coffey County	38.2	-95.7	KY	Adair County	37.1	-85.3
KS	Comanche County	37.3	-99.3	KY	Allen County	36.7	-86.2
KS	Cowley County	37.2	-96.9	KY	Anderson County	38.0	-85.0
KS	Crawford County	37.5	-94.8	KY	Ballard County	37.1	-89.0
KS	Decatur County	39.8	-100.4	KY	Baren County	37.0	-85.9
KS	Dickinson County	38.8	-97.1	KY	Bath County	38.1	-83.8
KS	Doniphan County	39.8	-95.1	KY	Bell County	36.7	-83.7
KS	Douglas County	38.9	-95.3	KY	Boone County	39.0	-84.7
KS	Edwards County	37.9	-99.3	KY	Bourbon County	38.2	-84.2
KS	Elk County	37.4	-96.2	KY	Boyd County	38.4	-82.7
KS	Ellis County	38.9	-99.3	KY	Boyle County	37.6	-84.8
KS	Ellsworth County	38.7	-98.2	KY	Bracken County	38.7	-84.1
KS	Finney County	38.0	-100.8	KY	Breathitt County	37.5	-83.3
KS	Ford County	37.7	-99.9	KY	Breckinridge County	37.8	-86.5
KS	Franklin County	38.6	-95.3	KY	Bullitt County	38.0	-85.7
KS	Geary County	39.0	-96.8	KY	Butler County	37.2	-86.7
KS	Gove County	39.0	-100.5	KY	Caldwell County	37.2	-87.9
KS	Graham County	39.3	-99.9	KY	Calloway County	36.6	-88.3
KS	Grant County	37.6	-101.3	KY	Campbell County	39.0	-84.4
KS	Gray County	37.7	-100.4	KY	Carlisle County	36.9	-89.0
KS	Greeley County	38.5	-101.8	KY	Carroll County	38.7	-85.1
KS	Greenwood County	37.9	-96.2	KY	Carter County	38.3	-83.0
KS	Hamilton County	38.0	-101.8	KY	Casey County	37.3	-84.9
KS	Harper County	37.2	-98.1	KY	Christian County	36.9	-87.5
KS	Harvey County	38.0	-97.4	KY	Clark County	38.0	-84.2
KS	Haskell County	37.5	-100.9	KY	Clay County	37.2	-83.7
KS	Hodgeman County	38.1	-99.9	KY	Clinton County	36.7	-85.1
KS	Jackson County	39.4	-95.8	KY	Crittenden County	37.3	-88.1
KS	Jefferson County	39.2	-95.4	KY	Cumberland County	36.8	-85.4
KS	Jewell County	39.8	-98.2	KY	Daviess County	37.8	-87.1
KS	Johnson County	38.9	-94.8	KY	Edmonson County	37.2	-86.2
KS	Kearny County	38.0	-101.3	KY	Elliott County	38.1	-83.1
KS	Kingman County	37.6	-98.1	KY	Estill County	37.7	-84.0
KS	Kiowa County	37.6	-99.3	KY	Fayette County	38.0	-84.5
KS	Labette County	37.2	-95.3	KY	Fleming County	38.4	-83.7
KS	Lane County	38.5	-100.5	KY	Floyd County	37.6	-82.7
KS	Leavenworth County	39.2	-95.0	KY	Franklin County	38.2	-84.9
KS	Lincoln County	39.0	-98.2	KY	Fulton County	36.5	-89.1
KS	Linn County	38.2	-94.8	KY	Gallatin County	38.7	-84.9
KS	Logan County	39.0	-101.1	KY	Garrard County	37.6	-84.6
KS	Lyon County	38.4	-96.1	KY	Grant County	38.7	-84.6
KS	McPherson County	38.4	-97.6	KY	Graves County	36.7	-88.6
KS	Marion County	38.3	-97.1	KY	Grayson County	37.5	-86.3
KS	Marshall County	39.8	-96.5	KY	Green County	37.3	-85.5
KS	Meade County	37.3	-100.4	KY	Greenup County	38.6	-82.9
KS	Miami County	38.6	-94.9	KY	Hancock County	37.9	-86.8
KS	Mitchell County	39.4	-98.2	KY	Hardin County	37.7	-85.9
KS	Montgomery County	37.1	-95.7	KY	Harlan County	36.9	-83.2
KS	Morris County	38.7	-96.6	KY	Harrison County	38.4	-84.3
KS	Morton County	37.1	-101.8	KY	Hart County	37.3	-85.9
KS	Nemaha County	39.8	-96.0	KY	Henderson County	37.8	-87.6
KS	Neosho County	37.6	-95.4	KY	Henry County	38.4	-85.2
KS	Ness County	38.5	-99.9	KY	Hickman County	36.7	-89.0
KS	Norton County	39.8	-99.9	KY	Hopkins County	37.3	-87.5
KS	Osage County	38.6	-95.7	KY	Jackson County	37.4	-84.0
KS	Osborne County	39.4	-98.8	KY	Jefferson County	38.2	-85.7
KS	Ottawa County	39.1	-97.7	KY	Jessamine County	37.9	-84.6
KS	Pawnee County	38.2	-99.2	KY	Johnson County	37.8	-82.8
KS	Phillips County	39.8	-99.3	KY	Kenton County	39.0	-84.5
KS	Pottawatomie County	39.3	-96.3	KY	Knott County	37.3	-83.0
KS	Pratt County	37.6	-98.7	KY	Knox County	36.9	-83.9
KS	Rawlins County	39.8	-101.1	KY	Larue County	37.5	-85.7
KS	Reno County	38.0	-98.0	KY	Laurel County	37.1	-84.1
KS	Republic County	39.8	-97.6	KY	Lawrence County	38.1	-82.7
KS	Rice County	38.3	-98.2	KY	Lee County	37.6	-83.7
KS	Riley County	39.3	-96.7	KY	Leslie County	37.1	-83.4
KS	Rooks County	39.4	-99.3	KY	Letcher County	37.1	-82.8
KS	Rush County	38.5	-99.3	KY	Lewis County	38.5	-83.3
KS	Russell County	38.9	-98.8	KY	Lincoln County	37.5	-84.7
KS	Saline County	38.8	-97.6	KY	Livingston County	37.2	-88.3
KS	Scott County	38.5	-100.9	KY	Logan County	36.9	-86.9
KS	Sedgwick County	37.7	-97.4	KY	Lyon County	37.0	-88.1
KS	Seward County	37.1	-100.9	KY	McCracken County	37.1	-88.7
KS	Shawnee County	39.0	-95.7	KY	McCreary County	36.7	-84.5
KS	Sheridan County	39.4	-100.5	KY	McLean County	37.5	-87.2
KS	Sherman County	39.3	-101.7	KY	Madison County	37.7	-84.3
KS	Smith County	39.8	-98.8	KY	Magoffin County	37.7	-83.1
KS	Stafford County	38.0	-98.7	KY	Marion County	37.6	-85.3
KS	Stanton County	37.6	-101.7	KY	Marshall County	36.9	-88.3
KS	Stevens County	37.2	-101.3	KY	Martin County	37.8	-82.5
KS	Sumner County	37.3	-97.4	KY	Mason County	38.6	-83.8

KY	Meade County	37.9	-86.1	LA	St. Tammany Parish	30.4	-89.9
KY	Menifee County	38.0	-83.6	LA	Tangipahoa Parish	30.6	-90.5
KY	Mercer County	37.8	-84.8	LA	Tensas Parish	32.0	-91.3
KY	Metcalfe County	37.0	-85.6	LA	Terrebonne Parish	29.5	-90.7
KY	Monroe County	36.7	-85.7	LA	Union Parish	32.8	-92.4
KY	Montgomery County	38.0	-83.9	LA	Vermilion Parish	30.0	-92.2
KY	Morgan County	37.9	-83.3	LA	Vernon Parish	31.1	-93.2
KY	Muhlenberg County	37.2	-87.1	LA	Washington Parish	30.8	-90.0
KY	Nelson County	37.8	-85.5	LA	Webster Parish	32.7	-93.3
KY	Nicholas County	38.3	-84.0	LA	West Baton Rouge Parish	30.5	-91.3
KY	Ohio County	37.5	-86.9	LA	West Carroll Parish	32.8	-91.4
KY	Oldham County	38.4	-85.4	LA	West Feliciana Parish	30.9	-91.4
KY	Owen County	38.5	-84.8	LA	Winn Parish	31.9	-92.6
KY	Owsley County	37.4	-83.7	ME	Androscoggin County	44.1	-70.2
KY	Pendleton County	38.7	-84.4	ME	Aroostook County	46.6	-68.3
KY	Perry County	37.2	-83.2	ME	Cumberland County	43.8	-70.3
KY	Pike County	37.4	-82.4	ME	Franklin County	44.9	-70.4
KY	Powell County	37.8	-83.9	ME	Hancock County	44.5	-68.4
KY	Pulaski County	37.1	-84.6	ME	Kennebec County	44.4	-69.8
KY	Robertson County	38.5	-84.1	ME	Knox County	44.1	-69.1
KY	Rockcastle County	37.4	-84.3	ME	Lincoln County	44.0	-69.5
KY	Rowan County	38.2	-83.4	ME	Oxford County	44.3	-70.7
KY	Russell County	37.0	-85.1	ME	Penobscot County	45.2	-68.7
KY	Scott County	38.2	-84.6	ME	Piscataquis County	45.6	-69.3
KY	Shelby County	38.2	-85.2	ME	Sagadahoc County	43.9	-69.9
KY	Simpson County	36.7	-86.6	ME	Somerset County	45.1	-69.9
KY	Spencer County	38.0	-85.3	ME	Waldo County	44.5	-69.1
KY	Taylor County	37.4	-85.3	ME	Washington County	44.9	-67.6
KY	Todd County	36.8	-87.2	ME	York County	43.4	-70.7
KY	Trigg County	36.8	-87.9	MD	Allegany County	39.6	-78.8
KY	Trimble County	38.6	-85.4	MD	Anne Arundel County	39.1	-76.6
KY	Union County	37.6	-87.9	MD	Baltimore County	39.4	-76.6
KY	Warren County	37.0	-86.4	MD	Calvert County	38.5	-76.5
KY	Washington County	37.7	-85.2	MD	Caroline County	38.9	-75.8
KY	Wayne County	36.8	-84.8	MD	Carroll County	39.6	-77.0
KY	Webster County	37.5	-87.7	MD	Cecil County	39.6	-76.0
KY	Whitley County	36.8	-84.1	MD	Charles County	38.5	-77.0
KY	Wolfe County	37.7	-83.5	MD	Dorchester County	38.5	-76.0
KY	Woodford County	38.1	-84.7	MD	Frederick County	39.5	-77.4
LA	Acadia Parish	30.3	-92.4	MD	Garrett County	39.5	-79.3
LA	Allen Parish	30.7	-92.8	MD	Harford County	39.5	-76.3
LA	Ascension Parish	30.2	-90.9	MD	Howard County	39.2	-76.9
LA	Assumption Parish	29.9	-91.1	MD	Kent County	39.3	-76.1
LA	Avoyelles Parish	31.1	-92.1	MD	Montgomery County	39.1	-77.1
LA	Beauregard Parish	30.7	-93.3	MD	Prince George's County	38.9	-76.9
LA	Bienville Parish	32.4	-93.0	MD	Queen Anne's County	39.0	-76.1
LA	Bossier Parish	32.6	-93.7	MD	St. Mary's County	38.3	-76.6
LA	Caddo Parish	32.5	-93.8	MD	Somerset County	38.1	-75.8
LA	Calcasieu Parish	30.2	-93.3	MD	Talbot County	38.8	-76.1
LA	Caldwell Parish	32.1	-92.1	MD	Washington County	39.6	-77.8
LA	Cameron Parish	29.9	-93.2	MD	Wicomico County	38.4	-75.6
LA	Catahoula Parish	31.7	-91.9	MD	Worcester County	38.3	-75.3
LA	Claiborne Parish	32.8	-93.0	MD	Baltimore city	39.3	-76.6
LA	Concordia Parish	31.6	-91.5	MA	Barnstable County	41.7	-70.3
LA	De Soto Parish	32.1	-93.8	MA	Berkshire County	42.4	-73.2
LA	East Baton Rouge Parish	30.5	-91.1	MA	Bristol County	41.8	-71.1
LA	East Carroll Parish	32.8	-91.2	MA	Dukes County	41.4	-70.6
LA	East Feliciana Parish	30.8	-91.1	MA	Essex County	42.6	-71.0
LA	Evangeline Parish	30.7	-92.4	MA	Franklin County	42.6	-72.6
LA	Franklin Parish	32.1	-91.7	MA	Hampden County	42.1	-72.6
LA	Grant Parish	31.6	-92.6	MA	Hampshire County	42.3	-72.6
LA	Iberia Parish	30.0	-91.8	MA	Middlesex County	42.5	-71.3
LA	Iberville Parish	30.3	-91.3	MA	Nantucket County	41.3	-70.1
LA	Jackson Parish	32.3	-92.6	MA	Norfolk County	42.2	-71.2
LA	Jefferson Parish	29.9	-90.2	MA	Plymouth County	42.0	-70.8
LA	Jefferson Davis Parish	30.2	-92.8	MA	Suffolk County	42.3	-71.1
LA	Lafayette Parish	30.2	-92.0	MA	Worcester County	42.3	-71.8
LA	Lafourche Parish	29.6	-90.6	MI	Alcona County	44.7	-83.6
LA	La Salle Parish	31.7	-92.2	MI	Alger County	46.4	-86.6
LA	Lincoln Parish	32.6	-92.7	MI	Allegan County	42.6	-85.9
LA	Livingston Parish	30.5	-90.8	MI	Alpena County	45.0	-83.5
LA	Madison Parish	32.4	-91.2	MI	Antrim County	45.0	-85.2
LA	Morehouse Parish	32.8	-91.9	MI	Arenac County	44.1	-83.9
LA	Natchitoches Parish	31.7	-93.1	MI	Baraga County	46.7	-88.4
LA	Orleans Parish	30.0	-90.1	MI	Bary County	42.6	-85.3
LA	Ouachita Parish	32.5	-92.1	MI	Bay County	43.6	-83.9
LA	Plaquemines Parish	29.6	-89.8	MI	Benzie County	44.6	-86.0
LA	Pointe Coupee Parish	30.6	-91.5	MI	Berrien County	42.0	-86.4
LA	Rapides Parish	31.3	-92.5	MI	Branch County	41.9	-85.1
LA	Red River Parish	32.1	-93.3	MI	Calhoun County	42.3	-85.1
LA	Richland Parish	32.4	-91.7	MI	Cass County	41.9	-86.0
LA	Sabine Parish	31.6	-93.6	MI	Charlevoix County	45.2	-85.1
LA	St. Bernard Parish	29.9	-89.9	MI	Cheboygan County	45.5	-84.5
LA	St. Charles Parish	29.9	-90.4	MI	Chippewa County	46.3	-84.5
LA	St. Helena Parish	30.8	-90.7	MI	Clare County	44.0	-84.9
LA	St. James Parish	30.0	-90.8	MI	Clinton County	42.9	-84.6
LA	St. John the Baptist Parish	30.1	-90.5	MI	Crawford County	44.7	-84.6
LA	St. Landry Parish	30.5	-92.1	MI	Delta County	45.9	-86.9
LA	St. Martin Parish	30.2	-91.8	MI	Dickinson County	45.9	-88.0
LA	St. Mary Parish	29.7	-91.4	MI	Eaton County	42.6	-84.8

MI	Emmet County	45.5	-84.9	MN	Itasca County	47.4	-93.6
MI	Genesee County	43.0	-83.7	MN	Jackson County	43.7	-95.1
MI	Gladwin County	44.0	-84.4	MN	Kanabec County	45.9	-93.3
MI	Gogebic County	46.4	-89.8	MN	Kandiyohi County	45.2	-95.0
MI	Grand Traverse County	44.7	-85.6	MN	Kittson County	48.8	-96.9
MI	Griatiot County	43.3	-84.6	MN	Koochiching County	48.4	-93.7
MI	Hillsdale County	41.9	-84.6	MN	Lac qui Parle County	45.0	-96.2
MI	Houghton County	47.0	-88.6	MN	Lake County	47.5	-91.5
MI	Huron County	43.8	-83.1	MN	Lake of the Woods County	48.7	-94.8
MI	Ingham County	42.7	-84.5	MN	Le Sueur County	44.4	-93.7
MI	Ionia County	43.0	-85.1	MN	Lincoln County	44.4	-96.3
MI	Iosco County	44.4	-83.6	MN	Lyon County	44.4	-95.8
MI	Iron County	46.2	-88.6	MN	McLeod County	44.8	-94.3
MI	Isabella County	43.6	-84.8	MN	Mahnomen County	47.3	-95.8
MI	Jackson County	42.2	-84.4	MN	Marshall County	48.3	-96.5
MI	Kalamazoo County	42.3	-85.6	MN	Martin County	43.7	-94.5
MI	Kalkaska County	44.7	-85.1	MN	Meeker County	45.1	-94.5
MI	Kent County	43.0	-85.6	MN	Millie Lacs County	45.9	-93.6
MI	Keweenaw County	47.4	-88.2	MN	Morrison County	46.0	-94.3
MI	Lake County	44.0	-85.8	MN	Mower County	43.7	-92.8
MI	Lapeer County	43.1	-83.2	MN	Murray County	44.0	-95.7
MI	Leelanau County	44.9	-85.8	MN	Nicollet County	44.3	-94.1
MI	Lenawee County	41.9	-84.1	MN	Nobles County	43.7	-95.7
MI	Livingston County	42.6	-83.9	MN	Norman County	47.3	-96.5
MI	Luce County	46.5	-85.6	MN	Olmsted County	44.0	-92.4
MI	MacKinnac County	46.0	-85.0	MN	Otter Tail County	46.4	-95.7
MI	Macomb County	42.6	-83.0	MN	Pennington County	48.1	-96.1
MI	Manistee County	44.3	-86.1	MN	Pine County	46.1	-92.8
MI	Marquette County	46.5	-87.6	MN	Pipestone County	44.0	-96.3
MI	Mason County	44.0	-86.3	MN	Polk County	47.8	-96.4
MI	Mecosta County	43.6	-85.4	MN	Pope County	45.6	-95.4
MI	Menominee County	45.5	-87.6	MN	Ramsey County	45.0	-93.1
MI	Midland County	43.6	-84.3	MN	Red Lake County	47.9	-96.1
MI	Missaukee County	44.3	-85.1	MN	Redwood County	44.4	-95.2
MI	Monroe County	41.9	-83.5	MN	Renville County	44.7	-94.9
MI	Montcalm County	43.3	-85.2	MN	Rice County	44.3	-93.3
MI	Montmorency County	45.0	-84.1	MN	Rock County	43.7	-96.2
MI	Muskegon County	43.3	-86.2	MN	Roseau County	48.8	-95.8
MI	Newaygo County	43.5	-85.8	MN	St. Louis County	47.4	-92.4
MI	Oakland County	42.6	-83.3	MN	Scott County	44.7	-93.5
MI	Oceana County	43.6	-86.3	MN	Sherburne County	45.4	-93.8
MI	Ogemaw County	44.3	-84.1	MN	Sibley County	44.6	-94.2
MI	Ontonagon County	46.7	-89.3	MN	Stearns County	45.5	-94.5
MI	Osceola County	44.0	-85.3	MN	Steele County	44.0	-93.2
MI	Oscoda County	44.7	-84.2	MN	Stevens County	45.6	-96.0
MI	Otsego County	45.0	-84.6	MN	Swift County	45.3	-95.7
MI	Ottawa County	42.9	-86.0	MN	Todd County	46.1	-94.9
MI	Presque Isle County	45.4	-83.9	MN	Traverse County	45.8	-96.5
MI	Roscommon County	44.4	-84.7	MN	Wabasha County	44.3	-92.2
MI	Saginaw County	43.4	-84.0	MN	Wadena County	46.5	-95.0
MI	St. Clair County	42.9	-82.6	MN	Waseca County	44.0	-93.6
MI	St. Joseph County	41.9	-85.5	MN	Washington County	45.0	-92.9
MI	Sanilac County	43.4	-82.8	MN	Watonwan County	44.0	-94.6
MI	Schoolcraft County	46.1	-86.2	MN	Wilkin County	46.3	-96.5
MI	Shiawassee County	42.9	-84.1	MN	Winona County	44.0	-91.7
MI	Tuscola County	43.5	-83.4	MN	Wright County	45.2	-93.9
MI	Van Buren County	42.3	-86.0	MN	Yellow Medicine County	44.7	-95.8
MI	Washtenaw County	42.3	-83.8	MS	Adams County	31.5	-91.4
MI	Wayne County	42.3	-83.2	MS	Alcorn County	34.9	-88.5
MI	Wexford County	44.3	-85.6	MS	Amite County	31.2	-90.8
MN	Aitkin County	46.6	-93.5	MS	Attala County	33.1	-89.6
MN	Anoka County	45.2	-93.3	MS	Benton County	34.8	-89.2
MN	Becker County	46.9	-95.7	MS	Belvoir County	33.8	-90.8
MN	Beltrami County	47.7	-94.8	MS	Calhoun County	33.9	-89.3
MN	Benton County	45.7	-94.1	MS	Carroll County	33.5	-89.9
MN	Big Stone County	45.4	-96.4	MS	Chickasaw County	33.9	-88.9
MN	Blue Earth County	44.1	-94.0	MS	Choctaw County	33.3	-89.3
MN	Brown County	44.3	-94.7	MS	Claiborne County	32.0	-90.9
MN	Carlton County	46.6	-92.6	MS	Clarke County	32.1	-88.7
MN	Carver County	44.8	-93.7	MS	Clay County	33.6	-88.7
MN	Cass County	46.9	-94.4	MS	Coahoma County	34.2	-90.6
MN	Chippewa County	45.0	-95.6	MS	Copiah County	31.9	-90.4
MN	Chisago County	45.5	-92.9	MS	Covington County	31.6	-89.5
MN	Clay County	46.9	-96.6	MS	DeSoto County	34.9	-90.0
MN	Clearwater County	47.5	-95.4	MS	Forrest County	31.3	-89.3
MN	Cook County	47.9	-90.5	MS	Franklin County	31.5	-90.9
MN	Cottonwood County	44.0	-95.2	MS	George County	30.9	-88.6
MN	Crow Wing County	46.5	-94.1	MS	Greene County	31.2	-88.6
MN	Dakota County	44.8	-93.1	MS	Grenada County	33.8	-89.8
MN	Dodge County	44.0	-92.8	MS	Hancock County	30.4	-89.5
MN	Douglas County	45.9	-95.4	MS	Harrison County	30.4	-89.1
MN	Faribault County	43.7	-94.0	MS	Hinds County	32.3	-90.3
MN	Fillmore County	43.7	-92.1	MS	Holmes County	33.1	-90.1
MN	Freeborn County	43.7	-93.4	MS	Humphreys County	33.1	-90.5
MN	Goodhue County	44.4	-92.7	MS	Issaquena County	32.8	-91.0
MN	Grant County	45.9	-96.0	MS	Itawamba County	34.3	-88.4
MN	Hennepin County	45.0	-93.4	MS	Jackson County	30.5	-88.6
MN	Houston County	43.7	-91.5	MS	Jasper County	32.0	-89.1
MN	Hubbard County	47.1	-94.9	MS	Jefferson County	31.7	-91.0
MN	Isanti County	45.6	-93.3	MS	Jefferson Davis County	31.6	-89.8

MS	Jones County	31.7	-89.2	MO	Henry County	38.4	-93.8
MS	Kemper County	32.8	-88.7	MO	Hickory County	37.9	-93.3
MS	Lafayette County	34.4	-89.5	MO	Holt County	40.1	-95.2
MS	Lamar County	31.2	-89.5	MO	Howard County	39.1	-92.7
MS	Lauderdale County	32.4	-88.7	MO	Howell County	36.8	-91.9
MS	Lawrence County	31.6	-90.1	MO	Iron County	37.5	-90.7
MS	Leake County	32.7	-89.5	MO	Jackson County	39.0	-94.5
MS	Lee County	34.3	-88.7	MO	Jasper County	37.1	-94.4
MS	Leflore County	33.6	-90.3	MO	Jefferson County	38.3	-90.5
MS	Lincoln County	31.5	-90.4	MO	Johnson County	38.7	-93.8
MS	Lowndes County	33.5	-88.4	MO	Knox County	40.1	-92.1
MS	Madison County	32.6	-90.1	MO	Laclede County	37.7	-92.6
MS	Marion County	31.2	-89.8	MO	Lafayette County	39.1	-93.8
MS	Marshall County	34.8	-89.5	MO	Lawrence County	37.1	-93.8
MS	Monroe County	33.9	-88.5	MO	Lewis County	40.1	-91.7
MS	Montgomery County	33.5	-89.7	MO	Lincoln County	39.0	-90.9
MS	Neshoba County	32.7	-89.1	MO	Linn County	39.8	-93.1
MS	Newton County	32.4	-89.1	MO	Livingston County	39.8	-93.6
MS	Noxubee County	33.1	-88.6	MO	McDonald County	36.6	-94.4
MS	Oktibbeha County	33.4	-88.9	MO	Macon County	39.8	-92.6
MS	Panola County	34.4	-90.0	MO	Madison County	37.5	-90.3
MS	Pearl River County	30.7	-89.6	MO	Maries County	38.1	-91.9
MS	Perry County	31.2	-89.0	MO	Marion County	39.8	-91.5
MS	Pike County	31.2	-90.4	MO	Mercer County	40.4	-93.6
MS	Pontotoc County	34.2	-89.0	MO	Miller County	38.2	-92.5
MS	Prentiss County	34.6	-88.5	MO	Mississippi County	36.8	-89.3
MS	Quitman County	34.3	-90.3	MO	Moniteau County	38.6	-92.6
MS	Rankin County	32.3	-90.0	MO	Monroe County	39.5	-92.0
MS	Scott County	32.4	-89.5	MO	Montgomery County	38.9	-91.5
MS	Sharkey County	32.9	-90.8	MO	Morgan County	38.4	-92.8
MS	Simpson County	31.9	-89.9	MO	New Madrid County	36.6	-89.7
MS	Smith County	32.0	-89.5	MO	Newton County	36.9	-94.4
MS	Stone County	30.8	-89.1	MO	Nodaway County	40.4	-94.9
MS	Sunflower County	33.6	-90.6	MO	Oregon County	36.6	-91.4
MS	Tallahatchie County	33.9	-90.2	MO	Osage County	38.5	-91.9
MS	Tate County	34.6	-90.0	MO	Ozark County	36.6	-92.5
MS	Tippah County	34.8	-88.9	MO	Pemiscot County	36.2	-89.8
MS	Tishomingo County	34.7	-88.2	MO	Perry County	37.7	-89.8
MS	Tunica County	34.7	-90.4	MO	Pettis County	38.7	-93.3
MS	Union County	34.5	-89.0	MO	Phelps County	37.9	-91.8
MS	Walthall County	31.1	-90.1	MO	Pike County	39.4	-91.1
MS	Warren County	32.3	-90.9	MO	Platte County	39.3	-94.7
MS	Washington County	33.4	-91.0	MS	Polk County	37.6	-93.4
MS	Wayne County	31.6	-88.7	MO	Pulaski County	37.8	-92.2
MS	Webster County	33.6	-89.2	MO	Putnam County	40.5	-93.0
MS	Wilkinson County	31.2	-91.3	MO	Ralls County	39.5	-91.5
MS	Winston County	33.1	-89.1	MO	Randolph County	39.4	-92.5
MS	Yalobusha County	34.1	-89.7	MO	Ray County	39.3	-94.0
MS	Yazoo County	32.8	-90.4	MO	Reynolds County	37.4	-91.0
MO	Adair County	40.2	-92.6	MO	Ripley County	36.6	-90.8
MO	Andrew County	40.0	-94.8	MO	St. Charles County	38.8	-90.7
MO	Atchison County	40.4	-95.4	MO	St. Clair County	38.1	-93.8
MO	Audrain County	39.2	-91.8	MO	Ste. Genevieve County	37.9	-90.2
MO	Barry County	36.7	-93.8	MO	St. Francois County	37.8	-90.5
MO	Barton County	37.5	-94.3	MO	St. Louis County	38.7	-90.4
MO	Bates County	38.2	-94.4	MO	Saline County	39.1	-93.2
MO	Benton County	38.3	-93.3	MO	Schuyler County	40.5	-92.5
MO	Bollinger County	37.3	-90.0	MO	Scotland County	40.4	-92.1
MO	Boone County	39.0	-92.3	MO	Scott County	37.0	-89.6
MO	Buchanan County	39.7	-94.8	MO	Shannon County	37.1	-91.4
MO	Butler County	36.7	-90.4	MO	Shelby County	39.8	-92.1
MO	Caldwell County	39.7	-94.0	MO	Stoddard County	36.8	-90.0
MO	Callaway County	38.8	-91.9	MO	Stone County	36.7	-93.5
MO	Camden County	38.1	-92.8	MO	Sullivan County	40.2	-93.1
MO	Cape Girardeau County	37.4	-89.6	MO	Taney County	36.7	-93.2
MO	Carroll County	39.4	-93.5	MO	Texas County	37.3	-92.0
MO	Carter County	36.9	-90.9	MO	Vernon County	37.8	-94.3
MO	Cass County	38.7	-94.4	MO	Warren County	38.8	-91.1
MO	Cedar County	37.7	-93.9	MO	Washington County	38.0	-90.8
MO	Chariton County	39.5	-93.0	MO	Wayne County	37.1	-90.5
MO	Christian County	37.0	-93.2	MO	Webster County	37.3	-92.9
MO	Clark County	40.4	-91.7	MO	Worth County	40.5	-94.4
MO	Clay County	39.3	-94.5	MO	Wright County	37.2	-92.5
MO	Clinton County	39.6	-94.4	MO	St. Louis city	38.6	-90.2
MO	Cole County	38.5	-92.2	MT	Beaverhead County	45.2	-112.9
MO	Cooper County	38.9	-92.8	MT	Big Horn County	45.5	-107.5
MO	Crawford County	38.0	-91.3	MT	Blaine County	48.5	-109.0
MO	Dade County	37.4	-93.8	MT	Broadwater County	46.3	-111.5
MO	Dallas County	37.7	-93.0	MT	Carbon County	45.3	-109.1
MO	Davies County	40.0	-94.0	MT	Carter County	45.6	-104.5
MO	DeKalb County	39.9	-94.4	MT	Cascade County	47.4	-111.3
MO	Dent County	37.6	-91.5	MT	Chouteau County	47.9	-110.4
MO	Douglas County	36.9	-92.5	MT	Custer County	46.3	-105.8
MO	Dunklin County	36.3	-90.1	MT	Daniels County	48.8	-105.4
MO	Franklin County	38.4	-91.0	MT	Dawson County	47.2	-104.8
MO	Gasconade County	38.4	-91.5	MT	Deer Lodge County	46.1	-113.0
MO	Gentry County	40.2	-94.4	MT	Fallon County	46.4	-104.4
MO	Greene County	37.2	-93.3	MT	Fergus County	47.1	-109.4
MO	Grundy County	40.1	-93.6	MT	Flathead County	48.3	-114.3
MO	Harrison County	40.3	-94.0	MT	Gallatin County	45.7	-111.2

MT	Garfield County	47.2	-107.0	NE	Keith County	41.2	-101.7
MT	Glacier County	48.6	-112.8	NE	Keya Paha County	42.9	-99.7
MT	Golden Valley County	46.4	-109.1	NE	Kimball County	41.2	-103.7
MT	Granite County	46.4	-113.4	NE	Knox County	42.6	-97.9
MT	Hill County	48.6	-110.0	NE	Lancaster County	40.8	-96.7
MT	Jefferson County	46.1	-112.1	NE	Lincoln County	41.1	-100.8
MT	Judith Basin County	47.0	-110.2	NE	Logan County	41.5	-100.5
MT	Lake County	47.7	-114.1	NE	Loup County	41.9	-99.4
MT	Lewis and Clark County	46.8	-112.2	NE	McPherson County	41.6	-101.0
MT	Liberty County	48.6	-111.0	NE	Madison County	42.0	-97.5
MT	Lincoln County	48.6	-115.4	NE	Merrick County	41.2	-98.0
MT	McCone County	47.6	-105.7	NE	Morrill County	41.7	-103.1
MT	Madison County	45.4	-111.9	NE	Nance County	41.4	-97.9
MT	Meagher County	46.6	-110.9	NE	Nemaha County	40.4	-95.8
MT	Mineral County	47.1	-115.0	NE	Nuckolls County	40.2	-98.0
MT	Missoula County	46.9	-114.0	NE	Otoe County	40.7	-96.1
MT	Musselshell County	46.6	-108.4	NE	Pawnee County	40.1	-96.2
MT	Park County	45.7	-110.5	NE	Perkins County	40.8	-101.6
MT	Petroleum County	47.0	-108.3	NE	Pheps County	40.5	-99.4
MT	Phillips County	48.4	-107.8	NE	Pierce County	42.3	-97.6
MT	Pondera County	48.2	-112.2	NE	Platte County	41.5	-97.5
MT	Powder River County	45.4	-105.6	NE	Polk County	41.2	-97.6
MT	Powell County	46.6	-112.8	NE	Red Willow County	40.2	-100.5
MT	Prairie County	46.9	-105.4	NE	Richardson County	40.1	-95.7
MT	Ravalli County	46.2	-114.1	NE	Rock County	42.5	-99.5
MT	Richland County	47.8	-104.5	NE	Saline County	40.5	-97.1
MT	Roosevelt County	48.2	-105.0	NE	Sarpy County	41.1	-96.0
MT	Rosebud County	46.0	-106.7	NE	Saunders County	41.2	-96.6
MT	Sanders County	47.6	-115.1	NE	Scotts Bluff County	41.9	-103.7
MT	Sheridan County	48.7	-104.5	NE	Seward County	40.9	-97.1
MT	Silver Bow County	46.0	-112.6	NE	Sheridan County	42.6	-102.4
MT	Stillwater County	45.6	-109.4	NE	Sherman County	41.2	-99.0
MT	Sweet Grass County	45.9	-109.9	NE	Sioux County	42.4	-103.8
MT	Teton County	47.8	-112.2	NE	Stanton County	41.9	-97.2
MT	Toole County	48.6	-111.8	NE	Thayer County	40.2	-97.6
MT	Treasure County	46.3	-107.3	NE	Thomas County	42.0	-100.6
MT	Valley County	48.3	-106.6	NE	Thurston County	42.2	-96.6
MT	Wheatland County	46.4	-109.9	NE	Valley County	41.5	-99.0
MT	Wibaux County	47.0	-104.2	NE	Washington County	41.5	-96.2
MT	Yellowstone County	45.8	-108.5	NE	Wayne County	42.2	-97.1
NE	Adams County	40.6	-98.5	NE	Webster County	40.2	-98.5
NE	Antelope County	42.2	-98.1	NE	Wheeler County	41.9	-98.5
NE	Arthur County	41.6	-101.7	NE	York County	40.9	-97.6
NE	Banner County	41.5	-103.7	NV	Churchill County	39.5	-118.7
NE	Blaine County	41.9	-100.0	NV	Clark County	36.1	-115.1
NE	Boone County	41.7	-98.0	NV	Douglas County	39.0	-119.7
NE	Box Butte County	42.2	-102.9	NV	Elko County	41.0	-115.4
NE	Boyd County	42.9	-98.7	NV	Esmeralda County	37.8	-117.6
NE	Brown County	42.5	-99.9	NV	Eureka County	40.0	-116.3
NE	Buffalo County	40.8	-99.1	NV	Humboldt County	41.3	-117.8
NE	Burt County	41.9	-96.3	NV	Lander County	40.0	-117.0
NE	Butler County	41.2	-97.1	NV	Lincoln County	37.8	-114.7
NE	Cass County	40.9	-96.1	NV	Lyon County	39.2	-119.3
NE	Cedar County	42.6	-97.2	NV	Mineral County	38.5	-118.5
NE	Chase County	40.5	-101.7	NV	Nye County	37.9	-116.6
NE	Cherry County	42.7	-101.1	NV	Pershing County	40.4	-118.3
NE	Cheyenne County	41.2	-103.0	NV	Storey County	39.4	-119.6
NE	Clay County	40.5	-98.0	NV	Washoe County	39.7	-119.8
NE	Colfax County	41.6	-97.1	NV	White Pine County	39.3	-114.9
NE	Cuming County	41.9	-96.8	NV	Carson City	39.2	-119.8
NE	Custer County	41.4	-99.6	NH	Belknap County	43.5	-71.4
NE	Dakota County	42.4	-96.5	NH	Carroll County	43.8	-71.2
NE	Dawes County	42.7	-103.2	NH	Cheshire County	42.9	-72.2
NE	Dawson County	40.8	-99.9	NH	Coos County	44.6	-71.3
NE	Deuel County	41.1	-102.3	NH	Grafton County	43.9	-71.9
NE	Dixon County	42.5	-96.8	NH	Hillsborough County	42.9	-71.6
NE	Dodge County	41.5	-96.6	NH	Merrimack County	43.3	-71.6
NE	Douglas County	41.3	-96.1	NH	Rockingham County	43.0	-71.1
NE	Dundy County	40.1	-101.6	NH	Strafford County	43.3	-71.0
NE	Fillmore County	40.5	-97.6	NH	Sullivan County	43.3	-72.2
NE	Franklin County	40.2	-98.9	NJ	Atlantic County	39.4	-74.6
NE	Frontier County	40.5	-100.4	NJ	Bergen County	40.9	-74.1
NE	Furnas County	40.2	-99.9	NJ	Burlington County	40.0	-74.8
NE	Gage County	40.2	-96.7	NJ	Camden County	39.9	-75.0
NE	Garden County	41.5	-102.3	NJ	Cape May County	39.1	-74.8
NE	Garfield County	41.8	-99.0	NJ	Cumberland County	39.4	-75.1
NE	Gosper County	40.6	-99.8	NJ	Essex County	40.8	-74.2
NE	Grant County	41.9	-101.7	NJ	Gloucester County	39.8	-75.1
NE	Greeley County	41.6	-98.5	NJ	Hudson County	40.7	-74.1
NE	Hall County	40.9	-98.4	NJ	Hunterdon County	40.6	-74.9
NE	Hamilton County	40.9	-98.0	NJ	Mercer County	40.3	-74.7
NE	Harlan County	40.2	-99.4	NJ	Middlesex County	40.5	-74.4
NE	Hayes County	40.5	-101.1	NJ	Monmouth County	40.3	-74.1
NE	Hitchcock County	40.2	-101.0	NJ	Morris County	40.9	-74.5
NE	Holt County	42.5	-98.7	NJ	Ocean County	39.9	-74.2
NE	Hooker County	42.0	-101.1	NJ	Passaic County	40.9	-74.2
NE	Howard County	41.2	-98.5	NJ	Salem County	39.6	-75.4
NE	Jefferson County	40.2	-97.1	NJ	Somerset County	40.6	-74.6
NE	Johnson County	40.4	-96.3	NJ	Sussex County	41.1	-74.7
NE	Kearney County	40.5	-99.0	NJ	Union County	40.7	-74.3

NJ	Warren County	40.8	-75.0	NY	Warren County	43.5	-73.8
NM	Bernalillo County	35.1	-106.6	NY	Washington County	43.3	-73.4
NM	Catron County	34.0	-108.4	NY	Wayne County	43.1	-77.1
NM	Chaves County	33.4	-104.4	NY	Westchester County	41.1	-73.8
NM	Cibola County	35.0	-108.0	NY	Wyoming County	42.7	-78.2
NM	Cofax County	36.6	-104.7	NY	Yates County	42.6	-77.1
NM	Curry County	34.5	-103.3	NC	Alamance County	36.1	-79.4
NM	De Baca County	34.4	-104.2	NC	Alexander County	35.9	-81.2
NM	Dona Ana County	32.3	-106.8	NC	Alleghany County	36.5	-81.1
NM	Eddy County	32.5	-104.3	NC	Anson County	35.0	-80.1
NM	Grant County	32.7	-108.2	NC	Ashe County	36.4	-81.5
NM	Guadalupe County	34.9	-104.8	NC	Avery County	36.1	-81.9
NM	Harding County	35.9	-103.9	NC	Beaufort County	35.5	-76.9
NM	Hidalgo County	32.0	-108.7	NC	Bertie County	36.1	-77.0
NM	Lea County	32.7	-103.3	NC	Bladen County	34.6	-78.6
NM	Lincoln County	33.6	-105.5	NC	Brunswick County	34.0	-78.2
NM	Los Alamos County	35.9	-106.3	NC	Buncombe County	35.6	-82.5
NM	Luna County	32.2	-107.7	NC	Burke County	35.7	-81.6
NM	McKinley County	35.6	-108.4	NC	Cabarrus County	35.4	-80.6
NM	Mora County	36.0	-104.9	NC	Caldwell County	35.9	-81.5
NM	Otero County	32.8	-105.8	NC	Camden County	36.4	-76.2
NM	Quay County	35.1	-103.6	NC	Carteret County	34.7	-76.8
NM	Rio Arriba County	36.4	-106.7	NC	Caswell County	36.4	-79.3
NM	Roosevelt County	34.1	-103.4	NC	Catawba County	35.7	-81.2
NM	Sandoval County	35.5	-106.8	NC	Chatham County	35.7	-79.3
NM	San Juan County	36.6	-108.3	NC	Cherokee County	35.1	-84.0
NM	San Miguel County	35.5	-105.1	NC	Chowan County	36.1	-76.6
NM	Santa Fe County	35.6	-106.0	NC	Clay County	35.0	-83.8
NM	Sierra County	33.1	-107.3	NC	Cleveland County	35.3	-81.5
NM	Socorro County	34.2	-107.0	NC	Columbus County	34.3	-78.7
NM	Taos County	36.5	-105.6	NC	Craven County	35.1	-77.1
NM	Torrance County	34.8	-106.0	NC	Cumberland County	35.1	-78.9
NM	Union County	36.5	-103.4	NC	Currituck County	36.4	-76.0
NM	Valencia County	34.7	-106.8	NC	Dare County	35.8	-75.7
NY	Albany County	42.7	-73.8	NC	Davidson County	35.8	-80.2
NY	Allegany County	42.2	-78.0	NC	Davie County	35.9	-80.5
NY	Bronx County	40.8	-73.9	NC	Duplin County	34.9	-78.0
NY	Broome County	42.1	-75.9	NC	Durham County	36.0	-78.9
NY	Cattaraugus County	42.2	-78.6	NC	Edgecombe County	35.9	-77.6
NY	Cayuga County	42.9	-76.6	NC	Forsyth County	36.1	-80.2
NY	Chautauqua County	42.2	-79.3	NC	Franklin County	36.1	-78.3
NY	Chemung County	42.1	-76.8	NC	Gaston County	35.3	-81.2
NY	Chenango County	42.5	-75.6	NC	Gates County	36.4	-76.7
NY	Clinton County	44.7	-73.6	NC	Graham County	35.4	-83.8
NY	Columbia County	42.3	-73.7	NC	Granville County	36.3	-78.7
NY	Cortland County	42.6	-76.1	NC	Greene County	35.5	-77.7
NY	Delaware County	42.2	-75.0	NC	Guilford County	36.1	-79.8
NY	Dutchess County	41.7	-73.8	NC	Halifax County	36.3	-77.7
NY	Erie County	42.9	-78.8	NC	Harnett County	35.4	-78.8
NY	Essex County	44.2	-73.7	NC	Haywood County	35.5	-83.0
NY	Franklin County	44.6	-74.3	NC	Henderson County	35.3	-82.5
NY	Fulton County	43.1	-74.4	NC	Hertford County	36.3	-77.0
NY	Genesee County	43.0	-78.2	NC	Hoke County	35.0	-79.2
NY	Greene County	42.3	-74.0	NC	Hyde County	35.5	-76.2
NY	Hamilton County	43.6	-74.5	NC	Iredell County	35.7	-80.9
NY	Herkimer County	43.2	-75.0	NC	Jackson County	35.3	-83.2
NY	Jefferson County	44.0	-75.9	NC	Johnston County	35.5	-78.4
NY	Kings County	40.6	-74.0	NC	Jones County	35.0	-77.4
NY	Lewis County	43.8	-75.5	NC	Lee County	35.5	-79.2
NY	Livingston County	42.7	-77.8	NC	Lenoir County	35.3	-77.6
NY	Madison County	42.9	-75.7	NC	Lincoln County	35.5	-81.2
NY	Monroe County	43.2	-77.6	NC	McDowell County	35.7	-82.0
NY	Montgomery County	42.9	-74.4	NC	Macon County	35.2	-83.4
NY	Nassau County	40.7	-73.6	NC	Madison County	35.8	-82.7
NY	New York County	40.8	-74.0	NC	Martin County	35.8	-77.1
NY	Niagara County	43.1	-78.8	NC	Mecklenburg County	35.2	-80.8
NY	Oneida County	43.2	-75.4	NC	Mitchell County	36.0	-82.1
NY	Onondaga County	43.0	-76.2	NC	Montgomery County	35.3	-79.9
NY	Ontario County	42.9	-77.3	NC	Moore County	35.2	-79.5
NY	Orange County	41.4	-74.3	NC	Nash County	36.0	-77.9
NY	Orleans County	43.3	-78.2	NC	New Hanover County	34.2	-77.9
NY	Oswego County	43.4	-76.2	NC	Northampton County	36.4	-77.5
NY	Otsego County	42.6	-75.0	NC	Onslow County	34.7	-77.4
NY	Putnam County	41.4	-73.7	NC	Orange County	36.0	-79.1
NY	Queens County	40.7	-73.8	NC	Pamlico County	35.1	-76.8
NY	Rensselaer County	42.7	-73.6	NC	Pasquotank County	36.3	-76.2
NY	Richmond County	40.6	-74.1	NC	Pender County	34.5	-77.9
NY	Rockland County	41.1	-74.0	NC	Perquimans County	36.2	-76.5
NY	St. Lawrence County	44.6	-75.2	NC	Person County	36.4	-79.0
NY	Saratoga County	43.0	-73.8	NC	Pitt County	35.6	-77.4
NY	Schenectady County	42.8	-74.0	NC	Polk County	35.3	-82.2
NY	Schoharie County	42.6	-74.4	NC	Randolph County	35.7	-79.8
NY	Schuyler County	42.4	-76.9	NC	Richmond County	35.0	-79.7
NY	Seneca County	42.8	-76.8	NC	Robeson County	34.7	-79.1
NY	Steuben County	42.3	-77.4	NC	Rockingham County	36.4	-79.8
NY	Suffolk County	40.8	-73.0	NC	Rowan County	35.6	-80.5
NY	Sullivan County	41.7	-74.7	NC	Rutherford County	35.4	-81.9
NY	Tioga County	42.1	-76.3	NC	Sampson County	35.0	-78.4
NY	Tompkins County	42.5	-76.5	NC	Scotland County	34.8	-79.5
NY	Ulster County	41.9	-74.1	NC	Stanly County	35.3	-80.2

NC	Stokes County	36.4	-80.3	OH	Erie County	41.4	-82.6
NC	Surry County	36.4	-80.7	OH	Fairfield County	39.8	-82.6
NC	Swain County	35.4	-83.4	OH	Fayette County	39.6	-83.5
NC	Tennessee County	35.2	-82.8	OH	Franklin County	40.0	-83.0
NC	Tyrrell County	35.8	-76.2	OH	Fulton County	41.6	-84.1
NC	Union County	35.0	-80.6	OH	Gallia County	38.8	-82.3
NC	Vance County	36.3	-78.4	OH	Geauga County	41.5	-81.2
NC	Wake County	35.8	-78.7	OH	Greene County	39.7	-83.9
NC	Warren County	36.4	-78.1	OH	Guernsey County	40.0	-81.5
NC	Washington County	35.9	-76.6	OH	Hamilton County	39.2	-84.5
NC	Watauga County	36.2	-81.7	OH	Hancock County	41.0	-83.7
NC	Wayne County	35.4	-78.0	OH	Hardin County	40.7	-83.6
NC	Wilkes County	36.2	-81.2	OH	Harrison County	40.3	-81.1
NC	Wilson County	35.7	-77.9	OH	Henry County	41.3	-84.1
NC	Yadkin County	36.2	-80.7	OH	Highland County	39.2	-83.6
NC	Yancey County	35.9	-82.3	OH	Hocking County	39.5	-82.4
ND	Adams County	46.1	-102.6	OH	Holmes County	40.6	-81.9
ND	Barnes County	46.9	-98.1	OH	Huron County	41.2	-82.6
ND	Benson County	48.1	-99.4	OH	Jackson County	39.0	-82.6
ND	Billings County	47.0	-103.4	OH	Jefferson County	40.4	-80.7
ND	Bottineau County	48.8	-100.8	OH	Knox County	40.4	-82.4
ND	Bowman County	46.1	-103.4	OH	Lake County	41.7	-81.3
ND	Burke County	48.8	-102.5	OH	Lawrence County	38.5	-82.5
ND	Burleigh County	46.9	-100.6	OH	Licking County	40.1	-82.5
ND	Cass County	46.9	-97.1	OH	Logan County	40.4	-83.8
ND	Cavalier County	48.8	-98.5	OH	Lorain County	41.4	-82.1
ND	Dickey County	46.1	-98.5	OH	Lucas County	41.6	-83.6
ND	Divide County	48.8	-103.5	OH	Madison County	39.9	-83.4
ND	Dunn County	47.3	-102.6	OH	Mahoning County	41.1	-80.7
ND	Eddy County	47.7	-99.0	OH	Marion County	40.6	-83.1
ND	Emmons County	46.3	-100.2	OH	Medina County	41.1	-81.9
ND	Foster County	47.5	-98.9	OH	Meigs County	39.1	-82.0
ND	Golden Valley County	46.9	-103.9	OH	Mercer County	40.5	-84.6
ND	Grand Forks County	47.9	-97.3	OH	Miami County	40.1	-84.2
ND	Grant County	46.4	-101.7	OH	Monroe County	39.7	-81.1
ND	Griggs County	47.5	-98.2	OH	Montgomery County	39.8	-84.2
ND	Hettinger County	46.4	-102.5	OH	Morgan County	39.6	-81.8
ND	Kidder County	47.0	-99.8	OH	Morrow County	40.5	-82.8
ND	LaMoure County	46.4	-98.5	OH	Muskingum County	40.0	-82.0
ND	Logan County	46.5	-99.5	OH	Noble County	39.8	-81.5
ND	McHenry County	48.2	-100.7	OH	Ottawa County	41.5	-83.0
ND	McIntosh County	46.1	-99.5	OH	Paulding County	41.1	-84.6
ND	McKenzie County	47.8	-103.4	OH	Perry County	39.7	-82.2
ND	McLean County	47.6	-101.2	OH	Pickaway County	39.6	-83.0
ND	Mercer County	47.3	-101.7	OH	Pike County	39.1	-83.0
ND	Morton County	46.8	-101.3	OH	Portage County	41.2	-81.3
ND	Mountrail County	48.2	-102.3	OH	Preble County	39.7	-84.6
ND	Nelson County	47.9	-98.2	OH	Putnam County	41.0	-84.1
ND	Oliver County	47.1	-101.4	OH	Richland County	40.8	-82.5
ND	Pembina County	48.8	-97.5	OH	Ross County	39.3	-83.0
ND	Pierce County	48.2	-100.0	OH	Sandusky County	41.4	-83.1
ND	Ramsey County	48.2	-98.8	OH	Scioto County	38.8	-82.9
ND	Ransom County	46.5	-97.7	OH	Seneca County	41.1	-83.2
ND	Renville County	48.7	-101.6	OH	Shelby County	40.3	-84.2
ND	Richland County	46.2	-96.9	OH	Stark County	40.8	-81.4
ND	Rolette County	48.8	-99.8	OH	Summit County	41.1	-81.5
ND	Sargent County	46.1	-97.6	OH	Trumbull County	41.2	-80.8
ND	Sheridan County	47.6	-100.3	OH	Tuscarawas County	40.5	-81.5
ND	Sioux County	46.1	-100.9	OH	Union County	40.3	-83.4
ND	Slope County	46.4	-103.4	OH	Van Wert County	40.9	-84.6
ND	Stark County	46.9	-102.7	OH	Vinton County	39.2	-82.5
ND	Steele County	47.5	-97.7	OH	Warren County	39.4	-84.2
ND	Stutsman County	47.0	-98.9	OH	Washington County	39.4	-81.5
ND	Towner County	48.7	-99.2	OH	Wayne County	40.8	-81.9
ND	Trail County	47.5	-97.2	OH	Williams County	41.5	-84.6
ND	Walsh County	48.4	-97.7	OH	Wood County	41.4	-83.6
ND	Ward County	48.3	-101.5	OH	Wyandot County	40.9	-83.3
ND	Wells County	47.6	-99.7	OK	Adair County	35.9	-94.6
ND	Williams County	48.3	-103.5	OK	Alfalfa County	36.7	-98.3
OH	Adams County	38.8	-83.5	OK	Atoka County	34.4	-96.1
OH	Allen County	40.8	-84.1	OK	Beaver County	36.7	-100.5
OH	Ashland County	40.8	-82.3	OK	Beckham County	35.3	-99.6
OH	Ashtabula County	41.8	-80.8	OK	Blaine County	35.9	-98.4
OH	Athens County	39.4	-82.1	OK	Bryan County	34.0	-96.3
OH	Auglaize County	40.5	-84.3	OK	Caddo County	35.1	-98.3
OH	Belmont County	40.0	-80.9	OK	Canadian County	35.5	-97.9
OH	Brown County	38.9	-83.9	OK	Carter County	34.2	-97.2
OH	Butler County	39.4	-84.5	OK	Cherokee County	35.9	-95.0
OH	Carroll County	40.6	-81.1	OK	Choctaw County	34.0	-95.5
OH	Champaign County	40.1	-83.8	OK	Cimarron County	36.8	-102.4
OH	Clark County	39.9	-83.8	OK	Cleveland County	35.2	-97.4
OH	Clermont County	39.1	-84.2	OK	Coal County	34.6	-96.3
OH	Clinton County	39.4	-83.8	OK	Comanche County	34.6	-98.4
OH	Columbiana County	40.8	-80.7	OK	Cotton County	34.3	-98.4
OH	Coshocton County	40.3	-81.9	OK	Craig County	36.7	-95.2
OH	Crawford County	40.8	-82.9	OK	Creek County	36.0	-96.3
OH	Cuyahoga County	41.5	-81.7	OK	Custer County	35.6	-98.9
OH	Darke County	40.1	-84.6	OK	Delaware County	36.5	-94.8
OH	Defiance County	41.3	-84.5	OK	Dewey County	36.0	-99.0
OH	Delaware County	40.3	-83.0	OK	Ellis County	36.3	-99.8

OK	Garfield County	36.4	-97.8	PA	Adams County	39.9	-77.2
OK	Garvin County	34.7	-97.3	PA	Allegheeny County	40.4	-80.0
OK	Grady County	35.1	-97.9	PA	Armstrong County	40.8	-79.5
OK	Grant County	36.8	-97.8	PA	Beaver County	40.7	-80.3
OK	Greer County	34.9	-99.5	PA	Bedford County	40.0	-78.5
OK	Harmon County	34.7	-99.9	PA	Berks County	40.4	-75.9
OK	Harper County	36.8	-99.7	PA	Blair County	40.5	-78.4
OK	Haskell County	35.2	-95.1	PA	Bradford County	41.8	-76.5
OK	Hughes County	35.1	-96.3	PA	Bucks County	40.3	-75.0
OK	Jackson County	34.6	-99.4	PA	Butler County	40.9	-79.9
OK	Jefferson County	34.1	-97.9	PA	Cambria County	40.4	-78.8
OK	Johnston County	34.3	-96.7	PA	Cameron County	41.4	-78.2
OK	Kay County	36.8	-97.2	PA	Carbon County	40.9	-75.7
OK	Kingsfisher County	35.9	-97.9	PA	Centre County	40.9	-77.8
OK	Kiowa County	34.9	-99.0	PA	Chester County	40.0	-75.7
OK	Latimer County	34.9	-95.3	PA	Clarion County	41.2	-79.4
OK	Le Flore County	35.0	-94.7	PA	Clearfield County	41.0	-78.5
OK	Lincoln County	35.7	-96.9	PA	Clinton County	41.2	-77.5
OK	Logan County	35.9	-97.4	PA	Columbia County	41.0	-76.4
OK	Love County	33.9	-97.2	PA	Crawford County	41.7	-80.1
OK	McClain County	35.0	-97.5	PA	Cumberland County	40.2	-77.1
OK	McCurtain County	34.1	-94.8	PA	Dauphin County	40.3	-76.8
OK	McIntosh County	35.4	-95.6	PA	Delaware County	39.9	-75.4
OK	Major County	36.3	-98.4	PA	Elk County	41.4	-78.7
OK	Marshall County	34.0	-96.7	PA	Erie County	42.1	-80.1
OK	Mayes County	36.3	-95.2	PA	Fayette County	40.0	-79.7
OK	Murray County	34.5	-97.0	PA	Forest County	41.5	-79.3
OK	Muskogee County	35.7	-95.4	PA	Franklin County	39.9	-77.7
OK	Noble County	36.4	-97.2	PA	Fulton County	39.9	-78.1
OK	Nowata County	36.8	-95.6	PA	Greene County	39.9	-80.2
OK	Okfuskee County	35.4	-96.3	PA	Huntingdon County	40.4	-78.0
OK	Oklahoma County	35.5	-97.5	PA	Indiana County	40.6	-79.1
OK	Oklmulgee County	35.6	-96.0	PA	Jefferson County	41.1	-79.0
OK	Osage County	36.6	-96.4	PA	Juniata County	40.6	-77.3
OK	Ottawa County	36.9	-94.8	PA	Lackawanna County	41.4	-75.6
OK	Pawnee County	36.3	-96.6	PA	Lancaster County	40.1	-76.3
OK	Payne County	36.1	-97.0	PA	Lawrence County	41.0	-80.3
OK	Pittsburg County	34.9	-95.7	PA	Lebanon County	40.3	-76.4
OK	Pontotoc County	34.8	-96.7	PA	Lehigh County	40.6	-75.5
OK	Pottawatomie County	35.3	-96.9	PA	Luzerne County	41.2	-75.9
OK	Pushmataha County	34.4	-95.4	PA	Lycoming County	41.3	-77.0
OK	Roger Mills County	35.7	-99.7	PA	McKean County	41.8	-78.6
OK	Rogers County	36.3	-95.6	PA	Mercer County	41.3	-80.3
OK	Seminole County	35.2	-96.6	PA	Mifflin County	40.6	-77.6
OK	Sequoyah County	35.5	-94.8	PA	Monroe County	41.1	-75.3
OK	Stephens County	34.5	-97.9	PA	Montgomery County	40.2	-75.3
OK	Texas County	36.7	-101.5	PA	Montour County	41.0	-76.6
OK	Tillman County	34.4	-98.9	PA	Northampton County	40.7	-75.3
OK	Tulsa County	36.1	-95.9	PA	Northumberland County	40.9	-76.7
OK	Wagoner County	36.0	-95.5	PA	Perry County	40.4	-77.2
OK	Washington County	36.7	-95.9	PA	Philadelphia County	40.0	-75.1
OK	Washita County	35.3	-99.0	PA	Pike County	41.3	-75.0
OK	Woods County	36.7	-98.8	PA	Potter County	41.8	-77.9
OK	Woodward County	36.4	-99.3	PA	Schuykill County	40.7	-76.2
OR	Baker County	44.7	-117.8	PA	Snyder County	40.8	-77.0
OR	Benton County	44.5	-123.3	PA	Somerset County	40.0	-79.0
OR	Clackamas County	45.3	-122.5	PA	Sullivan County	41.5	-76.5
OR	Clatsop County	46.0	-123.8	PA	Susquehanna County	41.8	-75.8
OR	Columbia County	45.9	-123.0	PA	Tioga County	41.8	-77.2
OR	Coos County	43.2	-124.1	PA	Union County	41.0	-77.0
OR	Crook County	44.2	-120.5	PA	Venango County	41.4	-79.8
OR	Curry County	42.4	-124.3	PA	Warren County	41.8	-79.3
OR	Deschutes County	44.0	-121.3	PA	Washington County	40.2	-80.1
OR	Douglas County	43.3	-123.3	PA	Wayne County	41.6	-75.3
OR	Gilliam County	45.3	-120.2	PA	Westmoreland County	40.3	-79.6
OR	Grant County	44.5	-118.9	PA	Wyoming County	41.5	-76.0
OR	Harney County	43.5	-119.0	PA	York County	39.9	-76.7
OR	Hood River County	45.6	-121.6	RI	Bristol County	41.7	-71.3
OR	Jackson County	42.4	-122.8	RI	Kent County	41.7	-71.5
OR	Jefferson County	44.6	-121.2	RI	Newport County	41.5	-71.3
OR	Josephine County	42.4	-123.4	RI	Providence County	41.9	-71.5
OR	Klamath County	42.7	-121.7	RI	Washington County	41.5	-71.6
OR	Lake County	42.7	-120.6	SC	Abbeville County	34.2	-82.5
OR	Lane County	44.0	-123.1	SC	Aiken County	33.6	-81.7
OR	Lincoln County	44.7	-123.9	SC	Allendale County	33.0	-81.3
OR	Linn County	44.5	-122.7	SC	Anderson County	34.5	-82.6
OR	Malheur County	43.6	-117.4	SC	Bamberg County	33.2	-81.1
OR	Marion County	44.9	-122.8	SC	Barnwell County	33.3	-81.4
OR	Morrow County	45.4	-119.6	SC	Beaufort County	32.4	-80.7
OR	Multnomah County	45.5	-122.6	SC	Berkeley County	33.1	-80.0
OR	Polk County	44.9	-123.4	SC	Calhoun County	33.7	-80.8
OR	Sherman County	45.5	-120.7	SC	Charleston County	32.8	-80.0
OR	Tillamook County	45.5	-123.8	SC	Cherokee County	35.1	-81.6
OR	Umatilla County	45.6	-118.8	SC	Chester County	34.7	-81.1
OR	Union County	45.3	-118.0	SC	Chesterfield County	34.7	-80.2
OR	Wallowa County	45.6	-117.3	SC	Clarendon County	33.7	-80.2
OR	Wasco County	45.3	-121.3	SC	Colleton County	32.9	-80.7
OR	Washington County	45.5	-122.9	SC	Darlington County	34.3	-80.0
OR	Wheeler County	44.7	-120.0	SC	Dillon County	34.4	-79.4
OR	Yamhill County	45.2	-123.2	SC	Dorchester County	33.0	-80.3

SC	Edgefield County	33.8	-81.9	SD	Union County	42.8	-96.7
SC	Fairfield County	34.4	-81.1	SD	Walworth County	45.5	-100.1
SC	Florence County	34.1	-79.7	SD	Yankton County	43.0	-97.4
SC	Georgetown County	33.4	-79.3	SD	Ziebach County	45.0	-101.7
SC	Greenville County	34.9	-82.4	TN	Anderson County	36.1	-84.2
SC	Greenwood County	34.2	-82.1	TN	Bedford County	35.5	-86.4
SC	Hampton County	32.8	-81.1	TN	Benton County	36.1	-88.1
SC	Horry County	33.8	-78.9	TN	Bledsoe County	35.6	-85.2
SC	Jasper County	32.4	-81.0	TN	Blount County	35.8	-84.0
SC	Kershaw County	34.3	-80.6	TN	Bradley County	35.2	-84.9
SC	Lancaster County	34.7	-80.7	TN	Campbell County	36.4	-84.1
SC	Laurens County	34.5	-82.0	TN	Cannon County	35.8	-86.1
SC	Lee County	34.2	-80.3	TN	Carroll County	36.0	-88.4
SC	Lexington County	33.9	-81.2	TN	Carter County	36.3	-82.2
SC	McCormick County	33.9	-82.3	TN	Cheatham County	36.3	-87.1
SC	Marion County	34.2	-79.3	TN	Chester County	35.4	-88.6
SC	Marlboro County	34.6	-79.7	TN	Claiborne County	36.5	-83.7
SC	Newberry County	34.3	-81.6	TN	Clay County	36.6	-85.5
SC	Oconee County	34.7	-83.0	TN	Cocke County	35.9	-83.1
SC	Orangeburg County	33.5	-80.8	TN	Coffee County	35.5	-86.1
SC	Pickens County	34.8	-82.7	TN	Crockett County	35.8	-89.1
SC	Richland County	34.0	-81.0	TN	Cumberland County	35.9	-85.0
SC	Saluda County	34.0	-81.7	TN	Davidson County	36.2	-86.8
SC	Spartanburg County	35.0	-82.0	TN	Decatur County	35.6	-88.1
SC	Sumter County	33.9	-80.4	TN	DeKalb County	36.0	-85.9
SC	Union County	34.7	-81.6	TN	Dickson County	36.1	-87.4
SC	Williamsburg County	33.6	-79.7	TN	Dyer County	36.1	-89.4
SC	York County	35.0	-81.1	TN	Fayette County	35.2	-89.4
SD	Aurora County	43.7	-98.5	TN	Fentress County	36.4	-84.9
SD	Beadle County	44.4	-98.3	TN	Franklin County	35.2	-86.1
SD	Bennett County	43.2	-101.7	TN	Gibson County	36.0	-88.9
SD	Bon Homme County	43.0	-97.9	TN	Giles County	35.2	-87.0
SD	Brookings County	44.3	-96.8	TN	Grainger County	36.3	-83.5
SD	Brown County	45.5	-98.4	TN	Greene County	36.2	-82.8
SD	Brule County	43.8	-99.1	TN	Grundy County	35.4	-85.7
SD	Buffalo County	44.0	-99.3	TN	Hamblen County	36.2	-83.3
SD	Butte County	44.8	-103.6	TN	Hamilton County	35.1	-85.2
SD	Campbell County	45.8	-100.0	TN	Hancock County	36.5	-83.2
SD	Charles Mix County	43.2	-98.5	TN	Hardeman County	35.2	-89.0
SD	Clark County	44.9	-97.7	TN	Hardin County	35.2	-88.2
SD	Clay County	42.9	-97.0	TN	Hawkins County	36.4	-82.9
SD	Codington County	44.9	-97.2	TN	Haywood County	35.6	-89.3
SD	Corson County	45.8	-101.1	TN	Henderson County	35.6	-88.4
SD	Custer County	43.7	-103.5	TN	Henry County	36.3	-88.3
SD	Davison County	43.7	-98.1	TN	Hickman County	35.8	-87.4
SD	Day County	45.4	-97.6	TN	Houston County	36.3	-87.7
SD	Deuel County	44.7	-96.7	TN	Humphreys County	36.1	-87.8
SD	Dewey County	45.2	-101.0	TN	Jackson County	36.4	-85.7
SD	Douglas County	43.4	-98.4	TN	Jefferson County	36.1	-83.4
SD	Edmunds County	45.4	-99.2	TN	Johnson County	36.4	-81.8
SD	Fall River County	43.3	-103.6	TN	Knox County	36.0	-84.0
SD	Faulk County	45.1	-99.1	TN	Lake County	36.3	-89.5
SD	Grant County	45.2	-96.7	TN	Lauderdale County	35.8	-89.5
SD	Gregory County	43.2	-99.2	TN	Lawrence County	35.2	-87.4
SD	Haakon County	44.2	-101.5	TN	Lewis County	35.5	-87.5
SD	Hamlin County	44.7	-97.2	TN	Lincoln County	35.1	-86.6
SD	Hand County	44.5	-99.0	TN	Loudon County	35.7	-84.3
SD	Hanson County	43.7	-97.8	TN	McMinn County	35.4	-84.6
SD	Harding County	45.6	-103.5	TN	McNairy County	35.2	-88.6
SD	Hughes County	44.4	-100.2	TN	Macon County	36.5	-86.0
SD	Hutchinson County	43.3	-97.7	TN	Madison County	35.6	-88.8
SD	Hyde County	44.6	-99.5	TN	Marion County	35.1	-85.6
SD	Jackson County	43.8	-101.7	TN	Marshall County	35.5	-86.8
SD	Jerauld County	44.1	-98.6	TN	Mauzy County	35.6	-87.1
SD	Jones County	44.0	-100.7	TN	Meigs County	35.5	-84.8
SD	Kingsbury County	44.4	-97.5	TN	Monroe County	35.5	-84.3
SD	Lake County	44.0	-97.1	TN	Montgomery County	36.5	-87.4
SD	Lawrence County	44.4	-103.8	TN	Moore County	35.3	-86.4
SD	Lincoln County	43.3	-96.7	TN	Morgan County	36.1	-84.6
SD	Lyman County	43.9	-99.8	TN	Obion County	36.4	-89.1
SD	McCook County	43.7	-97.4	TN	Overton County	36.4	-85.3
SD	McPherson County	45.8	-99.3	TN	Perry County	35.6	-87.9
SD	Marshall County	45.7	-97.6	TN	Pickett County	36.6	-85.1
SD	Meade County	44.4	-103.1	TN	Polk County	35.1	-84.5
SD	Mellette County	43.6	-100.8	TN	Putnam County	36.2	-85.5
SD	Miner County	44.0	-97.6	TN	Rhea County	35.6	-84.9
SD	Minnehaha County	43.6	-96.7	TN	Roane County	35.9	-84.5
SD	Moody County	44.0	-96.7	TN	Robertson County	36.5	-86.9
SD	Pennington County	44.0	-103.1	TN	Rutherford County	35.9	-86.4
SD	Perkins County	45.6	-102.4	TN	Scott County	36.4	-84.5
SD	Potter County	45.0	-99.9	TN	Sequatchie County	35.4	-85.4
SD	Roberts County	45.6	-96.9	TN	Sevier County	35.8	-83.5
SD	Sanborn County	44.0	-98.1	TN	Shelby County	35.1	-89.9
SD	Shannon County	43.3	-102.5	TN	Smith County	36.2	-86.0
SD	Spink County	44.9	-98.4	TN	Stewart County	36.5	-87.8
SD	Stanley County	44.4	-100.6	TN	Sullivan County	36.5	-82.4
SD	Sully County	44.7	-100.1	TN	Sumner County	36.4	-86.5
SD	Todd County	43.2	-100.8	TN	Tipton County	35.5	-89.7
SD	Tripp County	43.4	-99.9	TN	Trusdale County	36.4	-86.2
SD	Turner County	43.3	-97.1	TN	Unicoi County	36.1	-82.4

TN	Union County	36.3	-83.8	TX	Frio County	28.9	-99.1
TN	Van Buren County	35.7	-85.5	TX	Gaines County	32.8	-102.7
TN	Warren County	35.7	-85.8	TX	Galveston County	29.4	-94.9
TN	Washington County	36.3	-82.4	TX	Garza County	33.2	-101.3
TN	Wayne County	35.2	-87.8	TX	Gillespie County	30.3	-98.9
TN	Weakley County	36.3	-88.7	TX	Glasscock County	31.9	-101.5
TN	White County	35.9	-85.5	TX	Goliad County	28.7	-97.4
TN	Williamson County	35.9	-86.9	TX	Gonzales County	29.5	-97.5
TN	Wilson County	36.2	-86.3	TX	Gray County	35.4	-100.9
TX	Anderson County	31.8	-95.6	TX	Grayson County	33.7	-96.6
TX	Andrews County	32.3	-102.6	TX	Gregg County	32.5	-94.8
TX	Angelina County	31.3	-94.7	TX	Grimes County	30.5	-96.0
TX	Aransas County	28.0	-97.0	TX	Guadalupe County	29.6	-98.0
TX	Archer County	33.7	-98.7	TX	Hale County	34.1	-101.8
TX	Armstrong County	35.0	-101.4	TX	Hall County	34.5	-100.7
TX	Atascosa County	28.9	-98.5	TX	Hamilton County	31.8	-98.1
TX	Austin County	29.9	-96.2	TX	Hansford County	36.3	-101.3
TX	Bailey County	34.1	-102.8	TX	Hardeman County	34.3	-99.7
TX	Bandera County	29.7	-99.1	TX	Hardin County	30.3	-94.3
TX	Bastrop County	30.1	-97.3	TX	Harris County	29.8	-95.4
TX	Baylor County	33.6	-99.3	TX	Harrison County	32.5	-94.4
TX	Bee County	28.4	-97.7	TX	Hartley County	35.9	-102.6
TX	Bell County	31.1	-97.5	TX	Haskell County	33.2	-99.8
TX	Bexar County	29.5	-98.5	TX	Hays County	30.0	-98.0
TX	Blanco County	30.2	-98.4	TX	Hemphill County	35.8	-100.3
TX	Borden County	32.7	-101.4	TX	Henderson County	32.2	-95.9
TX	Bosque County	31.9	-97.6	TX	Hidalgo County	26.2	-98.2
TX	Bowie County	33.4	-94.3	TX	Hill County	32.0	-97.2
TX	Brazoria County	29.2	-95.4	TX	Hockley County	33.6	-102.4
TX	Brazos County	30.6	-96.3	TX	Hood County	32.4	-97.8
TX	Brewster County	30.0	-103.4	TX	Hopkins County	33.1	-95.6
TX	Briscoe County	34.5	-101.3	TX	Houston County	31.3	-95.4
TX	Brooks County	27.1	-98.2	TX	Howard County	32.2	-101.4
TX	Brown County	31.8	-99.0	TX	Hudspeth County	31.5	-105.4
TX	Burleson County	30.4	-96.6	TX	Hunt County	33.1	-96.1
TX	Burnet County	30.7	-98.2	TX	Hutchinson County	35.7	-101.4
TX	Caldwell County	29.8	-97.7	TX	Irion County	31.3	-101.0
TX	Calhoun County	28.5	-96.6	TX	Jack County	33.2	-98.2
TX	Callahan County	32.3	-99.4	TX	Jackson County	28.9	-96.6
TX	Cameron County	26.1	-97.6	TX	Jasper County	30.8	-94.0
TX	Camp County	33.0	-95.0	TX	Jeff Davis County	30.7	-104.1
TX	Carson County	35.4	-101.3	TX	Jefferson County	30.0	-94.1
TX	Cass County	33.1	-94.3	TX	Jim Hogg County	27.1	-98.7
TX	Castro County	34.5	-102.3	TX	Jim Wells County	27.7	-98.1
TX	Chambers County	29.8	-94.7	TX	Johnson County	32.4	-97.3
TX	Cherokee County	31.9	-95.2	TX	Jones County	32.8	-99.9
TX	Childress County	34.5	-100.2	TX	Karnes County	28.9	-97.9
TX	Clay County	33.8	-98.2	TX	Kaufman County	32.6	-96.3
TX	Cochran County	33.7	-102.8	TX	Kendall County	29.9	-98.7
TX	Coke County	31.9	-100.5	TX	Kenedy County	26.9	-97.7
TX	Coleman County	31.8	-99.4	TX	Kent County	33.2	-100.7
TX	Collin County	33.1	-96.6	TX	Kerr County	30.0	-99.2
TX	Collingsworth County	34.9	-100.2	TX	Kimble County	30.5	-99.7
TX	Colorado County	29.6	-96.5	TX	King County	33.6	-100.3
TX	Comal County	29.8	-98.2	TX	Kinney County	29.3	-100.4
TX	Comanche County	32.0	-98.6	TX	Kleberg County	27.5	-97.9
TX	Concho County	31.3	-99.9	TX	Knox County	33.5	-99.7
TX	Cooke County	33.6	-97.2	TX	Lamar County	33.7	-95.6
TX	Coryell County	31.3	-97.8	TX	Lamb County	34.1	-102.4
TX	Cottle County	34.1	-100.3	TX	Lampasas County	31.1	-98.2
TX	Crane County	31.4	-102.5	TX	La Salle County	28.4	-99.2
TX	Crockett County	30.7	-101.4	TX	Lavaca County	29.4	-97.0
TX	Crosby County	33.6	-101.3	TX	Lee County	30.3	-96.9
TX	Culberson County	31.3	-104.6	TX	Leon County	31.3	-96.1
TX	Dallam County	36.2	-102.7	TX	Liberty County	30.2	-94.8
TX	Dallas County	32.8	-96.8	TX	Limestone County	31.6	-96.6
TX	Dawson County	32.7	-101.9	TX	Lipscomb County	36.3	-100.3
TX	Deaf Smith County	34.9	-102.5	TX	Live Oak County	28.3	-98.1
TX	Delta County	33.4	-95.7	TX	Llano County	30.7	-98.6
TX	Denton County	33.1	-97.1	TX	Loving County	31.8	-103.6
TX	DeWitt County	29.1	-97.3	TX	Lubbock County	33.6	-101.9
TX	Dickens County	33.6	-100.8	TX	Lynn County	33.2	-101.8
TX	Dimmit County	28.5	-99.8	TX	McCulloch County	31.2	-99.3
TX	Donley County	35.0	-100.8	TX	McLennan County	31.5	-97.2
TX	Duval County	27.7	-98.5	TX	McMullen County	28.4	-98.5
TX	Eastland County	32.3	-98.8	TX	Madison County	31.0	-96.0
TX	Ector County	31.9	-102.4	TX	Marion County	32.8	-94.4
TX	Edwards County	30.0	-100.2	TX	Martin County	32.3	-101.9
TX	Ellis County	32.4	-96.8	TX	Mason County	30.8	-99.2
TX	El Paso County	31.8	-106.4	TX	Matagorda County	28.9	-96.0
TX	Erath County	32.2	-98.2	TX	Maverick County	28.7	-100.4
TX	Falls County	31.3	-97.0	TX	Medina County	29.3	-99.0
TX	Fannin County	33.6	-96.2	TX	Menard County	30.9	-99.8
TX	Fayette County	29.9	-96.9	TX	Midland County	32.0	-102.1
TX	Fisher County	32.8	-100.4	TX	Milam County	30.8	-97.0
TX	Floyd County	34.1	-101.3	TX	Mills County	31.5	-98.6
TX	Foard County	34.0	-99.8	TX	Mitchell County	32.3	-100.9
TX	Fort Bend County	29.6	-95.7	TX	Montague County	33.7	-97.7
TX	Franklin County	33.1	-95.2	TX	Montgomery County	30.3	-95.5
TX	Freestone County	31.7	-96.2	TX	Moore County	35.9	-101.9

TX	Morris County	33.1	-94.7	UT	Emery County	39.2	-110.9
TX	Motley County	34.1	-100.8	UT	Garfield County	37.8	-111.9
TX	Nacogdoches County	31.6	-94.6	UT	Grand County	38.8	-109.5
TX	Navarro County	32.1	-96.5	UT	Iron County	37.8	-113.2
TX	Newton County	30.8	-93.7	UT	Juab County	39.7	-112.3
TX	Nolan County	32.4	-100.4	UT	Kane County	37.3	-112.4
TX	Nueces County	27.7	-97.5	UT	Millard County	39.1	-112.9
TX	Ochiltree County	36.3	-100.8	UT	Morgan County	41.1	-111.6
TX	Oldham County	35.4	-102.6	UT	Plute County	38.3	-112.1
TX	Orange County	30.1	-93.8	UT	Rich County	41.7	-111.3
TX	Palo Pinto County	32.8	-98.3	UT	Salt Lake County	40.7	-111.9
TX	Panola County	32.2	-94.3	UT	San Juan County	37.4	-109.5
TX	Parker County	32.8	-97.8	UT	Sanpete County	39.4	-111.6
TX	Parmer County	34.5	-102.8	UT	Sevier County	38.8	-111.9
TX	Pecos County	30.9	-102.7	UT	Summit County	40.8	-111.3
TX	Polk County	30.8	-94.9	UT	Tooele County	40.4	-112.7
TX	Potter County	35.3	-101.8	UT	Uintah County	40.3	-109.6
TX	Presidio County	30.0	-104.2	UT	Utah County	40.2	-111.7
TX	Rains County	32.9	-95.8	UT	Wasatch County	40.5	-111.4
TX	Randall County	35.1	-101.9	UT	Washington County	37.2	-113.5
TX	Reagan County	31.3	-101.5	UT	Wayne County	38.3	-111.3
TX	Real County	29.8	-99.9	UT	Weber County	41.2	-112.0
TX	Red River County	33.6	-95.1	VT	Addison County	44.0	-73.2
TX	Reeves County	31.3	-103.6	VT	Bennington County	43.0	-73.1
TX	Refugio County	28.3	-97.2	VT	Caledonia County	44.5	-72.1
TX	Roberts County	35.8	-100.8	VT	Chittenden County	44.5	-73.1
TX	Robertson County	31.0	-96.6	VT	Essex County	44.7	-71.7
TX	Rockwall County	32.9	-96.4	VT	Franklin County	44.9	-73.0
TX	Runnels County	31.8	-100.0	VT	Grand Isle County	44.8	-73.3
TX	Rusk County	32.2	-94.8	VT	Lamoille County	44.6	-72.6
TX	Sabine County	31.3	-93.9	VT	Orange County	44.0	-72.4
TX	San Augustine County	31.4	-94.2	VT	Orleans County	44.8	-72.2
TX	San Jacinto County	30.6	-95.1	VT	Rutland County	43.6	-73.1
TX	San Patricio County	28.0	-97.5	VT	Washington County	44.2	-72.6
TX	San Saba County	31.2	-98.8	VT	Windham County	43.0	-72.7
TX	Schleicher County	30.9	-100.5	VT	Windsor County	43.6	-72.5
TX	Scurry County	32.7	-101.0	VA	Accomack County	37.8	-75.6
TX	Shackelford County	32.7	-99.3	VA	Albemarle County	38.0	-78.5
TX	Shelby County	31.8	-94.1	VA	Allegheny County	37.8	-80.0
TX	Sherman County	36.3	-101.9	VA	Amelia County	37.3	-78.0
TX	Smith County	32.3	-95.3	VA	Amherst County	37.6	-79.1
TX	Somervell County	32.2	-97.8	VA	Appomattox County	37.4	-78.8
TX	Starr County	26.5	-98.8	VA	Arlington County	38.9	-77.1
TX	Stephens County	32.7	-98.9	VA	Augusta County	38.1	-79.1
TX	Sterling County	31.8	-101.0	VA	Bath County	38.0	-79.7
TX	Stonewall County	33.2	-100.2	VA	Bedford County	37.3	-79.6
TX	Sutton County	30.5	-100.6	VA	Bland County	37.1	-81.1
TX	Swisher County	34.5	-101.7	VA	Botetourt County	37.5	-79.8
TX	Tarrant County	32.8	-97.3	VA	Brownswick County	36.8	-77.9
TX	Taylor County	32.4	-99.8	VA	Buchanan County	37.3	-82.0
TX	Terrell County	30.2	-102.1	VA	Buckingham County	37.6	-78.5
TX	Terry County	33.2	-102.3	VA	Campbell County	37.2	-79.1
TX	Throckmorton County	33.2	-99.2	VA	Caroline County	38.0	-77.4
TX	Titus County	33.2	-95.0	VA	Carroll County	36.7	-80.7
TX	Tom Green County	31.4	-100.5	VA	Charles City County	37.3	-77.1
TX	Travis County	30.3	-97.8	VA	Charlotte County	37.0	-78.6
TX	Trinity County	31.0	-95.2	VA	Chesterfield County	37.4	-77.5
TX	Tyler County	30.8	-94.4	VA	Clarke County	39.1	-78.0
TX	Upshur County	32.7	-94.9	VA	Craig County	37.5	-80.2
TX	Upton County	31.3	-102.1	VA	Culpeper County	38.5	-78.0
TX	Uvalde County	29.3	-99.7	VA	Cumberland County	37.5	-78.3
TX	Val Verde County	29.6	-101.0	VA	Dickenson County	37.1	-82.4
TX	Van Zandt County	32.6	-95.8	VA	Dinwiddie County	37.1	-77.6
TX	Victoria County	28.8	-97.0	VA	Essex County	37.9	-76.9
TX	Walker County	30.7	-95.5	VA	Fairfax County	38.8	-77.2
TX	Waller County	30.0	-96.0	VA	Fauquier County	38.7	-77.8
TX	Ward County	31.5	-103.0	VA	Floyd County	36.9	-80.4
TX	Washington County	30.2	-96.4	VA	Fluvanna County	37.9	-78.3
TX	Webb County	27.6	-99.4	VA	Franklin County	37.0	-79.9
TX	Wharton County	29.3	-96.2	VA	Frederick County	39.2	-78.2
TX	Wheeler County	35.4	-100.3	VA	Giles County	37.3	-80.7
TX	Wichita County	33.9	-98.6	VA	Gloucester County	37.4	-76.5
TX	Wilbarger County	34.1	-99.2	VA	Goochland County	37.7	-77.9
TX	Willacy County	26.5	-97.8	VA	Grayson County	36.6	-81.2
TX	Williamson County	30.6	-97.7	VA	Greene County	38.3	-78.5
TX	Wilson County	29.2	-98.1	VA	Greensville County	36.7	-77.6
TX	Winkler County	31.8	-103.1	VA	Halifax County	36.7	-78.9
TX	Wise County	33.2	-97.7	VA	Hanover County	37.7	-77.4
TX	Wood County	32.8	-95.4	VA	Henrico County	37.6	-77.5
TX	Yoakum County	33.1	-102.8	VA	Henry County	36.7	-79.9
TX	Young County	33.2	-98.7	VA	Highland County	38.4	-79.6
TX	Zapata County	27.0	-99.2	VA	Isle of Wight County	36.9	-76.7
TX	Zavala County	28.9	-99.8	VA	James City County	37.3	-76.8
UT	Beaver County	38.3	-113.0	VA	King and Queen County	37.7	-76.9
UT	Box Elder County	41.6	-112.5	VA	King George County	38.3	-77.2
UT	Cache County	41.8	-111.8	VA	King William County	37.7	-77.0
UT	Carbon County	39.6	-110.8	VA	Lancaster County	37.7	-76.5
UT	Daggett County	40.9	-109.5	VA	Lee County	36.7	-83.1
UT	Davis County	41.0	-111.9	VA	Loudoun County	39.1	-77.6
UT	Duchesne County	40.2	-110.3	VA	Louisa County	38.0	-78.0

VA	Lunenburg County	36.9	-78.2	WA	Ferry County	48.5	-118.5
VA	Madison County	38.4	-78.3	WA	Franklin County	46.4	-119.0
VA	Mathews County	37.4	-76.3	WA	Garfield County	46.4	-117.5
VA	Mecklenburg County	36.7	-78.3	WA	Grant County	47.2	-119.4
VA	Middlesex County	37.6	-76.5	WA	Grays Harbor County	47.1	-123.8
VA	Montgomery County	37.2	-80.4	WA	Island County	48.2	-122.6
VA	Nelson County	37.8	-78.9	WA	Jefferson County	47.9	-123.2
VA	New Kent County	37.5	-77.0	WA	King County	47.5	-122.2
VA	Northampton County	37.4	-75.9	WA	Kitsap County	47.6	-122.6
VA	Northumberland County	37.9	-76.4	WA	Kittitas County	47.1	-120.7
VA	Nottoway County	37.1	-78.1	WA	Klickitat County	45.9	-121.0
VA	Orange County	38.2	-78.1	WA	Lewis County	46.6	-122.7
VA	Page County	38.6	-78.5	WA	Lincoln County	47.6	-118.4
VA	Patrick County	36.7	-80.3	WA	Mason County	47.3	-123.1
VA	Pittsylvania County	36.8	-79.4	WA	Okanogan County	48.5	-119.6
VA	Powhatan County	37.6	-77.9	WA	Pacific County	46.5	-123.8
VA	Prince Edward County	37.2	-78.4	WA	Pend Oreille County	48.5	-117.3
VA	Prince George County	37.2	-77.3	WA	Pierce County	47.2	-122.4
VA	Prince William County	38.7	-77.4	WA	San Juan County	48.6	-123.0
VA	Pulaski County	37.1	-80.7	WA	Skagit County	48.5	-122.2
VA	Rappahannock County	38.7	-78.2	WA	Skamania County	45.9	-122.0
VA	Richmond County	37.9	-76.7	WA	Snohomish County	48	-122.1
VA	Roanoke County	37.3	-80.0	WA	Spokane County	47.7	-117.4
VA	Rockbridge County	37.8	-79.4	WA	Stevens County	48.4	-117.8
VA	Rockingham County	38.5	-78.8	WA	Thurston County	47.0	-122.8
VA	Russell County	36.9	-82.1	WA	Wahkiakum County	46.3	-123.5
VA	Scott County	36.7	-82.6	WA	Walla Walla County	46.1	-118.4
VA	Shenandoah County	38.9	-78.6	WA	Whatcom County	48.8	-122.4
VA	Smyth County	36.8	-81.6	WA	Whitman County	46.9	-117.4
VA	Southampton County	36.7	-77.1	WA	Yakima County	46.5	-120.5
VA	Spotsylvania County	38.2	-77.6	WV	Barbour County	39.1	-80.0
VA	Stafford County	38.4	-77.4	WV	Berkeley County	39.5	-78.0
VA	Surry County	37.1	-76.9	WV	Boone County	38.1	-81.7
VA	Sussex County	36.9	-77.3	WV	Braxton County	38.7	-80.7
VA	Tazewell County	37.1	-81.6	WV	Brooke County	40.3	-80.6
VA	Warren County	38.9	-78.2	WV	Cabell County	38.4	-82.3
VA	Washington County	36.7	-82.0	WV	Calhoun County	38.9	-81.1
VA	Westmoreland County	38.2	-76.8	WV	Clay County	38.5	-81.1
VA	Wise County	37.0	-82.6	WV	Doddridge County	39.3	-80.7
VA	Wythe County	36.9	-81.1	WV	Fayette County	38.0	-81.1
VA	York County	37.2	-76.5	WV	Gilmer County	38.9	-80.8
VA	Alexandria city	38.8	-77.1	WV	Grant County	39.1	-79.2
VA	Bedford city	37.3	-79.5	WV	Greenbrier County	37.9	-80.5
VA	Bristol city	36.6	-82.2	WV	Hampshire County	39.3	-78.6
VA	Buena Vista city	37.7	-79.4	WV	Hancock County	40.5	-80.6
VA	Charlottesville city	38.0	-78.5	WV	Hardy County	39.0	-78.9
VA	Chesapeake city	36.8	-76.3	WV	Harrison County	39.3	-80.3
VA	Clifton Forge city	37.8	-79.8	WV	Jackson County	38.8	-81.7
VA	Colonial Heights city	37.3	-77.4	WV	Jefferson County	39.3	-77.8
VA	Covington city	37.8	-80.0	WV	Kanawha County	38.3	-81.6
VA	Danville city	36.6	-79.4	WV	Lewis County	39.0	-80.5
VA	Emporia city	36.7	-77.5	WV	Lincoln County	38.2	-82.1
VA	Fairfax city	38.9	-77.3	WV	Logan County	37.8	-82.0
VA	Falls Church city	38.9	-77.2	WV	McDowell County	37.4	-81.6
VA	Franklin city	36.7	-76.9	WV	Marion County	39.5	-80.2
VA	Fredericksburg city	38.3	-77.5	WV	Marshall County	39.9	-80.7
VA	Galax city	36.7	-80.9	WV	Mason County	38.8	-82.0
VA	Hampton city	37.0	-76.4	WV	Mercer County	37.3	-81.2
VA	Harrisonburg city	38.4	-78.9	WV	Mineral County	39.4	-78.9
VA	Hopewell city	37.3	-77.3	WV	Mingo County	37.7	-82.2
VA	Lexington city	37.8	-79.4	WV	Monongalia County	39.6	-80.0
VA	Lynchburg city	37.4	-79.2	WV	Monroe County	37.6	-80.6
VA	Manassas city	38.8	-77.5	WV	Morgan County	38.6	-78.3
VA	Manassas Park city	38.8	-77.5	WV	Nicholas County	38.3	-80.8
VA	Martinsville city	36.7	-79.9	WV	Ohio County	40.1	-80.7
VA	Newport News city	37.1	-76.5	WV	Pendleton County	38.7	-79.3
VA	Norfolk city	36.9	-76.3	WV	Pleasants County	39.4	-81.2
VA	Norton city	36.9	-82.6	WV	Pocahontas County	38.3	-80.0
VA	Petersburg city	37.2	-77.4	WV	Preston County	39.5	-79.7
VA	Poquoson city	37.1	-76.4	WV	Putnam County	38.5	-81.9
VA	Portsmouth city	36.8	-76.3	WV	Raleigh County	37.8	-81.2
VA	Radford city	37.1	-80.6	WV	Randolph County	38.8	-79.9
VA	Richmond city	37.5	-77.5	WV	Ritchie County	39.2	-81.1
VA	Roanoke city	37.3	-80.0	WV	Roane County	38.7	-81.4
VA	Salem city	37.3	-80.1	WV	Summers County	37.7	-80.8
VA	Staunton city	38.2	-79.1	WV	Taylor County	39.3	-80.0
VA	Suffolk city	36.7	-76.6	WV	Tucker County	39.1	-79.6
VA	Virginia Beach city	36.8	-76.1	WV	Tyler County	39.5	-80.9
VA	Waynesboro city	38.1	-78.9	WV	Upshur County	38.9	-80.2
VA	Williamsburg city	37.3	-76.7	WV	Wayne County	38.2	-82.5
VA	Winchester city	39.2	-78.2	WV	Webster County	38.5	-80.4
WA	Adams County	47.0	-118.7	WV	Wetzel County	39.6	-80.7
WA	Asotin County	46.3	-117.1	WV	Wirt County	39.0	-81.4
WA	Benton County	46.2	-119.4	WV	Wood County	39.3	-81.5
WA	Chelan County	47.6	-120.4	WV	Wyoming County	37.6	-81.5
WA	Clallam County	48.1	-123.8	WI	Adams County	44.0	-89.8
WA	Clark County	45.7	-122.5	WI	Ashland County	46.3	-90.7
WA	Columbia County	46.3	-118.0	WI	Barron County	45.4	-91.8
WA	Cowlitz County	46.2	-122.7	WI	Bayfield County	46.5	-91.2
WA	Douglas County	47.7	-119.9	WI	Brown County	44.5	-88.0

WI	Buffalo County	44.4	-91.8	PR	Adjuntas Municipio	18.2	-66.7
WI	Burnett County	45.9	-92.4	PR	Aguada Municipio	18.4	-67.2
WI	Calumet County	44.1	-88.2	PR	Aguadilla Municipio	18.5	-67.1
WI	Chippewa County	45.0	-91.3	PR	Aguas Buenas Municipio	18.3	-66.1
WI	Clark County	44.8	-90.6	PR	Aibonito Municipio	18.1	-66.3
WI	Columbia County	43.5	-89.3	PR	A±asco Municipio	18.3	-67.1
WI	Crawford County	43.2	-91.0	PR	Arecibo Municipio	18.4	-66.7
WI	Dane County	43.1	-89.4	PR	Arroyo Municipio	18.0	-66.1
WI	Dodge County	43.4	-88.7	PR	Barceloneta Municipio	18.5	-66.6
WI	Door County	45.0	-87.3	PR	Barraquitas Municipio	18.2	-66.3
WI	Douglas County	46.5	-91.9	PR	Bayamín Municipio	18.4	-66.2
WI	Dunn County	44.9	-91.9	PR	Cabo Rojo Municipio	18.1	-67.2
WI	Eau Claire County	44.8	-91.4	PR	Caguas Municipio	18.2	-66.0
WI	Florence County	45.8	-88.4	PR	Camuy Municipio	18.4	-66.9
WI	Fond du Lac County	43.8	-88.5	PR	Canivanas Municipio	18.4	-65.9
WI	Forest County	45.6	-88.8	PR	Carolina Municipio	18.4	-66.0
WI	Grant County	42.9	-90.7	PR	Cata±o Municipio	18.4	-66.1
WI	Green County	42.7	-89.6	PR	Cayey Municipio	18.1	-66.2
WI	Green Lake County	43.8	-89.0	PR	Ceiba Municipio	18.3	-65.7
WI	Iowa County	43.0	-90.1	PR	Ciales Municipio	18.3	-66.5
WI	Iron County	46.3	-90.2	PR	Cidra Municipio	18.2	-66.2
WI	Jackson County	44.3	-90.9	PR	Coamo Municipio	18.1	-66.4
WI	Jefferson County	43.0	-88.8	PR	Comerio Municipio	18.2	-66.2
WI	Juneau County	43.9	-90.1	PR	Corozal Municipio	18.3	-66.3
WI	Kenosha County	42.6	-88.0	PR	Culebra Municipio	18.3	-65.3
WI	Kewaunee County	44.5	-87.6	PR	Dorado Municipio	18.4	-66.3
WI	La Crosse County	43.9	-91.2	PR	Fajardo Municipio	18.3	-65.7
WI	Lafayette County	42.7	-90.1	PR	Florida Municipio	18.4	-66.6
WI	Langlade County	45.2	-89.1	PR	Guánica Municipio	18.0	-66.9
WI	Lincoln County	45.3	-89.7	PR	Guayama Municipio	18.0	-66.1
WI	Manitowoc County	44.1	-87.8	PR	Guayanilla Municipio	18.0	-66.8
WI	Marathon County	44.9	-89.7	PR	Guaynabo Municipio	18.4	-66.1
WI	Marinette County	45.3	-87.9	PR	Gurabo Municipio	18.3	-66.0
WI	Marquette County	43.8	-89.4	PR	Hatillo Municipio	18.4	-66.8
WI	Menominee County	44.9	-88.6	PR	Hormigueros Municipio	18.1	-67.1
WI	Milwaukee County	43.0	-88.0	PR	Humacao Municipio	18.1	-65.8
WI	Monroe County	43.9	-90.6	PR	Isabela Municipio	18.5	-67.0
WI	Oconto County	45.0	-88.2	PR	Jayuya Municipio	18.2	-66.6
WI	Oneida County	45.7	-89.5	PR	Juana Diaz Municipio	18.0	-66.5
WI	Outagamie County	44.3	-88.4	PR	Juncos Municipio	18.2	-65.9
WI	Ozaukee County	43.3	-87.9	PR	Lajas Municipio	18.0	-67.0
WI	Pepin County	44.6	-92.0	PR	Lares Municipio	18.3	-66.9
WI	Pierce County	44.7	-92.5	PR	Las Marias Municipio	18.2	-67.0
WI	Polk County	45.5	-92.5	PR	Las Piedras Municipio	18.2	-65.9
WI	Portage County	44.5	-89.5	PR	Loiza Municipio	18.4	-65.9
WI	Price County	45.7	-90.4	PR	Luquillo Municipio	18.4	-65.7
WI	Racine County	42.7	-88.0	PR	Manatí Municipio	18.4	-66.5
WI	Richland County	43.4	-90.4	PR	Maricao Municipio	18.2	-67.0
WI	Rock County	42.7	-89.0	PR	Maunabo Municipio	18.0	-65.9
WI	Rusk County	45.4	-91.1	PR	Mayagüez Municipio	18.2	-67.1
WI	St. Croix County	45.0	-92.5	PR	Moca Municipio	18.4	-67.1
WI	Sauk County	43.4	-89.9	PR	Morovis Municipio	18.3	-66.4
WI	Sawyer County	45.9	-91.3	PR	Naguabo Municipio	18.2	-65.7
WI	Shawano County	44.8	-88.8	PR	Naranjito Municipio	18.3	-66.3
WI	Sheboygan County	43.7	-87.9	PR	Orocovis Municipio	18.2	-66.4
WI	Taylor County	45.2	-90.5	PR	Patillas Municipio	18.0	-66.0
WI	Trempealeau County	44.3	-91.4	PR	Pezuelas Municipio	18.1	-66.7
WI	Vernon County	43.6	-90.8	PR	Ponce Municipio	18.0	-66.6
WI	Vilas County	46.0	-89.5	PR	Quebradillas Municipio	18.5	-66.9
WI	Walworth County	42.6	-88.5	PR	Rincin Municipio	18.3	-67.2
WI	Washburn County	45.9	-91.8	PR	Rio Grande Municipio	18.4	-65.8
WI	Washington County	43.4	-88.2	PR	Sabana Grande Municipio	18.1	-66.9
WI	Waukesha County	43.0	-88.3	PR	Salinas Municipio	18.0	-66.3
WI	Waupaca County	44.5	-89.0	PR	San Germán Municipio	18.1	-67.0
WI	Waushara County	44.1	-89.3	PR	San Juan Municipio	18.4	-66.1
WI	Winnebago County	44.1	-88.6	PR	San Lorenzo Municipio	18.2	-66.0
WI	Wood County	44.4	-90.0	PR	San Sebastián Municipio	18.3	-67.0
WY	Albany County	41.4	-105.7	PR	Santa Isabel Municipio	18.0	-66.4
WY	Big Horn County	44.5	-108.1	PR	Toa Alta Municipio	18.4	-66.2
WY	Campbell County	44.1	-105.5	PR	Toa Baja Municipio	18.4	-66.2
WY	Carbon County	41.7	-106.9	PR	Trujillo Alto Municipio	18.3	-66.0
WY	Converse County	42.9	-105.5	PR	Utua±o Municipio	18.3	-66.7
WY	Crook County	44.6	-104.6	PR	Vega Alta Municipio	18.4	-66.3
WY	Fremont County	43.1	-108.7	PR	Vega Baja Municipio	18.4	-66.4
WY	Goshen County	42.1	-104.3	PR	Vieques Municipio	18.1	-65.5
WY	Hot Springs County	43.7	-108.3	PR	Villalba Municipio	18.1	-66.5
WY	Johnson County	44.1	-106.6	PR	Yabucoa Municipio	18.1	-65.9
WY	Laramie County	41.2	-104.8	PR	Yauco Municipio	18.1	-66.9
WY	Lincoln County	42.2	-110.7				
WY	Natrona County	42.9	-106.5				
WY	Niobrara County	43.0	-104.5				
WY	Park County	44.6	-109.0				
WY	Platte County	42.2	-104.9				
WY	Sheridan County	44.8	-107.0				
WY	Sublette County	42.8	-110.0				
WY	Sweetwater County	41.6	-109.2				
WY	Teton County	43.6	-110.7				
WY	Uinta County	41.3	-110.6				
WY	Washakie County	44.0	-107.7				
WY	Weston County	43.9	-104.6				

Appendix C: Table of time zone difference from UTC

Time Zone	Major Cities	Symbol	Difference from UTC
Atlantic Time	San Juan	AST	-4
Eastern Time	Boston, New York, Washington DC, Miami	EST	-5
Central Time	Minneapolis, New Orleans, Houston, Chicago	CST	-6
Mountain Time	Salt Lake City, Boise, Denver	MST	-7
Pacific Time	Seattle, San Francisco, Los Angeles, Las Vegas	PST	-8
Alaska Time	Fairbanks	AKST	-9
Hawaii-Aleutian Time	Honolulu	HAST	-10

Enter the difference from UTC (Coordinate Universal Time)/GMT (Greenwich Mean Time) for your time zone when you configure the Weather Station as per chapter 3.3.5.

Do not consider daylight saving time when making this entry. Follow instructions for setting the status of daylight saving time as a separate entry.

WARRANTY INFORMATION

La Crosse Technology, Ltd provides a 1-year limited warranty on this product against manufacturing defects in materials and workmanship.

This limited warranty begins on the original date of purchase, is valid only on products purchased and used in North America and only to the original purchaser of this product. To receive warranty service, the purchaser must contact La Crosse Technology, Ltd for problem determination and service procedures. Warranty service can only be performed by a La Crosse Technology, Ltd authorized service center. The original dated bill of sale must be presented upon request as proof of purchase to La Crosse Technology, Ltd or La Crosse Technology, Ltd's authorized service center.

La Crosse Technology, Ltd will repair or replace this product, at our option and at no charge as stipulated herein, with new or reconditioned parts or products if found to be defective during the limited warranty period specified above. All replaced parts and products become the property of La Crosse Technology, Ltd and must be returned to La Crosse Technology, Ltd.

Replacement parts and products assume the remaining original warranty, or ninety (90) days, whichever is longer. La Crosse Technology, Ltd will pay all expenses for labor and materials for all repairs covered by this warranty. If necessary repairs are not covered by this warranty, or if a product is examined which is not in need of repair, you will be charged for the repairs or examination.

The owner must pay any shipping charges incurred in getting your La Crosse Technology, Ltd product to a La Crosse Technology, Ltd authorized service center.

Your La Crosse Technology, Ltd warranty covers all defects in material and workmanship with the following specified exceptions: (1) damage caused by accident, unreasonable use or neglect (including the lack of reasonable and necessary maintenance); (2) damage occurring during shipment (claims must be presented to the carrier); (3) damage to, or deterioration of, any accessory or decorative surface; (4) damage resulting from failure to follow instructions contained in your owner's manual; (5) damage resulting from the performance of repairs or alterations by someone other than an authorized La Crosse Technology, Ltd authorized service center; (6) units used for other than home use (7) applications and uses that this product was not intended or (8) the products inability to receive a signal due to any source of interference.

This warranty covers only actual defects within the product itself, and does not cover the cost of installation or removal from a fixed installation, normal set-up or adjustments, claims based on misrepresentation by the seller or performance variations resulting from installation-related circumstances.

LA CROSSE TECHNOLOGY, LTD WILL NOT ASSUME LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, PUNITIVE, OR OTHER SIMILAR DAMAGES ASSOCIATED WITH THE OPERATION OR MALFUNCTION OF THIS PRODUCT. THIS PRODUCT IS NOT TO BE USED FOR MEDICAL PURPOSES OR FOR PUBLIC INFORMATION. THIS PRODUCT IS NOT A TOY. KEEP OUT OF CHILDREN'S REACH.

This warranty gives you specific legal rights. You may also have other rights specific to your State. Some States do not allow the exclusion of consequential or incidental damages therefore the above exclusion of limitation may not apply to you.

For warranty work, technical support, or information contact:

La Crosse Technology, Ltd
2809 Losey Blvd S.
La Crosse, WI 54601
Phone: 608.782.1610
Fax: 608.796.1020

e-mail:

support@lacrossetechnology.com
(warranty work)

sales@lacrossetechnology.com
(information on other products)

web:

www.lacrossetechnology.com

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