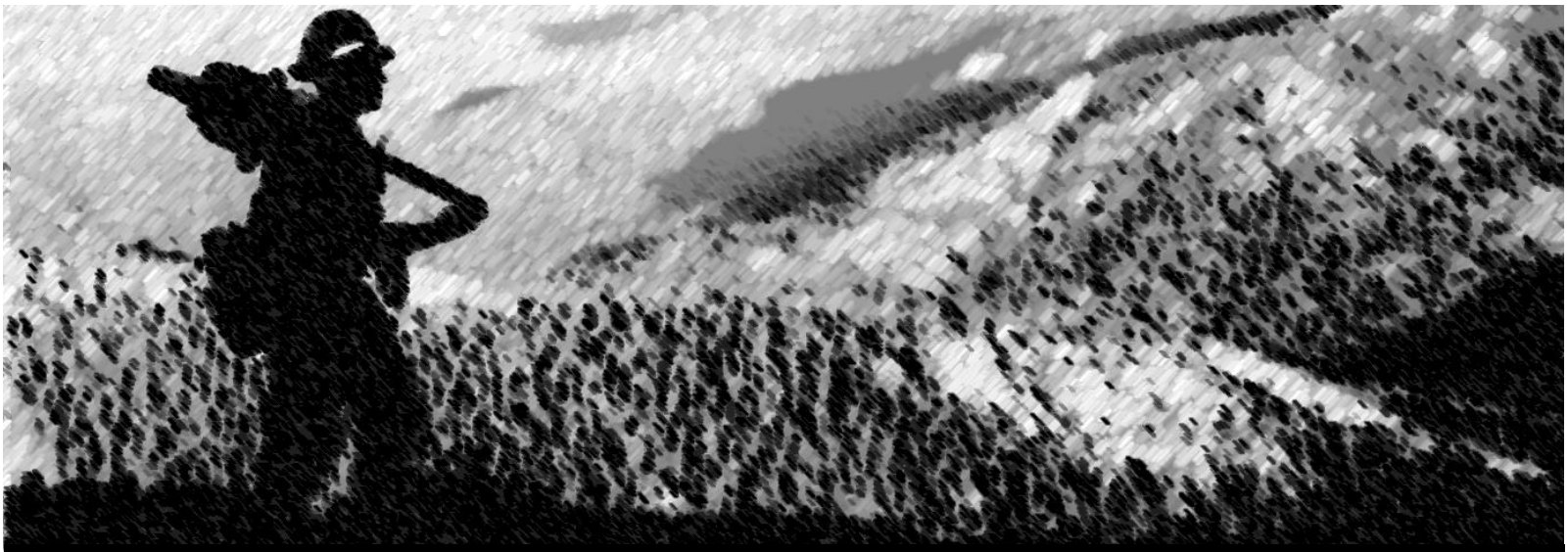

Interagency Wildland Fire Module Field Guide

2015-16

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This document is intended to supplement, and not replace, existing NWCG approved guides including the Incident Response Pocket Guide (IRPG, NFES 1077) and Fireline Handbook (NFES 0065), among others. In addition, this document is not intended to replace previous editions of the Interagency Fire Use Module Field Guide.

Additions/Changes to this document will be considered by the Interagency Wildland Fire Module Unit.

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Cover Photo: Sean Gaines, Zion Module, Lewis Creek Fire-Kings Canyon National Park- 1999

MISSION AND PURPOSE

The MISSION of the Interagency Wildland Fire Module Program is to develop and provide an innovative, safe, highly mobile, logistically independent, and versatile fire module with a primary commitment to maintain fire's role as a natural ecological process for wildland fire management and incident operations.

The PURPOSE of the Interagency Wildland Fire Module program is to facilitate the use of fire and other management techniques involving planned and unplanned wildland fire events. WFMs are highly skilled and versatile fire crews, which provide technical and ecological based expertise in the areas of long term planning, ignitions, holding, suppression, prescribed fire preparation and implementation support, hazard fuels reduction, and fire effects monitoring, resulting in fire fulfilling its natural/historic role to meet resource and management objectives.

CHIEF OF PARTY CHECKLIST

General:

- Safety of group at all times is your paramount responsibility
- Accept your role as the leader
- Be ready at all times.
- Work hard, be safe

Mobilization

- Obtain copy of Resource Order and make 5 copies
- Update crew Manifest and make 5 copies
- Update crew Quals sheet and make 5 copies
- Document accountable property you are taking (e.g. Radios, GPS units, etc.)
- Download GPS Maps for assignment location
- Document start mileage for vehicles
- Plan travel route and ETA, make hotel reservations if necessary
- Collect applicable maps from files
- Coordinate with the incident/requesting unit re: Food, Backcountry Gear, etc.
- Copies to Office: Manifest, Travel Authorizations, Travel Route, and ETA
- Coordinate with incident/requesting unit while en route

At Assignment

- Check in: Notify Home Unit/Duty Officer of arrival
- Manifest and time records to overhead
- Obtain radio freqs and program by hand or computer (Never Clone from Incident Radios!!)
- Find out specific assignment, sleeping, food, etc.
- Attend all operational briefings.
- Fill out and submit signed CTR's every day
- Pass along any and all updates on progress, changes and status
- Pre-plan Logistical needs: Place orders by 1300 for next shift
- Log chainsaw use and maintenance
- Fill-out and submit 214s and all Documentation
- AAR every shift

Check-Out

- Verify that times on CTRs match times on FTRs for each person
- On most incidents, never depart without signed FTRs in hand
- Make copies if possible of all reports, assignments, photos and maps
- Obtain S #'s for all equipment to be fire replaced, treat supply nicely
- Obtain and review crew evaluations
- Notify Home Unit/Duty Officer and dispatch of departure and travel plans (ie: routes, ETA, RONs)
- If moving between incidents, Start time = Departure time from current incident

Return to Station

- Notify Duty Officer and Home Dispatch of return
- Tell Dispatch to change status in ROSS for R&R and module availability
- Fuel all vehicles
- Fill out mileage forms
- Clean inside and outside of vehicles
- Disinfect all food containers, cook equipment and water coolers
- Rehab and log all chainsaws, tools, pumps, etc.
- Before departure, all module gear and vehicles are fire ready
- Restock the fire monitoring kits
- Fill out fire report and make copies and send one to Home Unit
- Fire Folder: All reports, trip manifest, resource order, CTR's collated, Maps, Relevant IAP's, Travel documentation, Crew evaluation, fire report, incident replacement requisitions, C of P Guidelines
- Documentation to Home Unit: Time records, fire reports, crew evaluations, travel sheets, mileage forms

CHAINSAW GUIDES

Use caution when making chainsaw carburetor adjustments.
Instructions below are intended for those who are experienced saw tuners.
If you are unfamiliar with these procedures, seek out someone who is.

If your saw fails to start, check the following:

1. Gas (50:1)
2. On/off switch is turned ON
3. Spark plug has spark
4. Exhaust screen is clean
5. Air filter is clean
6. Jets are adjusted correctly: NEVER OVER TIGHTEN JETS
   Turn both jets to the right (clockwise) until snug.
   Then, back to the left (counter-clockwise) until desired setting.
   Stihl: high 3/4 turn, low 1/4 turn
7. Carburetor is flooded:
   Tighten high jet until its snug.
   Pull starter cord until saw starts.
   Turn jet left to correct setting.

JET and IDLE Field Adjustments

1. Clean or replace air filter. You cannot properly tune the carb unless the air filter is clean and in good condition.
2. Run saw at full throttle. Turn HS screw in (clockwise) slowly. As the HS screw is turned in, saw is being leaned out (more air, less gas). Keep leaning as long as the saw flutters. Go to flat line (no flutter) and back off.
3. Release throttle and let saw idle. If saw idles too fast (chain turning) or too slow (dies), adjust idle screw only. Turn screw counter clockwise to stop chain or clockwise if saw dies.
4. Idle for 30 seconds. Do the dump/roll test. Saw should idle in all positions. If saw fails the dump test, tighten (turn clockwise) the LS screw a quarter turn. Fuel is pooling and flooding out the engine. Repeat.
5. Throttle up saw. Saw should immediately respond. If it stutters, the LS is too lean. Back out (counter clockwise) the LS screw a quarter turn or less. Repeat until saw revs immediately. Adjust Idle as needed, and repeat steps 3 thru 5.
6. **TACH TUNE ASAP. HIGH RPMS SHOULD BE 13,500 OR LESS. IDLE RPM~2,500.**

Purging Instructions:

1. Drain fuel tank.
2. Run saw until it stops.
3. Attempt restarting with choke on until saw fails to detonate.
4. Remove fuel tank cap and invert saw for 5 minutes.
5. Remove spark plug
6. Pull starter cord until piston is at lowest point in cylinder
7. Spray WD-40 into cylinder and pull cord a few times
8. Replace cap and plug

Commonly replaced *STIHL* Parts	
Part Description	***STIHL***/Mfg Part #
E clip	9460 624 0801
7 tooth Rim Sprocket	0000 642 1223
Sprocket Washer	0000 958 1032
HD Air Filter	0000 120 1654
Fuel Filter/Pick-up body	0000 350 3504
Spark Plug (NGK)	BPMR 7 A
Spark Plug (Bosch)	WSR 6 F
Round File, Box of 1 Dozen	5605 773 5512
91 Driver **Full Skip Chisel Chain** 3/8" Pitch, .050" gauge	33RSF (specify # of drivers w/ this part #)
28" bar Rollomatic ES Widetip **91 drivers 3/8" pitch, .050" gauge**	3003 000 9638

STIHL **Bars**	
3/8" Pitch .050 Gauge	
Bar Length	**# of Drivers**
25"	84
28"	91
32"	105
36"	114

TACH RPM GUIDE		
Model	**Idle**	**High**
Stihl		
MS360	2800	13500
MS440	2500	13500
MS460	2500	13500
MS660	2500	13500
Husky		
372 XP	2700	13500
385 XP	2700	12500
395 XP	2500	12000

1 CUP =	8 ounces
1 PINT =	2 Cups 16 Ounces
1 QUART =	4 Cups 2 Pints 32 Ounces .946 liters
1 GALLON =	4 Quarts 128 Ounces 3.785 liters 8.33 lbs

2-CYCLE MIX QUANTITIES (Ounces)					
	Gasoline Quantity				
Mix Ratio	**.5 gal**	**1.0 gal**	**2.0 gal**	**2.5 gal**	**5 gal**
16 : 1	4.0	8.0	16.0	20.0	40.0
24 : 1	2.7	5.4	10.7	13.4	27.0
32 : 1	2.0	4.0	8.0	10.0	20.0
40 : 1	1.6	3.2	6.4	8.0	16.0
50 : 1	1.3	2.6	5.2	6.4	12.8

MIXING GUIDE: 3:1 SLASH MIX- 5 GALLONS		
# of cans	**3 Parts Diesel** Stop fuel pump@__ gal:	**1 Part Gasoline** Stop fuel pump@__ gal:
1	**3.75**	**1.25**
2	**7.5**	**2.50**
3	**11.25**	**3.75**
4	**15.00**	**5.00**
5	**18.75**	**6.25**
6	**22.50**	**7.50**
7	**26.25**	**8.75**
8	**30.00**	**10.00**

PORTABLE PUMP OPERATING INSTRUCTIONS

FUEL

- Use **24:1** mix (that's 5 gal. gas / 27 oz. oil) for 2 **stroke**
- **Some new "mini pumps" are 4 stroke engines which take straight gas!! Double check fuel requirements!!**
- Connect fuel can line to tank with quick connect. Loosen lid on tank for venting.

Fuel Consumption:

- Mark III, 5 gal/ 3 hours
- Shindaiwa 5 gal/ 10 hours

CAUTIONS:

1. Do not run engine at full speed until it is thoroughly warmed up (1 minute).
2. Do not run engine with pump disconnected
3. Do not run pump dry.
4. Do not use suction hose without foot valve strainer
5. Remove and drain pump after final use, and at night if temperatures below freezing.

SETTING UP AND STARTING MARK III AND MARK 26 PUMPS

1. Connect fuel line to fuel can and pump as specified above.
2. Connect suction hose to the pump. Be sure to connect the foot valve to the male end of the suction hose. Make sure that the rubber gasket or washer is in place before attaching the female end to the pump. **Tighten firmly with a spanner wrench**. Put the foot valve inside the canvas bucket in the pump kit, and/or use rope or a float to the strainer to keep it from being too close to the water surface or resting on the bottom in the mud.
3. Attach wye valve to discharge side of pump. Hand-tighten only. Twist priming pump onto one leg of the wye and hose on the other. Close valve to the hose, leave primer valve open. Stroke primer till water squirts out the small holes, or until resistance is too great to keep at it. After priming, close valve to primer and open valve to hose.
4. Pull the decompression switch out until it comes to a "click" stop. (New pumps don't have decompression switches).
5. Put the choke on START, if the engine is cold.
6. Move throttle to "START AND WARM UP" position.
7. Give starter rope several quick, steady pulls until engine starts or pops. Turn choke off immediately after engine makes any noise to prevent flooding on the next pull.
8. Put choke on RUN and pull engine over until it starts (usually 1 to 3 pulls).
9. Push decompression switch fully in as soon as engine starts.
10. Allow engine to warm up fully (hot to the touch) before using full throttle.

If the pump shuts down automatically, you may need to **reset the automatic cutout**

Do this by pushing in on the reset rod (yellow circular wire located below stop switch)

STOPPING A MARK III OR MARK 26 PUMP

1. Move throttle lever to "stop" position.
2. Let pump run for about two minutes in this position.
3. Press and hold stop switch until engine is fully stopped.

ORDERING PUMPS:

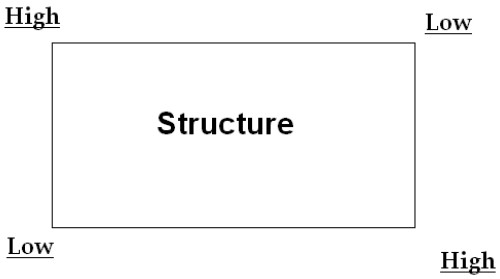
- Order two pump kits (NFES 0870) (one is probably short something you really need).
- Hose and appliances: Figure 100 ft. 1" laterals for every 200 ft. 1 ½" trunk line.
- Remember: Gated "Wye's", nozzles, hose clamps, reducers, etc.

STRUCTURE PROTECTION TIPS

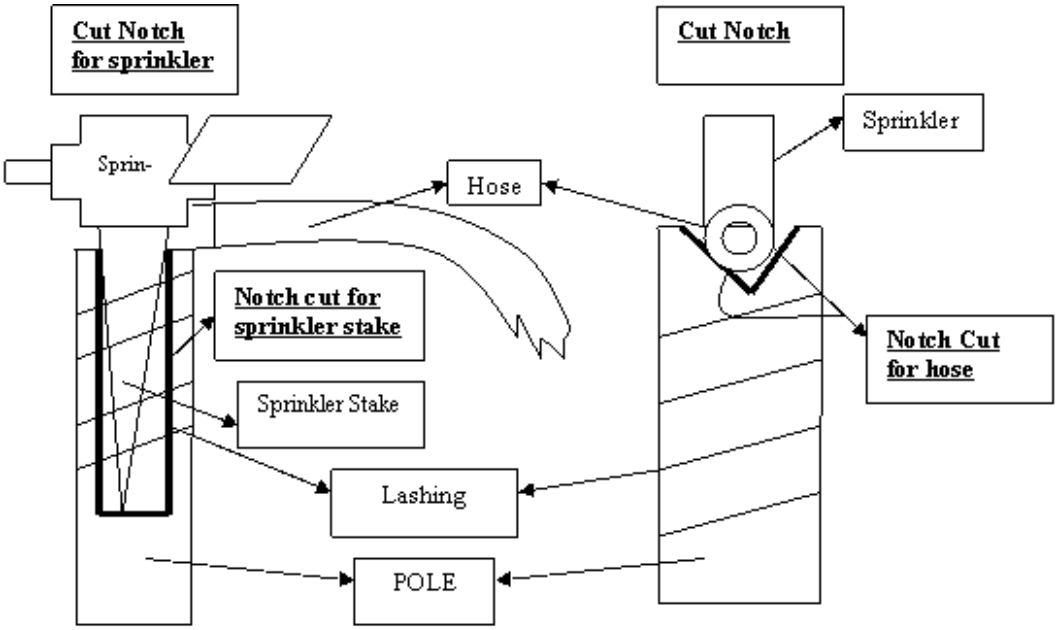
From the Alaska Smokejumper Operations Guide

1. Identify fire hazards that need to be mitigated to protect cabin
   a) Is the roof clear?
   b) Are the eaves clear?
   c) Are there building materials or fire wood stacked against the cabin?
   d) Are there trees, snags, or other vegetation that pose a direct hazard to the cabin?

2. Sprinkler system set up tips
   a) Sprinkler coverage should wet all surfaces of the structure.
   b) Sprinklers at the structure corners provide the best coverage
   c) Vary heights to provide the best coverage.
   d) Set two sprinklers at opposite corners above the roof line and the other two below the roof line.
   e) Adjust sprinklers for long range spray or short range mist.



3. Sprinkler head attachment methods.
   a) Set sprinkler heads on poles, tripods, or stands to get them above ground/cabin



Saw cuts for sprinkler attachment - *Notches prevent sprinklers from rotating when hose is charged*

4. Pumps
   a) Shindaiwa type pumps work well close to water sources
   b) Use 5 gal can and fuel line attachment in Sprinkler Kit for Shindaiwa
   c) Mark III type pumps work well when the structure is far from, or high above the water source.

5. Misc.
   a) Use extra sprinklers on wood piles or surrounding fuels
   b) **Make sure your hose lay is protected**
   c) Take the extra step to prevent water from entering the structure

BASIC CABIN PROTECTION ORDER

- 1 pump kit (#0870)
- 1 sprinkler kit (either #0920or #1048)
- 700' of 1" hose (#7273)
- 10 gallon premix (#9027)

SPRINKLER KIT CONTENTS

Cache Item: NFES 0920

Quantity	Cache Item	Description
8 ea	8621	Adapters, ½" Riser Extension
1 ea	2210	Cap, tee, w/ chain
1 ea	0385	Carton, 7 ¼ x 9 ¼ x 26
8 ea	8609	Coupling, ½"
16 ea	8606	Extensions, 18"
1 ea	0321	Hammer, claw
8 ea	0538	Pin, panel, hold down, 8"
1 hk	1041	Rope, nylon ¼", 100ft
8 ea	8605	Sprinklers
16 ea	0825	Stakes, tent, metal
8 ea	0731	Tee
8 ea	8607	U-bolts 1 ½"
8 ea	8608	Valve, Shutoff ½"
1 ea	0332	Wrench, adjustable, 6"

A more comprehensive kit may also be available from the Great Basin Cache (NFES 1048)

WRAPPING STRUCTURES – TIPS & CONSIDERATIONS

Structure wrap usually comes in 5' x 150' rolls (750 ft^2). Sheets of 10' x 50' are also available (500 ft^2).

Suggested order list:

- Ladders (min. 2) tall enough to reach roof peak
- Staplers and staples (order extra)
- Scissors
- Needle-nose pliers
- Sharpies/Permanent markers
- 3" Aluminum tape (avail in rolls of 360')

Things to think about:

- Take some time to plan.
- Start from the bottom of the building so your seams don't catch embers.
- Consider likely wind/fire-front direction when deciding how to overlap vertical seams.
- Using aluminum tape on seams should reduce the number of staples needed.
- Draw windows on outside of wrap to prevent breaking them in the process of wrapping & unwrapping.
- Can you safely work on the roof (if necessary)? Will it support your weight? Are there other options?
- Will you still need access to the inside of the building?
- Consider the unwrapping stage when deciding how many staples to use.

BENDIX KING DPHX PROGRAMMING AND CLONING INSTRUCTIONS

The instructions below are for analog narrowband frequencies. If you need to program digital frequencies, See the* **Digital Programming** *section below.

Use caution when field programming any radio. These instructions are designed for radio users with field programming experience. If you are unfamiliar with these procedures, seek out someone who is.

1. Using a programming plug, hold red plug button then Function [FCN] key until display shows *"-- -- -- ID"*
2. Enter Password (usually 000000), then press the Enter [ENT] key
3. Display will read *"CH 00".* Select a channel by entering the channel you want (1-16) then press the [FCN]key
4. Display will show "RX" receive frequency. To change, press [CLR], then enter desired frequency (the decimal will insert automatically). ***THEN PRESS [ENT]***.
5. Display will show *"MODE--A"*.***** DO NOT CHANGE. Press [FCN]
6. Display will show RX CG, the Code Guard or Tone. To change, press [CLR], enter in desired 4 digits (the decimal will insert automatically), ***THEN PRESS [ENT]***. To skip press [FCN].
7. Display will show *"NAC0000".** DO NOT CHANGE-Press [FCN] to skip.
8. Display will show *"SQL—NRM"*.***** DO NOT CHANGE- Press [FCN] to skip.
9. Display will show "TX" transmit frequency. To change, press [CLR], then enter desired frequency (the decimal will insert automatically) ***THEN PRESS [ENT]***.
10. Display will show *"MODE--A"* DO NOT CHANGE. Press [FCN] to skip.
11. Display will show TX CG, the Code Guard or Tone. To change, press [CLR], enter in desired 4 digits (the decimal will insert automatically)***THEN PRESS [ENT]***. To skip press[FCN].
12. Display will show *"NAC0000".** DO NOT CHANGE. Press [FCN] to skip.
13. Display will show *"TG00001".** DO NOT CHANGE. Press [FCN] to skip.
14. Display will show channel label. See page 9 below for label editing instructions. To skip press [FCN]
15. Display will read *"CH XX".* Select next channel (press [PRI] for next channel) to program and repeat steps 1-14.

***=DIGITAL FUNCTIONS**

CLONING

1. Obtain programmed Master radio.
2. Turn on Master and Slave (your) radios and attach cloning cable between radios. Make sure all scan and priority switches are OFF for both radios.
3. Select desired group to program in Slave radio
4. Access Programming mode of MASTER radio. (see above)
5. With Master radio display reading *"CH 00",* press the * key on the Master radio
6. "PROG" will appear in screen and flash.
7. Press the Function [FCN] key and "PROG" will appear without flashing as the slave radio is programmed (Slave radio's screen will flash VH-1)
8. Turn off slave, and connect and program the next slave by pressing the [FCN] key once again.

If display reads "FAIL" - an error has occurred. Seek Help.

NOTES:

- **If you want to change a frequency from Narrowband to Wide band, here's what you do:**
  1. In step 4 above, after you enter in a channel number, *15* for example, you may see *15N.* The *N* means the frequency is Narrowband.
  2. Press the # key. You should see the *N* disappear, and now the channel is Wideband
- If you have trouble keying in a tone or changing groups, your keypad may be locked. Look at your screen, and if it says "*LOCKED"* then press and hold the [FCN] key until you see "*UNLOCKED."*

BENDIX KING - "ZERO CODES"

The "Zero Codes" control numerous features of your BK radio. USE CAUTION WHEN CHANGING.

- Zero Codes are specific to each group.
- Common settings are indicated with **yellow highlights** below.
- In the table below, a function is enabled if a particular number is **Grey**.
- In your radio, a function is enabled if the number is flashing. For example, to enable DTMF encoder, the number 5 must be flashing in the Group 2 functions. In the chart, you'll see that the number **5** is grey next to the DTMF
- To change a number from flashing to solid (ie disable a function), simply touch the number on the keypad, ***THEN PRESS [ENT]***. The opposite will also work: to enable a function, touch the number on the keypad, ***THEN PRESS [ENT]***.
- To change the "*LITE*" settings (BACKLIGHT OPERATION) touch the [PRI] button to scroll thru your options, ***THEN PRESS [ENT]***.

COMMON SETTINGS	
GROUP FUNCTION	FLASHING (ENABLED)
1	**2,3**
2	**1,3,5**
3	**5**

Grey numbers = Flashing numbers= Enabled Function
Yellow numbers=Flashing numbers=Common Settings

Group One Functions						
Battery Saver Off *(If 1 is flashing, Battery Saver is OFF!!)*	**1**	1	2	3	4	5
Group Scan List	**1**	1	2	3	4	5
Transmit on PRI 1 (old PRI Mode C)	**1**	1	2	3	4	5
Priority Key Lockout	**1**	1	2	3	4	5
Scan List Lockout	**1**	1	2	3	4	5
Group Two Functions						
User Code Guard Enabled	**2**	1	2	3	4	5
Busy Channel Indicator enabled	**2**	1	2	3	4	5
Busy Channel Lockout enabled (rarely enabled)	**2**	1	2	3	4	5
Busy Channel Override enabled (rarely enabled)	**2**	1	2	3	4	5
ANI enabled (rarely enabled)	**2**	1	2	3	4	5
Manual DTMF Encoder enabled	**2**	1	2	3	4	5
Group Three Functions						
Light on Display Change	**3**	1	2	3	4	5
Light on Key Press	**3**	1	2	3	4	5
Alpha-numeric Mode enabled	**3**	1	2	3	4	5
Back Light Duration CHOOSE LITE OFF!!						
Group Label **(SEE BELOW)**						

National Standard Tones / NACs			
Std Tone #	**Analog Freq**	**DEC NAC**	**HEX NAC**
1	110.9	1109	455
2	123.0	1230	4CE
3	131.8	1318	526
4	136.5	1365	555
5	146.2	1462	5B6
6	156.7	1567	61F
7	167.9	1679	68F
8	103.5	1035	40B
9	100.0	1000	3E8
10	107.2	1072	430
11	114.8	1148	47C
12	127.3	1273	4F9
13	141.3	1413	585
14	151.4	1514	5EA
15	162.2	1622	656
16	192.8	1928	788

NOAA WX Freqs
RX 162.400
RX 162.425
RX 162.450
RX 162.475
RX 162.500
RX 162.525
RX 162.550

LABEL EDITING

Channel and Group Labels

1. To enter a new label, press the [**FCN**] key. The display becomes blank.
2. Press the [**PRI**] key repeatedly to cycle through characters 0-9, A-Z, -, *, $, /, +, %, \, _, <, >, h, blank, then back to the start again. The characters appear in position eight. (if you pass the desired character, press the [**PRI**] key repeatedly until you reach that character again).
3. Press the [**FCN**] key to shift the display left by one position, leaving position eight blank.
4. Press the [**PRI**] key repeatedly to enter the next character, or press the [**FCN**] key a second time to enter a blank space.
5. Press number keys to enter 0-9 in positions one through seven. The digits start in position seven, then move left.
6. Press the [**#**] key to toggle a decimal on or off to the right of the character in position seven. The decimal moves left with the number in position seven as new numbers are entered.
7. To abandon changes, press the [**CLR**] key, restoring the original label.
8. Press the [**ENT**] key to store changes and go back to the starting point.

DIGITAL PROGRAMMING

In order to use your DPH as a digital radio, there are several things that you need in order for it to work.

MODE: Must Be **D** (Digital) or **M** (Mixed)
NAC=Network Access Code: Essentially a digital "tone." This code will be provided for you, and it is required for digital freqs to work. The code may be either HEX or DECIMAL. MAKE SURE YOU KNOW WHICH ONE: Hand programming requires Decimal inputs.
SQ OP: don't change from default of "Normal"
TG=Talk Group ID: provided for you by management unit -usually talk group 1.

Things to remember:

- DPH radios can be set up with digital and analog frequencies in a single group.
- When transmitting on a digital frequency, key your mic and wait one full second before speaking.
- Digital repeaters may not be set up with a transmission "tail" or "kick-back". An actual voice transmission may be needed to verify contact with the repeater.
- If you know you'll be using digital frequencies, plan ahead- you may have most success programming your radios with the laptop and the BK software.
- You can clone digital frequencies between DPH radios, just like analog frequencies.

NACS
F7E is what you program in if you want to listen in. F7E will listen to any digital signal
F7e is hexadecimal= 3966 is decimal (Hand Programming Mode Requires Decimal)
F7e is a receive nac only
Convert hexadecimal to decimal and vice-versa with the Microsoft calculator in Scientific Mode.

IRIDIUM SATELLITE PHONE PROCEDURES

Adapted from AFS Handy Dandy Field Guide

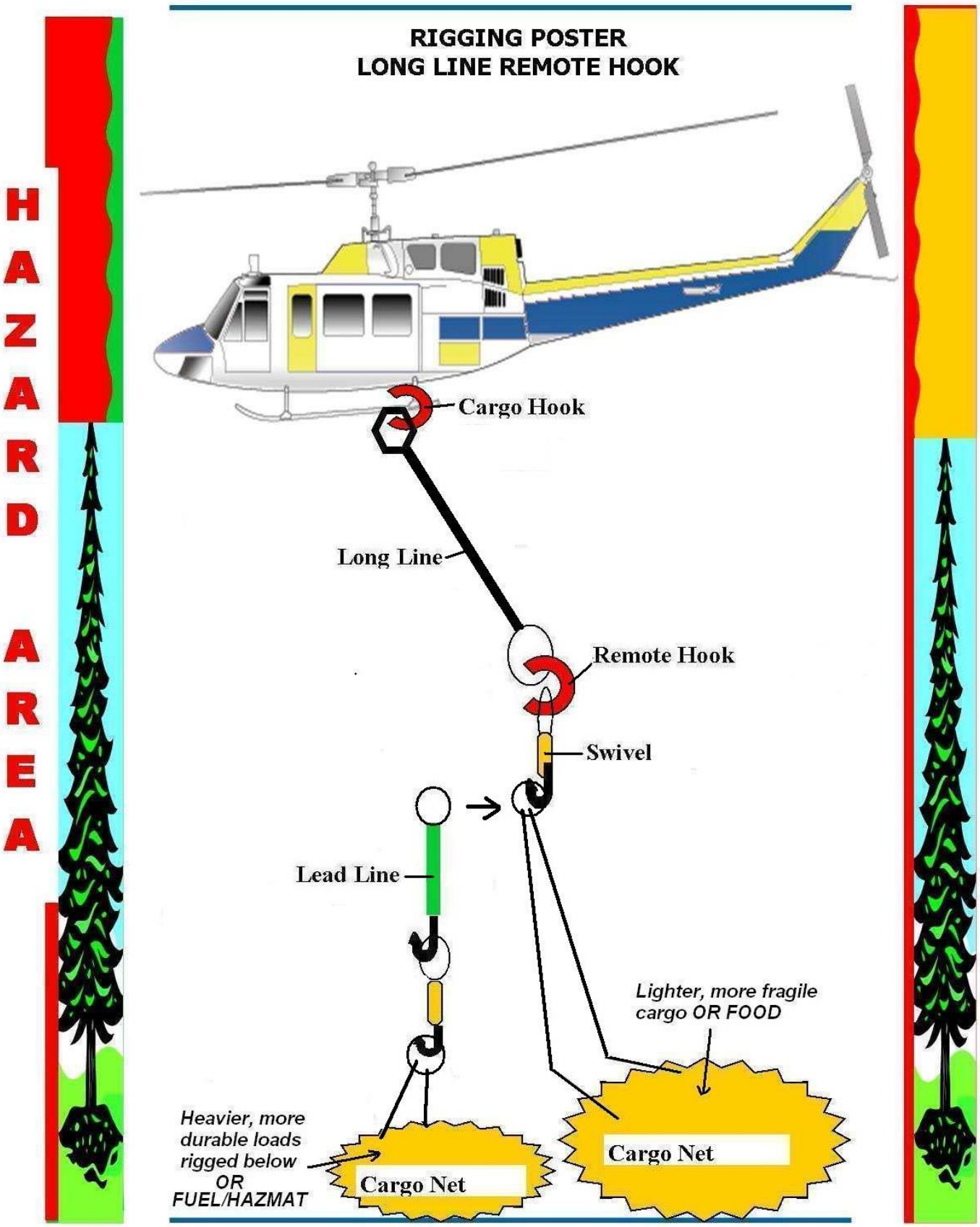
1. Ensure SIM card is inserted and battery is charged
2. Ensure antenna is seated firmly against body of phone. Swing antenna up to click stop and extend antenna up to full length
3. Press power button (red circle) on lower left of keyboard
4. Some phones require a PIN. Default PIN is usually 1111. Be sure to check your phone prior to travel.
5. Once the phone displays "Registered" and adequate signal strength is attained (usually 3-4 bars), you should be able to send/receive calls.
6. All calls are initiated with the access code "00" followed by country code and full phone number. For US calls, country code is "1". See **Dialing Procedures** below.
7. Antenna has click stops for maintaining vertical position when using right or left handed.
8. An audible tone is heard indicating the system is connecting the call. When connected, you will hear normal ring sounds. Remind other callers that the satellite system has a slight delay (much like international calling) transmitting audio.
9. The arrow buttons below the display screen allow you to scroll through the various menu options.
10. If all else fails, read the manual!

DIALING PROCEDURES

To call from ISU to Landline/mobile device: dial 001 then phone number
(ex. 001-208-387-5512)

To call from landline/mobile device to ISU: dial 011 then Iridium phone number
(ex. 011-8816-314-41187)

To call from ISU to ISU: dial 00 then Iridium phone number
(ex. 00-8816-314-41187)



Ensure adequate long-lines by providing helibase with accurate tree heights!

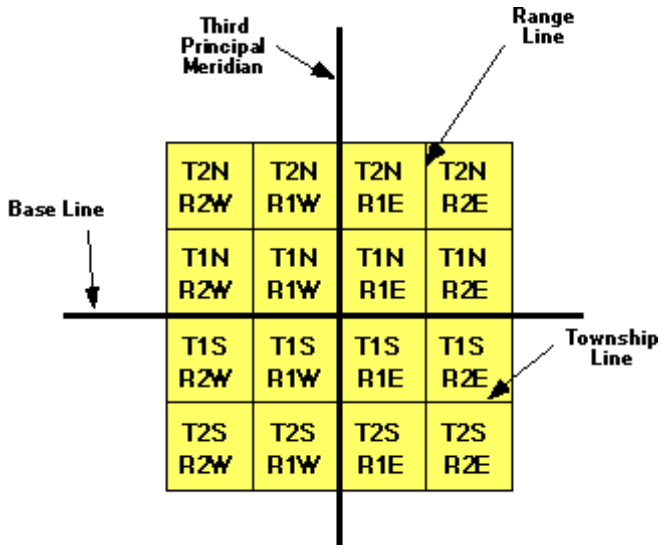
TOWNSHIP/RANGE SYSTEM OF LAND MEASURE

Township Lines run EAST to WEST six miles apart
Range Lines run NORTH to SOUTH six miles apart

Within each township are 36 sections, each one mile square. Each section contains 640 acres.

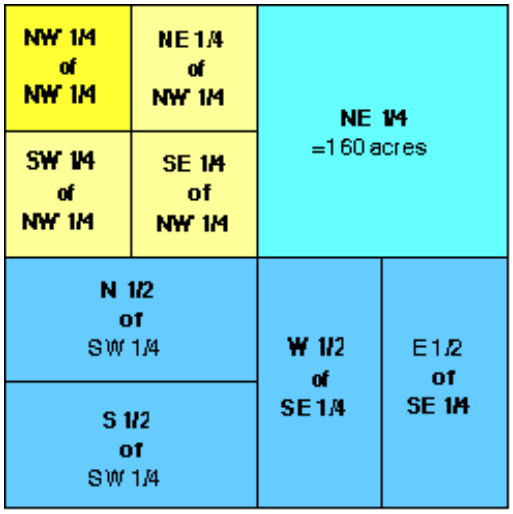
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Section Numbers in a Typical Township



Within each section, the land is referred to as half and quarter sections. A one-sixteenth division is called a quarter of a quarter, as in the NW1/4 of the NW1/4.

The descriptions are read from the smallest division to the largest. ↓↓



CONVERTING LATITUDE LONGITUDE

Latitude and Longitude may be shown in three different formats:

FORMAT	WHAT IT LOOKS LIKE	HOW YOU SAY IT (Radio Etiquette)
A. Degrees Decimal Minutes (*Aircraft*)	48° 36.12’ 114° 08.12’	“Four-eight degrees, three six point one two minutes.”
B. Degrees Minutes Seconds (*many maps*)	48° 36’ 12” 114° 08’ 12”	“Four-eight degrees, three six minutes, and one two seconds.”
C. Degrees Decimal Degree (*seldom used*)	48.3612° 114.0812°	“Four-eight point three six one two degrees.”

Most handheld GPS units can be set up to display any format
<u>If you do not have that option, do this:</u>

To convert **Degrees Minutes <u>Seconds</u>** to **Degrees Decimal Minutes**, divide seconds by 60.

- Example: 48° 20’ <u>30”</u> ⇨ **(**<u>30”</u>)/60 = .5’ ⇨ 48° 20.5’

To convert **Degrees <u>Decimal Minutes</u>** to **Degrees Minutes Seconds**, multiply hundredths (i.e. .12) by 60.

- Example: 48° 20.5’ ⇨ .5’ x 60 = 30” ⇨ 48° 20’ 30”

- **One degree of latitude or longitude = 60 minutes (60’)**
- **One minute of latitude or longitude = 60 seconds (60”)**
- **A 7.5 minute quad covers 7.5 minutes of longitude and 7.5 minutes of latitude**

Aviation
Datum=WGS 84
Units: Decimal/Minutes
(ddd°mm.mmm’)

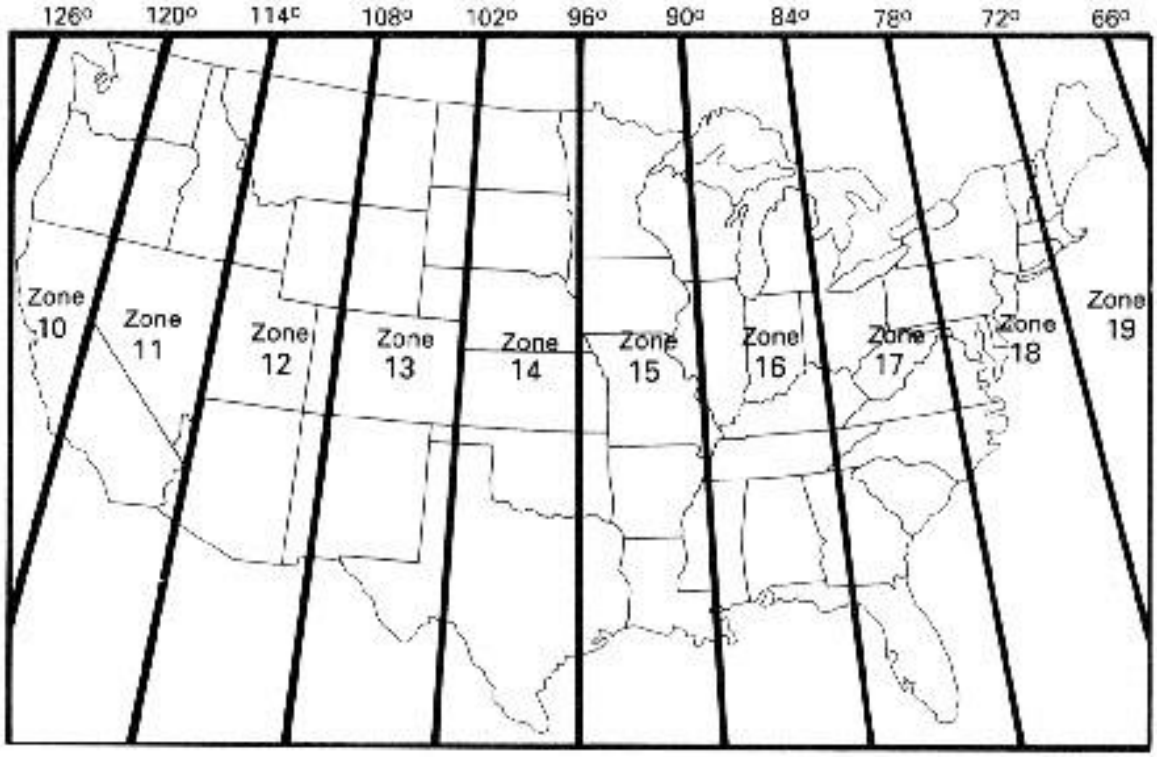
CONVERSION CHARTS

UNITS OF MEASURE	
1 inch	2.54 centimeters
1 foot	.3048 meters
1 Meter	3.28 feet 39.37 inches
1 Kilometer	.623 miles 1,093.6 yards 3280.8ft
1 Chain	66 feet 20.11 meters
1 Acre	10 square chains 208.7 x 208.7 ft 43,560 sq. feet .405 hectares
1 Mile	5280 feet 80 chains 1.6 kilometers
Township	36 square miles
Section	1 square mile 640 acres

1 CUP	8 ounces
1 PINT	2 Cups 16 Ounces
1 QUART	4 Cups 2 Pints 32 Ounces .946 liters
1 GALLON	4 Quarts 128 Ounces 3.785 liters 8.33 lbs

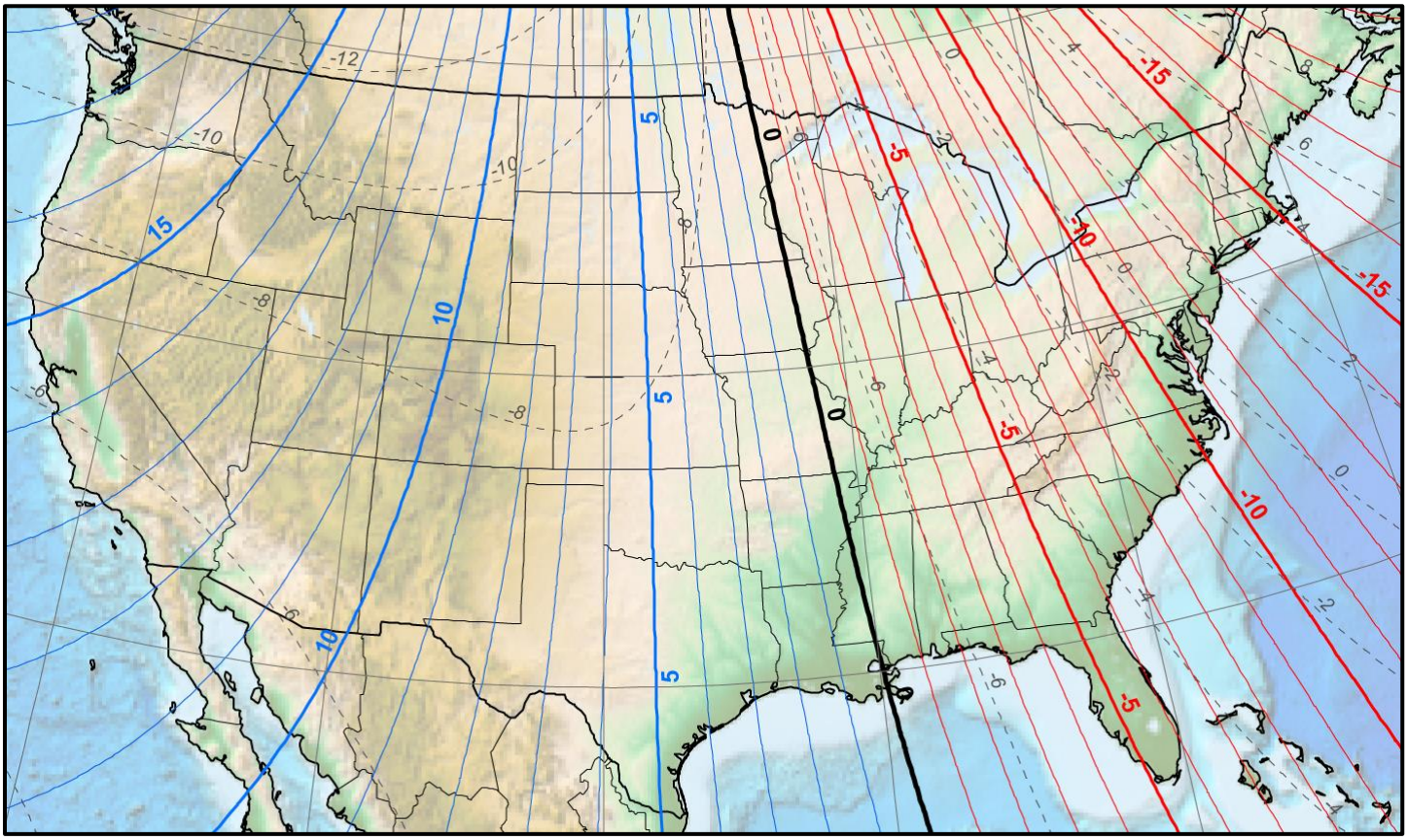
MAP SCALE CONVERSION		
MAP SCALE	**1 inch on the map=**	**1 Mile on the Earth= ___inches on map**
1:5,000	416.67 feet 127.00 meters	12.67
1:10,000	833.33 feet 254.00 meters	6.34
1:12,500	1,041.66 feet 317.00 meters	5.07
1:20,000	1,666.70 feet 508.00 meters	3.17
1:24,000 7.5" Quad	2,000 feet 609.6 meters	2.64
1:25,000 7.5" Quad	2,083.30 feet 635.00 meters	2.53
1:50,000	4,166.70 feet 1,270.0 meters	1.27
1:62,500 15" Quad	.986 Miles 5206.1 feet 1586.8 meters	1.014
1:63,360 Alaska Maps	5,280.00 feet 1,609.3 meters	1
1:100,000	8,333.30 feet 2,540.0 meters	.634
1:250,000	20,833.00 feet 6,350.0 meters	.253
1:500,000	41,667.00 feet 12,700.0 meters	.127

USA - UTM ZONES



Use Longitude to aid in determining UTM zone

MAGNETIC DECLINATION FOR THE U.S. 2010



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GARMIN GPS CHECKLIST

Pre-field:

- Make sure your batteries have enough charge to complete the GPS mission; it's a good idea to have an extra set. Make sure your GPS is set to the battery type setting that matches what you are using- alkaline, NiCad, or NiMH.
- Load GPS with background maps of the area you'll be working in using MapSource.
- Clear any waypoints and tracklogs you don't need from your device's memory.
- Set the **coordinate system** to UTM or Lat/Long.
- Set the **position format** to the format you want to use, Dd.dd°, Dd°mm.mm', or Dd°mm'ss.s".
- Choose the **datum** you will be using.

** If you will be using a map, you will want the datum, coordinate system and position format to match the map you will be using. If you will be giving coordinates to your local dispatch, it is a good idea to check with them regarding these settings, some dispatch offices have standards they prefer for these settings.*

In the field:

- If you have moved a long distance from where you were when you last turned your GPS on, be prepared for it to take a few extra minutes for your GPS to acquire satellites.
- Hold your GPS antenna away from your body with the antenna up.
- Wait until you have 3D positioning to collect data.
- **Waypoints:**
    1) When creating waypoints, average your position. This will improve the accuracy of your point. Give waypoints meaningful names to help you remember what they are and in case you need to have someone else download your data.
    2) In addition, to being able to mark your current location most GPS units will also allow you to enter coordinates to create a waypoint or create a waypoint by pointing to a location on a map.
    3) When you create a waypoint, your GPS will use the datum you have your unit set to, to store the coordinates accurately. Once you save a waypoint you can then view it in different datums if need be. Conversely, if you entered coordinates from a paper map that you thought used NAD 27, but later discovered they were really NAD 83, you cannot simply change the settings in your unit- you will need to re-enter the coordinates.
- **Tracklogs:**
    1) Turn off "Wrap when full", some devices may say "Stop when full".
    2) Set record method to "Auto". (If this is not an option, time seems to produce smoother lines, but be sure to increase the time interval accordingly for larger fires.)
    3) Set interval to "Most Often". (If this is not an option, try using 1 second for fires less than an acre. Increase the time as needed for larger fires.)
    4) **Before creating a tracklog be sure your active tracklog is clear!** (If you don't, your GPS will connect your new track to the end of the last track you collected- even if one is in Alaska and the other is in Florida. Among other things, this will cause problems when you try to view the acreage of your fire perimeter.)
    5) If you need to deviate from your track, be sure to stop/pause your track log. When you return to where you left off, restart your track log
    6) Save your track log when you are finished. Give it a descriptive name such as "06182011Perimeter", in case someone else will be downloading and looking at the data. It is good to include date, time, and what the tracklog represents to eliminate confusion.
    7) Upon saving your track log, most GPS devices will allow you to see your acreage if your track log was a polygon. Be aware that if you don't walk a complete polygon, but rather a semi-circle, some GPS units will try to make it into a polygon when it saves it by adding a straight line

between your starting and ending points. Your GPS will show you an acreage, but of course it won't be accurate.

8) If you need to record another track log, don't forget to clear your active track log.

* Clarify the datum and coordinate system you are using if there is any doubt. If reading coordinates over the radio, be clear about the format you are using. For example, N 37° 40' 39", would be read: "North, three seven *degrees*, four zero *minutes*, three nine *seconds*." W 113° 03.71' would be read: "West one one three *degrees*, three, decimal seven one *minutes*."

DNR GPS (Garmin) QUICK DOWNLOAD

1. Turn GPS on => Connect GPS to your computer => Open DNR GPS.
2. Current versions of DNR GPS should auto connect to GPS. If it still fails to recognize the GPS unit, check to be sure that it is turned on.
3. Ensure DNR GPS is set to correct projection. Select **File =>Set Projection** to change. Select **File =>File Properties >Projection** once DNR GPS has connected to your GPS to get your current Projection.
4. Select **Track=>Download** for Track data (fire perim) or **Waypoint=>Download** for points. If you have multiple tracklogs or waypoints on your GPS highlight the ones you want to save by clicking on the pt.# (leftmost column) and using the shift key.
5. After data loads, save your data by selecting **File =>Save to =>File…** Save data to correct location: C:\2015Incidents\FireName\ArcGIS\incident_data where "Fire Name" is your current fire.
6. First save your file as a comma delimited text file (*.txt), then as an **ESRI Shapefile** (*.shp). When saving a tracklog, you will be asked to define the output type, choose **line** (easiest to edit). Change file types with the Save as type at bottom of the Save as window:

When saving a file (.txt or .shp) use the following naming convention (http://gis.nwcg.gov/gstop_sop.html)

yyyymmdd_time_incidentname_datatype_source_featuretype_coordinatesystemdatum

Ex: 20100618_1300_monster_perimeter_ZionWFM_pts_utm12n83.txt/shp

Datatype= what was mapped (perimeter, dozer line, MAP, etc.); Source= use crew name (& your name); Featuretype= use pts for waypoints, ln for line and pl for polygon.

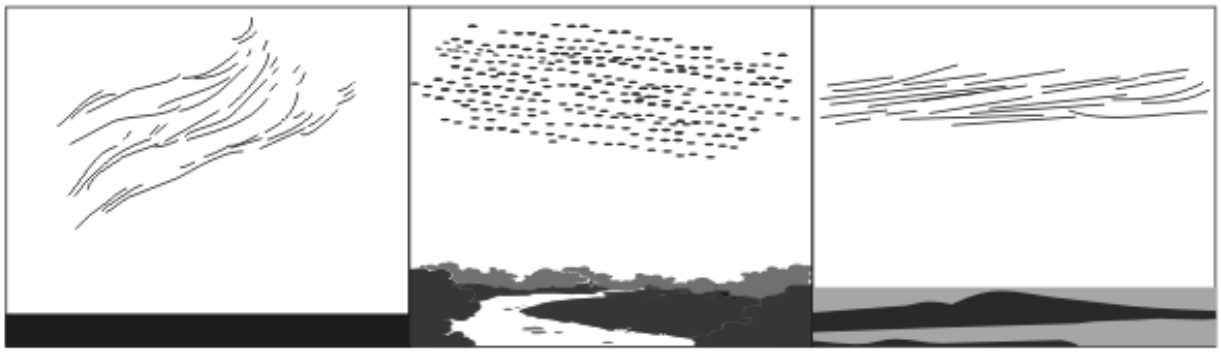
7. If you plan to hand off your data right away, do not drag and drop files to a jump drive or CD. Copy and Paste or Save As to another location.

Other things to consider:

- Consult incident GIS Specialist for preferred file naming conventions.
- Organizing files: place initial downloaded files in C:\20**XX** Fires\Fire Name\ArcGIS\incident_data where "Fire Name" is your current fire and XX=year.
- If you make any changes to your data, save them in the EDITS folder,
- Moving files: Copy and Paste all files associated with a shapefile. There will be at least 3 (i.e. .shx, .dbf). Do not drag and drop files! This may permanently move files, and we need to keep a copy of everything we generate.

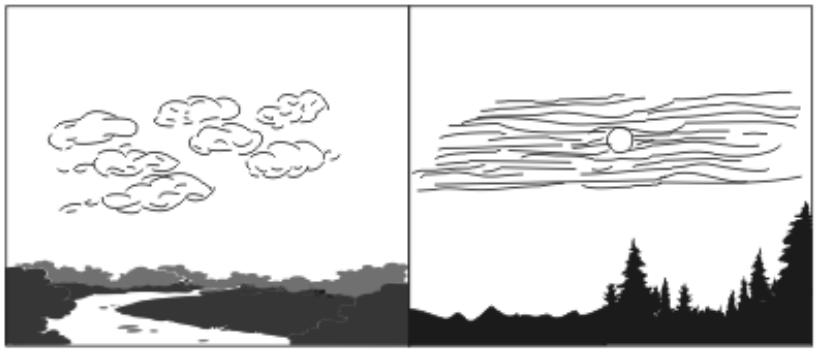
Cloud Types

High Clouds



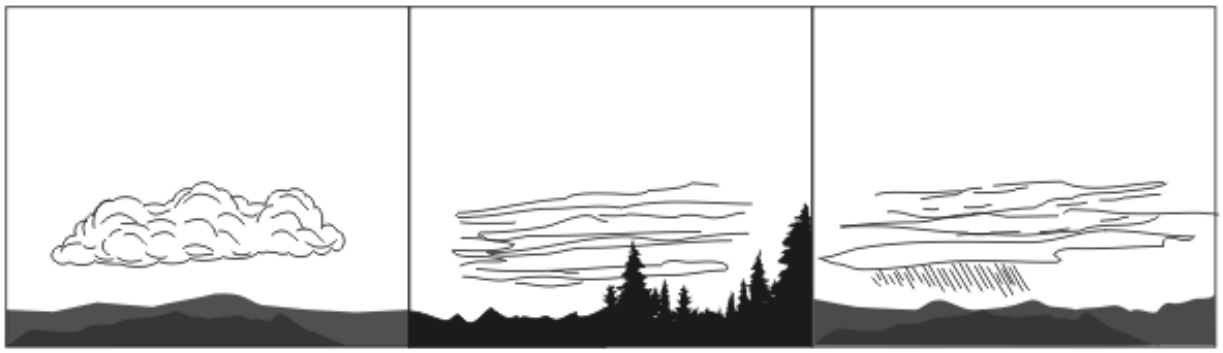
Cirrus (Ci) | Cirrocumulus (Cc) | Cirrostratus (Cs)

Middle Clouds



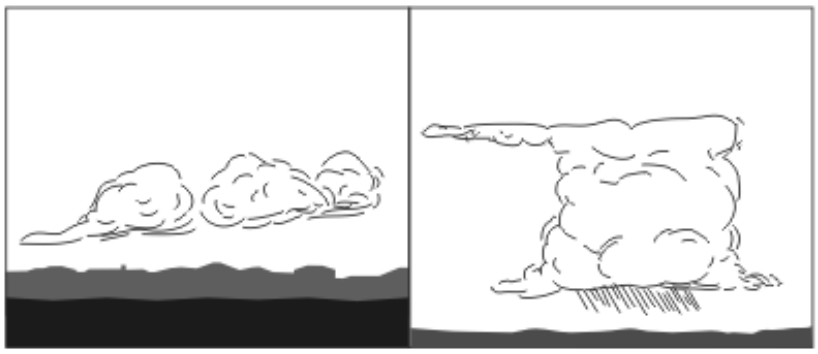
Altocumulus (Ac) | Altostratus (As)

Low Clouds

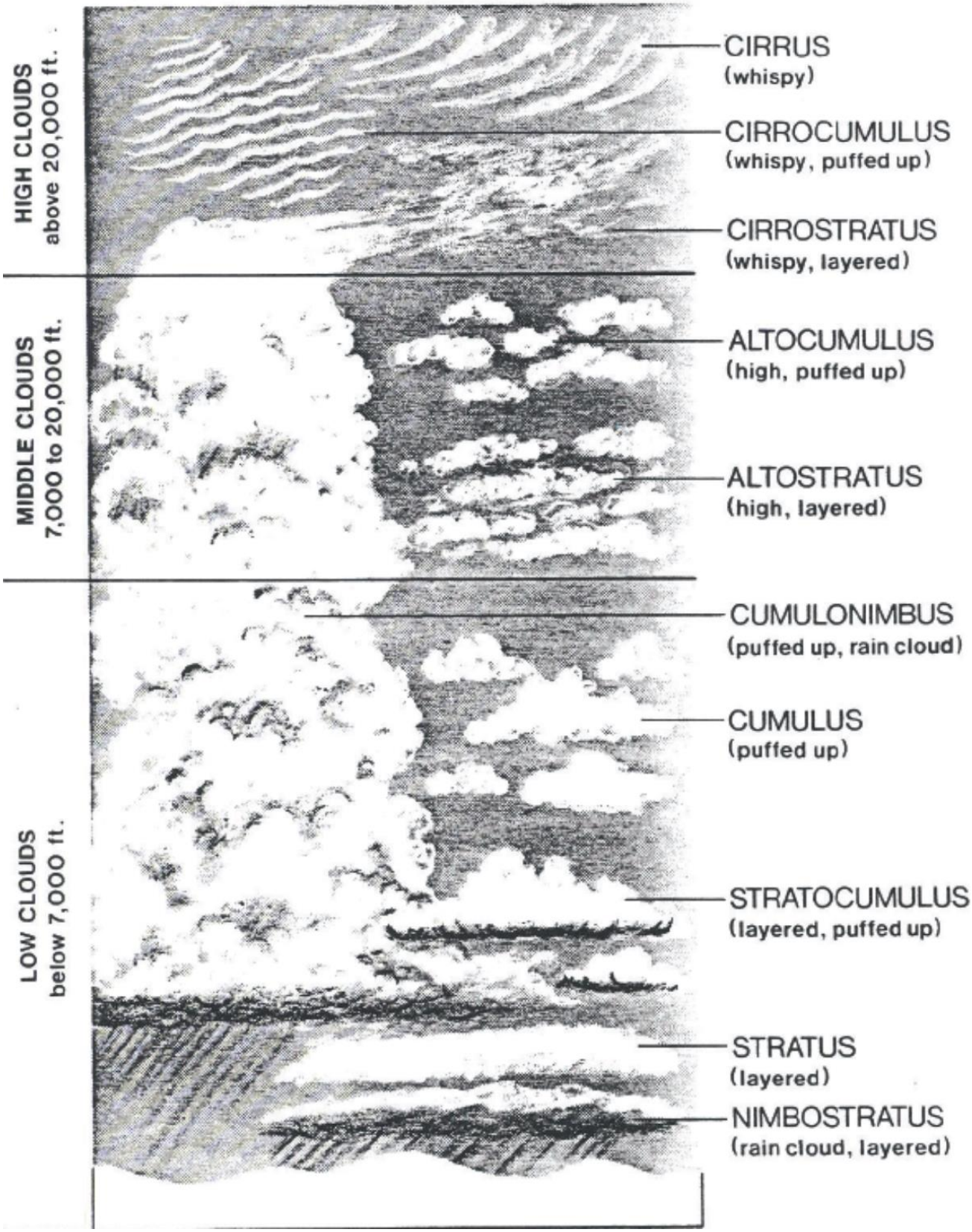


Stratocumulus (Sc) | Stratus (St) | Nimbostratus (Ns)

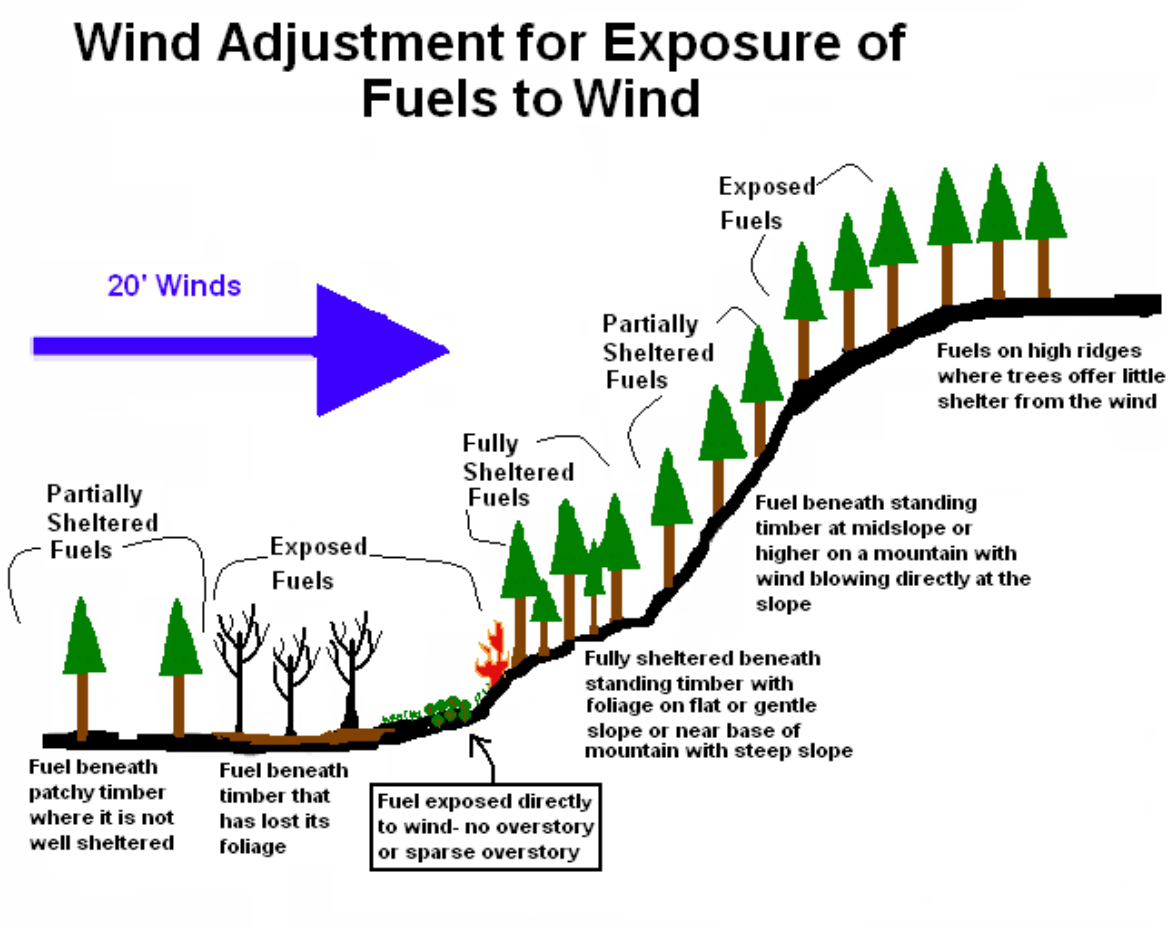
clouds of Vertical Development



Cumulus (Cu) | Cumulonimbus (Cb)



Cloud Base Height (AGL):
Temperature – Dew Point/3.5 x 1000



Fuel Exposure	Fuel Model	Adjustment Factor
Exposed Fuels Fuel exposed directly to the wind. No or sparse overstory. Fuel beneath timber that has lost its foliage overstory; fuel beneath timber near clearings or clear-cuts; fuel on high ridges where trees offer little shelter from the wind.	**4** **13** **All others***	**0.6** **0.5** **0.4**
Partially Sheltered Fuels Fuel beneath patchy timber where it is not well sheltered; fuel beneath standing timber at mid-slope or higher on a mountain with wind blowing directly at the slope	All Fuel Models	**0.3**
Fully Sheltered Fuels Fuel sheltered beneath standing timber on flat or gentle slope or near base of mountain with steep slopes	All Fuel Models	0.2 Open Stands 0.1 Dense Stands

***Fuel Models 2 and 7 are usually partially sheltered**
Fuel models 8, 9 and 10 are usually fully sheltered

RATE OF SPREAD ESTIMATOR

Spread distance (ft)				
1	3	5	10	
Time in Minutes(') and Seconds(")				ROS ch/hr
3'38"	10'55"	18'10"	36'22"	0.25
1'49"	5'27"	9'05"	18'10"	0.5
55"	2'44"	4'33"	9'05"	1
36"	1'49"	3'02"	6'04"	1.5
27"	1'22"	2'16"	4'33"	2
18"	55"	1'31"	3'02"	3
14"	41"	1'08"	2'16"	4
11"	33"	55"	1'49"	5
9"	27"	45"	1'31"	6
8"	23"	39"	1'18"	7
7"	20"	34"	1'08"	8
6"	18"	30"	1'01"	9
5"	16"	27"	55"	10
4"	11"	18"	36"	15
3"	8"	14"	27"	20
2"	7"	11"	22"	25
2"	5"	9"	18"	30
2"	5"	8"	16"	35
1"	4"	7"	14"	40
1"	3"	5"	11"	50
1	3	5	10	
Spread distance (ft)				

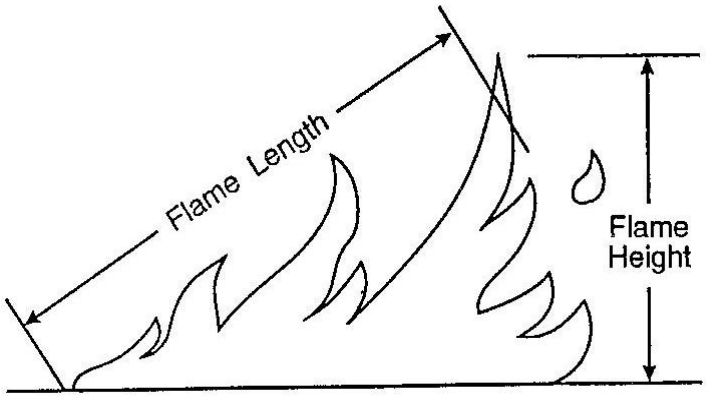
Use this chart as an aid to *estimate* rate of spread

Here's how:

1. Measure out 1, 3, 5 or 10 feet. Mark distance with two points.
2. Time fire as it spreads between your two points and record this time.
3. Using the appropriate spread distance column (1, 3, 5 or 10), place your time on the sheet between two times listed, your "bracketed" times.
4. Move to the right with the bracket times. This is your ROS range.

Time Key
1' 49" = 1 minute and 49 seconds
36" = 36 seconds

Example: Say you're monitoring a backing fire burning in light ponderosa needle cast. You measure out 3 feet, and place two stones at each of the points. You time the fire as it moves between the stones. In this case, say the fire takes 1 minute 6 seconds (1'6") to move 3 feet. Looking at the 3 column, you move down until you see the two times which bracket our time: 1'22" and 55". You then scroll right and see that the rate of spread is between 2 and 3 chains per hour.



|<--------Flame Zone Depth--------->|

FIRE BEHAVIOR TERMINOLOGY

Smoldering – no flame, barely spreading
Creeping – low flame, slow spread
Running – definite flames, rapid spread in surface fuels with well-defined head
Torching – fire runs up ladder fuels into crowns of individual trees with no crown to crown spread
Crowning – fire spreading from crown to crown, either dependent or independent of surface fire
Flame length – length from base to tip, not vertically
Rate of spread – chains per hour = feet per minute
Ground fire – fire burning in organic material below surface litter
Surface fire – fire that burns surface litter, other loose debris of the forest floor and small vegetation
Backing – fire spreading against the wind, or spreading on level or downward-sloping ground with no wind
Flanking – fire spreading perpendicular to the wind
Backfire – fire used as an indirect attack method to stop, slow or turn a wildfire
Burnout – fire set to fuels inside the control line, to strengthen line, as a part of line construction
Flare-up – any sudden acceleration of fire spread or intensification of the fire. A flare-up is of relatively short-duration and doesn't radically change existing control plans.
Spot Fire – fire outside the perimeter of the main fire started by flying, or rolling sparks or embers

SLING PSYCHROMETER USE

The following are instructions for determining wet and dry bulb temperatures using the sling psychrometer. These instructions are based on those from page 259 of the S-290 Instructors Manual. Several additional comments have been added.

1. Stand in a shaded, open area away from objects that might be struck during whirling. If in open country, use your body shade to shade the psychrometer. If possible, take your weather observations over a fuel bed that is representative of the fuels that the fire is burning in.
2. If your sling has been in your pack, you may need to hang it in a tree, in the shade, to let it adjust to the outside air temperature.
3. Face the wind to avoid influence of body heat on the thermometers.
4. Saturate the wick of the wet bulb with clean, mineral free water (distilled).
5. Ventilate the thermometers by whirling at full arms length. Your arm should be parallel to the ground. Whirl for 1 minute.
6. Note the wet bulb temperature. Whirl for anther 40 or 50 times and read again. If the wet bulb is lower than the first reading, continue to whirl and read until it will go no lower. Read and record the lowest point. If the wet bulb is not read at the lowest point, the calculated relative humidity will be too high.
7. **Read the dry bulb immediately after the lowest wet bulb reading is obtained**.
8. Determine the relative humidity from the tables.

Important Tips: Sometimes beginners do not take accurate psychrometer readings because of the following common mistakes:

1. not ventilating the psychrometer long enough to reach equilibrium;
2. not getting the wick wet enough, or letting it dry out;
3. holding it too close to the body or taking too long to read the thermometers;
4. touching the bulb ends with the hands while reading;
5. not facing into the breeze.

Rule of thumb: RH in % divided by 5 = estimate of FDFM

FUEL MOISTURE SAMPLING

General Guidelines

- Record site name, date, time, observer name, observed weather, general site description
- DO NOT collect samples if water drops or dew are present on samples
- Keep samples in a cool and dry location
- Seal containers with tape that will not leave residue

Dead Fuels

- Samples should not be attached to live trees or shrubs
- Avoid decayed samples that crumble or splinter when rubbed
- Collect samples from several different plants
- Ensure container is ¾ full or about 20 grams
- Do not collect buried samples
- Pick samples of different size within the time lag class
- Recently fallen material should be avoided
- Remove all lichen, moss, and very loose bark from sample

Duff and Soil

- Remove all soil and live tree or plant roots from sample
- Avoid any soil particles in duff samples and vice versa

Litter

- Collect only un-compacted dry litter from both sunny and shady areas

Live Fuels

- Only collect foliage (needles) and very small twigs remove flowers, seeds, nuts, or berries
- Pack containers loosely to avoid spillage but ensure container is ¾ full
- Include stems of herbaceous plants
- Replace lid on container immediately after collecting sample

Drying Samples:

-Preheat drying oven between 60°C (140°F) – 100°C (212°F). Be sure to note temp used.
-Place sample cans with closed lids on scale and record "wet" weights
-Remove lid just prior to placing in oven. If material is lost, re-weigh sample
-Dry sample for 24 hours (very wet samples 48 hours)
-Replace Lids immediately after sample is removed from oven and weigh
-Calculate fuel moisture using the following formula:

$$\frac{\text{wet weight of sample} - \text{dry weight of sample}}{\text{dry sample weight} - \text{container tare weight}} (100) = \text{percent moisture content}$$

Please see example below:

A	B	C	D	E	F
Gross Weight		Container Tare Weight	Water Weight	Dry Weight	% Moisture
Wet	Dry				
Calculation Summary					
A – B = D B – C = E (D / E) x 100 = F					

Live Fuel Moisture Estimates

Guidelines for estimating live fuel (foliage) moisture content. Live fuel moisture is required for fuel models 2,4,5,7, and 10. If data are unavailable for estimating live fuel moisture the following rough estimates can be used.

Stage of vegetative development	Moisture content
Fresh foliage, annuals developing, early in growing cycle	300%
Maturing foliage, still developing with full turgor	200%
Mature foliage, new growth complete and comparable to older perennial foliage	100%
Entering dormancy, coloration starting, some leaves may have dropped from stem	50%
Completely cured	Less than 30%, treat as a dead fuel

FUEL SIZE CLASSES – woody debris

Dead woody class			Piece diameter
			inches (cm)
DWD	FWD	1-hr	0–0.25 (0–0.6)
		10-hr	0.25–1.0 (0.6–2.5)
		100-hr	1.0–3.0 (2.5–8.0)
	CWD	1,000-hr and greater	3.0 and greater (8.0 and greater)

SCOTT AND BURGAN FUEL MODELS (2005) - "THE NEW 40"

- Determine the general fire-carrying fuel type (**grass, grass/shrub, shrub, timber/understory, timber litter, slash**).
- Determine general climate for your area (**arid, semi-arid, sub-humid, humid**). TIMBER LITTER Fuel models do not have climate groupings.
- Match **fuel model** description (fuel depth, fuel load, fuel continuity) with fuels of interest.

1. Nearly pure grass and/or forb type (Grass):

- ***Arid to semiarid climate (rainfall deficient in summer). Extinction moisture content is 15%.***

GR1-Grass is short, patchy and possibly heavily grazed. Spread rate moderate; flame length low.
GR2-Moderately coarse continuous grass, average depth about 1ft. Spread rate high; flame length moderate.
GR4-Moderately coarse continuous grass, average depth about 2ft. Spread rate very high; flame length high.
GR7-Moderately coarse continuous grass, average depth about 3ft. Spread rate very high; flame length very high.

- ***Subhumid to humid climate (rainfall adequate in all seasons). Extinction moisture content is 30 - 40 %.***

GR1-Grass is short, patchy, and possibly heavily grazed. Spread rate moderate; flame length low.
GR3-Very coarse grass, average depth about 2 ft. Spread rate high; flame length moderate.
GR5-Dense, coarse grass, average depth about 1 - 2ft. Spread rate very high; flame length high.
GR6-Dryland grass about 1 - 2 ft tall. Spread rate very high; flame length very high.
GR8-Heavy, coarse, continuous grass 3 - 5 ft tall. Spread rate very high; flame length very high.
GR9-Very heavy, coarse, continuous grass 5 - 8 ft tall. Spread rate extreme; flame length extreme.

2. Mixture of grass and shrub, up to about 50 percent shrub coverage (Grass-Shrub)

- ***Arid to semiarid climate (rainfall deficient in summer). Extinction moisture content is 15 %.***

GS1-Shrubs are about 1 ft high, low grass load. Spread rate moderate; flame length low.
GS2-Shrubs are 1 - 3 ft high, moderate grass load. Spread rate high; flame length moderate.

- ***Subhumid to humid climate (rainfall adequate in all seasons). Extinction moisture content is 30 – 40%.***

GS3-Moderate grass/shrub load, average grass/shrub depth < 2 ft. Spread rate high; flame length moderate.
GS4-Heavy grass/shrub load, depth greater than 2 ft. Spread rate high;flame length very high.

3. Shrubs cover at least 50 percent of the site; grass sparse to nonexistent (Shrub)

- ***Arid to semiarid climate (rainfall deficient in summer). Extinction moisture content is 15 %.***

SH1-Low shrub fuel load, fuelbed depth about 1 ft; some grass may be present. Spread rate very low; flame length very low.
SH2-Moderate fuel load (higher than SH1), depth about 1 ft, no grass fuel present. Spread rate low to moderate; flame length low to moderate.
SH5-Heavy shrub load, depth 4 - 6 ft. Spread rate very high; flame length very high.
SH7-Very heavy shrub load, depth 4 - 6 ft. Spread rate lower than SH5, but flame length similar. Spread rate high; flame length very high.

- ***Subhumid to humid climate (rainfall adequate in all seasons). Extinction moisture content is 30 – 40%***

SH3-Moderate shrub load, possibly with pine overstory or herbaceous fuel, fuel bed depth 2 - 3 ft. Spread rate low; flame length low.
SH4-Low to moderate shrub and litter load, possibly with pine overstory, fuel bed depth about 3 ft. Spread rate high; flame length moderate.
SH6-Dense shrubs, little or no herb fuel, depth about 2 ft. Spread rate high; flame length high.
SH8-Dense shrubs, little or no herb fuel, depth about 3 ft. Spread rates high; flame length high.
SH9-Dense, finely branched shrubs with significant fine dead fuel, about 4 - 6 ft tall; some herbaceous fuel may be present. Spread rate high, flame length very high.

4. Grass or shrubs mixed with litter from forest canopy (Timber-Understory)

- ***Semiarid to Subhumid climate. Extinction moisture content is 20 %.***

TU1-Fuelbed is low load of grass and/or shrub with litter. Spread rate low; flame length low.
TU4-Fuelbed is short conifer trees with grass or moss understory. Spread rate moderate; flame length moderate.

TU5-Fuelbed is high load conifer litter with shrub understory. Spread rate moderate; flame length moderate.

- ***Humid climate. Extinction moisture content is 30 %.***

TU2-Fuelbed is moderate litter load with shrub component. Spread rate moderate; flame length low.
TU3-Fuelbed is moderate litter load with grass and shrub components. Spread rate high; flame length moderate.

5. Dead and down woody fuel (litter) beneath a forest canopy (Timber Litter)

- ***Fuelbed is recently burned but able to carry wildland fire.***

TL1-Light to moderate load, fuels 1 - 2 in deep. Spread rate very low; flame length very low.

- ***Fuelbed composed of broadleaf (hardwood) litter.***

TL2-Low load, compact. Spread rate very low; flame length very low.
TL6-Moderate load, less compact. Spread rate moderate; flame length low.
TL9-Very high load, fluffy. Spread rate moderate; flame length moderate.

- ***Fuelbed composed of long-needle pine litter.***

TL8-Moderate load and compactness may include small amount of herbaceous load. Spread rate moderate; flame length low.

- ***Fuelbed not composed broadleaf or long-needle pine litter.***

TL4-Moderate load, includes small diameter downed logs. Spread rate low; flame length low.
TL7-Heavy load, includes larger diameter downed logs. Spread rate low; flame length low.
TL3-Moderate load conifer litter. Spread rate very low; flame length low.
TL5-High load conifer litter; light slash or mortality fuel. Spread rate low; flame length low.
TL9-Very high load broadleaf litter; heavy needle-drape in otherwise sparse shrub layer. Spread rate moderate; flame length moderate.

6. Activity fuel (Slash) or debris from wind damage.

- ***Fuelbed is activity fuel.***

SB1-Fine fuel load is 10 - 20 tons/acre, weighted toward fuels 1 - 3 in diameter class, depth is <1 ft. Spread rate moderate; flame length low.
SB2-Fine fuel load is 7 -12 tons/acre, evenly distributed across 0 - 0.25
SB3-Fine fuel load is 7 - 12 tons/acre, weighted toward 0 to 0.25 in diameter class, depth is >1 ft. Spread rate high; flame length high.

- ***Fuelbed is blowdown***

SB2-Blowdown is scattered, with many trees still standing. Spread rate moderate; flame length moderate.
SB3-Blowdown is moderate, trees compacted to near the ground. Spread rate high; flame length high.
SB4-Blowdown is total, fuel bed not compacted, foliage still attached. Spread rate very high; flame length very high.

7. Insufficient wildland fuel to carry wildland fire under any condition (Nonburnable)

NB1-Urban or suburban development; insufficient wildland fuel to carry wildland fire.
NB2-Snow/ice.
NB3-Agricultural field, maintained in nonburnable condition.
NB8-Open water.
NB9-Bare ground.

ANDERSON FUEL MODELS - "THE ORIGINAL 13"

Primary carrier of the fire is GRASS

FM1-Grass is fine structured, generally below knee level, and cured primarily. Grass is essentially continuous. Spread rate moderate; flame length low. ***Grasslands, savanna, grass tundra***

FM2-Grass is usually under an open timber or brush overstory. Litter from overstory is involved, but grass carries the fire. Expected ROS is < FM1 and intensity is < FM3. Spread rate moderate; flame length moderate. ***Open shrub land and pine stands, some pinon-juniper***

FM3-Grass is coarse structured, above knee level (average about 3ft. deep) and can be difficult to walk through. 1/3 of stand is dead or cured. Spread rate high; flame length high.

Primary Carrier of the fire is BRUSH or litter beneath the BRUSH.

FM4-Brush is head height (>6ft.), with heavy loadings of dead woody fuel. Fire may involve foliage, live and dead woody material and canopy. Spread rate very high; flame length very high. ***Mixed chapparal, high pocosins, pine barrens of New Jersey, closed jack pine stands of north central states***

FM5-Brush is about 2ft. high, with light loading of brush litter underneath. Litter may carry fire, especially at low wind speeds. Spread rate low to moderate; flame length low to moderate ***Young green stands with little or no deadwood. Laurel, vine maple, alder, manzanita***

FM6-Live fuels are absent or sparse. Brush averages 2 to 4ft. high. Brush requires moderate winds to carry fire. Spread rate high (with wind); flame length high. FM6 may not predict rate of spread accurately in mature PJ or taller oak brush. ***Chapparal, chamise, oak brush, low pocosin, Alaskan black spruce, taiga, shrub tundra, PJ at high winds (20mph at 20' level)***

FM7-Fires burn through the surface and shrub strata with equal ease and can occur at higher dead fuel moisture contents due to the flammability of live foliage and other live material. Stands of shrubs are generally between 2 and 6ft. high. Spread rate high; flame length high. ***Palmetto-gallberry understory with pine overstory, Alaskan black spruce with shrub***

Primary Carrier of the fire is LITTER beneath a TIMBER stand.

FM8-Dead foliage is tightly compacted, short needle (2 in. or less) conifer or hardwood litter. Spread rate low; flame length low with occasional jackpot of heavy fuels increasing intensity. ***White and lodgepole pine, spruce, true firs, larches***

FM9-Dead foliage litter is loosely compacted long needle pine or hardwoods. Spread rate moderate; flame length moderate. Concentrations of dead-down woody material will contribute to possible torching out of trees, spotting, and crowning. ***Closed stands of long needle pine- Jeffrey ponderosa, and southern pine plantations***

FM10-There is a significant amount of larger fuels with attached branches and twigs, or has rotted enough that it is splintered and broken. The larger fuels are fairly well distributed over the area. Some green fuel may be present. Overall depth of the fuel is primarily below knees, but some fuel may be higher. Any forest type may be considered if heavy down material is present. Crowning out, spotting, and torching of individual trees are more frequent in this fuel situation, leading to potential fire control difficulties. Spread rate moderate to high; flame length high. ***Insect- or disease-ridden stands, windthrown stands, overmature situations with deadfall, and aged light thinning or partial-cut slash***

Primary Carrier of the fire is LOGGING SLASH.

FM11-Slash is not continuous. Needle litter or small amounts of grass or shrubs must be present to carry the fire, but primary carrier is still slash. Live fuels are absent or do not play a significant role in fire behavior. Spread Rate low; flame length moderate. ***Light partial cuts or thinning ops in mixed conifer or hardwood stands and southern pine harvests***

FM12-Slash generally covers the ground (heavier loadings than FM11), though there may be some bare spots or areas of light coverage. Average slash depth is about 2ft. Slash is not excessively compacted. Approximately ½ of the needles may still be on the branches but are not red. Live fuels are absent, or are not expected to affect fire behavior. Spread rate low; flame length moderate to high. ***Heavily thinned conifer stands, clear cuts and med to heavy partial cuts***

FM13-Slash is continuous or nearly so (heavier loadings than FM12). Slash is not extremely compacted and has an average depth of 3ft. Approximately ½ of the needles are still present and are red, or all of the needles are still on the branches but are green. Live fuels are not expected to influence fire behavior. Spread rate low; flame length high. ***Clear cuts and heavy partial cuts in mature or over mature stands where slash is dominated by >3" material or load like FM12 but with "red" needles still attached***

Elevations between 0 and 500 feet

Dry Bulb Temperatures 41 to 60 F (Read Across)

Wet Bulb Temperatures 28 to 59 F (Read Down)

Wet Bulb Temperatures 23 to 40 F

Dry Bulb Temperatures	28	29	30	31	32	33	34	35	36	37	38	39	40
41	-36 3	-12 10	-1 17	7 24	13 32	18 39	22 44	25 53	29 61	31 68	34 74	37 84	39 92
42		-23 5	-7 12	3 19	10 26	15 33	20 40	23 47	27 54	30 62	33 69	35 77	38 84
43		-49 1	-15 8	-2 14	4 21	12 28	17 35	21 41	25 48	28 55	31 62	34 70	36 77
44			-29 4	-9 10	2 17	9 23	14 29	19 36	23 43	26 49	29 54	32 63	35 70
45				-18 6	-4 12	5 19	11 25	16 31	21 37	24 44	28 51	31 57	34 64
46				-33 2	-11 8	0 14	7 20	13 26	18 32	22 39	26 45	29 52	32 58
47					-22 5	-6 10	3 16	10 22	16 28	20 34	24 40	27 46	31 53
48					-45 1	-14 7	-2 12	6 18	13 24	18 29	22 35	26 41	29 47
49						-27 3	-8 9	2 14	9 20	15 25	20 31	24 37	27 42
50							-17 5	-3 10	5 14	12 21	17 27	21 32	25 38
51							-33 2	-11 7	1 12	8 17	14 23	19 28	23 34
52								-21 4	-5 9	4 14	11 19	17 24	21 29
53								-42 1	-13 6	-1 11	8 16	14 21	19 26
54									-25 3	-7 8	3 12	11 17	16 22
55										-15 5	-2 9	7 14	13 19
56										-29 2	-8 7	3 11	10 16
57											-17 4	-3 8	6 13
58											-33 2	-10 6	2 10
59												-19 3	-4 7
60												-38 1	-11 5

Wet Bulb Temperatures 23 to 40 F	23	24	25	26	27	28	29	30
31	-8 18	1 27	8 37	13 47	18 57	22 68	25 78	28 89
32	-16 11	-4 20	4 30	10 39	15 49	19 59	23 69	26 79
33	-31 5	-12 14	-1 23	4 32	12 41	17 51	21 60	24 70
34	-22 8	-7 16	2 25	9 34	14 43	18 52	22 62	26 71
35	-47 2	-16 10	-4 19	5 27	11 36	16 45	20 54	24 63
36		-30 5	-11 13	0 21	7 29	13 38	18 47	22 55
37			-21 7	-4 15	3 23	9 31	15 40	19 48
38			-42 2	-14 10	-2 18	4 25	12 33	17 42
39				-27 5	-9 12	1 20	8 28	14 35
40					-18 7	-4 15	4 22	11 30

	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
31	31																												
32	29 89	32																											
33	28 80	30 90	33																										
34	26 71	29 81	32 90	34																									
35	24 63	27 72	30 81	33 91	35																								
36	22 55	25 64	28 73	31 82	34 91	36																							
37	19 48	23 57	26 65	29 74	32 82	35 91	37																						
38	17 42	21 50	25 58	28 66	31 74	33 83	36 91	38																					
39	14 35	19 43	22 51	26 59	29 67	32 75	34 83	37 92	39																				
40	11 30	16 37	20 45	24 52	27 60	30 68	33 76	35 84	38 92	40																			

DP RH | DP RH

Elevations between 0 and 500 feet

Wet Bulb Temperatures

40 to 79 F

(Read Down)

Dry Bulb Temperatures

61 to 80 F

(Read Across)

DP	DP
RH	RH

	40	41	42	43	44	45	46	46	48	49	50	51	52	53	54	55	56	57	58	59	60																
61	-21 3	-4 7	5 11	12 15	18 19	23 23	27 27	30 31	34 36	36 40	39 44	42 49	44 54	46 58	48 63	50 68	52 73	54 78	56 84	58 89	59 94	61															
62	-44 1	-12 6	1 8	9 12	15 16	20 20	25 24	29 28	32 32	35 37	38 41	41 45	43 50	45 54	48 59	50 64	52 69	54 74	55 79	57 84	59 89	60 95	62														
63	-23 2	-7 6	3 10	12 14	18 17	23 21	27 25	31 29	34 33	37 38	39 42	42 46	44 51	47 55	49 60	51 64	53 69	55 74	56 79	58 84	60 89	61 95	63														
64	-50 1	-11 4	0 8	9 11	18 15	21 19	25 23	29 26	32 30	35 34	38 39	41 43	43 47	46 51	48 56	50 60	52 65	54 70	56 74	57 79	59 84	61 89	62 95	64													
65	-23 2	-5 6	5 9	12 11	18 16	23 20	27 24	31 28	34 31	37 35	40 39	42 44	45 48	47 52	49 56	51 61	53 65	55 70	57 75	59 80	60 85	62 90	63 95	65													
66	-57	-13 4	0 7	9 10	15 14	21 18	25 21	29 25	33 29	36 32	39 36	41 40	44 44	46 49	48 53	50 57	52 62	54 66	56 71	58 75	60 80	61 85	63 90	64 95	66												
67		-26 2	-6 5	5 8	12 12	18 15	23 19	27 22	31 26	34 30	37 34	40 37	43 41	45 45	47 49	50 54	52 58	54 62	55 66	57 71	59 76	61 80	62 85	64 90	65 95	67											
68			-14 3	0 7	9 10	16 13	21 17	25 20	29 24	33 27	36 31	39 34	42 38	44 42	47 46	49 50	51 54	53 58	55 63	57 67	58 71	60 76	62 81	63 85	65 91	67 95	68										
69			-26 2	-6 5	5 8	13 11	19 14	23 18	28 21	31 23	35 28	38 32	41 35	43 39	44 43	48 47	50 51	52 55	54 59	56 63	58 67	60 72	61 76	63 81	64 85	66 90	68 95	69									
70				-14 3	0 6	9 9	16 12	21 16	26 19	30 22	33 26	36 29	39 33	42 36	45 40	47 44	49 48	51 51	53 55	55 60	57 64	59 68	61 72	62 77	64 81	66 86	67 90	69 95	70								
71				-26 2	-5 5	5 8	13 11	19 14	24 17	28 20	32 23	35 27	38 30	41 34	44 37	46 41	48 45	51 48	53 52	55 54	56 60	58 64	60 68	62 73	63 77	65 81	67 86	68 90	70 95	71							
72					-13 3	1 6	10 9	16 12	22 15	26 18	30 21	34 24	37 29	40 31	43 35	45 38	47 42	50 45	52 49	54 53	56 57	58 61	59 65	61 69	63 73	64 77	66 82	68 85	69 91	71 95	72						
73					-26 2	-5 4	6 7	13 10	19 13	24 16	29 19	32 22	36 25	39 29	41 32	44 35	47 39	49 42	51 44	53 50	55 53	57 57	59 61	61 65	62 69	64 73	66 77	67 82	69 84	70 91	72 95	73					
74						-13 1	1 6	10 8	17 11	22 14	27 17	31 20	34 23	37 24	40 30	43 33	46 34	48 40	50 43	52 47	54 50	56 54	58 58	60 62	62 66	63 70	65 74	67 78	68 82	70 84	71 91	73 95	74				
75						-25 2	-4 4	6 7	14 10	20 12	25 15	29 18	33 21	34 24	39 27	42 31	45 34	47 37	49 40	52 44	54 47	56 51	58 55	59 58	61 62	63 66	65 70	66 74	68 78	69 82	71 87	72 91	74 95	75			
76							-57	-12 3	2 5	11 8	17 11	23 14	27 16	31 19	35 22	38 25	41 28	44 31	46 35	49 38	51 41	53 45	55 48	57 52	59 55	61 59	62 63	64 64	66 70	67 74	69 78	70 82	72 87	73 91	75 95	76		
77								-23 2	-3 4	7 7	15 9	21 12	25 15	30 18	33 20	37 23	40 24	43 29	45 32	48 35	50 39	52 42	54 45	56 49	58 52	60 54	62 59	63 63	65 67	67 71	68 75	70 79	71 83	73 87	74 91	76 94	77	
78								-49	-11 3	3 5	12 8	18 10	23 13	28 16	32 19	35 21	39 24	41 27	44 30	47 33	49 36	51 39	53 43	56 46	57 49	59 53	61 56	63 60	65 63	66 67	68 71	69 75	71 79	72 83	74 87	75 91	77 94	78
79									-21 2	-2 4	8 6	15 9	21 12	26 14	30 17	34 20	37 22	40 25	43 28	44 31	48 34	51 37	53 40	55 43	57 47	59 50	61 53	62 57	64 60	66 64	67 68	69 71	70 75	72 79	73 83	75 87	76 91	78 94	79
80										-43	-9 3	4 5	12 8	19 10	24 13	29 15	33 18	36 21	39 23	42 26	45 29	47 32	50 35	52 38	54 41	56 44	58 47	60 50	62 54	64 57	65 61	67 64	68 68	70 72	72 75	73 79	74 83	76 87	77 91	79 94

Elevations between 0 and 500 feet

Wet Bulb Temperatures

50 to 90 F

(Read Down)

	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	-19	-1	9	16	22	27	31	35	38	41	44	46	49	51	53	55	57	59	61	63	65	66	68	70	71	73	74	76	77	78	80
	2	4	6	9	11	14	16	19	21	24	27	30	33	35	38	42	45	48	51	54	58	61	65	68	72	76	80	83	87	92	96
82	-37	-7	5	13	20	25	29	33	37	40	43	45	48	50	53	55	57	59	61	62	64	66	68	69	71	72	74	75	77	78	79
	1	3	5	7	10	12	15	17	20	22	25	28	31	33	36	39	42	45	48	52	55	58	62	65	69	72	76	80	84	88	95
83	-16	0	10	17	23	28	32	35	39	42	44	47	50	52	54	56	58	60	62	64	65	67	69	70	72	73	75	76	78	79	80
	2	4	6	9	11	13	16	18	21	23	26	29	31	34	37	40	43	46	49	52	55	59	62	65	69	73	76	80	84	88	92
84	-31	-6	6	14	21	26	30	34	37	41	43	46	49	51	53	55	57	59	61	63	65	67	68	70	71	73	74	76	77	79	80
	1	3	5	7	10	12	14	17	19	22	24	27	29	32	35	38	41	43	46	50	53	56	59	62	66	69	73	76	80	84	88
85	-14	2	11	18	24	28	33	36	39	42	45	48	50	53	55	57	59	61	63	64	66	68	69	71	72	74	75	77	78	80	81
	2	4	6	8	11	13	15	18	20	22	25	28	30	33	34	38	41	44	47	50	53	56	60	63	66	70	73	77	80	84	88
86	-26	-4	8	15	22	27	31	35	38	41	44	47	49	52	54	56	58	60	62	64	66	67	69	70	72	74	75	77	78	79	81
	1	3	5	7	9	12	14	16	18	21	23	26	28	31	34	36	39	42	45	48	51	54	57	60	63	67	70	73	77	81	84
87	-11	3	12	19	25	29	33	37	40	43	44	49	51	53	55	58	59	61	63	65	67	68	70	72	73	75	76	78	79	80	82
	2	4	6	8	10	13	15	17	19	22	24	27	29	32	34	37	40	42	45	48	51	54	57	60	64	67	70	74	77	81	84
88	-22	-2	9	17	23	28	32	36	39	42	45	48	50	53	55	57	59	61	63	64	66	68	70	71	73	74	76	77	79	80	81
	1	3	5	7	9	11	13	16	18	20	22	25	27	30	32	35	38	40	43	46	49	52	55	58	61	64	67	71	74	77	81
89	-45	-8	5	14	20	26	30	34	38	41	44	47	49	52	54	56	58	60	62	64	66	67	69	71	72	74	75	77	78	80	81
		2	4	6	8	10	12	14	17	19	21	23	26	28	30	33	36	38	41	44	46	49	52	55	58	61	64	68	71	74	78
90	-17	0	11	18	24	29	33	37	40	43	44	48	51	53	55	58	60	62	63	65	67	69	70	72	73	75	76	78	79	81	82
	1	3	5	7	9	11	13	15	17	20	22	24	26	29	31	34	36	39	41	44	47	50	53	55	58	62	65	68	71	74	78
91	-34	-5	7	15	22	27	31	35	39	42	45	48	50	53	55	57	59	61	63	65	66	68	70	71	73	75	76	78	79	80	82
	1	2	4	6	8	10	12	14	16	18	20	23	25	27	29	32	34	37	39	42	45	47	50	53	56	59	62	65	68	71	75
92	-13	3	12	19	25	30	34	37	41	44	47	49	52	54	56	58	60	62	64	66	68	69	71	73	74	76	77	79	80	82	83
	2	3	5	7	9	11	13	15	17	19	21	23	26	28	30	33	35	37	40	43	45	48	51	53	56	59	62	65	68	72	75
93	-26	-3	9	17	23	28	32	36	40	43	46	48	51	53	56	58	60	62	64	65	67	69	71	72	74	75	77	78	80	81	83
	1	3	4	6	8	10	12	14	16	18	20	22	24	26	28	31	33	36	38	41	43	46	48	51	54	57	60	63	66	69	72
94	-10	5	14	21	26	31	35	38	42	45	48	50	53	55	57	59	61	63	65	67	68	70	72	73	75	76	78	79	81	82	84
	2	3	5	7	9	11	13	14	16	18	21	23	25	27	29	31	34	36	39	41	44	46	49	52	54	57	60	63	66	69	72
95	-20	0	11	18	24	29	33	37	41	44	47	49	52	54	56	59	61	63	64	66	68	70	71	73	75	76	78	79	81	82	83
	1	3	4	6	8	10	11	13	15	17	19	21	23	25	28	30	32	34	37	39	42	44	47	49	52	55	57	60	63	66	69
96	-39	-6	7	15	22	27	32	36	39	43	46	48	51	53	56	58	60	62	64	66	68	69	71	73	74	76	77	79	80	82	83
		2	4	5	7	9	10	12	14	16	18	20	22	24	26	28	30	33	35	37	40	42	45	47	50	52	55	58	61	64	67
97	-14	2	12	20	25	30	35	38	42	45	48	50	53	55	57	59	61	63	65	67	69	71	72	74	75	77	78	80	81	83	84
	1	3	4	6	8	10	11	13	15	17	19	21	23	25	27	29	31	33	36	38	40	43	45	48	50	53	55	58	61	64	67
98	-28	-3	9	17	23	29	33	37	40	44	47	49	52	54	57	59	61	63	65	67	68	70	72	73	75	77	78	80	81	82	84
	1	2	4	5	7	9	10	12	14	16	18	19	21	23	25	27	30	32	34	36	38	41	43	46	48	51	53	56	59	61	64
99	-10	5	14	21	27	32	36	39	43	46	48	51	54	56	58	60	62	64	66	68	70	71	73	75	76	78	79	81	82	84	85
	1	3	5	6	8	9	11	13	15	16	18	20	22	24	26	28	30	32	34	37	39	41	44	46	48	51	54	56	59	62	65
100	-20	0	11	19	25	30	34	38	42	45	48	50	53	55	57	60	62	64	66	67	69	71	73	74	76	77	79	80	82	83	85
	1	2	4	5	7	9	10	12	14	15	17	19	21	23	25	27	29	31	33	35	37	39	42	44	46	49	51	54	57	59	62

	86	87	88	89	90	91	92	93	94	95
86	85									
	96									
87	86	87								
	94									
88	85	87	88							
	92	94								
89	84	86	88	89						
	89	92	94							
90	84	85	87	89	90					
	85	89	92	96						
91	83	85	86	88	90	91				
	78	82	85	89	92	96				
92	82	84	86	87	89	91	92			
	75	78	82	85	89	92	96			
93	81	84	85	87	89	91	92	93		
	72	75	78	82	85	89	93	96		
94	82	84	85	86	88	89	90	92	93	94
	69	72	75	79	82	85	89	93	96	
95	82	83	85	86	87	89	90	91	93	94
	66	69	72	76	79	82	86	89	91	96
96	80	82	83	84	86	87	88	90	91	92
	64	67	70	73	74	79	82	86	89	93
97	81	83	84	85	87	88	89	91	92	93
	64	67	70	73	76	79	83	86	89	93
98	81	82	84	85	87	88	89	91	92	93
	61	64	67	70	73	76	79	83	86	89
99	81	82	84	85	86	88	89	90	92	93
	59	62	65	67	70	73	76	80	83	86
100	80	82	83	85	86	87	89	90	91	93
	57	59	62	65	68	71	74	77	80	83

DP
RH

DP
RH

Dry Bulb Temperatures

81 to 100 F

(Read Across)

Elevations between 0 and 500 feet

Wet Bulb Temperatures, 58 to 95 F

(Read Down)

Dry Bulb Temperatures 101 to 119 F (Read Across)	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
101	-40	-6	8	16	23	28	33	37	40	44	47	49	52	54	57	59	61	63	65	67	69	70	72	74	75	77	79	80	81	83	84	86	87	88	90	91	92	94
DP		2	3	5	6	8	9	11	13	14	16	18	20	21	23	25	27	29	31	33	36	38	40	42	45	47	49	52	54	57	60	62	65	68	71	74	77	80
102		-14	3	13	21	26	31	36	39	43	46	49	51	54	56	58	61	63	65	66	68	70	72	73	75	77	78	80	81	83	84	86	87	88	90	91	92	93
DP		1	3	4	5	7	9	10	12	13	15	17	18	20	22	24	26	28	30	32	34	36	38	40	43	45	47	50	52	55	57	60	63	65	68	71	74	77
103		-26	-2	10	18	24	30	34	38	42	45	48	50	53	55	58	60	62	64	66	68	70	71	73	75	76	78	79	81	82	84	85	87	88	89	91	92	93
DP		1	2	3	5	6	8	9	11	12	14	16	17	19	21	23	25	26	28	30	32	34	37	39	41	43	45	48	50	53	55	58	60	63	66	68	71	74
104			-8	6	15	22	26	33	37	40	44	47	50	52	55	57	59	61	63	65	67	69	71	73	74	76	77	79	80	82	83	85	86	88	89	90	92	93
DP			1	3	4	6	7	9	10	12	13	15	16	18	20	22	23	25	27	29	31	33	35	37	39	41	44	46	48	51	53	55	58	61	63	66	69	72
105			-18	2	12	20	26	31	35	39	43	46	49	51	55	56	59	61	63	65	67	69	70	72	74	75	77	79	80	82	83	85	86	87	89	90	91	93
DP			1	2	4	5	6	8	9	11	12	14	15	17	19	20	22	24	26	28	30	31	33	35	38	40	42	44	46	49	51	53	56	58	61	63	66	69
106				-34	-4	9	18	24	29	34	38	42	45	48	51	53	56	58	60	62	64	66	68	70	72	73	75	77	78	80	81	83	84	86	87	88	90	91	92
DP					2	3	4	6	7	8	10	11	13	14	16	18	19	21	23	25	26	28	30	32	34	36	38	40	42	44	47	49	51	54	56	59	61	64	66
107					-11	5	15	22	28	33	37	41	44	47	50	53	55	57	60	62	64	66	68	70	71	73	75	76	78	79	81	83	84	85	87	88	90	91	92
DP					1	2	4	5	6	8	9	11	12	14	15	17	18	20	22	23	25	27	29	31	32	34	36	38	41	43	45	47	49	52	54	56	59	61	64
108					-22	0	12	20	26	31	35	39	43	46	49	52	54	57	59	61	63	65	67	69	71	73	74	76	78	79	81	82	84	85	87	88	89	91	92
DP					1	2	3	4	6	7	8	10	11	13	14	16	17	19	21	22	24	26	27	29	31	33	35	37	39	41	43	45	47	50	52	54	57	59	62
109						-46	-6	8	17	24	29	34	38	42	45	48	51	54	56	58	61	63	65	67	69	70	72	74	76	77	79	80	82	83	85	86	88	89	90	92
DP							1	3	4	5	6	8	9	11	12	13	15	16	18	20	21	23	24	26	28	30	32	33	35	37	39	41	43	46	48	50	52	55	57	60
110							-14	4	14	22	28	33	37	41	44	47	50	53	55	58	60	62	64	66	68	70	72	74	75	77	78	80	82	83	85	86	87	89	90	91
DP							1	2	3	5	6	7	8	10	11	13	14	15	17	19	20	22	23	25	27	28	30	32	34	36	38	40	42	44	46	48	50	53	55	57
111								-26	-1	11	19	26	31	36	39	43	46	49	52	55	57	59	62	64	66	68	70	71	73	75	76	78	80	81	83	84	86	87	89	90	91
DP									2	3	4	5	6	8	9	10	12	13	15	16	18	19	21	22	24	26	27	29	31	33	34	36	38	40	42	44	46	49	51	53	55
112									-7	8	17	24	29	34	38	42	45	48	51	54	56	59	61	63	65	67	69	71	73	74	76	78	79	81	82	84	85	87	88	90	91
RH									1	2	3	5	6	7	8	10	11	12	14	15	17	18	20	21	23	24	26	28	29	31	33	35	37	39	41	43	45	47	49	51	53
113									-16	3	14	22	28	33	37	41	44	48	50	53	56	58	60	63	65	67	69	70	72	74	76	77	79	81	82	84	85	87	88	89	91
RH									1	2	3	4	5	7	8	9	10	12	13	14	16	17	19	20	22	23	25	27	28	30	32	33	35	37	39	41	43	45	47	49	51
114									-31	-2	11	19	26	31	36	40	43	47	50	52	55	57	60	62	64	66	68	70	72	74	75	77	79	80	82	83	85	86	88	89	91
RH										1	3	4	5	6	7	8	10	11	12	14	15	16	18	19	21	22	24	25	27	29	30	32	34	36	38	39	41	43	45	47	50
115										-9	7	17	24	29	34	39	42	46	49	52	54	57	59	61	64	66	68	70	71	73	75	77	78	80	81	83	85	86	87	89	90
RH										1	2	3	4	5	7	8	9	10	12	13	14	16	17	18	20	21	23	24	26	28	29	31	33	34	36	38	40	42	44	46	48
116											-18	3	14	22	28	33	37	41	45	48	51	54	56	59	61	63	65	67	69	71	73	75	76	78	80	81	83	84	86	87	89	90
RH											1	2	3	4	5	6	7	8	10	11	12	13	15	16	17	19	20	22	23	25	26	28	30	31	33	35	37	38	40	42	44	46
117											-35	-3	11	19	26	31	36	40	44	47	50	53	55	58	60	63	65	67	69	71	72	74	76	78	79	81	82	84	85	87	88	90
RH												1	2	3	4	6	7	8	9	10	11	13	14	15	17	18	19	21	22	24	25	27	28	30	32	33	35	37	39	41	43	44
118												-9	7	17	24	30	35	39	43	46	49	52	55	57	60	62	64	66	68	70	72	74	76	77	79	80	82	84	85	87	88	89
RH												1	2	3	4	5	6	7	8	10	11	12	13	15	16	17	19	20	21	23	24	26	27	29	31	32	34	36	37	39	41	43
119												-19	2	14	22	28	33	38	42	45	48	51	54	57	59	61	64	66	68	70	72	73	75	77	79	80	82	83	85	86	88	89
RH												1	1	2	4	5	6	7	8	9	10	11	13	14	15	16	18	19	20	22	23	25	26	28	29	31	33	34	36	38	40	41

Elevations between 501 and 1,900 feet

Wet Bulb Temperatur

28 to 59 F

(Read Down)

Dry Bulb Temperatures

41 to 60 F

(Read Across)

DP	DP
RH	RH

Wet Bulb Temperatures

Dry Bulb Temperatures	28	29	30	31	32	33	34	35	36	37	38	39	40
41	-26 5	-9 11	1 18	8 24	14 33	18 40	22 47	26 54	29 61	32 69	34 77	37 84	39 92
42		-18 7	-4 14	5 21	11 28	16 34	20 41	24 48	27 55	30 62	33 70	35 77	38 85
43			-33 3	-11 9	0 16	8 23	13 29	18 36	22 42	25 49	28 54	31 63	34 70	36 78
44				-21 5	-6 12	3 18	10 24	13 31	20 37	23 44	27 50	30 57	33 64	35 71
45				-42 2	-13 8	-1 14	6 20	12 26	17 32	21 39	25 45	28 51	31 58	34 65
46					-25 4	-7 10	2 16	9 22	14 28	19 34	23 40	26 46	30 52	32 59
47					-36 1	-16 6	-3 12	5 18	11 23	17 29	21 35	25 41	28 47	31 53
48						-29 3	-10 8	1 14	8 19	14 25	19 31	23 36	26 42	29 48
49							-19 5	-5 10	4 16	11 21	16 26	20 32	24 38	28 43
50							-37 2	-12 7	-1 12	7 17	13 22	18 28	22 33	26 39
51								-23 4	-6 9	3 14	10 19	15 24	20 29	24 35
52								-47 1	-14 6	-2 11	6 15	13 20	18 25	22 31
53									-27 3	-8 7	2 12	9 17	15 22	20 27
54										-17 5	-3 9	6 14	12 19	17 23
55										-32 2	-10 6	1 11	9 15	15 20
56											-19 4	-4 8	5 13	12 17
57											-37 1	-11 4	1 10	8 14
58												-21 3	-5 7	5 11
59												-43 1	12 5	0 9
60													-24 3	-6 7

Dry Bulb Temperatures	21	22	23	24	25	26	27	28	29	30
31	-37 1	-19 10	-8 20	2 29	9 38	14 48	18 58	22 68	25 78	28 89
32		-34 4	-13 13	-3 22	5 31	11 40	15 50	20 60	23 69	26 79
33			-25 7	-9 15	0 24	7 33	13 42	17 52	21 61	25 71
34			-36 1	-18 9	-5 18	3 26	9 35	14 44	19 53	23 62
35				-34 4	-13 12	-2 20	4 29	11 37	16 46	20 55
36					-14 6	-8 14	1 22	8 31	14 39	18 48
37					-50 1	-17 9	-4 17	4 25	10 33	15 41
38						-31 4	-11 11	0 19	7 27	13 35
39							-21 7	-6 14	3 21	9 29
40							-42 2	-14 9	-2 16	6 23

Dry Bulb Temperatures	31	32	33	34	35	36	37	38	39	40
31	29 38	32 48	34 58	37 68	39 78	41 89				
32	32 90	34 99	37 109	39 119	41 129	43 139				
33	28 80	30 90	33 99	35 109	37 119	39 129	41 139			
34	26 72	29 81	32 91	34 101	36 111	38 121	40 131	42 141		
35	24 64	27 73	30 82	33 91	35 101	37 111	39 121	41 131	43 141	
36	22 54	25 65	28 74	31 82	34 91	36 101	38 111	40 121	42 131	44 141
37	20 49	24 58	27 66	30 74	32 83	35 91	37 101	39 111	41 121	43 131
38	17 43	21 51	25 59	28 67	31 75	33 83	34 91	38 101	40 111	42 121
39	15 37	19 44	23 52	26 60	29 67	32 75	34 83	37 92	39 101	41 111
40	12 31	17 38	21 46	24 53	28 61	30 68	33 76	36 84	38 92	41 101

Dry Bulb Temperatures	41	42	43	44	45	46	47	48	49	50
41	41 92									
42	40 92	42 101								
43	39 85	41 92	43 101							
44	38 78	40 85	42 93	44 101						
45	36 72	39 78	41 86	43 93	45 101					
46	35 65	38 72	40 79	42 86	44 93	46 101				
47	34 60	36 66	39 73	41 79	43 86	45 93	47 101			
48	32 54	35 60	38 67	40 73	42 80	44 86	46 93	48 101		
49	31 49	34 55	36 61	39 67	41 74	43 80	45 87	47 93	49 101	
50	29 44	32 50	35 56	38 62	40 68	42 74	44 80	46 87	48 93	50 101
51	28 40	31 46	34 51	36 57	39 63	41 69	43 75	45 81	47 87	49 93
52	26 36	29 41	32 47	35 52	38 58	40 63	42 69	44 75	46 81	48 87
53	24 32	27 37	31 42	34 48	36 53	39 58	41 64	43 70	46 76	48 82
54	22 28	26 33	29 38	32 43	35 49	38 54	40 59	42 65	45 70	47 76
55	20 25	24 30	27 34	31 39	34 44	36 49	39 55	41 60	44 65	46 71
56	17 21	22 26	26 31	29 36	32 40	35 45	38 50	40 55	43 61	45 66
57	14 18	19 23	24 27	27 32	31 37	34 41	37 46	39 51	42 56	44 61
58	11 16	17 20	22 24	26 29	29 33	32 38	35 42	38 47	40 52	43 57
59	8 13	14 17	19 21	24 25	28 30	31 34	34 39	37 43	39 48	42 53
60	4 10	11 14	17 18	22 22	26 27	29 31	33 35	36 40	38 44	41 49

Dry Bulb Temperatures	51	52	53	54	55	56	57	58	59
51	51 101								
52	50 94	52 101							
53	49 88	51 96	53 101						
54	49 82	50 88	52 94	54 101					
55	48 76	50 82	52 88	53 94	55 101				
56	47 71	49 77	51 82	53 88	54 94	56 101			
57	46 67	48 72	50 77	52 83	54 88	55 94	57 101		
58	45 62	47 67	49 72	51 78	53 83	55 89	56 94	58 101	
59	44 58	46 63	48 68	50 73	52 78	54 83	56 89	57 94	59 101
60	43 54	45 58	47 63	49 68	51 73	53 78	55 83	57 88	58 94

Elevations between 501 and 1,900 feet

Wet Bulb Temperatur
39 to 80 F
(Read Down)

Dry Bulb Temperatures
61 to 80 F
(Read Across)

	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	-50 1	-14 4	-1 8	8 12	14 16	19 20	24 24	28 28	31 32	34 34	37 41	40 45	42 50	44 54	47 59	49 64	51 69	53 74	54 79	56 84	58 89	59 95
62		-25 2	-6 6	4 10	11 13	17 17	22 21	26 25	30 29	33 33	34 37	38 42	41 44	43 50	44 55	48 60	50 64	52 69	54 74	55 79	57 84	59 89
63		-54	-14 4	-1 7	8 11	14 15	20 19	24 22	28 24	31 30	34 34	37 38	40 43	42 47	45 51	47 56	49 60	51 65	53 70	55 74	57 79	58 84
64			-27 2	-7 5	4 9	11 12	17 14	22 20	26 24	30 27	33 31	34 35	39 39	41 43	44 48	46 52	48 54	50 61	52 65	54 70	56 75	58 80
65				-15 3	-1 7	8 10	14 14	20 17	24 21	28 25	32 29	35 32	38 34	40 40	43 44	45 48	47 53	49 57	51 61	53 64	55 70	57 75
66				-28 2	-7 5	4 8	11 12	17 15	22 19	24 22	30 26	33 30	36 33	39 37	42 41	44 45	46 49	49 53	51 58	53 62	54 64	56 71
67					-15 3	-1 6	8 10	15 13	20 16	24 20	28 23	32 27	35 31	38 34	41 38	43 42	44 46	48 50	50 54	52 58	54 63	56 67
68					-29 2	-7 5	4 8	12 11	18 14	22 18	27 21	30 24	34 28	37 32	40 35	42 39	45 43	47 47	49 51	51 55	53 59	55 63
69						-15 3	-1 4	8 9	15 12	20 16	25 19	29 22	32 24	35 29	38 33	41 34	44 40	46 44	48 47	50 51	52 55	54 59
70						-29 1	-7 4	4 7	12 10	18 14	23 17	27 20	31 23	34 27	37 30	40 34	43 37	45 41	47 44	50 48	52 52	54 56
71							-15 3	0 6	9 9	15 12	21 15	25 18	29 21	33 24	34 28	39 31	42 34	44 38	46 42	49 45	51 49	53 53
72							-28 1	-6 4	5 7	12 10	18 13	23 16	28 19	31 22	35 25	38 29	40 32	43 35	44 39	48 42	50 44	52 50
73								-14 3	0 5	9 8	16 11	21 14	26 17	30 20	33 23	34 26	39 30	42 33	45 36	47 40	49 43	51 47
74								-27 1	-4 4	5 7	13 10	19 12	24 15	28 18	32 21	35 24	38 27	41 30	44 34	46 37	48 40	51 44
75									-13 3	1 5	10 8	16 11	22 13	26 16	30 19	34 22	37 25	40 28	43 31	45 35	48 38	50 41
76									-25 1	-5 4	4 7	14 9	20 12	24 15	29 17	32 20	34 23	39 26	42 29	44 32	47 35	49 39
77									-57	-12 3	2 5	10 8	17 10	22 13	27 16	31 18	34 21	38 24	41 27	43 30	46 33	48 36
78										-23 1	-4 4	7 6	14 9	20 11	25 14	29 17	33 19	36 22	39 25	42 28	45 31	47 34
79										-48	-11 3	3 5	11 8	18 10	23 13	28 15	32 18	35 20	38 23	41 26	44 29	46 32
80											-21 2	-2 4	8 6	15 9	21 11	26 14	30 16	34 19	37 21	40 24	43 27	45 30

	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
61	61																			
62	60 95	62																		
63	60 89	61 95	63																	
64	59 85	61 90	62 95	64																
65	59 80	60 85	62 90	63 95	65															
66	58 74	60 80	61 85	63 90	64 95	66														
67	57 71	59 76	61 80	62 85	64 90	66 95	67													
68	57 67	59 72	60 76	62 81	63 85	65 90	67 95	68												
69	56 64	58 68	60 72	61 77	63 81	65 84	66 90	68 95	69											
70	55 60	57 64	59 68	60 72	62 77	64 81	66 86	67 90	69 95	70										
71	55 57	57 60	58 65	60 69	62 73	63 77	65 82	67 86	68 91	70 95	71									
72	54 53	56 57	58 61	60 65	61 69	63 73	65 77	66 82	68 86	69 91	71 95	72								
73	53 50	55 55	57 58	59 62	61 65	62 69	64 74	66 78	67 82	69 84	70 91	72 95	73							
74	53 47	55 51	57 54	58 58	60 62	62 64	64 70	65 74	67 78	68 82	70 87	71 91	73 95	74						
75	52 44	54 48	56 51	58 55	60 59	61 62	63 66	65 70	66 74	68 78	69 82	71 87	72 91	74 95	75					
76	51 42	53 45	55 49	57 52	59 56	61 59	62 63	64 67	66 71	67 75	69 79	70 83	72 87	73 91	75 96	76				
77	50 39	53 43	55 46	57 49	58 53	60 56	62 60	64 63	65 67	67 71	68 75	70 79	71 83	73 87	74 91	76 96	77			
78	50 37	52 40	54 43	56 46	58 50	60 53	61 57	63 60	65 64	66 67	68 71	69 75	71 79	72 83	74 87	75 91	77 96	78		
79	49 35	51 38	53 41	55 44	57 47	59 50	61 54	63 57	64 61	66 64	67 68	69 72	71 75	72 79	73 83	75 87	76 91	78 96	79	
80	48 32	50 35	52 38	54 41	56 45	58 48	60 51	62 54	64 58	65 61	67 65	69 68	70 72	72 76	73 79	75 83	76 87	77 92	79 96	80

DP	DP
RH	RH

Elevations between 501 and 1,900 feet

Wet Bulb Temperatur 49 to 91 F
(Read Down)

Dry Bulb Temperatures 81 to 100 F
(Read Across)

DP / RH	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	-40 / 1	-9 / 3	4 / 5	12 / 7	19 / 10	24 / 12	28 / 15	32 / 17	34 / 20	39 / 22	42 / 25	45 / 28	47 / 30	49 / 33	52 / 36	54 / 39	56 / 42	58 / 45	60 / 48	61 / 51	63 / 55	65 / 58	67 / 62	68 / 65	70 / 69	71 / 72	73 / 76	74 / 80	76 / 84	77 / 88	78 / 92	80 / 96
82	-18 / 2	-1 / 4	9 / 6	16 / 8	22 / 10	27 / 13	31 / 16	34 / 18	38 / 21	41 / 23	44 / 26	46 / 28	49 / 31	51 / 34	53 / 37	55 / 40	57 / 43	59 / 46	61 / 49	63 / 52	64 / 55	66 / 59	68 / 62	69 / 65	71 / 69	72 / 73	74 / 76	75 / 80	77 / 84	78 / 88	79 / 92	81 / 96
83	-34 / 1	-7 / 3	5 / 5	13 / 7	20 / 9	25 / 12	29 / 14	33 / 17	34 / 19	40 / 21	43 / 24	45 / 27	48 / 29	50 / 32	52 / 35	54 / 38	56 / 40	58 / 43	60 / 46	62 / 49	64 / 53	66 / 56	67 / 59	69 / 62	70 / 66	72 / 69	73 / 73	75 / 76	76 / 80	78 / 84	79 / 88	80 / 92
84	-15 / 2	1 / 4	10 / 6	17 / 8	23 / 10	27 / 13	32 / 15	35 / 17	38 / 20	41 / 22	44 / 25	47 / 27	49 / 30	52 / 33	54 / 35	56 / 38	58 / 41	60 / 44	62 / 47	63 / 50	65 / 53	67 / 56	68 / 59	70 / 63	71 / 66	73 / 70	74 / 73	76 / 77	77 / 80	79 / 84	80 / 88
85	-29 / 1	-5 / 3	7 / 5	14 / 7	21 / 9	26 / 11	30 / 14	34 / 16	37 / 18	40 / 21	43 / 23	46 / 26	48 / 28	51 / 31	53 / 33	55 / 36	57 / 39	59 / 42	61 / 45	63 / 47	65 / 50	66 / 54	68 / 57	69 / 60	71 / 63	73 / 66	74 / 70	76 / 73	77 / 77	78 / 81	80 / 84
86	-12 / 2	2 / 4	11 / 6	18 / 8	24 / 10	28 / 12	32 / 15	36 / 17	39 / 19	42 / 22	45 / 24	48 / 26	50 / 29	52 / 32	54 / 34	57 / 37	59 / 40	60 / 42	62 / 45	64 / 48	66 / 51	67 / 54	69 / 57	71 / 60	72 / 64	74 / 67	75 / 70	77 / 74	78 / 77	79 / 81	81 / 84
87	-24 / 1	-3 / 3	6 / 5	16 / 7	22 / 9	27 / 11	31 / 13	35 / 16	38 / 18	41 / 20	44 / 22	47 / 25	49 / 27	52 / 30	54 / 32	56 / 35	58 / 37	60 / 40	62 / 43	64 / 46	65 / 49	67 / 51	69 / 54	70 / 58	72 / 61	73 / 64	75 / 67	76 / 70	78 / 74	79 / 77	80 / 81
88	-50	-10 / 2	4 / 4	13 / 6	16 / 8	25 / 10	29 / 12	33 / 14	37 / 16	40 / 19	43 / 21	46 / 23	48 / 26	51 / 28	53 / 30	55 / 33	57 / 35	59 / 38	61 / 41	63 / 43	65 / 46	66 / 49	68 / 52	70 / 55	71 / 58	73 / 61	74 / 64	76 / 67	77 / 71	79 / 74	80 / 78
89	-19 / 1	-1 / 3	10 / 5	17 / 7	23 / 9	28 / 11	32 / 13	36 / 15	39 / 17	42 / 19	45 / 22	48 / 24	50 / 26	52 / 29	55 / 31	57 / 34	59 / 36	61 / 39	62 / 41	64 / 44	66 / 47	68 / 50	69 / 52	71 / 55	72 / 58	74 / 61	76 / 65	77 / 68	78 / 71	80 / 74	81 / 78
90	-37	-7 / 2	6 / 4	14 / 6	21 / 8	26 / 10	30 / 12	34 / 14	38 / 16	41 / 18	44 / 20	47 / 22	49 / 25	52 / 27	54 / 29	56 / 32	58 / 34	60 / 37	62 / 39	64 / 42	66 / 45	67 / 47	69 / 50	71 / 53	72 / 56	74 / 59	75 / 62	77 / 65	78 / 68	79 / 71	81 / 75
91	-15 / 1	1 / 3	11 / 5	18 / 7	24 / 9	29 / 11	33 / 13	37 / 15	40 / 17	43 / 19	46 / 21	48 / 23	51 / 25	53 / 28	55 / 30	57 / 32	59 / 35	61 / 37	63 / 40	65 / 42	67 / 45	68 / 48	70 / 51	72 / 53	73 / 56	76 / 59	78 / 62	79 / 65	81 / 68	82 / 72	83 / 75
92	-28 / 1	-4 / 2	8 / 4	16 / 6	22 / 8	27 / 10	31 / 12	35 / 14	39 / 16	42 / 18	45 / 20	47 / 22	50 / 24	52 / 26	55 / 28	57 / 31	59 / 33	61 / 35	63 / 38	65 / 40	66 / 43	68 / 46	70 / 48	71 / 51	73 / 54	74 / 57	76 / 60	77 / 63	79 / 66	80 / 69	82 / 72
93	-11 / 2	4 / 3	13 / 5	20 / 7	25 / 9	30 / 11	34 / 12	38 / 14	41 / 16	44 / 18	47 / 20	49 / 23	52 / 25	54 / 27	56 / 29	58 / 31	60 / 34	62 / 36	64 / 38	66 / 41	68 / 43	69 / 46	71 / 49	72 / 51	74 / 54	76 / 57	77 / 60	78 / 63	80 / 66	81 / 69	83 / 72
94	-21 / 1	-1 / 3	10 / 4	17 / 6	23 / 8	28 / 10	32 / 11	36 / 13	40 / 15	43 / 17	46 / 19	48 / 21	51 / 23	53 / 25	55 / 28	58 / 30	60 / 32	62 / 34	63 / 37	65 / 39	67 / 41	69 / 44	70 / 47	72 / 49	74 / 52	75 / 55	77 / 57	78 / 60	80 / 63	81 / 66	82 / 69
95	-43	-7 / 2	6 / 4	14 / 5	21 / 7	26 / 9	31 / 10	35 / 12	39 / 14	42 / 16	45 / 18	47 / 20	50 / 22	52 / 24	55 / 26	57 / 28	59 / 30	61 / 33	63 / 35	65 / 37	67 / 40	68 / 42	70 / 45	72 / 47	73 / 50	75 / 52	76 / 55	78 / 58	79 / 61	81 / 64	82 / 66
96	-16 / 1	1 / 3	11 / 4	19 / 6	25 / 8	29 / 9	34 / 11	37 / 13	41 / 15	44 / 17	47 / 19	49 / 21	52 / 23	54 / 25	56 / 27	58 / 29	60 / 31	62 / 33	64 / 35	66 / 38	68 / 40	70 / 43	71 / 45	73 / 48	74 / 50	76 / 53	77 / 55	79 / 58	80 / 61	82 / 64	83 / 67
97	-30 / 1	-4 / 2	8 / 4	16 / 5	23 / 7	28 / 9	32 / 10	36 / 12	40 / 14	43 / 16	46 / 17	48 / 19	51 / 21	53 / 23	56 / 25	58 / 27	60 / 29	62 / 32	64 / 34	66 / 36	67 / 38	69 / 41	71 / 43	72 / 45	74 / 48	76 / 51	77 / 53	79 / 56	80 / 59	81 / 61	83 / 64
98	-11 / 1	4 / 3	13 / 5	20 / 6	26 / 8	31 / 9	35 / 11	38 / 13	42 / 15	45 / 16	48 / 18	50 / 20	53 / 22	55 / 24	57 / 26	59 / 28	61 / 30	63 / 32	65 / 34	67 / 37	69 / 39	70 / 41	72 / 44	74 / 46	75 / 48	77 / 51	78 / 54	80 / 56	81 / 59	83 / 62	84 / 64
99	-21 / 1	-1 / 2	10 / 4	18 / 5	24 / 7	29 / 9	33 / 10	37 / 12	41 / 14	44 / 15	47 / 17	49 / 19	52 / 21	54 / 23	57 / 25	59 / 27	61 / 29	63 / 31	65 / 33	66 / 35	68 / 37	70 / 39	72 / 42	73 / 44	75 / 46	76 / 49	78 / 51	79 / 54	81 / 57	82 / 59	84 / 62
100	-43	-7 / 2	4 / 3	15 / 5	22 / 6	27 / 8	32 / 9	36 / 11	40 / 13	43 / 14	46 / 16	49 / 18	51 / 20	54 / 21	56 / 23	58 / 25	60 / 27	62 / 29	64 / 31	66 / 33	68 / 35	70 / 38	71 / 40	73 / 42	74 / 44	76 / 47	78 / 49	79 / 52	81 / 54	82 / 57	83 / 60

DP / RH	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
49	-40 / 1	-18 / 2	-34 / 1	-15 / 2	-29 / 1	-12 / 2	-24 / 1	-50	-19 / 1	-37	-15 / 1	-28 / 1	-11 / 2	-21 / 1	-43
50	-9 / 3	-1 / 4	-7 / 3	1 / 4	-5 / 3	2 / 4	-3 / 3	-10 / 2	-1 / 3	-7 / 2	1 / 3	-4 / 2	4 / 3	-1 / 3	-7 / 2
51	4 / 5	9 / 6	-7 / 5	10 / 6	7 / 5	11 / 6	6 / 5	4 / 4	10 / 5	6 / 4	11 / 5	8 / 4	13 / 5	10 / 4	6 / 4
52	12 / 7	16 / 8	13 / 7	17 / 8	14 / 7	18 / 8	16 / 7	13 / 6	17 / 7	14 / 6	18 / 7	16 / 6	20 / 7	17 / 6	14 / 5
53	19 / 10	22 / 10	20 / 9	23 / 10	21 / 9	24 / 10	22 / 9	25 / 10	23 / 9	21 / 8	24 / 9	22 / 8	25 / 9	23 / 8	21 / 7
54	24 / 12	27 / 13	25 / 12	27 / 13	26 / 11	28 / 12	27 / 11	29 / 12	28 / 11	26 / 10	29 / 11	27 / 10	30 / 11	28 / 10	26 / 9
55	28 / 15	31 / 16	29 / 14	32 / 15	30 / 14	32 / 15	31 / 13	33 / 13	32 / 13	30 / 12	33 / 13	31 / 12	34 / 12	32 / 11	30 / 10
56	32 / 17	34 / 18	33 / 17	35 / 17	34 / 16	36 / 17	35 / 16	37 / 16	36 / 15	34 / 14	37 / 15	35 / 14	38 / 14	36 / 13	35 / 12
57	34 / 20	38 / 21	34 / 19	38 / 20	37 / 19	39 / 19	38 / 18	40 / 19	39 / 17	38 / 16	40 / 17	38 / 16	41 / 16	39 / 15	39 / 14
58	39 / 22	41 / 23	40 / 21	41 / 22	40 / 21	42 / 22	41 / 20	42 / 21	41 / 19	41 / 18	42 / 19	41 / 18	43 / 18	42 / 17	42 / 16
59	42 / 25	44 / 26	43 / 24	44 / 25	43 / 24	45 / 24	44 / 22	45 / 22	44 / 22	44 / 20	45 / 21	44 / 20	46 / 20	45 / 19	45 / 18
60	45 / 28	46 / 28	45 / 26	46 / 27	45 / 26	47 / 26	46 / 25	47 / 24	46 / 24	46 / 22	47 / 23	46 / 22	48 / 22	47 / 21	47 / 20
61	47 / 30	49 / 31	48 / 29	49 / 30	48 / 28	50 / 29	49 / 27	50 / 27	49 / 26	49 / 25	50 / 25	49 / 24	51 / 24	50 / 23	50 / 22
62	49 / 33	51 / 34	50 / 32	51 / 33	50 / 31	52 / 32	51 / 30	52 / 30	51 / 29	51 / 27	52 / 28	51 / 27	53 / 27	52 / 26	52 / 25
63	52 / 36	53 / 37	52 / 35	53 / 36	52 / 34	54 / 35	53 / 33	54 / 33	53 / 32	53 / 30	54 / 31	53 / 30	55 / 30	54 / 29	54 / 28
64	54 / 39	55 / 40	54 / 38	55 / 39	54 / 37	56 / 38	55 / 36	56 / 36	55 / 35	55 / 33	56 / 34	55 / 33	57 / 33	56 / 32	56 / 31
65	56 / 42	57 / 43	56 / 41	57 / 42	56 / 40	58 / 41	57 / 39	58 / 39	57 / 38	57 / 36	58 / 37	57 / 36	59 / 36	58 / 35	58 / 34
66	58 / 45	59 / 46	58 / 44	59 / 45	58 / 43	60 / 44	59 / 42	60 / 42	59 / 41	59 / 39	60 / 40	59 / 39	61 / 39	60 / 38	60 / 37
67	60 / 48	61 / 49	60 / 47	61 / 48	60 / 46	62 / 47	61 / 45	62 / 45	61 / 44	61 / 42	62 / 43	61 / 42	63 / 42	62 / 41	62 / 40
68	61 / 51	63 / 52	62 / 50	63 / 51	62 / 49	64 / 50	63 / 48	64 / 48	63 / 47	63 / 45	64 / 46	63 / 45	65 / 45	64 / 44	64 / 43
69	63 / 55	64 / 55	63 / 53	64 / 54	63 / 53	65 / 53	64 / 51	65 / 51	64 / 50	64 / 48	65 / 49	64 / 48	66 / 48	65 / 47	65 / 46
70	65 / 58	66 / 59	65 / 56	66 / 57	65 / 56	67 / 56	66 / 54	67 / 54	66 / 53	66 / 51	67 / 52	66 / 51	68 / 51	67 / 50	67 / 49
71	67 / 62	68 / 62	67 / 59	68 / 60	67 / 59	69 / 59	68 / 57	69 / 57	68 / 56	68 / 54	69 / 55	68 / 54	70 / 54	69 / 53	69 / 52
72	68 / 65	68 / 65	69 / 62	69 / 63	69 / 62	70 / 62	69 / 60	70 / 60	69 / 59	69 / 57	70 / 58	69 / 57	71 / 57	70 / 56	70 / 55
73	70 / 69	69 / 69	70 / 66	70 / 66	70 / 65	71 / 65	70 / 63	71 / 63	70 / 62	70 / 60	71 / 61	70 / 60	72 / 60	71 / 59	71 / 58
74	71 / 72	71 / 72	70 / 69	71 / 69	71 / 68	72 / 68	71 / 66	72 / 66	71 / 65	71 / 63	72 / 64	71 / 63	73 / 63	72 / 62	72 / 61
75	73 / 76	72 / 76	72 / 73	72 / 73	72 / 72	73 / 72	72 / 70	73 / 70	72 / 69	72 / 67	73 / 68	72 / 67	74 / 67	73 / 66	73 / 65
76	74 / 80	74 / 80	73 / 76	73 / 77	73 / 77	74 / 77	73 / 75	74 / 75	73 / 74	73 / 72	74 / 73	73 / 72	75 / 72	74 / 71	74 / 70
77	76 / 84	75 / 84	75 / 80	74 / 80	74 / 78	75 / 78	74 / 76	75 / 76	74 / 75	74 / 73	75 / 74	74 / 73	76 / 73	75 / 72	75 / 71
78	77 / 88	77 / 88	76 / 84	76 / 84	75 / 81	76 / 81	75 / 78	76 / 78	75 / 77	75 / 75	76 / 76	75 / 75	77 / 75	76 / 74	76 / 73
79	78 / 92	78 / 92	78 / 88	77 / 88	77 / 85	77 / 85	76 / 82	77 / 82	76 / 81	76 / 79	77 / 80	76 / 79	78 / 79	77 / 78	77 / 77
80	80 / 96	79 / 96	79 / 92	79 / 92	78 / 89	78 / 89	77 / 86	78 / 86	77 / 85	77 / 83	78 / 84	77 / 83	79 / 83	78 / 82	78 / 81

Elevations between 501 and 1,900 feet

Wet Bulb Temperatures, 58 to 95 F

(Read Down)

Dry Bulb Temperatures 101 to 119 F (Read Across)	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
101	-15	2	12	20	26	30	35	38	42	45	48	50	53	55	57	60	62	64	65	67	69	71	72	74	76	77	79	80	82	83	84	86	87	89	90	91	92	94
	1	3	4	5	7	8	10	12	13	15	17	18	20	22	24	26	28	30	32	34	36	38	40	43	45	47	50	52	55	57	60	63	65	68	71	74	77	80
102	-28	-3	9	17	24	29	33	37	41	44	47	50	52	55	57	59	61	63	65	67	69	70	72	74	75	77	78	80	81	83	84	86	87	88	90	91	92	93
	1	2	3	5	6	8	9	11	12	14	16	17	19	21	23	25	26	28	30	32	34	36	39	41	43	45	48	50	53	55	58	60	63	66	68	71	74	77
103	-10	5	15	21	27	32	36	40	43	46	49	51	54	56	58	60	63	64	66	68	70	72	73	75	76	78	80	81	82	84	85	87	88	89	91	92	93
	1	3	4	6	7	8	10	12	13	15	16	18	20	21	23	25	27	29	31	33	35	37	39	41	43	46	48	50	53	55	58	60	63	66	69	71	74
104	-19	1	12	19	25	30	35	38	42	45	48	51	53	55	58	60	62	64	66	68	69	71	73	75	76	78	79	81	82	84	85	86	88	89	90	92	93
	1	2	3	5	6	8	9	11	12	14	15	17	19	20	22	24	26	28	29	31	33	35	37	40	42	44	46	48	51	53	56	58	61	63	66	69	72
105	-37	-5	8	17	23	29	33	37	41	44	47	50	52	55	57	59	61	63	65	67	69	71	72	74	76	77	79	80	82	83	85	86	87	89	90	91	93
		2	3	4	6	7	8	10	11	13	14	16	18	9	21	23	24	26	28	30	32	34	36	38	40	42	44	47	49	51	54	56	59	61	64	66	69
106	-12	4	14	21	27	32	36	40	43	46	49	52	54	56	59	61	63	65	67	69	70	72	74	75	77	79	80	82	83	84	86	87	89	90	91	93
	1	2	4	5	6	8	9	11	12	14	15	17	18	20	22	23	25	27	29	30	32	34	36	38	40	43	45	47	49	52	54	56	59	61	64	67
107	-23	-1	11	19	25	30	35	38	42	45	48	51	53	56	58	60	62	64	66	68	70	72	73	75	77	78	80	81	83	84	86	87	88	90	91	92
	1	2	3	4	6	7	8	10	11	13	14	16	17	19	20	22	24	26	27	29	31	33	35	37	39	41	43	45	47	50	52	54	57	59	62	64
108	-49	-7	7	16	23	29	33	37	41	44	47	50	53	55	57	60	62	64	66	68	70	71	73	75	76	78	79	81	82	84	85	87	88	89	91	92
		1	3	4	5	6	8	9	10	12	13	15	16	18	19	21	23	24	26	28	30	31	33	35	37	39	41	43	46	48	50	52	55	57	59	62
109	-15	3	13	21	27	32	36	40	43	46	49	52	54	57	59	61	63	65	67	69	71	73	74	76	78	79	81	82	84	85	86	88	89	91	92
	1	2	3	5	6	7	8	10	11	13	14	15	17	18	20	22	23	25	27	28	30	32	34	36	38	40	42	44	46	48	50	53	55	57	60
110	-28	-2	10	19	25	30	35	39	42	45	48	51	54	56	58	61	63	65	67	69	70	72	74	76	77	79	80	82	83	85	86	88	89	90	92
		2	3	4	5	6	8	9	10	12	13	15	16	18	19	21	22	24	25	27	29	31	32	34	36	38	40	42	44	46	48	51	53	55	58
111	-8	7	16	23	29	33	37	41	44	48	50	53	56	58	60	62	64	66	68	70	72	73	75	77	78	80	81	83	84	86	87	89	90	91
	1	2	3	5	6	7	8	10	11	12	14	15	17	18	20	21	23	24	26	28	29	31	33	35	37	39	41	43	45	47	49	51	53	56
112	-17	2	13	21	27	32	36	40	43	47	50	52	55	57	60	62	64	66	68	70	71	73	75	76	78	80	81	83	84	86	87	88	90	91
	1	2	3	4	5	7	8	9	10	12	13	14	16	17	19	20	22	23	25	26	28	30	32	33	35	37	39	41	43	45	47	49	51	54
113	-32	-3	10	18	25	30	35	39	42	46	49	52	54	57	59	61	63	65	67	69	71	73	74	76	78	79	81	82	84	85	87	88	90	91
		1	2	4	5	6	7	8	10	11	12	14	15	16	18	19	21	22	24	25	27	29	30	32	34	36	37	39	41	43	45	47	50	52
114	-10	6	16	23	29	33	38	41	45	48	51	53	56	58	61	63	65	67	69	71	72	74	76	77	79	81	82	84	85	86	88	89	91
	1	2	3	4	5	7	8	9	10	11	13	14	15	17	18	20	21	23	24	26	27	29	31	32	34	36	38	40	42	44	46	48	50
115	-19	2	13	21	27	32	36	40	44	47	50	53	55	58	60	62	64	66	68	70	72	74	75	77	79	80	82	83	85	86	88	89	90
	1	2	3	4	5	6	7	8	10	11	12	13	15	16	17	19	20	22	23	25	26	28	30	31	33	35	36	38	40	42	44	46	48
116	-3	10	18	25	30	35	39	43	44	49	52	55	57	59	62	64	66	68	70	71	73	75	77	78	80	81	83	84	86	87	89	90
	1	2	3	4	6	7	8	9	10	11	13	14	15	17	18	19	21	22	24	25	27	28	30	32	33	35	37	39	41	42	44	46
117	-10	6	16	23	29	34	38	42	45	48	51	54	56	59	61	63	65	67	69	71	73	75	76	78	80	81	83	84	86	87	89	90
	1	2	3	4	5	6	7	8	10	11	12	13	14	16	17	18	20	21	23	24	26	27	29	30	32	34	36	37	39	41	43	45
118	-20	2	13	21	27	32	37	41	44	47	50	53	56	58	60	63	65	67	69	71	72	74	76	78	79	81	82	84	85	87	88	90
	1	1	2	3	5	6	7	8	9	10	11	12	14	15	16	18	19	20	22	23	25	26	28	29	31	33	34	36	38	39	41	43
119	-40	-4	10	19	25	31	35	40	43	47	50	52	55	58	60	62	64	66	68	70	72	74	76	77	79	80	82	84	85	87	88
		1	2	3	4	5	6	7	8	9	11	12	13	14	15	17	18	19	21	22	24	25	27	28	30	31	33	35	36	38	40

DP	DP
RH	RH

Elevations between 1,901 and 3,900 feet

Dry Bulb Temperatures 41 to 60 F
(Read Across)

Wet Bulb Temperatures 27 to 57 F
(Read Down)

DP / RH

Dry Bulb	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	-43 2	-15 8	-3 15	5 22	11 28	16 35	20 42	23 49	26 56	29 63	32 70	34 77	37 85	39 92
42		-27 4	-9 11	0 17	8 24	13 30	18 37	21 43	25 50	28 57	31 64	33 71	36 78	38 85
43			-18 7	-5 13	4 19	10 26	15 32	19 38	23 45	26 51	29 58	32 64	34 71	37 78
44			-32 3	-11 9	-1 15	7 21	12 27	17 33	21 39	24 46	28 52	30 59	33 65	36 72
45				-21 5	-6 11	3 17	9 23	14 29	19 35	23 41	26 47	29 53	32 59	34 66
46				-38 2	-13 8	-2 13	6 19	12 25	16 30	21 36	24 42	27 48	30 54	33 60
47					-24 4	-7 10	2 15	9 21	14 26	18 32	22 37	26 43	29 49	32 55
48					-46 1	-15 6	-3 12	5 17	11 2	16 28	20 33	24 39	27 44	30 50
49						-26 3	-9 8	1 13	8 18	13 24	18 29	22 34	26 40	29 45
50						-57 1	-17 5	-4 10	4 15	11 20	16 25	20 30	24 36	32 41
51							-31 2	-11 7	0 12	7 17	13 22	18 27	22 32	26 37
52								-20 4	-5 9	4 14	10 18	15 23	20 28	24 33
53								-36 2	-12 6	-1 11	7 15	13 20	18 24	22 29
54									-22 4	-6 8	3 12	10 17	15 21	20 26
55										-42 1	-14 5	-2 9	6 14	12 18
56											-25 3	-7 7	2 11	9 15
57											-50 1	-15 5	-2 9	6 13
58												-27 2	-8 6	2 10
59													-16 4	-3 8
60														-29 2

Dry Bulb	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
41	41																		
42	40 92	42																	
43	39 85	41 93	43																
44	38 79	40 86	42 93	44															
45	37 72	39 79	41 86	43 93	45														
46	36 67	38 73	40 80	42 86	44 93	46													
47	34 61	37 67	39 74	41 80	43 87	45 93	47												
48	33 56	36 62	38 68	40 74	42 80	44 87	46 93	48											
49	32 51	34 57	37 63	39 68	41 75	43 81	45 87	47 93	49										
50	30 46	33 52	36 57	38 63	40 69	42 75	44 81	46 87	48 94	50									
51	29 42	32 47	34 53	37 58	39 64	41 70	44 75	46 81	47 88	49 94	51								
52	27 38	30 43	33 48	36 54	38 59	40 65	43 70	45 76	47 81	48 86	50 94	52							
53	25 34	29 39	32 44	34 49	37 54	39 60	42 65	44 71	46 76	48 82	50 88	51 94	53						
54	24 30	27 35	30 40	33 45	36 50	38 55	41 60	43 66	45 71	47 77	49 82	51 88	52 94	54					
55	22 27	25 32	29 36	32 41	35 46	37 51	40 56	42 61	44 66	46 72	48 77	50 83	52 88	53 94	55				
56	20 24	24 28	27 33	30 37	33 42	36 47	39 52	41 57	43 62	45 67	47 73	49 78	51 83	53 89	54 94	56			
57	17 21	22 25	26 30	29 34	32 39	35 43	37 48	40 53	42 57	44 62	46 67	48 73	50 78	52 83	54 89	55 94	57		
58	15 18	20 22	24 26	27 31	31 35	34 40	36 44	39 49	41 53	43 58	46 63	48 68	49 73	51 78	53 84	55 89	56 94	58	
59	12 16	17 20	22 24	26 28	29 32	32 36	35 41	38 45	40 50	42 54	45 59	47 64	49 69	51 73	52 79	54 84	56 89	57 94	59
60	9 13	15 17	20 21	24 25	28 29	31 33	34 37	37 41	39 49	41 50	44 55	46 59	48 64	50 69	52 74	53 79	55 84	57 89	58 95

Wet Bulb Temperatures

Dry Bulb	22	23	24	25	26	27	28	29	30
31	-13 14	-3 23	5 32	10 41	15 50	19 60	22 69	25 79	28 89
32	-23 8	-6 17	0 25	7 34	12 43	16 52	20 61	24 71	27 80
33	-43 2	-16 11	-5 19	3 27	9 36	14 45	18 54	22 63	25 72
34		-29 5	-12 13	-2 21	5 29	11 38	16 46	20 55	23 64
35			-21 8	-7 16	1 23	8 31	13 40	17 48	21 57
36			-39 3	-15 10	-4 18	4 26	10 33	15 42	19 50
37				-27 5	-10 13	0 20	7 28	12 35	17 43
38				-57 1	-18 8	-6 15	3 22	9 30	14 37
39					-33 3	-12 10	-2 17	4 24	11 32
40					-23 6	-7 13	2 19	8 26	14 34

Dry Bulb	31	32	33	34	35	36	37	38	39	40
31	31									
32	29 90	32								
33	28 81	31 91	33							
34	26 73	29 82	32 91	34						
35	25 65	28 74	30 83	33 91	35					
36	23 58	26 66	29 75	31 83	34 91	36				
37	21 51	24 59	27 67	30 75	32 83	35 91	37			
38	19 45	22 53	26 60	28 68	31 76	34 84	36 92	38		
39	16 39	20 47	24 54	27 61	30 69	32 76	35 84	37 92	39	
40	14 34	18 41	22 48	25 55	28 62	31 69	33 77	36 84	38 92	40

Elevations between 1,901 and 3,900 feet

Wet Bulb Temperatures
39 to 79 F
(Read Down)

Dry Bulb Temperatures
61 to 80 F
(Read Across)

	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	-17 4	-3 7	6 11	12 14	18 18	22 22	26 26	29 30	33 34	35 38	38 42	40 47	43 51	45 56	47 60	49 65	51 69	53 74	55 79	56 84	58 89	59 95
62	-31 2	-9 5	2 9	9 12	15 16	20 20	24 23	28 27	31 31	34 35	37 39	39 43	42 48	44 52	46 56	48 61	50 65	52 70	54 75	56 80	57 85	59 90
63	-18 3	-3 7	6 10	12 14	18 17	22 21	26 25	30 28	33 32	36 36	38 40	41 44	43 48	45 53	47 57	49 61	51 66	53 70	55 75	57 80	58 85	60 90
64	-32 1	-9 5	2 8	9 11	15 15	20 18	24 22	28 26	31 29	34 33	37 37	40 41	42 45	45 49	47 53	49 57	51 62	53 66	54 71	56 75	58 80	59 85
65	-18 3	-3 6	6 9	13 13	18 16	23 20	27 23	30 27	33 30	36 34	39 38	41 42	44 46	46 50	48 54	50 58	52 62	54 67	55 71	57 76	59 80	60 85
66	-32 1	-9 4	2 8	10 11	16 14	21 17	25 21	29 24	32 28	35 31	38 35	40 39	43 43	45 47	47 51	49 55	51 59	53 63	55 67	57 72	58 76	60 81
67	-18 3	-3 6	6 9	13 12	18 15	23 19	27 22	30 25	34 29	37 32	39 36	42 40	44 43	46 47	48 51	50 55	52 59	54 63	56 68	58 72	59 76	61 81
68	-32 1	-9 4	2 7	10 10	16 13	21 17	25 20	29 23	32 26	35 30	38 33	41 37	43 41	45 44	48 48	50 52	52 56	54 60	55 64	57 68	59 72	60 77
69	-17 3	-3 6	7 9	13 12	19 15	23 18	27 21	31 24	34 27	37 31	40 34	42 38	45 41	47 45	49 49	51 53	53 56	55 60	56 64	58 69	60 73	62 77
70	-31 1	-9 4	3 7	10 10	16 13	21 16	26 19	29 22	33 25	36 28	39 32	41 35	44 39	46 42	48 46	50 49	52 53	54 57	56 61	58 65	59 69	61 73
71	-17 3	-2 5	7 8	14 11	19 14	24 17	28 20	31 23	35 26	38 29	40 33	43 36	45 39	47 43	49 46	51 50	53 54	55 58	57 61	59 65	60 69	62 73
72	-30 1	-8 4	3 7	11 9	17 12	22 15	26 18	30 21	33 24	36 27	39 30	42 34	44 37	46 40	49 44	51 47	53 51	55 54	56 58	58 62	60 66	62 70
73	-16 3	-1 5	8 8	15 11	20 13	24 16	28 19	32 22	35 25	38 28	41 31	43 34	46 38	48 41	50 44	52 48	54 51	56 55	58 59	59 62	61 66	63 70
74	-28 1	-7 4	4 6	12 9	18 12	23 14	27 17	31 20	34 23	37 26	40 29	42 32	45 35	47 38	49 42	51 45	53 48	55 52	57 55	59 59	61 63	62 67
75	-14 3	0 5	9 8	15 10	21 13	25 16	29 18	33 21	36 24	39 27	41 30	44 33	46 36	48 39	51 42	53 46	55 49	56 52	58 56	60 60	62 63	63 67
76	-26 1	-6 4	5 6	13 9	18 11	23 14	27 17	31 19	35 22	38 25	40 28	43 31	45 34	48 37	50 40	52 43	54 46	56 50	58 53	59 57	61 60	63 64
77	-54	-13 3	1 5	9 7	16 10	21 12	26 15	30 18	33 20	36 23	39 26	42 29	45 32	47 34	49 37	51 41	53 44	55 47	57 50	59* 54	61 57	62 61
78	-23 1	-4 4	6 6	13 9	19 11	24 13	28 16	32 19	35 21	38 24	41 27	44 29	46 32	48 35	51 38	53 41	55 44	56 48	58 51	60 54	62 57	63 61
79	-45	-11 3	2 5	10 7	17 10	22 12	27 14	30 17	34 20	37 22	40 25	43 27	45 30	48 33	50 36	52 39	54 42	56 45	58 46	60 51	61 55	63 58
80			-20 2	-3 4	7 6	14 8	20 11	25 13	29 15	33 18	36 20	39 23	42 26	44 28	47 31	49 34	51 37	53 40	55 43	57 46	59 49	61 52

	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
61																			
62	60 95																		
63	60 90	61 95																	
64	59 85	61 90	63 95																
65	59 80	60 85	62 90	64 95															
66	58 76	60 81	61 85	63 90	65 95														
67	58 72	59 76	61 81	63 86	64 90	66 95													
68	57 68	59 72	60 77	62 81	64 86	65 90	67 95												
69	56 64	58 69	60 73	62 77	63 81	65 86	66 91	68 95											
70	56 61	58 65	59 69	61 73	63 77	64 82	66 86	67 91	69 95										
71	55 58	57 61	59 65	60 69	62 73	64 78	65 82	67 86	68 91	70 95									
72	55 54	56 58	58 62	60 66	62 70	63 74	65 78	66 82	68 86	69 91	71 95								
73	54 51	56 55	58 59	59 62	61 66	63 70	64 74	66 78	67 82	69 87	70 91	72 95							
74	53 48	55 52	57 55	59 59	61 63	62 67	64 70	65 74	67 78	68 83	70 87	71 91	73 95						
75	53 46	55 49	56 52	58 56	60 60	62 63	63 67	65 71	66 75	68 79	69 83	71 87	72 91	74 96					
76	52 43	54 46	56 50	58 53	59 57	61 60	63 64	64 67	66 71	68 75	69 79	70 83	72 87	73 91	75 96				
77	51 41	53 44	55 47	57 50	59* 54	61 57	62 61	64 64	66 68	67 71	69 75	70 79	71 83	73 87	74 91	76 96			
78	51 38	53 41	55 44	56 48	58 51	60 54	62 57	63 61	65 64	67 68	68 72	70 76	71 79	73 83	74 87	75 91	77 96		
79	50 36	52 39	54 42	56 45	58 46	60 51	61 55	63 58	65 61	66 65	68 68	69 72	71 76	72 80	74 84	75 88	76 92	78 96	
80	49 34	51 37	53 40	55 43	57 46	59 49	61 52	62 55	64 58	66 62	67 65	69 69	70 72	72 76	73 80	75 84	76 88	77 92	79 96

DP	DP
RH	RH

Elevations between 1,901 and 3,900 feet

Wet Bulb Temperatures 49 to 89 F

(Read Down)

Dry Bulb Temperatures 81 to 100 F (Read Across)	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
81	-9	3	12	18	23	27	31	35	38	41	43	46	48	50	53	55	57	58	60	62	64	65	67	68	70	71	73	74	76	77	78	80	81									
	3	5	7	9	12	14	16	19	21	24	26	29	32	35	37	40	43	46	49	52	56	59	62	66	69	73	76	80	84	88	92	96										
82	-17	-1	8	15	21	26	30	33	37	40	42	45	47	50	52	54	56	58	60	61	63	65	66	68	70	71	72	74	75	77	78	79	81	82								
	2	4	6	8	10	13	15	17	20	22	25	27	30	33	35	38	41	44	47	50	53	56	59	63	66	69	73	77	80	84	88	92	96									
83	-31	-7	5	13	19	24	28	32	35	39	41	44	47	49	51	53	55	57	59	61	63	64	66	68	69	71	72	74	75	76	78	79	80	82	83							
	1	3	5	7	9	11	14	16	18	21	23	26	28	31	33	36	39	42	44	47	50	53	57	60	63	66	70	73	77	80	84	88	92	96								
84	-14	1	10	17	22	27	31	34	37	40	43	46	48	50	53	55	57	59	60	62	64	66	67	69	70	72	73	75	76	77	79	80	81	83	84							
	2	4	6	8	10	12	15	17	19	21	24	26	29	31	34	37	39	42	45	48	51	54	57	60	63	67	70	74	77	81	84	88	92	96								
85	-26	-5	6	14	20	25	29	33	36	39	42	45	47	50	52	54	56	58	60	62	63	65	67	68	70	71	73	74	76	77	78	80	81	82	84	85						
	1	3	5	7	9	11	13	15	18	20	22	25	27	30	32	35	37	40	43	46	48	51	54	57	61	64	67	70	74	77	81	85	88	92	96							
86	-11	2	11	18	23	28	32	35	38	41	44	47	49	51	53	55	57	59	61	63	65	66	68	69	71	72	74	75	77	78	80	81	82	83	85	86						
	2	4	6	8	10	12	14	16	19	21	23	25	28	30	33	35	38	41	43	46	49	52	55	58	61	64	67	71	74	78	81	85	88	92	96							
87	-21	-2	8	15	21	26	30	34	37	40	43	46	48	50	53	55	57	59	61	62	64	66	67	69	71	72	74	75	76	78	79	81	82	83	84	86	87					
	1	3	5	7	9	11	13	15	17	19	22	24	26	29	31	33	36	39	41	44	47	49	52	55	58	61	64	68	71	74	78	81	85	88	92	96						
88	-39	-8	4	13	19	24	29	33	36	39	42	45	47	50	52	54	56	58	60	62	64	65	67	69	70	72	73	75	76	78	79	80	82	83	84	85	87	88				
		2	4	6	8	10	12	14	16	18	20	22	25	27	29	32	34	37	39	42	44	47	50	53	56	59	62	65	68	71	75	78	81	85	89	92	96					
89	-17	0	9	17	22	27	31	35	38	41	44	47	49	51	53	56	58	59	61	63	65	67	68	70	71	73	74	76	77	79	80	81	83	84	85	87	88	89				
	1	3	5	7	9	11	13	15	17	19	21	23	25	28	30	32	35	37	40	42	45	48	50	53	56	59	62	65	68	71	75	78	82	85	89	92	96					
90	-30	-6	6	14	20	25	30	34	37	40	43	46	48	51	53	55	57	59	61	63	64	66	68	69	71	72	74	75	77	78	80	81	82	84	85	86	88	89	90			
	1	2	4	6	8	10	12	13	15	17	20	22	24	26	28	31	33	35	38	40	43	45	48	51	54	56	59	62	65	69	72	75	78	82	85	89	92	96				
91	-13	2	11	18	23	28	32	36	39	42	45	47	50	52	54	56	58	60	62	64	66	67	69	71	72	74	75	77	78	79	81	82	83	85	86	87	89	90				
	2	3	5	7	9	11	12	14	16	18	20	22	25	27	29	31	34	36	38	41	43	46	49	51	54	57	60	63	66	69	72	75	79	82	85	89	93	96				
92	-23	-3	8	16	22	27	31	35	38	41	44	47	49	51	54	56	58	60	62	63	65	67	69	70	72	73	75	76	78	79	80	82	83	84	86	87	88	90				
	1	3	4	6	8	10	11	13	15	17	19	21	23	25	27	30	32	34	36	39	41	44	46	49	52	54	57	60	63	66	69	72	75	79	82	86	89	93				
93	-45	-9	4	13	19	25	29	33	37	40	43	46	48	51	53	55	57	59	61	63	65	66	68	70	71	73	74	76	77	79	80	81	83	84	85	87	88	89				
		2	3	5	7	9	10	12	14	16	18	20	22	24	26	28	30	32	35	37	39	42	44	47	50	52	55	58	60	63	66	69	73	76	79	82	86	89				
94	-17	0	10	17	23	28	32	36	39	42	45	47	50	52	54	57	59	61	62	64	66	68	69	71	72	74	76	77	78	80	81	83	84	85	87	88	89					
	1	3	4	6	8	9	11	13	15	17	19	20	22	24	27	29	31	33	35	38	40	42	45	47	50	53	55	58	61	64	67	70	73	76	79	82	86					
95	-31	-5	6	15	21	26	30	34	38	41	44	47	59	52	54	56	58	60	62	64	66	67	69	71	72	74	75	77	78	80	81	82	84	85	86	88	89					
	1	2	4	5	7	9	10	12	14	16	17	19	21	23	25	27	29	31	34	36	38	40	43	45	48	50	53	56	58	61	64	67	70	73	76	79	83					
96	-12	3	12	19	24	29	33	37	40	43	46	48	51	53	55	57	59	61	63	65	67	68	70	72	73	75	76	78	79	81	82	83	85	86	87	89						
	1	3	4	6	8	9	11	13	14	16	18	20	22	24	26	28	30	32	34	36	39	41	43	46	48	51	53	56	59	61	64	67	70	73	76	79						
97	-23	-2	9	16	22	27	32	36	39	42	45	48	50	52	55	57	59	61	63	65	66	68	70	71	73	74	76	77	79	80	82	83	84	86	87	88						
	1	2	4	5	7	8	10	12	13	15	17	19	21	23	24	26	28	30	33	35	37	39	41	44	46	49	51	54	56	59	62	65	67	70	73	76						
98	-44	-8	5	14	20	26	30	34	38	41	44	47	49	52	54	56	58	60	62	64	66	68	69	71	73	74	76	77	79	80	81	83	84	85	87	88						
		2	3	5	6	8	9	11	13	14	16	18	19	21	23	25	27	29	31	33	35	37	40	42	44	47	49	52	54	57	59	62	65	68	71	74						
99	-16	1	11	18	24	29	33	37	40	43	46	49	51	53	56	58	60	62	64	65	67	69	71	72	74	75	77	78	80	81	83	84	85	87	88							
		1	2	4	5	7	8	10	12	13	15	17	18	20	22	24	26	28	30	32	34	36	38	40	42	45	47	50	52	55	57	60	62	65	68	71						
100	-29	-4	8	16	22	27	32	35	39	42	45	48	50	53	55	57	59	61	63	65	67	68	70	72	73	75	76	78	79	81	82	84	85	86	88							
	1	2	3	5	6	8	9	11	12	14	16	17	19	21	23	24	26	28	30	32	34	36	38	41	43	45	48	50	52	55	57	60	63	65	68							

Elevations between 1,901 and 3,900 feet

Wet Bulb Temperatures, 57 to 90 F

(Read Down)

Dry Bulb Temperatures 101 to 119 F (Read Across)	DP / RH	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
101	DP	-11	4	13	20	25	30	34	38	41	44	47	50	52	54	57	59	61	63	65	66	68	70	71	73	75	76	78	79	81	82	83	85	86	87
	RH	1	3	4	5	7	8	10	11	13	15	16	18	20	21	23	25	27	29	31	33	35	37	39	41	43	46	48	50	53	55	50	60	63	66
102	DP	-20	-1	10	18	24	29	33	37	40	43	46	49	51	54	56	58	60	62	64	66	68	69	71	73	74	76	77	79	80	82	83	84	86	87
	RH	1	2	3	5	6	8	9	11	12	14	15	17	19	20	22	24	26	27	29	31	33	35	37	39	42	44	46	48	51	53	56	58	61	63
103	DP	-37	-6	7	15	22	27	32	36	39	42	45	48	51	53	55	58	60	62	64	65	67	69	71	72	74	75	77	78	80	81	83	84	86	87
	RH		2	3	4	6	7	8	10	11	13	14	16	18	19	21	23	24	26	28	30	32	34	36	38	40	42	44	48	49	51	53	56	58	61
104	DP		-13	3	13	20	25	30	34	38	41	44	47	50	52	55	57	59	61	63	65	67	69	70	72	74	75	77	78	80	81	83	84	85	87
	RH		1	2	4	5	6	8	9	11	12	13	15	17	18	20	21	23	25	27	28	30	32	34	36	38	40	42	45	47	49	51	54	56	59
105	DP		-24	-2	9	17	24	29	33	37	40	43	46	49	52	54	56	58	61	63	64	66	68	70	72	73	75	76	78	79	81	82	84	85	86
	RH		1	2	3	4	6	7	8	10	11	13	14	16	17	19	20	22	24	25	27	29	31	33	35	37	49	41	43	45	47	49	52	54	57
106	DP		-48	8	6	15	22	27	32	36	39	43	46	48	51	53	56	58	60	62	64	66	68	69	71	73	74	76	78	79	80	82	83	85	86
	RH			1	3	4	5	6	8	9	10	12	13	15	16	18	19	21	23	24	26	28	30	31	33	35	37	39	41	43	45	48	50	52	54
107	DP			-16	2	12	19	25	30	34	38	42	45	48	50	53	55	57	59	62	64	65	67	69	71	72	74	76	77	79	80	82	83	84	86
	RH			1	2	3	4	6	7	8	10	11	12	14	15	17	18	20	22	23	25	27	28	30	32	34	36	38	40	42	44	46	48	50	52
108	DP			-28	-3	9	17	23	29	33	37	41	44	47	49	52	54	57	59	61	63	65	67	69	70	72	74	75	77	78	80	81	83	84	86
	RH				2	3	4	5	6	8	9	10	12	13	14	16	17	19	20	22	24	25	27	29	31	32	34	36	38	40	42	44	46	48	51
109	DP				-9	5	15	21	27	32	36	40	43	46	49	51	54	56	58	60	63	64	66	68	70	72	73	75	77	78	80	81	83	84	85
	RH				1	2	3	5	6	7	8	10	11	12	14	15	17	18	19	21	23	24	26	28	29	31	33	35	36	38	40	42	44	47	49
110	DP				-18	1	12	19	25	30	35	38	42	45	48	51	53	56	58	60	62	64	66	68	70	71	73	75	76	78	79	81	82	84	85
	RH				1	2	3	4	5	6	8	9	10	12	13	14	16	17	19	20	22	23	25	26	28	30	31	33	35	37	39	41	43	45	47
111	DP				-32	-4	9	17	24	29	33	37	41	44	47	50	52	55	57	59	61	64	65	67	69	71	73	74	76	77	79	80	82	83	85
	RH					1	2	4	5	6	7	8	10	11	12	13	15	16	18	19	21	22	24	25	27	28	30	32	34	35	37	39	41	43	45
112	DP					-10	5	15	22	27	32	36	40	43	46	49	52	54	57	59	61	63	65	67	69	70	72	74	76	77	79	80	82	83	85
	RH					1	2	3	4	5	7	8	9	10	11	13	14	15	17	18	20	21	23	24	26	27	29	31	32	34	36	38	40	42	44
113	DP					-19	1	12	19	25	31	35	39	42	45	48	51	54	56	58	60	63	65	66	68	70	72	74	75	77	78	80	81	83	84
	RH					1	2	3	4	5	6	7	8	10	11	12	13	15	16	17	19	20	22	23	25	26	28	29	31	33	35	36	38	40	42
114	DP					-35	-4	9	17	24	29	34	38	41	44	47	50	53	55	58	60	62	64	66	68	70	71	73	75	76	78	80	81	83	84
	RH						1	2	3	4	5	6	7	8	9	11	13	14	15	16	18	19	21	22	24	25	27	28	30	32	33	35	37	39	40
115	DP						-11	5	15	22	27	32	36	40	44	47	50	52	55	57	59	61	64	66	67	69	71	73	74	76	78	79	81	82	84
	RH						1	2	3	4	5	6	7	8	9	11	12	13	14	16	17	18	20	21	23	24	26	27	29	30	32	34	35	37	39
116	DP						-20	1	12	20	26	31	35	39	43	46	49	51	54	56	59	61	63	65	67	69	71	72	74	76	77	79	81	82	84
	RH						1	2	2	4	5	6	7	8	9	10	11	12	14	15	16	18	19	20	22	23	25	26	28	29	31	32	34	36	38
117	DP						-38	-4	9	17	24	29	34	38	42	45	48	51	53	56	58	60	63	65	67	68	70	72	74	75	77	79	80	82	83
	RH							1	2	3	4	5	6	7	8	9	11	12	13	14	15	17	18	19	21	22	24	25	26	28	30	31	33	34	36
118	DP							-11	5	15	22	28	33	37	41	46	47	50	53	55	58	60	62	64	66	68	70	72	73	75	77	78	80	81	83
	RH							1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	17	18	20	21	23	24	25	27	28	30	32	33	35
119	DP							-21	1	12	20	26	31	36	40	43	46	49	52	55	57	59	62	64	66	68	69	71	73	75	76	78	80	81	83
	RH								1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	18	19	20	22	23	24	26	27	29	30	32	34

Elevations between 3,901 and 6,100 feet

Dry Bulb Temperatures 41 to 60 F

(Read Across)

Wet Bulb Temperatures 27 to 56 F

(Read Down)

DP	DP
RH	RH

Dry Bulb Temperatures	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	-22 6	-8 12	1 18	8 25	13 31	17 38	21 44	24 51	27 58	30 64	32 71	35 78	37 85	39 93
42	-39 2	-15 8	-3 14	4 20	10 27	15 33	19 39	23 46	26 52	29 58	31 64	34 71	36 78	38 85
43	-25 5	-9 10	0 16	7 22	13 29	17 35	21 41	24 47	27 53	30 59	32 66	35 72	37 79	39 86
44	-48 1	-17 7	-4 13	4 18	10 24	15 30	19 36	22 42	25 48	28 54	31 60	34 66	36 73	38 80
45		-29 4	-10 9	0 15	7 20	12 26	17 31	20 37	24 43	27 49	30 55	32 61	35 67	37 73
46			-19 6	-5 11	3 17	9 22	14 27	18 33	22 38	25 44	28 50	31 56	34 62	36 68
47			-32 3	-12 8	-1 13	6 18	12 23	16 29	20 34	24 40	27 45	30 51	32 57	35 62
48				-20 5	-6 10	2 15	9 20	14 25	18 30	22 35	25 41	28 46	31 52	34 57
49				-35 2	-13 7	-2 12	5 17	11 21	16 26	20 31	24 37	27 42	30 47	32 53
50					-22 4	-7 9	2 13	8 18	14 23	18 28	22 33	25 38	28 43	31 48
51					-39 2	-14 6	-3 10	5 15	11 20	16 24	20 29	24 34	27 39	30 44
52						-24 3	-8 8	1 12	8 17	13 21	18 26	22 30	25 35	28 40
53						-45 1	-16 5	-3 9	5 14	11 18	16 22	20 27	24 32	27 36
54							-27 3	-9 7	1 11	8 15	13 19	18 24	22 28	25 33
55							-53 1	-17 5	-4 8	4 13	11 17	16 21	20 25	24 29
56								-29 2	-10 6	0 10	8 14	13 18	18 22	22 26
57									-18 4	-4 8	4 12	11 15	16 19	20 23
58									-31 2	-10 6	0 9	7 13	13 17	18 21
59										-19 4	-5 7	4 11	11 14	16 18
60										-32 2	-11 5	0 9	8 12	13 16

Wet Bulb Temperatures

Dry Bulb Temperatures	21	22	23	24	25	26	27	28	29	30
31	-20 10	-8 18	0 26	6 35	11 44	16 52	19 61	23 71	26 80	28 90
32	-35 4	-15 12	-4 20	3 28	9 37	13 45	17 54	21 63	24 73	27 81
33	-25 7	-10 15	-1 22	5 30	11 39	15 47	19 56	22 64	25 73	28 82
34	-48 2	-18 9	-6 17	2 25	8 32	12 40	17 49	20 57	24 65	27 74
35		-31 4	-13 12	-3 19	4 27	10 34	14 42	18 50	22 58	25 67
36			-22 7	-9 14	0 21	7 29	12 36	16 44	20 52	23 60
37			-40 3	-16 9	-5 16	3 23	9 31	14 38	18 46	22 53
38				-27 5	-11 12	-1 19	6 26	11 33	16 40	20 47
39				-55 1	-19 7	-6 14	2 21	8 27	13 34	18 42
40					-32 3	-13 10	-2 16	5 23	11 29	15 36

Elevations between 3,901 and 6,100 feet

Wet Bulb Temperatures 38 to 79 F
(Read Down)

Dry Bulb Temperatures 61 to 80 F
(Read Across)

DP	DP
RH	RH

	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60																					
61	-19 3	-5 7	4 10	11 14	16 17	21 21	24 24	28 28	31 32	34 36	37 40	39 44	41 48	43 52	46 57	48 61	49 66	51 70	53 75	55 80	56 85	58 90	59 95	61																					
62	-33 1	-11 5	0 8	8 11	14 15	19 18	23 22	26 26	30 29	33 33	35 37	38 41	40 45	43 49	45 53	47 57	49 62	51 66	52 71	54 75	56 80	57 85	59 90	61 95	62																				
63	-19 3	-5 6	4 9	11 13	16 16	21 20	25 23	28 27	31 30	34 34	37 38	39 42	42 46	44 50	46 54	48 58	50 62	52 67	54 71	55 76	57 80	58 85	60 90	62 95	63																				
64	-34 1	-11 4	0 8	8 11	14 14	19 17	23 21	27 24	30 28	33 31	36 35	38 39	41 43	43 46	45 50	47 54	49 59	51 63	53 67	55 72	56 76	58 81	60 85	61 90	63 95	64																			
65	-19 3	-4 6	5 9	11 12	17 15	21 19	25 22	29 25	32 29	35 32	37 36	40 40	42 43	44 47	47 51	49 55	50 59	52 63	54 68	56 72	57 76	59 81	61 86	62 90	64 95	65																			
66	-33 1	-10 4	1 7	8 10	14 13	19 16	23 20	27 23	31 26	34 30	36 33	39 37	41 40	44 44	46 48	48 52	50 56	52 60	53 64	55 68	57 72	58 77	60 81	62 86	63 90	65 95	65																	
67	-19 3	-4 6	5 8	12 11	17 15	22 18	26 21	29 24	32 27	35 31	38 34	40 38	43 41	45 45	47 49	49 52	51 56	53 60	55 64	56 68	58 73	60 77	61 81	63 86	64 90	66 95	67																	
68	-32 1	-10 4	1 7	9 10	15 13	20 16	24 19	28 22	31 25	34 28	37 32	39 35	42 39	44 42	46 46	48 49	50 53	52 57	54 61	56 65	57 69	59 73	61 77	62 82	64 86	65 91	67 95	68																
69	-18 3	-3 5	6 8	12 11	18 14	22 17	26 20	30 23	33 26	36 29	38 33	41 36	43 39	45 43	48 46	50 50	52 54	53 57	55 61	57 65	59 69	60 73	62 78	63 82	65 86	66 91	68 95	69																
70	-31 1	-9 4	2 7	10 9	15 12	20 15	25 18	28 21	32 24	35 27	37 30	40 33	42 37	45 40	47 44	49 47	51 51	53 54	55 58	56 62	58 66	60 70	61 74	63 78	64 82	66 86	67 91	69 95	70															
71	-17 3	-3 5	6 8	13 11	18 13	23 16	27 19	30 22	33 25	36 28	39 31	41 34	44 38	46 41	48 44	50 48	52 51	54 55	56 58	57 62	59 66	61 70	62 74	64 78	65 82	67 87	68 91	70 95	71															
72	-29 1	-8 4	3 6	10 9	16 12	21 14	25 17	29 20	32 23	35 26	38 29	41 32	43 35	45 38	47 42	49 45	51 48	53 52	55 55	57 59	59 63	60 66	62 70	63 74	65 78	66 83	68 87	69 91	71 95	72														
73	-15 3	-2 5	7 8	14 10	19 13	23 16	27 18	31 21	34 24	37 27	40 30	42 33	44 36	47 39	49 42	51 46	53 49	55 52	56 56	58 59	60 63	61 67	63 71	64 75	66 79	67 83	69 87	70 91	72 96	73													
74	-26 1	-7 4	4 6	11 9	17 11	22 14	26 17	30 19	33 22	36 25	39 28	41 31	44 34	46 37	48 40	50 43	52 46	54 50	56 53	58 56	59 60	61 64	62 67	64 71	66 75	67 79	68 83	70 87	71 91	73 96	74											
75	-52	-14 3	0 5	8 7	15 10	20 12	24 15	28 18	32 20	35 23	38 26	40 29	43 31	45 34	47 37	49 41	51 44	53 47	55 50	57 53	59 57	60 60	62 64	64 68	65 71	67 75	68 79	70 83	71 87	72 91	74 96	75									
76	-24 2	5 4	5 6	12 9	18 11	22 13	27 16	30 19	33 21	36 24	39 27	42 29	44 32	47 35	49 38	51 41	53 44	55 47	56 51	58 54	60 57	62 61	63 64	65 68	66 72	68 75	69 79	71 83	72 87	73 91	75 96	76								
77	-43	-12 3	1 5	9 7	15 10	21 12	25 14	29 17	32 19	35 22	38 25	41 27	43 30	46 33	48 36	50 39	52 42	54 45	56 48	58 51	59 55	61 58	63 61	64 65	66 68	67 72	69 76	70 80	72 83	73 87	74 92	76 96	77							
78	-21 2	-4 4	6 6	13 8	19 11	23 13	27 15	31 18	34 20	37 23	40 26	43 28	45 31	47 34	49 37	51 40	53 42	55 46	57 49	59 52	61 55	62 58	64 62	65 65	67 69	68 72	70 76	71 80	73 84	74 88	75 92	77 96	78						
79	-36 1	-10 3	2 5	10 7	16 9	21 12	26 14	30 16	33 19	36 21	39 24	42 26	44 29	46 32	49 35	51 37	53 40	55 43	57 46	58 49	60 52	62 6	63 59	65 62	66 66	68 69	69 73	71 76	72 80	74 84	75 88	76 92	78 96	79					
80	-18 2	-2 4	7 6	14 8	20 10	24 13	28 15	32 17	35 20	38 22	41 25	43 27	46 30	48 32	50 35	52 38	54 41	56 44	58 47	60 50	61 53	63 56	65 59	66 63	68 66	69 69	71 73	72 77	73 80	75 84	76 88	77 92	79 96						

Elevations between 3,901 and 6,100 feet

Wet Bulb Temperatures 48 to 89 F (Read Down)

DP / RH	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	-8 3	4 5	11 7	17 9	22 11	27 14	30 16	34 18	37 21	40 23	42 25	45 28	47 31	49 33	51 36	53 39	55 41	57 44	59 47	61 50	62 53	64 56	66 60	67 63	69 66	70 70	72 73	73 77	74 80	76 84	77 88	78 92	80 96
82	-15 2	-1 4	8 6	15 8	21 10	25 12	29 15	33 17	36 19	39 21	41 24	44 26	46 29	49 31	51 34	53 37	55 39	57 42	59 45	60 48	62 51	64 54	65 57	67 60	68 63	70 67	71 70	73 73	74 77	75 81	77 84	78 88	80 92
83	-26 1	-6 3	5 5	13 7	19 9	23 11	28 13	31 15	35 18	38 20	41 22	43 25	46 27	48 29	50 32	52 35	54 37	56 40	58 43	60 45	61 48	63 51	65 54	66 57	68 60	69 64	71 67	72 70	74 74	75 77	76 81	78 84	79 88
84	-49	-12 2	1 4	10 6	16 8	22 10	26 12	30 14	34 16	37 18	40 21	42 23	45 25	47 28	49 30	52 33	54 35	56 38	57 41	59 43	61 46	63 49	64 52	66 55	68 58	69 61	71 64	72 67	73 71	75 74	76 77	78 81	79 85
85		-21 1	-3 3	7 5	14 7	20 9	24 11	29 13	32 15	36 17	39 19	41 22	44 24	46 26	49 28	51 31	53 33	55 36	57 38	59 41	61 44	62 47	64 49	66 52	67 55	69 58	70 61	72 64	73 68	74 71	76 74	77 78	79 81
86		-37 1	-9 2	3 4	11 6	18 8	23 10	27 12	31 14	34 16	38 18	40 20	43 22	46 25	48 27	50 29	52 32	54 34	56 36	58 39	60 42	62 44	63 47	65 50	67 53	68 56	70 59	71 62	73 65	74 68	76 71	77 74	78 78
87			-17 2	-1 3	8 5	15 7	21 9	26 11	30 13	33 15	36 17	39 19	42 21	45 23	47 25	50 28	52 30	54 32	56 35	58 37	60 40	61 42	63 45	65 48	66 50	68 53	69 56	71 59	72 62	74 65	75 68	77 71	78 75
88			-29 1	-6 2	5 4	13 6	19 8	24 10	28 12	32 13	35 15	38 17	41 20	44 22	46 24	49 26	51 28	53 31	55 33	57 35	59 38	61 40	63 43	64 45	66 48	67 51	69 54	71 56	72 59	73 62	75 65	76 68	78 72
89				-13 2	1 3	10 5	17 7	22 9	27 11	31 12	34 14	37 16	40 18	43 20	46 22	48 24	50 27	53 29	55 31	57 33	58 36	60 38	62 41	64 43	65 46	67 49	69 51	70 54	72 57	73 60	7 63	76 66	77 69
90				-22 1	-3 3	7 4	14 6	20 8	25 10	29 11	33 13	36 15	39 17	42 19	45 21	47 23	50 25	52 27	54 30	56 32	58 34	60 36	62 39	63 41	65 44	67 46	68 49	70 52	71 54	73 57	74 60	76 63	77 66
91				-40	-9 2	3 4	12 5	18 7	23 9	28 10	32 12	35 14	38 16	41 18	44 20	47 22	49 24	51 26	53 28	55 30	57 32	59 35	61 37	63 39	65 42	66 44	68 47	69 49	71 52	72 55	74 58	75 60	77 63
92					-17 1	-1 3	9 4	16 6	22 8	26 9	30 11	34 13	37 15	40 17	43 19	46 20	48 22	51 24	53 27	55 29	57 31	59 33	61 35	62 38	64 40	66 42	67 45	69 47	71 50	72 52	74 55	75 58	76 61
93					-29 1	-6 2	6 4	14 5	20 7	25 9	29 10	33 12	36 14	39 16	42 17	45 19	48 21	50 23	52 25	54 27	56 29	58 31	60 34	62 36	64 38	65 40	67 43	69 45	70 48	72 50	73 53	75 56	76 58
94						-12 2	2 3	11 5	18 6	23 8	28 9	32 11	35 13	38 14	41 16	44 18	47 20	49 22	51 24	54 26	56 28	58 30	60 32	61 34	63 36	65 39	67 41	68 43	70 46	71 48	73 51	74 53	76 56
95						-22 1	-3 2	8 4	15 5	21 7	26 9	30 10	34 12	37 13	40 15	43 17	46 19	48 21	51 22	53 24	55 26	57 28	59 30	61 33	63 35	65 37	66 39	68 41	69 44	71 46	73 49	74 51	76 54
96							-39	-8 2	4 3	13 5	19 6	24 8	29 9	33 11	36 13	40 14	42 16	45 18	48 19	50 21	52 23	55 25	57 27	59 29	60 31	62 33	64 35	66 37	67 40	69 42	71 44	72 47	74 49	75 51
97								-16 1	0 3	10 4	17 5	23 7	27 8	32 10	35 12	39 13	42 15	44 17	47 18	49 20	52 22	54 24	56 26	58 28	60 30	62 32	64 34	65 36	67 38	69 40	70 42	72 45	73 47	75 49
98								-27 1	-4 2	7 3	15 5	21 6	26 8	30 9	34 11	37 12	41 14	44 16	46 17	49 19	51 21	53 23	55 24	58 26	59 28	61 30	63 32	65 34	67 36	68 38	70 41	72 43	73 45	75 47
99								-54	-10 1	3 3	12 4	19 6	24 7	29 8	33 10	36 11	40 13	43 15	45 16	48 18	50 20	53 21	55 23	57 25	59 27	61 29	63 31	65 33	66 35	68 ##	70 39	71 41	73 43	74 46
100									-19 1	-1 2	9 4	17 5	22 6	27 8	32 9	35 11	39 12	42 14	45 15	47 17	50 19	52 20	54 22	56 24	58 26	60 27	62 29	64 31	66 33	68 35	69 37	71 39	72 41	74 44

Dry Bulb Temperatures 81 to 100 F (Read Across)

DP / RH	81	82	83	84	85	86	87	88	89	90
81										
82	80 96									
83	80 92	82 96								
84	80 88	81 92	83 96							
85	80 82	81 88	82 92	84 96						
86	80 81	81 85	82 89	83 92	85 96					
87	79 78	81 82	82 85	83 89	85 92	86 96				
88	79 75	80 78	82 82	83 85	84 89	86 92	87 96			
89	79 72	80 75	81 78	83 82	84 85	85 89	87 93	88 96		
90	78 69	80 72	81 75	82 79	84 82	85 85	86 89	88 93	89 96	
91	78 66	80 69	81 72	82 76	84 79	85 82	86 86	87 89	89 93	90 96
92	78 64	79 67	81 70	82 73	83 76	85 79	86 82	87 86	88 89	90 93
93	78 61	79 64	80 67	82 70	83 73	84 76	86 79	87 82	88 86	89 89
94	77 59	79 61	80 64	81 67	83 70	84 73	85 76	87 79	88 83	89 86
95	77 56	78 59	80 62	81 65	82 67	84 70	85 73	86 76	88 80	89 83
96	77 54	78 57	80 59	81 62	82 65	84 68	85 71	86 74	87 77	89 80
97	76 52	78 54	79 57	81 60	82 62	83 65	85 68	86 71	87 74	88 77
98	76 50	78 52	79 55	80 57	82 60	83 63	84 65	86 68	87 71	88 74
99	76 48	77 50	79 53	80 55	81 58	83 60	84 63	85 66	87 68	88 71
100	75 46	77 48	78 51	80 53	81 55	83 58	84 61	85 63	87 66	88 69

Elevations between 3,901 and 6,100 feet

Wet Bulb Temperatures, 55 to 90 F

(Read Down)

	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
101	-33	-6	6	14	21	26	30	34	38	41	44	46	49	51	54	56	58	60	62	64	65	67	69	70	72	74	75	77	78	79	81	82	84	85	86	88
		2	3	4	6	7	8	10	11	13	14	16	18	19	21	23	24	26	28	30	32	34	36	38	40	42	44	46	49	51	53	56	58	61	63	66
102		-13	2	12	19	24	29	33	37	40	43	46	48	51	53	55	57	59	61	63	65	67	68	70	72	73	75	76	78	79	81	82	83	85	86	87
		1	2	4	5	6	8	9	11	12	13	15	17	18	20	21	23	25	27	28	30	32	34	36	38	40	42	44	47	49	51	54	56	59	61	64
103		-22	-2	9	16	22	27	32	35	39	42	45	48	50	52	55	57	59	61	63	65	66	68	70	71	73	74	76	77	79	80	82	83	84	86	87
		1	2	3	4	6	7	8	10	11	13	14	16	17	19	20	22	24	25	27	29	31	33	35	37	39	41	43	45	47	49	52	54	56	59	61
104		-39	-7	5	14	20	26	30	34	38	41	44	47	49	52	54	56	58	60	62	64	66	68	69	71	73	74	76	77	79	80	81	83	84	86	87
			1	3	4	5	6	8	9	10	12	13	15	16	18	19	21	23	24	26	28	29	31	33	35	37	39	41	43	45	47	50	52	54	57	59
105			-14	2	11	18	24	29	33	37	40	43	46	49	51	53	56	58	60	62	64	65	67	69	71	72	74	75	77	78	80	81	83	84	85	87
			1	2	3	5	6	7	8	10	11	12	14	15	17	18	20	21	23	25	26	28	30	32	34	36	37	39	41	44	46	48	50	52	55	57
106			-25	-3	8	16	22	27	32	36	39	42	45	48	50	53	55	57	59	61	63	65	67	69	70	72	73	75	77	78	80	81	82	84	85	86
			1	2	3	4	5	6	8	9	10	12	13	14	16	17	19	20	22	24	25	27	29	30	32	34	36	38	40	42	44	46	48	50	53	55
107			-47	-8	5	14	20	26	30	35	38	41	44	47	50	52	54	57	59	61	63	65	66	68	70	72	73	75	76	78	79	81	82	83	85	86
				1	2	4	5	6	7	8	10	11	12	14	15	17	18	19	21	23	24	26	27	29	31	33	35	36	38	40	42	44	46	49	51	55
108				-16	1	11	18	24	29	33	37	40	44	46	49	52	54	56	58	60	62	64	66	68	69	71	73	74	76	77	79	80	82	83	85	86
				1	2	3	4	5	7	8	9	10	12	13	14	16	17	19	20	22	23	25	26	28	30	31	33	35	37	39	41	43	45	47	49	51
109				-27	-3	8	16	23	28	32	36	39	43	46	48	51	53	56	58	60	62	64	66	67	69	71	72	74	76	77	79	80	82	83	84	86
					2	3	4	5	6	7	8	10	11	12	13	15	16	18	19	21	22	24	25	27	28	30	32	34	35	37	39	41	43	45	47	49
110				-58	-9	5	14	21	26	31	35	38	42	45	48	50	53	55	57	59	61	63	65	67	69	70	72	74	75	77	78	80	81	83	84	85
					1	2	3	4	5	7	8	9	10	11	13	14	15	17	18	20	21	23	24	26	27	29	31	32	34	36	38	40	41	43	45	47
111					-17	1	11	19	24	29	34	37	41	44	47	49	52	54	57	59	61	63	65	67	68	70	72	73	75	77	78	80	81	82	84	85
					1	2	3	4	5	6	7	8	10	11	12	13	15	16	17	19	20	22	23	25	26	28	29	31	33	34	36	38	40	42	44	46
112					-29	-4	8	16	23	28	32	36	40	43	46	49	51	54	56	58	60	62	64	66	68	70	71	73	75	76	78	79	81	82	84	85
						1	2	3	4	6	7	8	9	10	11	13	14	15	16	18	19	21	22	24	25	27	28	30	31	33	35	37	38	39	42	44
113						-10	5	14	21	26	31	35	39	42	45	48	51	53	55	58	60	62	64	66	68	69	71	73	74	76	77	79	80	82	83	85
						1	2	3	4	5	6	7	8	10	11	12	13	14	16	17	18	20	21	23	24	26	27	29	30	32	34	35	37	39	41	43
114						-18	1	11	19	25	30	34	38	41	44	47	50	53	55	57	59	61	63	65	67	69	71	72	74	76	77	79	80	82	83	85
						1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	19	20	22	23	24	26	27	29	31	32	34	36	37	39	41
115						-31	-4	8	17	23	28	33	37	40	44	47	49	52	54	57	59	61	63	65	67	69	70	72	74	75	77	78	80	81	83	84
							1	2	3	4	5	6	7	8	9	11	12	13	14	15	17	18	19	21	22	23	25	26	28	29	31	33	34	36	38	40
116							-10	5	14	21	27	32	36	39	43	46	49	51	54	56	58	60	62	64	66	68	70	72	73	75	77	78	80	81	83	84
							1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	17	18	20	21	23	24	25	27	28	30	31	33	35	36	38
117							-18	1	12	19	25	30	35	38	42	45	48	51	53	55	58	60	62	64	66	68	70	71	73	75	76	78	79	81	82	84
							1	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	18	19	20	22	23	24	26	27	29	30	32	33	35	37
118							-31	-3	9	17	24	29	33	37	41	44	47	50	52	55	57	59	62	64	65	67	69	71	73	74	76	78	79	81	82	84
								1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	17	18	19	21	22	23	25	26	28	29	31	32	34	35
119								-9	6	15	22	27	32	36	40	43	46	49	52	54	57	59	61	63	65	67	69	71	72	74	76	77	79	80	82	83
								1	2	3	4	4	5	6	7	8	9	10	12	13	14	15	16	17	19	20	21	22	24	25	27	28	30	31	33	34

DP / RH

DP / RH

Dry Bulb Temperatures 101 to 119 F

(Read Across)

Elevations between 6,101 and 8,500 feet

Wet Bulb Temperatures

20 to 50 F

(Read Down)

Dry Bulb Temperatures

31 to 50 F

(Read Across)

DP	DP
RH	RH

	20	21	22	23	24	25	26	27	28	29	30														
31	-29 6	-13 14	-4 22	3 30	8 38	13 46	17 55	20 63	23 72	26 81	28 90	31													
32	-57 1	-21 9	-9 16	-1 24	5 32	10 40	14 48	18 56	21 64	24 73	27 82	30 91	32												
33	-36 4	-16 11	-5 18	2 26	7 34	12 41	16 49	20 57	23 66	36 74	28 83	31 92	33												
34	-26 6	-11 13	-2 21	4 28	10 35	14 43	18 51	21 59	24 67	27 75	30 84	32 92	34												
35	-44 2	-19 9	-7 16	1 23	7 30	12 37	16 45	19 52	23 60	26 68	28 76	31 84	33 92	35											
36	-31 4	-13 11	-4 18	3 25	9 32	13 39	17 46	21 54	24 61	27 69	29 77	32 84	34 92	36											
37	-22 7	-9 13	0 20	6 27	11 34	15 41	19 48	22 55	25 63	28 70	31 77	33 85	35 92	37											
38	-37 3	-16 9	-5 16	3 22	8 29	13 35	17 42	21 49	24 57	27 64	29 71	32 78	24 85	36 92	38										
39	-25 5	-10 11	-1 18	4 24	11 31	15 37	19 44	22 51	25 58	28 64	30 71	33 78	35 85	37 93	39										
40	-45 2	-18 8	-6 14	2 20	8 26	13 32	17 39	21 46	24 52	27 58	29 65	32 72	34 79	36 86	38 93	40									
41	-29 4	-12 10	-2 16	5 22	10 28	15 34	19 41	22 47	25 53	28 59	30 66	33 72	35 79	37 86	39 93	41									
42	-57 1	-20 6	-7 12	1 18	8 24	13 30	17 36	20 42	24 48	27 54	29 60	32 66	34 73	36 80	38 86	40 93	42								
43	-33 3	-13 9	-3 14	4 20	10 26	15 31	19 37	22 43	25 49	28 55	30 61	33 67	35 73	37 80	39 86	41 93	43								
44	-22 5	-8 11	1 16	7 22	12 27	17 33	20 38	24 44	26 50	29 56	32 62	34 68	36 74	38 80	40 87	42 93	44								
45	-37 2	-14 7	-3 13	4 18	10 24	15 29	18 34	22 40	25 45	28 51	31 57	33 62	35 68	37 74	39 81	41 87	43 93	45							
46	-24 4	-9 9	0 15	7 20	12 25	16 30	20 35	23 41	26 46	29 52	32 57	34 63	36 69	39 75	41 81	42 87	44 94	46							
47	-41 2	-15 7	-4 12	4 17	10 21	14 26	18 31	22 37	25 42	28 47	31 53	33 58	35 64	38 70	40 75	42 81	43 87	45 94	47						
48	-25 4	-9 9	0 13	7 18	12 23	16 28	20 33	23 38	27 43	29 48	32 53	34 59	37 64	39 70	41 76	43 82	45 88	46 94	48						
49	-45 1	-16 6	-4 11	3 15	9 20	14 24	18 29	22 34	25 39	28 44	31 49	33 54	36 60	38 65	40 71	42 76	44 82	46 88	47 94	49					
50	-26 3	-9 8	0 12	6 17	12 21	16 26	20 30	24 35	27 40	29 45	32 50	35 55	37 60	39 66	41 71	43 77	45 82	47 88	48 94	50					

Elevations between 6,101 and 8,500 feet

Wet Bulb Temperatures

31 to 70 F

(Read Down)

Dry Bulb Temperatures

51 to 70 F

(Read Across)

DP	DP
RH	RH

	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50													
51	-44 1	-16 5	-5 10	3 14	9 18	14 23	18 27	22 32	25 36	28 41	31 46	33 51	36 56	38 61	40 66	42 72	44 77	46 83	48 88	49 94	51												
52		-27 3	-10 7	-1 11	6 15	12 20	16 24	20 28	24 33	27 37	30 42	32 47	35 52	37 57	39 62	41 67	43 72	45 77	47 83	49 88	50 94	52											
53			-50 1	-18 5	-5 9	3 13	9 17	14 21	18 25	22 30	25 34	28 38	31 43	34 48	36 52	38 57	40 62	42 67	44 73	46 78	48 83	50 89	51 94	53									
54				-29 2	-11 6	-1 10	4 14	12 18	16 22	20 26	24 31	27 35	30 39	33 44	35 49	37 53	40 58	42 63	44 68	46 73	47 78	49 83	51 89	52 94	54								
55				-57	-19 4	-6 8	3 12	9 16	14 20	18 24	22 28	26 32	39 36	31 40	34 45	36 49	39 54	41 59	43 64	45 68	47 73	48 79	50 84	52 89	53 94	55							
56					-30 2	-11 6	-1 9	4 13	12 17	16 21	21 25	24 29	27 33	30 37	33 41	35 46	38 50	40 55	42 59	44 64	46 69	48 74	50 79	51 84	53 89	54 95	56						
57						-19 4	-6 7	3 11	9 15	14 18	19 22	22 26	26 30	29 34	32 38	34 42	37 47	39 51	41 55	43 60	45 65	47 69	49 74	51 79	52 84	54 89	55 95	57					
58						-22 2	-12 5	-1 9	6 12	12 16	17 20	21 23	24 27	28 31	31 35	33 39	36 43	38 47	40 52	42 56	44 61	46 65	48 70	50 75	52 79	53 84	55 90	56 95	58				
59							-20 3	-6 7	3 10	9 14	15 17	19 21	23 25	26 28	29 32	32 36	35 40	37 44	39 48	42 52	44 57	46 61	48 66	49 70	51 75	53 80	54 85	56 90	58 95	59			
60							-32 2	-12 5	-1 8	6 12	12 15	17 18	21 22	25 26	28 29	31 33	34 37	36 41	39 45	41 49	43 53	45 57	47 62	49 66	50 71	52 75	54 80	55 85	57 89	59 95	60		
61								-20 3	-4 6	3 10	10 13	15 16	19 20	23 23	27 27	30 30	33 34	35 38	38 42	40 46	42 50	44 54	46 58	48 62	50 67	52 71	53 76	55 80	56 85	58 90	60 95	61		
62								-32 2	-11 5	-1 8	7 11	13 14	17 17	21 21	25 24	28 28	31 31	34 35	37 39	39 43	41 46	43 50	45 54	47 59	49 63	51 67	52 72	54 76	56 81	58 85	59 90	61 95	62	
63									-19 3	-5 6	4 9	10 12	15 15	20 19	24 22	27 25	30 29	33 32	36 36	38 40	40 43	43 47	45 51	47 55	49 59	50 63	52 68	54 72	55 76	57 81	59 85	60 90	62 95	63	
64									-32 1	-11 4	0 7	7 10	13 13	18 17	22 20	26 23	29 26	32 30	35 33	37 37	40 40	42 44	44 48	46 52	48 56	50 60	52 64	53 68	55 72	57 77	58 81	60 86	61 90	63 95	64	
65										-19 3	-5 6	4 9	11 12	16 15	20 18	24 21	28 24	31 27	34 31	36 34	39 38	41 41	43 45	45 49	47 52	49 56	51 60	53 64	54 68	56 73	58 77	59 81	61 86	62 90	64 95	65	
66										-31 1	-10 4	0 7	8 10	14 13	18 16	22 19	26 22	29 25	32 28	35 32	38 35	40 39	42 42	44 44	46 49	48 53	50 57	52 61	54 65	55 69	57 73	59 77	60 82	62 86	63 91	65 95	66	
67											-18 3	-44 4	5 8	11 11	16 14	21 17	25 20	28 23	31 26	34 29	37 33	39 34	41 39	44 43	46 46	48 50	50 54	51 57	53 61	55 65	57 69	58 73	60 78	61 82	63 86	64 91	66 95	67	
68											-29 1	-9 4	1 7	8 10	14 12	19 15	23 18	27 21	30 24	33 27	34 30	38 33	41 37	43 40	45 44	47 47	49 51	51 54	53 58	54 62	54 66	58 70	59 74	61 78	62 82	64 86	65 91	67 95	68	
69											-54	-16 3	-3 5	5 8	12 11	17 13	21 16	25 19	29 22	32 25	35 28	37 31	40 34	42 38	44 41	46 44	48 48	50 51	52 55	54 58	56 62	57 66	59 70	60 74	62 78	63 82	65 87	66 91	68 95	69	
70												-27 2	-8 4	2 7	9 9	5 12	20 15	24 17	27 20	31 23	34 26	36 29	39 32	41 35	43 38	46 42	48 45	50 48	51 52	53 55	55 59	57 63	58 66	60 70	61 74	63 78	64 82	66 87	67 91	69 95	70

Elevations between 6,101 and 8,500 feet

Wet Bulb Temperatures 42 to 81 F
(Read Down)

Dry Bulb Temperatures 71 to 90 F
(Read Across)

DP / RH

	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70															
71	-15	-2	4	13	18	22	26	29	32	35	38	40	43	45	47	49	51	53	54	56	58	59	61	63	64	65	67	68	70	71														
	3	5	8	10	13	16	18	21	24	27	30	33	34	39	42	46	49	52	56	59	63	67	71	75	79	83	87	91	96															
72	-25	-7	3	10	16	20	24	28	31	34	37	39	42	44	46	48	50	52	54	56	57	59	61	62	64	65	67	68	69	71	72													
	2	4	6	9	11	14	17	19	22	25	28	31	34	37	40	43	46	50	53	56	60	64	67	71	75	7*9	83	87	91	96														
73	-43	-13	-1	7	13	18	23	27	30	33	36	39	41	43	46	48	50	52	53	55	56	58	60	62	63	65	66	68	69	70	72	73												
	1	3	5	8	10	13	15	18	20	23	26	29	32	34	37	41	44	47	50	53	57	60	64	68	71	75	79	83	87	91	96													
74	-22	-6	4	11	16	21	25	29	32	35	38	40	43	45	47	49	81	53	55	56	58	60	61	63	64	66	67	69	70	71	73	74												
	2	4	6	9	11	14	16	19	21	24	27	29	32	35	38	41	44	47	51	54	57	61	64	68	72	75	79	83	87	91	96													
75	-37	-12	0	8	14	19	24	27	31	34	37	39	42	44	46	48	50	52	54	56	58	59	61	62	64	65	67	##	70	71	72	74	75											
	1	3	5	7	10	12	15	17	20	22	25	28	30	33	36	39	42	45	48	51	55	58	61	65	68	72	76	80	83	87	92	96												
76	-19	-4	5	12	17	22	26	30	33	36	38	41	43	45	48	50	52	53	55	57	59	60	62	63	65	66	68	69	71	72	73	75	76											
	2	4	6	9	11	13	16	18	21	23	26	28	31	34	37	40	43	46	49	52	55	58	62	65	69	72	76	80	84	88	92	96												
77	-32	-10	2	9	15	20	24	28	32	35	37	40	42	45	47	49	51	53	55	56	58	60	61	63	65	66	68	69	70	72	73	74	76	77										
	1	3	5	7	10	12	14	17	19	21	24	26	29	32	35	37	40	43	46	49	52	55	59	62	66	69	73	76	80	84	88	92	96											
78	-17	-3	4	13	18	23	27	30	33	34	39	42	44	46	48	50	52	54	56	58	59	61	63	64	66	67	69	70	71	73	74	75	77	78										
	2	4	6	8	11	13	15	17	20	22	25	27	30	33	35	38	41	44	47	50	53	56	59	63	66	69	73	76	80	84	88	92	96											
79	-27	-8	3	11	16	21	25	29	32	35	38	41	43	45	48	50	52	54	55	57	59	61	62	64	65	67	68	70	71	72	74	75	76	78	79									
	1	3	5	7	9	12	14	16	18	21	23	26	28	31	33	36	39	41	44	47	50	53	56	60	63	66	70	73	77	80	84	88	92	96										
80	-52	-14	-1	8	14	19	24	28	31	34	37	40	42	45	47	49	51	53	55	57	58	60	62	63	65	66	68	69	71	72	73	75	76	77	79	80								
		2	4	6	8	10	12	15	17	19	22	24	26	29	31	34	37	39	42	45	48	51	54	57	60	63	67	70	73	77	81	84	88	92	96									
81	-21	-3	5	12	17	22	26	30	33	36	39	42	44	46	48	50	52	54	56	58	60	61	63	64	66	68	69	70	72	73	75	76	77	78	80	81								
	1	3	5	7	9	11	13	16	18	20	22	25	27	30	32	35	37	40	43	45	48	51	54	57	60	64	67	70	74	77	81	84	88	92	96									
82	-40	-11	1	9	15	20	25	29	32	35	38	41	43	46	48	50	52	54	56	57	59	61	62	64	66	67	69	70	71	73	74	76	77	78	79	81	82							
	1	2	4	6	8	10	12	14	16	19	21	23	25	28	30	33	35	38	41	43	46	49	52	55	58	61	64	67	71	74	77	81	85	88	92	96								
83	-19	-3	4	13	19	23	27	31	34	37	40	42	45	47	49	51	53	55	57	59	60	62	64	65	67	68	70	71	73	74	75	77	78	79	80	82	83							
	2	3	5	7	9	11	13	15	17	19	22	24	26	29	31	33	36	38	41	44	47	49	52	55	58	61	64	68	71	74	78	81	85	88	92	96								
84	-31	-8	3	11	17	22	26	30	33	36	39	42	44	46	49	51	53	55	56	58	60	62	63	65	66	68	69	71	72	74	75	76	78	79	80	82	83	84						
	1	3	4	6	8	10	12	14	16	18	20	22	25	27	29	32	34	37	39	42	44	47	50	53	56	59	62	65	68	71	74	78	81	85	89	92	96							
85	-15	-1	8	14	20	24	28	32	35	38	41	43	46	48	50	52	54	56	58	59	61	63	64	66	68	69	70	72	73	75	76	77	79	80	81	83	84	85						
	2	4	5	7	9	11	13	15	17	19	21	23	25	28	30	32	35	37	40	42	45	48	50	53	56	59	62	65	68	71	75	78	81	85	89	92	96							
86	-25	-6	5	12	18	23	27	31	34	37	40	42	43	47	49	51	53	55	57	59	61	62	64	66	67	69	70	72	73	74	76	77	78	80	81	82	84	85						
	1	3	4	6	8	10	12	14	16	18	20	22	24	26	28	31	33	35	38	40	43	45	48	51	54	56	59	62	65	68	72	75	78	82	85	89	92	96						
87	-44	-12	1	9	16	21	26	29	33	36	39	42	44	46	49	51	53	55	57	59	60	62	64	65	67	68	70	71	73	74	75	77	78	79	81	82	83	85						
		2	4	5	7	9	11	13	14	16	18	20	22	25	27	29	31	33	36	38	41	43	46	48	51	54	57	60	63	66	69	72	75	78	82	85	89	92						
88	-20	-3	7	14	19	24	28	32	35	38	41	43	46	48	50	52	54	56	58	60	62	63	65	66	68	69	71	72	74	75	77	78	79	81	82	83	84							
	1	3	5	6	8	10	12	13	15	17	19	21	23	25	27	30	32	34	36	39	41	44	46	49	52	54	57	60	63	66	69	72	75	79	82	85	89							
89	-33	-8	3	11	17	21	27	30	34	37	40	43	45	47	50	52	54	56	58	59	61	63	64	66	68	69	71	72	73	75	76	78	79	80	81	83	84							
	1	2	4	5	7	9	11	12	14	16	18	20	22	24	26	28	30	32	35	37	39	42	44	47	49	52	55	58	60	63	66	69	72	76	79	82	86							
90	-15	-1	8	15	21	25	29	33	36	39	42	44	47	49	51	53	55	57	59	61	62	64	66	67	69	70	72	73	75	76	77	79	80	81	83	84								
	2	3	5	6	8	10	11	13	15	17	19	21	22	25	27	29	31	33	35	38	40	42	45	47	50	52	55	58	61	64	67	70	73	76	79	82								

Correction Note: If you happen to use a dry bulb of 74 and a wet bulb of 59, you will see a DP of 81. This is not correct. The DP should be 51.

Elevations between 6,101 and 8,500 feet

Wet Bulb Temperatures, 50 to 85 F

(Read Down)

Dry Bulb Temperatures 91 to 109 F (Read Across)	DP	RH	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85
91	-25	1	-5	2	5	4	13	5	19	7	24	9	28	10	32	12	35	14	38	16	41	17	43	19	46	21	48	23	50	25	53	27	55	29	57	31	58	34	60	36	62	38	64	40	65	43	67	45	68	48	70	50	71	53	73	56	74	58	76	61	77	64	78	67	80	70	81	73	82	76	84	79
92	-44		-11	2	2	3	10	5	17	6	22	8	27	10	30	11	34	13	37	15	40	16	43	18	45	20	48	22	50	24	52	26	54	28	56	30	58	32	60	34	61	36	63	39	65	41	66	43	68	46	70	48	71	51	73	53	74	56	75	59	77	61	78	64	79	67	81	70	82	73	83	76
93			-18	1	-2	3	6	4	15	6	20	7	25	9	29	10	33	12	36	14	39	15	42	17	44	19	47	21	49	23	51	24	53	26	55	28	57	30	59	33	61	35	63	37	64	39	66	41	69	44	69	46	71	49	72	51	74	54	75	56	76	59	78	62	79	64	81	67	82	70	83	73
94			-31	1	-7	2	4	3	12	5	18	6	23	8	28	9	32	11	35	13	38	14	41	16	44	18	46	20	49	21	51	23	53	25	55	27	57	29	59	31	61	33	62	35	64	37	66	40	67	42	69	44	70	47	72	49	73	51	75	54	76	57	78	59	79	62	80	65	82	68	83	71
95					-13	1	1	3	10	4	16	6	22	7	26	9	30	10	34	12	37	13	40	15	43	17	45	18	48	20	50	22	52	24	54	26	56	28	58	30	60	32	62	34	64	36	65	38	67	40	69	42	70	45	72	47	73	49	75	52	76	54	77	57	79	60	80	62	81	65	83	68
96					-22	1	-3	2	7	4	14	5	20	6	25	8	29	9	33	11	36	12	39	14	42	16	45	17	47	19	50	21	52	23	54	24	56	26	58	28	60	30	61	32	63	34	65	36	67	38	68	41	70	43	71	45	73	47	74	50	76	52	77	55	78	57	80	60	81	63	82	65
97					-38		-9	2	4	3	12	4	18	6	23	7	28	9	32	10	35	12	38	13	41	15	44	16	46	18	49	20	51	21	53	23	55	25	57	27	59	29	61	31	63	33	64	35	66	37	68	39	69	41	71	43	72	45	74	48	75	50	77	53	78	55	80	58	81	60	82	63
98							-16	1	0	2	3	4	16	5	22	6	26	8	30	9	34	11	37	12	40	14	43	15	46	17	48	19	50	20	53	22	55	24	57	26	59	27	61	29	62	31	64	33	66	35	67	37	69	39	71	41	75	44	74	46	75	48	76	51	78	53	79	55	81	58	82	60
99							-26	1	-5	2	4	3	14	4	20	6	25	7	29	9	33	10	36	11	39	13	42	14	45	16	48	18	50	19	52	21	54	23	56	24	58	26	60	28	62	30	64	32	65	34	67	36	69	38	70	40	72	42	73	44	75	46	76	49	78	51	79	53	80	56	81	58
100									-47		-10	1	3	3	11	4	18	5	23	7	28	8	32	9	35	11	39	12	42	14	44	15	47	17	49	18	51	20	54	21	56	23	58	25	60	27	61	28	63	30	65	32	67	34	68	36	70	38	71	40	73	42	74	44	76	47	77	49	79	51	80	54	81	56
101											-18	1	-1	2	9	3	16	5	22	6	26	7	31	9	34	10	38	11	41	13	43	14	46	16	49	17	51	19	53	20	55	22	57	24	59	25	61	27	63	29	65	31	66	33	68	35	70	37	71	39	73	41	74	43	75	45	77	47	78	49	80	52	81	54
102													-29		-4	2	6	3	14	4	20	5	25	7	29	8	33	9	37	11	40	12	43	13	45	15	48	16	50	18	53	19	55	21	57	23	59	24	61	26	62	28	64	29	66	31	68	33	69	35	71	37	72	39	74	41	75	43	77	45	78	47	80	50	81	52
103															-12	1	2	2	11	4	18	5	23	6	28	7	32	9	36	10	39	11	42	13	45	14	47	15	50	17	52	18	54	20	56	22	58	23	60	25	62	26	64	28	66	30	67	32	69	34	70	35	72	37	74	39	75	41	76	43	78	46	79	48	81	50
104															-20	1	-2	2	9	3	16	4	22	5	27	7	31	8	35	9	38	10	41	12	44	13	46	15	49	16	51	17	54	19	56	20	58	22	60	24	62	25	63	27	65	29	67	30	68	32	70	34	72	36	73	38	75	40	76	42	78	44	79	46	80	48
105																	-33		-6	1	6	3	14	4	20	5	25	6	30	7	33	9	37	10	40	11	43	12	44	14	48	15	51	17	53	18	55	20	57	21	59	23	61	24	63	26	65	27	66	29	68	31	70	33	71	34	73	36	74	38	76	40	77	42	79	44	80	46
106																			-13	1	2	2	11	3	18	4	24	6	28	7	32	8	36	9	39	10	42	12	45	13	48	14	50	16	52	17	55	19	57	20	59	22	61	23	63	25	64	26	66	28	68	30	69	31	71	33	73	35	74	37	76	39	77	41	79	43	80	45
107																			-21	1	-2	2	9	3	16	4	22	5	27	6	31	7	35	9	38	10	41	11	44	12	47	14	49	15	52	16	54	18	56	19	58	21	60	22	62	24	64	25	66	27	67	28	69	30	71	32	72	34	74	35	75	37	77	39	78	41	80	43
108																			-35		-7	1	5	2	14	3	20	5	25	6	30	7	34	8	37	9	41	10	43	12	44	13	49	14	51	15	53	17	56	18	58	20	60	21	62	23	63	24	65	26	67	27	69	29	70	31	72	32	74	34	75	36	77	38	78	39	79	41
109																					-13	1	2	2	11	3	18	4	24	5	29	6	33	7	36	9	40	10	43	11	45	12	48	13	51	15	53	16	55	17	57	19	59	20	61	22	63	23	65	25	67	26	68	28	70	29	72	31	73	33	75	34	76	36	78	38	79	40

Elevations between 8,501 and 11,000 feet

Wet Bulb Temperatures
19 to 50 F
(Read Down)

Dry Bulb Temperatures
31 to 50 F
(Read Across)

	DP	DP
	RH	RH

	19	20	21	22	23	24	25	26	27	28	29	30																
31	-38 / 4	-18 / 11	-8 / 18	-1 / 25	5 / 33	10 / 41	14 / 49	17 / 57	21 / 65	23 / 73	26 / 82	28 / 90	31															
32		-28 / 6	-13 / 13	-5 / 20	2 / 27	7 / 35	11 / 42	15 / 50	19 / 58	22 / 66	25 / 74	27 / 82	30 / 91	32														
33			-49 / 2	-21 / 9	-9 / 15	-2 / 22	4 / 29	9 / 37	13 / 44	17 / 52	20 / 59	23 / 67	26 / 75	28 / 83	31 / 92	33												
34				-33 / 4	-15 / 11	-6 / 17	1 / 24	6 / 31	11 / 38	15 / 46	19 / 53	22 / 61	25 / 68	27 / 76	30 / 84	32 / 92	34											
35					-24 / 7	-11 / 13	-3 / 20	4 / 26	9 / 33	13 / 40	17 / 47	20 / 54	23 / 62	26 / 69	29 / 77	31 / 95	33 / 92	35										
36					-39 / 3	-18 / 9	-7 / 15	0 / 22	6 / 28	11 / 35	15 / 42	19 / 49	22 / 56	25 / 63	27 / 71	30 / 78	32 / 85	34 / 92	36									
37						-27 / 5	-13 / 11	-3 / 17	3 / 24	8 / 30	13 / 37	17 / 43	20 / 50	23 / 57	26 / 64	29 / 71	31 / 78	33 / 85	35 / 93	37								
38						-47 / 2	-20 / 7	-8 / 13	0 / 19	6 / 25	10 / 32	15 / 38	18 / 45	22 / 52	25 / 59	27 / 65	30 / 72	32 / 79	34 / 86	36 / 93	38							
39							-31 / 4	-14 / 10	-4 / 15	3 / 21	8 / 27	12 / 34	16 / 40	20 / 46	23 / 53	26 / 59	29 / 66	31 / 72	33 / 79	35 / 86	37 / 93	39						
40							-60 / 1	-22 / 6	-9 / 12	-1 / 17	5 / 23	10 / 29	14 / 35	18 / 41	22 / 48	25 / 54	27 / 60	30 / 67	32 / 73	34 / 80	36 / 86	38 / 93	40					
41								-35 / 3	-15 / 8	-5 / 14	2 / 19	8 / 25	12 / 31	16 / 37	20 / 43	23 / 49	26 / 55	29 / 61	31 / 67	33 / 74	35 / 80	37 / 87	39 / 93	41				
42									-24 / 5	-10 / 10	-1 / 16	5 / 21	10 / 27	14 / 33	18 / 39	22 / 44	25 / 50	27 / 56	30 / 62	32 / 68	34 / 74	36 / 80	38 / 87	40 / 93	42			
43									-39 / 2	-16 / 7	-6 / 12	2 / 18	8 / 23	12 / 29	17 / 34	20 / 40	23 / 45	26 / 51	29 / 57	31 / 63	33 / 68	36 / 75	37 / 81	39 / 87	41 / 93	43		
44										-25 / 4	-11 / 9	-2 / 14	5 / 20	10 / 25	15 / 30	18 / 36	22 / 41	25 / 46	27 / 52	30 / 57	32 / 63	35 / 69	37 / 75	39 / 81	40 / 87	42 / 94	44	
45										-43 / 2	-17 / 6	-6 / 11	2 / 16	8 / 21	13 / 27	16 / 32	20 / 37	23 / 42	26 / 47	29 / 53	31 / 58	34 / 64	36 / 70	38 / 75	40 / 81	41 / 87	43 / 94	45
46											-27 / 4	-11 / 8	-2 / 13	5 / 18	10 / 23	15 / 28	18 / 33	22 / 38	25 / 43	28 / 48	30 / 54	33 / 59	35 / 65	37 / 70	39 / 76	41 / 82	43 / 88	44 / 94
47											-46 / 1	-18 / 6	-6 / 10	2 / 15	8 / 20	13 / 25	16 / 29	20 / 34	23 / 39	26 / 44	29 / 49	31 / 54	34 / 60	36 / 65	38 / 71	40 / 76	42 / 82	44 / 88
48												-28 / 3	-11 / 8	-2 / 12	5 / 17	10 / 21	15 / 26	18 / 31	22 / 35	25 / 40	28 / 45	30 / 50	33 / 55	35 / 60	37 / 66	39 / 71	41 / 77	43 / 82
49												-49 / 1	-18 / 5	-6 / 10	2 / 14	8 / 18	13 / 23	17 / 27	20 / 32	23 / 37	26 / 41	29 / 46	32 / 51	34 / 56	36 / 61	38 / 66	40 / 72	42 / 77
50													-29 / 3	-11 / 7	-2 / 12	5 / 16	10 / 20	15 / 24	18 / 29	22 / 33	25 / 38	28 / 42	30 / 47	33 / 52	35 / 57	38 / 62	40 / 67	41 / 72

31																												
32																												
33																												
34																												
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36																												
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39																												
40																												
41																												
42																												
43																												
44																												
45																												
46	45 / 94																											
47	45 / 94	47																										
48	46 / 94	48																										
49	46 / 88	47 / 94	49																									
50	45 / 86	47 / 89	48 / 94	50																								

Elevations between 8,501 and 11,000 feet

Wet Bulb Temperatures 31 to 70 F
(Read Down)

Dry Bulb Temperatures 51 to 70 F
(Read Across)

DP = Dew Point (°F), RH = Relative Humidity (%)

Dry Bulb	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
51	-18 / 5	-6 / 9	2 / 13	8 / 17	13 / 21	17 / 26	20 / 30	24 / 34	27 / 39	29 / 43	32 / 48	34 / 53	37 / 57	39 / 62	41 / 67	43 / 73	44 / 78	46 / 83	48 / 89	49 / 94
52	-29 / 3	-11 / 7	-2 / 11	5 / 15	10 / 19	15 / 23	19 / 27	22 / 31	25 / 35	28 / 40	31 / 44	33 / 49	36 / 53	38 / 58	40 / 63	42 / 68	44 / 73	45 / 78	47 / 83	49 / 89
53	-51 / 1	-18 / 5	-6 / 8	2 / 12	8 / 16	13 / 20	17 / 24	21 / 28	24 / 32	27 / 36	30 / 41	32 / 45	35 / 50	37 / 54	39 / 59	41 / 64	43 / 68	45 / 73	47 / 79	48 / 84
54		-28 / 3	-11 / 6	-2 / 10	5 / 14	11 / 17	15 / 21	19 / 25	22 / 29	25 / 33	28 / 37	31 / 42	34 / 46	36 / 50	38 / 55	40 / 59	42 / 64	44 / 69	46 / 74	48 / 79
55		-50 / 1	-18 / 4	-6 / 8	2 / 11	8 / 15	13 / 19	17 / 22	21 / 26	24 / 30	27 / 34	30 / 38	32 / 43	35 / 47	37 / 51	39 / 56	42 / 60	43 / 65	45 / 69	47 / 74
56			-29 / 2	-11 / 6	-2 / 9	5 / 13	11 / 16	15 / 20	19 / 24	23 / 27	26 / 31	29 / 35	31 / 39	34 / 43	37 / 48	39 / 52	41 / 56	43 / 61	45 / 65	46 / 70
57			-52 / 1	-19 / 4	-6 / 7	2 / 11	8 / 14	13 / 18	18 / 21	21 / 25	24 / 29	27 / 32	30 / 36	33 / 40	35 / 44	38 / 48	40 / 53	42 / 57	44 / 61	46 / 66
58				-29 / 2	-11 / 5	-2 / 9	5 / 12	11 / 15	16 / 19	20 / 22	23 / 26	26 / 30	29 / 33	32 / 37	34 / 41	37 / 45	39 / 49	41 / 53	43 / 58	45 / 62
59				-53 / 1	-18 / 4	-6 / 7	2 / 10	9 / 13	14 / 17	18 / 20	22 / 24	25 / 27	28 / 31	31 / 34	33 / 38	36 / 42	38 / 46	40 / 50	42 / 54	44 / 58
60					-29 / 2	-11 / 5	-1 / 8	6 / 11	11 / 15	16 / 18	20 / 21	24 / 25	27 / 28	30 / 32	32 / 35	35 / 39	37 / 43	39 / 47	42 / 51	44 / 55
61						-18 / 3	-5 / 6	3 / 10	9 / 13	14 / 16	18 / 19	22 / 22	25 / 26	28 / 29	31 / 33	34 / 36	36 / 40	39 / 44	41 / 47	43 / 51
62						-28 / 2	-11 / 5	-1 / 8	6 / 11	12 / 14	17 / 17	21 / 20	24 / 23	27 / 27	30 / 30	33 / 34	35 / 37	38 / 41	40 / 44	42 / 48
63							-17 / 3	-5 / 6	3 / 9	9 / 12	15 / 15	19 / 18	23 / 21	26 / 24	29 / 28	32 / 31	34 / 34	37 / 38	39 / 41	41 / 45
64							-27 / 2	-10 / 5	0 / 8	7 / 10	12 / 13	17 / 16	21 / 19	25 / 22	28 / 25	31 / 29	33 / 32	36 / 35	38 / 39	40 / 42
65							-47 / 1	-16 / 3	-4 / 6	4 / 9	10 / 12	15 / 14	20 / 17	23 / 20	27 / 23	30 / 26	32 / 30	35 / 33	37 / 36	40 / 40
66								-26 / 2	-9 / 5	1 / 7	7 / 10	13 / 13	18 / 16	22 / 18	25 / 21	28 / 24	31 / 27	34 / 31	36 / 34	39 / 37
67								-43 / 1	-15 / 3	-3 / 6	5 / 8	11 / 11	16 / 14	20 / 17	24 / 19	27 / 22	30 / 25	33 / 28	35 / 31	38 / 35
68									-24 / 2	-8 / 4	2 / 7	8 / 10	14 / 12	18 / 15	22 / 18	26 / 20	29 / 23	32 / 26	35 / 29	37 / 32
69									-39 / 1	-14 / 3	-2 / 6	5 / 8	12 / 11	17 / 13	21 / 16	25 / 19	28 / 21	31 / 24	34 / 27	36 / 30
70										-22 / 2	-7 / 4	3 / 7	9 / 9	15 / 12	19 / 14	23 / 17	27 / 20	30 / 22	33 / 25	35 / 28

Dry Bulb	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70
51	51																			
52	50 / 94	52																		
53	50 / 89	51 / 94	53																	
54	49 / 84	51 / 89	52 / 95	54																
55	49 / 79	50 / 84	52 / 89	53 / 95	55															
56	48 / 75	50 / 80	51 / 84	53 / 90	54 / 95	56														
57	48 / 70	49 / 75	51 / 80	52 / 85	54 / 90	55 / 95	57													
58	47 / 66	49 / 71	50 / 75	52 / 80	53 / 85	55 / 90	56 / 95	58												
59	46 / 62	48 / 67	50 / 71	51 / 76	53 / 80	55 / 85	56 / 90	58 / 95	59											
60	46 / 59	47 / 63	49 / 67	51 / 72	53 / 76	54 / 81	56 / 85	57 / 90	59 / 95	60										
61	45 / 55	47 / 59	49 / 63	50 / 68	52 / 72	54 / 76	55 / 81	57 / 86	58 / 90	60 / 95	61									
62	44 / 52	46 / 56	48 / 60	50 / 64	51 / 68	53 / 72	55 / 77	56 / 81	58 / 86	59 / 90	61 / 95	62								
63	43 / 49	45 / 53	47 / 56	49 / 60	51 / 64	53 / 68	54 / 73	56 / 77	57 / 81	59 / 86	60 / 90	62 / 95	63							
64	43 / 46	45 / 49	47 / 53	49 / 57	50 / 61	52 / 65	54 / 69	55 / 73	57 / 77	58 / 82	60 / 86	61 / 91	63 / 95	64						
65	42 / 43	44 / 46	46 / 50	48 / 54	50 / 58	52 / 61	53 / 65	55 / 69	56 / 73	58 / 78	59 / 82	61 / 86	62 / 91	64 / 95	65					
66	41 / 40	43 / 44	45 / 47	47 / 51	49 / 54	51 / 58	53 / 62	54 / 66	56 / 70	58 / 74	59 / 78	60 / 82	62 / 86	63 / 91	65 / 95	66				
67	40 / 38	42 / 41	45 / 44	47 / 48	49 / 51	50 / 55	52 / 59	54 / 62	55 / 66	57 / 70	59 / 74	60 / 78	61 / 82	63 / 87	64 / 91	66 / 95	67			
68	39 / 35	42 / 39	44 / 42	46 / 45	48 / 48	50 / 52	52 / 55	53 / 59	55 / 63	57 / 67	58 / 70	60 / 74	61 / 78	63 / 83	64 / 87	65 / 91	67 / 95	68		
69	39 / 33	41 / 36	43 / 39	45 / 42	47 / 46	49 / 49	51 / 52	53 / 56	54 / 60	56 / 63	58 / 67	59 / 71	61 / 75	62 / 79	64 / 83	65 / 87	66 / 91	68 / 96	69	
70	38 / 31	40 / 34	42 / 37	44 / 40	46 / 43	48 / 46	50 / 50	52 / 53	54 / 56	56 / 60	57 / 64	59 / 67	60 / 71	62 / 75	63 / 79	65 / 83	66 / 87	67 / 91	69 / 95	70

Elevations between 8,501 and 11,000 feet

Wet Bulb Temperatures 41 to 80 ºF

	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70												
71	-12 3	-1 6	6 8	12 10	17 13	22 15	25 18	29 21	32 23	34 26	37 29	39 32	42 35	44 38	46 41	48 44	50 47	52 50	53 54	55 57	57 60	58 64	60 68	61 71	63 75	64 79	66 83	67 87	68 91	70 96	71											
72	-19 2	-5 4	4 7	10 9	15 11	20 14	24 16	27 19	30 22	33 24	36 27	38 30	41 32	43 35	45 38	47 41	49 44	51 48	53 51	55 54	56 57	58 61	60 64	61 68	63 72	64 75	65 79	67 83	68 88	69 91	71 96	72										
73	-31 1	-10 3	0 6	7 8	13 10	18 13	22 15	26 17	29 20	32 22	35 25	38 28	40 30	42 33	44 36	46 39	48 42	50 45	52 48	54 51	56 55	57 58	59 61	61 66	62 68	64 72	65 76	66 80	68 83	69 87	70 92	72 96	73									
74	-17 2	-4 4	5 7	11 9	16 11	21 14	25 16	28 18	31 21	34 23	37 26	39 29	41 31	44 34	46 37	48 40	50 43	52 46	54 49	55 52	57 55	59 58	60 62	63 65	65 69	66 72	67 76	69 80	70 84	70 88	71 92	73 96	74									
75	-27 1	-9 3	2 6	9 8	14 10	19 12	23 14	27 17	30 19	33 22	36 24	38 27	41 29	43 32	45 35	47 37	49 40	51 43	53 46	55 49	57 52	58 56	60 59	61 62	63 66	64 69	66 73	67 76	69 80	70 84	71 88	72 92	74 96	75								
76	-15 2	-2 4	6 7	12 9	17 11	22 13	26 15	29 18	32 20	35 23	37 25	40 27	42 30	44 33	47 35	49 38	50 41	52 44	54 47	56 50	58 53	59 56	61 59	63 63	64 66	65 69	67 73	68 76	70 80	71 84	72 88	73 92	75 96	76								
77	-23 2	-7 3	3 6	10 8	15 10	20 12	24 14	28 16	31 19	34 21	37 23	39 26	41 28	44 31	46 33	48 36	50 39	52 42	54 44	55 47	57 50	59 53	61 56	62 60	64 63	65 66	67 70	68 73	69 77	71 80	72 84	73 88	74 92	76 96	77							
78	-37 1	-12 3	0 5	7 7	13 9	18 11	23 13	26 15	30 17	33 19	36 22	38 24	41 27	43 29	45 32	47 34	49 37	51 39	53 42	55 45	57 48	58 51	60 54	62 57	63 60	65 63	66 67	68 70	69 73	70 77	72 81	73 84	74 88	75 92	77 96	78						
79	-19 2	-5 4	5 6	11 7	16 10	21 12	25 14	29 16	32 18	35 20	37 23	40 25	42 27	45 30	47 32	49 35	51 37	53 40	54 43	56 46	58 48	60 51	61 54	63 57	64 60	66 64	67 67	69 70	70 74	71 77	73 81	74 84	75 88	76 92	78 96	79					
80	-31 1	-10 3	1 5	9 7	14 9	19 10	24 13	27 15	31 17	34 19	37 21	39 23	42 26	44 28	46 30	48 33	50 35	52 38	54 41	56 43	57 46	59 49	61 52	62 55	64 58	66 61	67 64	68 67	70 71	71 74	72 77	74 81	75 85	76 88	77 92	79 96	80				

	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80								
81	-16 2	-2 4	6 6	13 7	18 9	22 11	26 13	30 15	33 18	36 20	38 22	41 24	43 26	45 29	47 31	49 34	51 36	53 39	55 41	57 44	59 47	60 49	62 52	64 55	65 58	67 61	68 64	69 68	71 71	72 74	73 78	75 81	76 85	77 88	79 92	80 96	81							
82	-25 1	-7 3	3 5	10 6	16 8	20 10	25 12	28 14	32 16	35 18	37 20	40 23	42 25	45 27	47 29	49 32	51 34	53 37	55 39	56 42	58 44	60 47	62 50	63 53	65 56	66 59	68 62	69 65	71 68	72 71	73 74	75 78	76 81	77 85	78 89	80 92	81 96	82						
83	-13 2	0 4	8 6	14 7	19 9	23 11	27 13	31 15	34 17	37 19	39 21	42 23	44 26	46 28	48 30	50 32	52 35	54 37	56 40	58 42	59 45	61 48	63 50	64 53	66 56	67 59	69 62	70 65	72 68	73 71	74 75	76 78	77 81	78 85	79 89	81 92	82 96	83						
84	-20 1	-5 3	5 5	12 7	17 8	22 10	26 12	29 14	33 16	36 18	38 20	41 22	43 24	46 26	48 28	50 31	52 33	54 35	55 38	57 40	59 43	61 45	62 48	64 51	66 54	67 56	69 59	70 62	71 65	73 68	74 72	75 75	77 78	78 82	79 85	80 89	82 92	83 96	84					
85	-32 1	-10 2	2 4	9 6	15 7	20 9	24 11	28 13	32 15	35 17	38 19	40 21	43 23	45 25	47 27	49 29	51 31	53 34	55 36	57 38	58 41	60 43	62 46	64 48	65 51	67 54	68 57	70 60	71 63	72 66	74 69	75 72	76 75	78 78	79 82	80 85	81 89	83 92	84 96	85				
86	-16 2	-2 3	7 5	13 7	18 8	23 10	27 12	30 14	34 15	37 17	39 19	42 21	44 23	46 25	49 28	51 30	53 32	54 34	56 37	58 38	60 41	61 44	63 46	65 49	66 52	68 54	69 57	71 60	72 63	74 66	75 69	76 72	77 75	79 79	80 82	81 85	82 89	84 93	85 96	86			
87	-25 1	-7 3	4 4	11 6	17 7	21 9	25 11	29 13	33 14	36 16	39 18	41 20	44 22	46 24	48 26	50 28	52 30	54 33	56 35	58 37	59 39	61 42	63 44	64 47	66 49	67 52	69 55	70 57	72 60	73 63	75 66	76 69	77 72	79 76	80 79	81 82	82 86	83 89	85 93	86 96	87		
88	-12 2	0 3	8 5	15 7	20 8	24 10	28 12	32 13	35 15	38 17	40 19	43 21	45 23	47 25	49 27	51 29	53 31	55 33	57 35	59 38	61 40	62 42	64 45	66 47	67 50	69 52	70 55	72 58	73 61	74 64	76 66	77 69	78 73	80 76	81 79	82 82	83 86	84 89	86 93	87 96	88		
89	-20 1	-4 3	6 4	13 6	18 7	23 9	27 11	30 12	34 14	37 16	40 18	42 20	44 21	47 23	49 25	51 27	53 29	55 31	57 34	58 36	60 38	62 40	63 43	65 45	67 48	68 50	70 53	71 55	73 58	74 61	75 64	77 67	78 70	79 73	81 76	82 79	83 82	84 86	85 89	87 93	88 96	89	
90	-31 1	-9 2	3 4	10 5	16 7	21 8	25 10	29 11	33 13	36 15	39 17	41 18	44 20	46 22	48 24	50 26	52 28	54 30	56 32	58 34	60 36	61 39	63 41	65 43	66 46	68 48	69 51	71 53	72 56	74 59	75 61	77 64	78 67	79 70	80 73	82 76	83 79	84 83	85 86	86 89	88 93	89 96

FINE DEAD FUEL MOISTURE TABLES

Reference Fuel Moisture (1) + Fuel moisture correction (2E/2S) = Fine Dead Fuel Moisture (3E/3S)

- **1+2E= 3E Exposed Fuel Moisture** *(<50% fuels shaded by clouds/canopy)*
- **1+2S= 3S Shaded Fuel Moisture** *(>50% fuels shaded by clouds/canopy)*

❖ **Before you begin: What time is it? What month is it? B, L or A? (see pg. 56)**

ReferenceFuel Moisture
Day Time
0800 - 1959

1	Relative Humidity (%)																				
Dry Bulb Temp. (F)	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	75 - 79	80 - 84	85 - 89	90 - 94	95 - 99	100
10 - 29	1	2	2	3	4	5	5	6	7	8	8	8	9	9	10	11	12	12	13	13	14
30 - 49	1	2	2	3	4	5	5	6	7	7	7	8	9	9	10	10	11	12	13	13	13
50 - 69	1	2	2	3	4	5	5	6	6	7	7	8	8	9	9	10	11	12	12	12	13
70 - 89	1	1	2	2	3	4	5	5	6	7	7	8	8	8	9	10	10	11	12	12	13
90 - 109	1	1	2	2	3	4	5	5	6	7	7	8	8	8	9	10	10	11	12	12	13
109 +	1	1	2	2	3	4	4	5	6	7	7	8	8	8	9	10	10	11	12	12	12

Dead Fuel Moisture Content Corrections

Feb. March April Aug. Sept. Oct.

2E	EXPOSED																				
	Exposed - Less than 50% shading of surface fuels																				
		0800 to			1000 to			1200 to			1400 to			1600 to			1800 to				
ASPCT	Slope	B	L	A	B	L	A	B	L	A	B	L	A	B	L	A	B	L	A		
N	0 - 30%	3	4	5	1	2	3	1	1	2	1	1	2	1	2	3	3	4	5		
	31%+	3	4	5	3	3	4	2	3	4	2	3	4	3	3	4	3	4	5		
E	0 - 30%	3	4	5	1	2	3	1	1	1	1	1	2	1	2	3	3	4	5		
	31%+	3	3	4	1	1	1	1	1	1	1	2	3	3	4	5	4	5	6		
S	0 - 30%	3	4	5	1	2	2	1	1	1	1	1	1	1	2	3	3	4	5		
	31%+	3	4	5	1	2	2	0	1	1	0	1	1	1	2	2	3	4	5		
W	0 - 30%	3	4	5	1	2	3	1	1	1	1	1	1	1	2	3	3	4	5		
	31%+	4	5	6	3	4	5	1	2	3	1	1	1	1	1	1	3	3	4		
2S	SHADED																				
	Shaded - Greater than or equal to 50% shading of surface fuels																				
N	All	4	5	6	4	5	5	3	4	5	3	4	5	4	5	5	4	5	6		
E	All	4	5	6	3	4	5	3	4	5	3	4	5	4	5	6	4	5	6		
S	All	4	5	6	3	4	5	3	4	5	3	4	5	3	4	5	4	5	6		
W	All	4	5	6	4	5	6	3	4	5	3	4	5	3	4	5	4	5	6		

DEAD FUEL MOISTURE CONTENT CORRECTIONS

May June July

2E	EXPOSED																		
	Exposed - Less than 50% shading of surface fuels																		
		0800 to			1000 to			1200 to			1400 to			1600 to			1800 to		
ASPCT	Slope	B	L	A	B	L	A	B	L	A	B	L	A	B	L	A	B	L	A
N	0 - 30%	2	3	4	1	1	1	0	0	1	0	0	1	1	1	1	2	3	4
	31%+	3	4	4	1	2	2	1	1	2	1	1	2	1	2	2	3	4	4
E	0 - 30%	2	2	3	1	1	1	0	0	1	0	0	1	1	1	2	3	4	4
	31%+	1	2	2	0	0	1	0	0	1	1	1	2	2	3	4	4	5	6
S	0 - 30%	2	3	3	1	1	1	0	0	1	0	0	1	1	1	1	2	3	3
	31%+	2	3	3	1	1	2	0	1	1	0	1	1	1	1	2	2	3	3
W	0 - 30%	2	3	4	1	1	2	0	0	1	0	0	1	0	1	1	2	3	3
	31%+	4	5	6	2	3	4	1	1	2	0	0	1	0	0	1	1	2	2
2S	SHADED																		
	Shaded - Greater than or equal to 50% shading of surface fuels																		
N	All	4	5	5	3	4	5	3	3	4	3	3	4	3	4	5	4	5	5
E	All	4	4	5	3	4	5	3	3	4	3	4	4	3	4	5	4	5	6
S	All	4	4	5	3	4	5	3	3	4	3	3	4	3	4	5	4	5	6
W	All	4	5	6	3	4	5	3	3	4	3	3	4	3	4	5	4	4	5

Dead Fuel Moisture Content Corrections

Nov. Dec. Jan.

2E	EXPOSED																		
	Exposed - Less than 50% shading of surface fuels																		
		0800 to			1000 to			1200 to			1400 to			1600 to			1800 to		
ASPCT	Slope	B	L	A	B	L	A	B	L	A	B	L	A	B	L	A	B	L	A
N	0 - 30%	4	5	6	3	4	5	2	3	4	2	3	4	3	4	5	4	5	6
	31%+	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6
E	0 - 30%	4	5	6	3	4	4	2	3	3	2	3	3	3	4	5	4	5	6
	31%+	4	5	6	2	3	4	2	2	3	3	4	4	4	5	6	4	5	6
S	0 - 30%	4	5	6	3	4	5	2	3	3	2	2	3	3	4	4	4	5	6
	31%+	4	5	6	2	3	3	1	1	2	1	1	2	2	3	3	4	5	6
W	0 - 30%	4	5	6	3	4	5	2	3	3	2	3	3	3	4	4	4	5	6
	31%+	4	5	6	4	5	6	3	4	4	2	2	3	2	3	4	4	5	6
2S	SHADED																		
	Shaded - Greater than or equal to 50% shading of surface fuels																		
N	All	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6
E	All	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6
S	All	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6
W	All	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6

NIGHT TIME FUEL MOISTURE CHARTS

Reference Fuel Moisture
Night Time
2000 - 0759

Dry Bulb Temp. (F)	Relative Humidity (%)																				
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	75 - 79	80 - 84	85 - 89	90 - 94	95 - 99	100
10 - 29	1	2	4	5	5	6	7	8	9	10	11	12	12	14	15	17	19	22	25	25+	25+
30 - 49	1	2	3	4	5	6	7	8	9	9	11	11	12	13	14	16	18	21	24	25+	25+
50 - 69	1	2	3	4	5	6	6	8	8	9	10	11	11	12	14	16	17	20	23	25+	25+
70 - 89	1	2	3	4	4	5	6	7	8	9	10	10	11	12	13	15	17	20	23	25+	25+
90 - 109	1	2	3	3	4	5	6	7	8	9	9	10	10	11	13	14	16	19	22	25	25+
109 +	1	2	2	3	4	5	6	6	8	8	9	9	10	11	12	14	16	19	21	24	25+

Dead Fuel Moisture Corrections
Night Time
2000 - 0759

	2000 to			2200 to			2400 to			0200 to			0400 to			0600 to		
Aspect	B	L	A	B	L	A	B	L	A	B	L	A	B	L	A	B	L	A
N & E	9	1	1	13	1	2	16	2	2	17	1	1	18	1	1	16	2	1
S & W	9	0	1	14	0	1	16	0	2	17	0	1	18	0	0	9	0	1

PROBABILITY OF IGNITION TABLE

	Shading (%)	Dry Bulb Temperature (°F)	Fine Dead Fuel Moisture (%)															
			2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
3E	Unshaded <50%	110+	100		80	70	60	60	50	40	40	30	30	20	20	20	20	10
EXPOSED		100 - 109	100	90	80	70	60	60	50	40	40	30	30	20	20	20	10	10
		90 - 99	100	90	80	70	60	50	40	40	30	30	30	20	20	20	10	10
		80 - 89	100	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10
		70 - 79	100	80	70	60	60	50	40	40	30	30	20	20	20	10	10	10
		60 - 69	90	80	70	60	50	50	40	30	30	20	20	20	20	10	10	10
		50 - 59	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10	10
		40 - 49	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10	10
		30 - 39	80	70	60	50	50	40	30	30	20	20	20	10	10	10	10	10
3S	Shaded >50%	110+	100	90	80	70	60	50	50	40	40	30	30	20	20	20	10	10
SHADED		100 - 109	100	90	80	70	60	50	50	40	30	30	30	20	20	20	10	10
		90 - 99	100	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10
		80 - 89	100	80	70	60	60	50	40	40	30	30	20	20	20	10	10	10
		70 - 79	90	80	70	60	50	50	40	30	30	30	20	20	20	10	10	10
		60 - 69	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10	10
		50 - 59	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10	10
		40 - 49	90	80	60	50	50	40	30	30	30	20	20	20	10	10	10	10
		30 - 39	80	80	60	50	50	40	30	30	20	20	20	10	10	10	10	10

Determining A, L, B
For Fine Dead Fuel Moisture Calculations

B – Weather observations are taken between 1,000' and 2,000' **ABOVE** the fire behavior observations/projections.

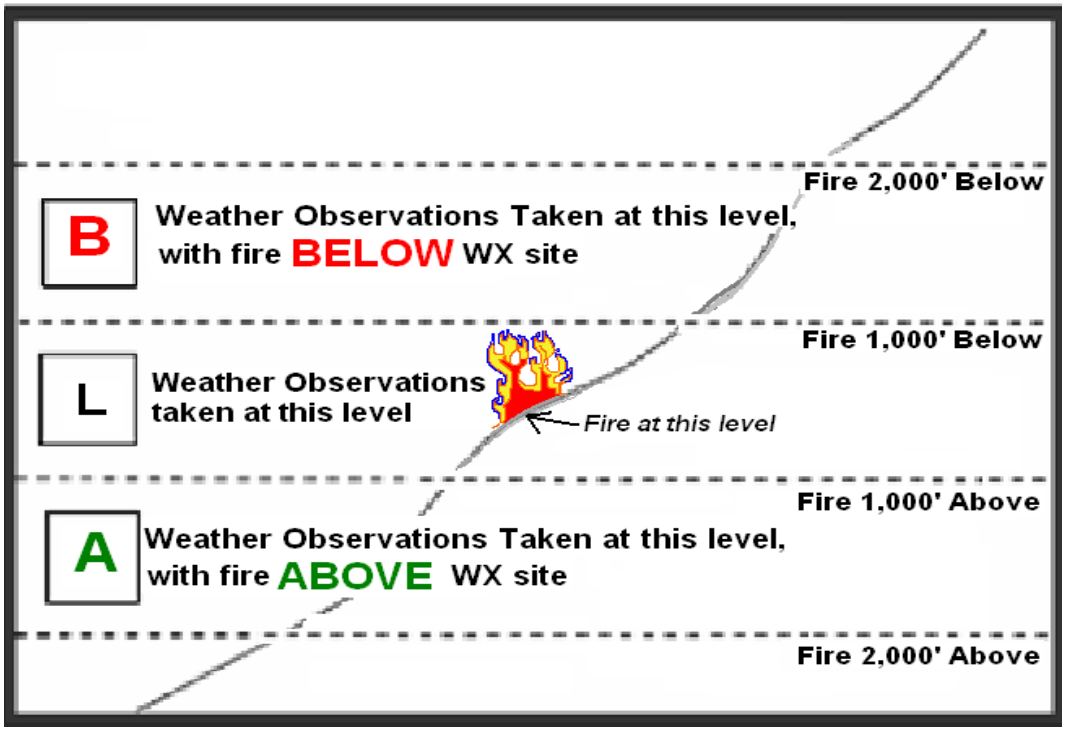
L – Weather observations are taken between 1,000 above and 1,000' below or' **Level** with the fire behavior observations/projections.

A – Weather observations are taken between 1,000' and 2,000' **BELOW** the fire behavior observations/projections.

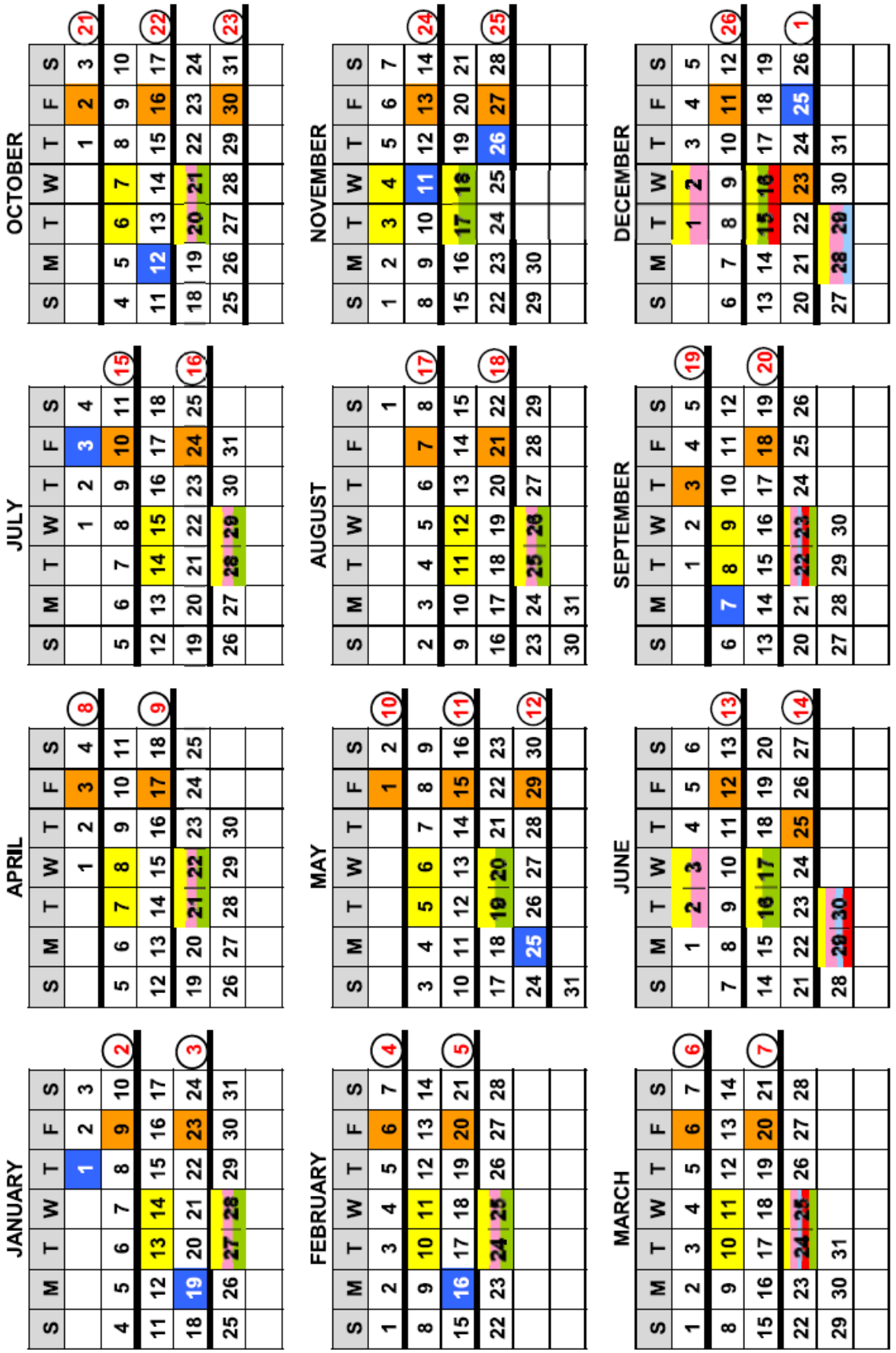
The question is simple: "Where is the Fire?"

Is the fire ABOVE your WX site? If so, use A

Is the Fire BELOW your WX site? If so, use B



2015 PAYROLL SCHEDULE



PAY PERIOD CALENDAR 2015

Month	Pay Period	S	M	T	W	T	F	S
JAN	26					1	2	3
		4	5	6	7	8	9	10
	01	11	12	13	14	15	16	17
		18	19	20	21	22	23	24
	02	25	26	27	28	29	30	31
FEB		1	2	3	4	5	6	7
	03	8	9	10	11	12	13	14
		15	16	17	18	19	20	21
	04	22	23	24	25	26	27	28
MAR		1	2	3	4	5	6	7
	05	8	9	10	11	12	13	14
		15	16	17	18	19	20	21
	06	22	23	24	25	26	27	28
		29	30	31				
APR					1	2	3	4
	07	5	6	7	8	9	10	11
		12	13	14	15	16	17	18
	08	19	20	21	22	23	24	25
		26	27	28	29	30		
MAY							1	2
	09	3	4	5	6	7	8	9
		10	11	12	13	14	15	16
	10	17	18	19	20	21	22	23
		24	25	26	27	28	29	30
		31						
JUN	11		1	2	3	4	5	6
		7	8	9	10	11	12	13
	12	14	15	16	17	18	19	20
		21	22	23	24	25	26	27
	13	28	29	30				

Month	Pay Period	S	M	T	W	T	F	S
JUL	13				1	2	3	4
		5	6	7	8	9	10	11
	14	12	13	14	15	16	17	18
		19	20	21	22	23	24	25
	15	26	27	28	29	30	31	
AUG								1
	16	2	3	4	5	6	7	8
		9	10	11	12	13	14	15
	17	16	17	18	19	20	21	22
		23	24	25	26	27	28	29
		30	31					
SEP				1	2	3	4	5
	18	6	7	8	9	10	11	12
		13	14	15	16	17	18	19
	19	20	21	22	23	24	25	26
		27	28	29	30			
OCT						1	2	3
	20	4	5	6	7	8	9	10
		11	12	13	14	15	16	17
	21	18	19	20	21	22	23	24
		25	26	27	28	29	30	31
NOV	22	1	2	3	4	5	6	7
		8	9	10	11	12	13	14
	23	15	16	17	18	19	20	21
		22	23	24	25	26	27	28
	24	29	30					
DEC				1	2	3	4	5
		6	7	8	9	10	11	12
	25	13	14	15	16	17	18	19
		20	21	22	23	24	25	26
	26	27	28	29	30	31		

FORM NFC-1217 (9/10)

Dept. Of Agriculture, USFS Payroll Calendar

2016 PAYROLL SCHEDULE

END OF PAY PERIOD

HOLIDAYS

JANUARY

S	M	T	W	T	F	S	
					1	2	
3	4	5	6	7	8	9	2
10	11	12	13	14	15	16	
17	18	19	20	21	22	23	3
24	25	26	27	28	29	30	
31							

FEBRUARY

S	M	T	W	T	F	S	
	1	2	3	4	5	6	4
7	8	9	10	11	12	13	
14	15	16	17	18	19	20	5
21	22	23	24	25	26	27	
28	29						

MARCH

S	M	T	W	T	F	S	
		1	2	3	4	5	6
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	7
20	21	22	23	24	25	26	
27	28	29	30	31			

APRIL

S	M	T	W	T	F	S	
					1	2	8
3	4	5	6	7	8	9	
10	11	12	13	14	15	16	9
17	18	19	20	21	22	23	
24	25	26	27	28	29	30	10

MAY

S	M	T	W	T	F	S	
1	2	3	4	5	6	7	
8	9	10	11	12	13	14	11
15	16	17	18	19	20	21	
22	23	24	25	26	27	28	12
29	30	31					

JUNE

S	M	T	W	T	F	S	
			1	2	3	4	
5	6	7	8	9	10	11	13
12	13	14	15	16	17	18	
19	20	21	22	23	24	25	14
26	27	28	29	30			

JULY

S	M	T	W	T	F	S	
					1	2	
3	4	5	6	7	8	9	15
10	11	12	13	14	15	16	
17	18	19	20	21	22	23	16
24	25	26	27	28	29	30	

AUGUST

S	M	T	W	T	F	S	
	1	2	3	4	5	6	17
7	8	9	10	11	12	13	
14	15	16	17	18	19	20	18
21	22	23	24	25	26	27	
28	29	30	31				

SEPTEMBER

S	M	T	W	T	F	S	
				1	2	3	19
4	5	6	7	8	9	10	
11	12	13	14	15	16	17	20
18	19	20	21	22	23	24	
25	26	27	28	29	30		

OCTOBER

S	M	T	W	T	F	S	
						1	21
2	3	4	5	6	7	8	
9	10	11	12	13	14	15	22
16	17	18	19	20	21	22	
23	24	25	26	27	28	29	23
30	31						

NOVEMBER

S	M	T	W	T	F	S	
		1	2	3	4	5	
6	7	8	9	10	11	12	24
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	25
27	28	29	30				

DECEMBER

S	M	T	W	T	F	S	
				1	2	3	
4	5	6	7	8	9	10	26
11	12	13	14	15	16	17	
18	19	20	21	22	23	24	1
25	26	27	28	29	30	31	

PAY PERIOD CALENDAR 2016

Month	Pay Period	S	M	T	W	T	F	S
JAN	26						1	2
		3	4	5	6	7	8	9
	01	10	11	12	13	14	15	16
		17	18	19	20	21	22	23
	02	24	25	26	27	28	29	30
		31						
FEB			1	2	3	4	5	6
	03	7	8	9	10	11	12	13
		14	15	16	17	18	19	20
	04	21	22	23	24	25	26	27
		28	29					
MAR				1	2	3	4	5
	05	6	7	8	9	10	11	12
		13	14	15	16	17	18	19
	06	20	21	22	23	24	25	26
		27	28	29	30	31		
APR							1	2
	07	3	4	5	6	7	8	9
		10	11	12	13	14	15	16
	08	17	18	19	20	21	22	23
		24	25	26	27	28	29	30
MAY	09	1	2	3	4	5	6	7
		8	9	10	11	12	13	14
	10	15	16	17	18	19	20	21
		22	23	24	25	26	27	28
		29	30	31				
JUN	11				1	2	3	4
		5	6	7	8	9	10	11
	12	12	13	14	15	16	17	18
		19	20	21	22	23	24	25
	13	26	27	28	29	30		

Month	Pay Period	S	M	T	W	T	F	S
JUL	13						1	2
		3	4	5	6	7	8	9
	14	10	11	12	13	14	15	16
		17	18	19	20	21	22	23
	15	24	25	26	27	28	29	30
		31						
AUG			1	2	3	4	5	6
	16	7	8	9	10	11	12	13
		14	15	16	17	18	19	20
	17	21	22	23	24	25	26	27
		28	29	30	31			
SEP						1	2	3
	18	4	5	6	7	8	9	10
		11	12	13	14	15	16	17
	19	18	19	20	21	22	23	24
		25	26	27	28	29	30	
OCT								1
	20	2	3	4	5	6	7	8
		9	10	11	12	13	14	15
	21	16	17	18	19	20	21	22
		23	24	25	26	27	28	29
		30	31					
NOV	22			1	2	3	4	5
		6	7	8	9	10	11	12
	23	13	14	15	16	17	18	19
		20	21	22	23	24	25	26
		27	28	29	30			
DEC	24					1	2	3
		4	5	6	7	8	9	10
	25	11	12	13	14	15	16	17
		18	19	20	21	22	23	24
	26	25	26	27	28	29	30	31

WESTERN AIR AMBULANCE PHONE LIST (NOT GARAUNTEED TO BE CURRENT)

STATE	SERVICE NAME	HOSPITAL / LOCATION	PHONE #'S
ALASKA	MAST	AK STATE TROOPERS	**907-451-5333/5100**
ARIZONA	GUARDIAN AIR	FLAGSTAFF MEDICAL CTR	**800-523-9391**
	CLASSIC LIFE GUARD	PAGE	**800-444-9223**
CALIFORNIA	MERCY AIR AMB.	MERCY MED CTR, REDDING	**530-225-7252**
	MOUNTAIN LIFEFLIGHT	SUSANVILLE	**800-926-0801**
	AIR MED TEAM	REDDING MED CTR	**800-432-9944**
COLORADO	ST. MARY'S AIR LIFE	ST. MARY'S, GRAND JUNCTION	**800-332-4923**
	YAMPA VALLEY AIR AMB.	STEAMBOAT SPRINGS	**800-900-6800**
	FLIGHT FOR LIFE	COLORADO SPRINGS	**800-4222254**
	AIR RESPONSE	ENGLEWOOD	**303-768-8089**
	FLIGHT FOR LIFE	ST ANTHONY'S, DENVER	**800-525-3712**
	TRANSPORT CARE	MEMORIAL, COLO SPRINGS	**800-763-4373**
IDAHO	LIFE FLIGHT	ST. ALPHONSUS, BOISE	**800-367-3230**
	LIFE FLIGHT	BANNOK MED CTR, POCATELLO	**800-232-0911**
	ACCESS AIR	BOISE	**208-333-9911**
MONTANA	LIFE FLIGHT	ST. PATRICK'S, MISSOULA	**800-991-SEND**
	MERCY FLIGHT/MEDFLIGHT	GREAT FALLS	**800-972-4000**
	MEDFLIGHT	BILLINGS	**800-325-1774**
NEVADA	MERCY AIR	LAS VEGAS	**800-842-4431**
	MEDIC AIR	RENO	**800-234-3822**
	ACCESS AIR	ELKO	**775-738-3493**
	CARE FLIGHT	RENO, GARDNERVILLE, TRUKEE	**775-858-5700**
NEW MEXICO	SOUTHWEST AIR AMB.	FAIRACRES/LAS CRUCES	**505-525-2660**
	MED FLIGHT AIR AMB.	ALBUQUERQUE	**800-842-4431**
	LIFEGUARD AIR EMERGENCY	ALBUQUERQUE	**800-633-5438**
	GALLUP MED FLIGHT	GALLUP	**505-863-6606**
OREGON	AIR LIFE OF OREGON	BEND	**800-522-2828**
	LIFE FLIGHT	PORTLAND	**800-452-7434**
	LIFEGUARD AIR AMB.	HILLSBORO	**503-640-2927**
UTAH	AIR MED	U OF UT HEALTH CTR, SALT LAKE	**800-453-0120**
	LIFE FLIGHT	INTERMT HLTH CARE, SALT LAKE	**801-321-1234**
WASHINGTON	NORTHWEST MEDSTAR	SPOKANE	**800-422-2440**
	AIRLIFT NORTHWEST	SEATTLE	**800-426-2430**
WYOMING	WYOMING LIFE FLIGHT	WY MED CTR, CASPER	**800-442-2222**

Medical Incident Report

Use items one through nine to communicate situation to communications/dispatch.

1. CONTACT COMMUNICATIONS/DISPATCH

Ex: "Communications, Div. Alpha. Stand-by for Priority Medical Incident Report." (If life threatening request designated frequency be cleared for emergency traffic.)

2. INCIDENT STATUS: Provide incident summary and command structure

Nature of Injury/Illness		*Describe the injury (Ex: Broken leg with bleeding)*
Incident Name:		*Geographic Name + "Medical" (Ex: Trout Meadow Medical)*
Incident Commander:		*Name of IC*
Patient Care:		*Name of Care Provider (Ex: EMT Smith)*

3. **INITIAL PATIENT ASSESSMENT:** *Complete this section for each patient. This is only a brief, initial assessment. Provide additional patient info after completing this 9 Line Report. See page 100 for detailed Patient Assessment.*

Number of Patients:	Male/Female	Age:	Weight:
Conscious?	☐ YES	☐ **NO = *MEDEVAC*!**	
Breathing?	☐ YES	☐ **NO = *MEDEVAC*!**	
Mechanism of Injury: *What caused the injury?*			
Lat./Long. (Datum WGS84) Ex: N 40º 42.45'x W 123º 03.24'			

4. SEVERITY OF EMERGENCY, TRANSPORT PRIORITY

SEVERITY	TRANSPORT PRIORITY
☐ **URGENT-RED Life threatening injury or illness.** Ex: Unconscious, difficulty breathing, bleeding severely, 2º-3º burns more than 4 palm sizes, heat stroke, disoriented.	Ambulance or MEDEVAC helicopter. Evacuation need is **IMMEDIATE**.
☐ **PRIORITY-YELLOW Serious injury or illness.** Ex: Significant trauma, not able to walk, 2º-3º burns not more than 1-2 palm sizes	Ambulance or consider air transport if at remote location. Evacuation may be **DELAYED**.
☐ **ROUTINE-GREEN** Not a life threatening injury or illness. Ex: Sprains, strains, minor heat-related illness	Non-Emergency. Evacuation considered **Routine of Convenience**.

5. TRANSPORT PLAN:

Air Transport: (Agency Aircraft Preferred)

☐ Helispot ☐ Short-haul/Hoist ☐Life Flight ☐ Other

Ground Transport:

☐ Self-Extract ☐ Carry-Out ☐ Ambulance ☐ Other

6. ADDITIONAL RESOURCE/EQUIPMENT NEEDS:

☐ Paramedic/EMT(s) ☐ Crew(s) ☐ SKED/Backboard/C-Collar

☐ Burn Sheet(s) ☐ Oxygen ☐ Trauma Bag

☐ Medication(s) ☐ IV/Fluid(s) ☐ Cardiac Monitor/AED

☐ **Other (e.g., splints, rope rescue, wheeled litter)**

7. COMMUNICATIONS:

Function	Channel Name/Number	Receive (Rx)	Tone/ NAC*	Transmit (Tx)	Tone/ NAC*
Ex: Command	*Forest Rpt, Ch. 2*	*168.3250*	*110.9*	*171.4325*	*110.9*
COMMAND					
AIR-TO-GRND					
TACTICAL					

**(NAC for digital radio system)*

8. EVACUATION LOCATION:

Lat./Long. (Datum WGS84) *EX: N 40° 42.45'x W 123° 03.24'*	
Patient's ETA to Evacuation Location:	
Helispot/Extraction Size and Hazards	

9. CONTINGENCY:

Considerations: If primary options fail, what actions can be implemented in conjunction with primary evacuation method? Be thinking ahead…

REMEMBER:

- **Confirm ETAs of resources ordered.**
- **Act according to your level of training.**
- **Be Alert. Keep Calm. Think Clearly. Act Decisively.**

FIRE LINE LEADER RESPONSIBILITIES

(Establish clear Leader's Intent and Supervise at the scene of action not in your truck/office)

Initial Attack Incident Commander (ICT4/5): also see pages 65 - 66

- Provide for Safety and welfare of assigned personnel
- Initiate and maintain Incident Briefing(ICS Form 201)
- Size up fire situation and concisely communicate resource needs
- Analyze Incident complexity
- Plan appropriate method of attack
- Brief personnel and keep them informed
- Direct and coordinate assigned resources
- Monitor weather, fire behavior, and environmental factors to anticipate changes
- Adjust tactics to meet changing conditions
- Maintain current Unit Log(ICS Form 214)
- Solicit Feedback and participate in AARs

Task Force/Strike Team Leader:

- Obtain briefing from DIVS/IC
- Review assignment with assigned resources
- Travel to and from line with assigned resources
- Monitor and inspect progress; make changes as necessary
- Coordinate action with adjacent resources
- Keep supervisor informed of status and progress
- Obtain logistics/equipment needs from assigned resources
- Retain control of assigned resources while off-line
- Maintain a current unit log (ICS form 214)

Single Resource Boss (CRWB, ENGB, FIRB, FELB):

- Responsible for supervising and directing a firefighting module such as: hand crew, engine, dozer, firing team, and fallers.
- Obtain briefing from Task Force/Strike Team Leader/IC
- Review assignment with module and assign work tasks
- Obtain Necessary equipment and supplies
- Review current and predicted Wx conditions and expected Fire Bx
- Brief module on safety including escape routes and safety zones
- Monitor work progress; make changes as necessary
- Keep supervisor informed of progress and changes
- Inform supervisor promptly of problems
- Brief/Debrief with relief personnel on the fireline
- Complete and turn in time records

INITIAL ATTACK FIRE SIZE-UP

1. FIRE NAME:	FIRE NUMBER	DOI
		USDA
2. IC NAME:		STATE
		PRIVATE

Descriptive location:			
Reported by:			
3. ARRIVAL DATE:		TIME:	
4. LEGAL:	Township:	Range:	Section(s):
Coordinates:	Latitude:	Longitude:	
UTM:	E:	N:	
5. ESTIMATED SIZE (acres):		6. OWNERSHIP:	

7. FUELS BURNING:	☐ Grass	☐ Re-prod	☐ Snag	☐ Duff	☐ Timber (light, heavy)
	☐ Brush	☐ Slash	☐ Logs	☐ Hardwood	
ADJACENT FUELS:	☐ Grass	☐ Re-prod	☐ Snag	☐ Duff	☐ Timber (light, heavy)
	☐ Brush	☐ Slash	☐ Logs	☐ Hardwood	
8. CHARACTER OF FIRE:	☐ Smoldering	☐ Running	☐ Crowning		
	☐ Creeping	☐ Torching	☐ Spotting		
9. FLAME LENGTH:	☐ under 2'	☐ 2-4'	☐ 4-8	☐ 8-11	☐ 11 plus
10. POSITION ON SLOPE:	☐ Bottom 1/3	☐ Middle 1/3	☐ Top 1/3		
11. PERCENT SLOPE:	☐ 0-30	☐ 45-60	☐ 30-45	☐ 60 plus	
12. ASPECT:	☐ North	☐ East	☐ South	☐ West	☐ Flat/Ridge top
13. WIND SPEED:					
WIND DIRECTION:	☐ N ☐ E ☐ S ☐ W	☐ Upslope	☐ Up Canyon		
		☐ Down Slope	☐ Down Canyon		
14. WIND INDICATORS:	☐ Cumulus	☐ Lenticular	☐ Cold Fronts	☐ Other:	

15. GROWTH POTENTIAL (estimate acres for next operational period):			☐ Acres:	
☐ None	☐ Low	☐ Moderate	☐ High	☐ Very High

16. VALUES AT RISK (Check all that apply):			
☐ Houses	☐ T&E Species	☐ Water Quality	☐Public Safety
☐Improvements	☐ Cultural/Historical	☐Other:	
17. IS FIRE NEAR ANY SENSITIVE AREAS?		☐ No	☐ Yes - *Check Below*
☐ Rivers or Streams	☐ Surface Waters	☐ Aspen Trees	☐ 5 Needle Pines
☐ Meadow	☐ Forest Edge	☐ Other (Specify)	
18. HAZARDS OR CONCERNS (Check all that apply):			
☐ Snags	☐ Hazmat	☐ Urban Interface	☐ Power Lines
☐ Mine Shafts	☐ Evacuation Concerns	☐ Cliffs	☐ Other
19. CAUSE:	☐ Lightning	☐ Human Cause	☐ Other
20. PROPOSED ACTION:	☐ Resource Benefit	☐ Confine	☐ Suppress
21. ADDITIONAL RESOURCES:		☐ No	☐ Yes - *Specify Below*

Personnel:	Equipment:	Supplies:	Aircraft:

REMOTE OPERATIONS UPDATE
CALL-IN CHEAT SHEET

When providing an update on a remote portion of a fire, managers may have specific questions about the current status of a fire, and they'll usually let you know what those are. If not, these items listed below will assist you in painting a decent picture of an ongoing fire's status.

- Estimated (or known) current fire size
- Growth Overnight/ since last checked
- % Active Perimeter
- Active portion / quadrant (N, S, E, W)
- Fuel Model carrying fire (pay special attention to FM transitions)
- Fire Behavior Observed: ROS, Flame Length, torching, spotting, smoke obs.
- Time of Activity (burning window)
- Weather highlights: High Temps, Low RH, wind speed and direction
- Communicate your plan for the shift
- Ask if any other information is needed (when they'd like the next update, etc)
- Specific safety or operational concerns/mitigations

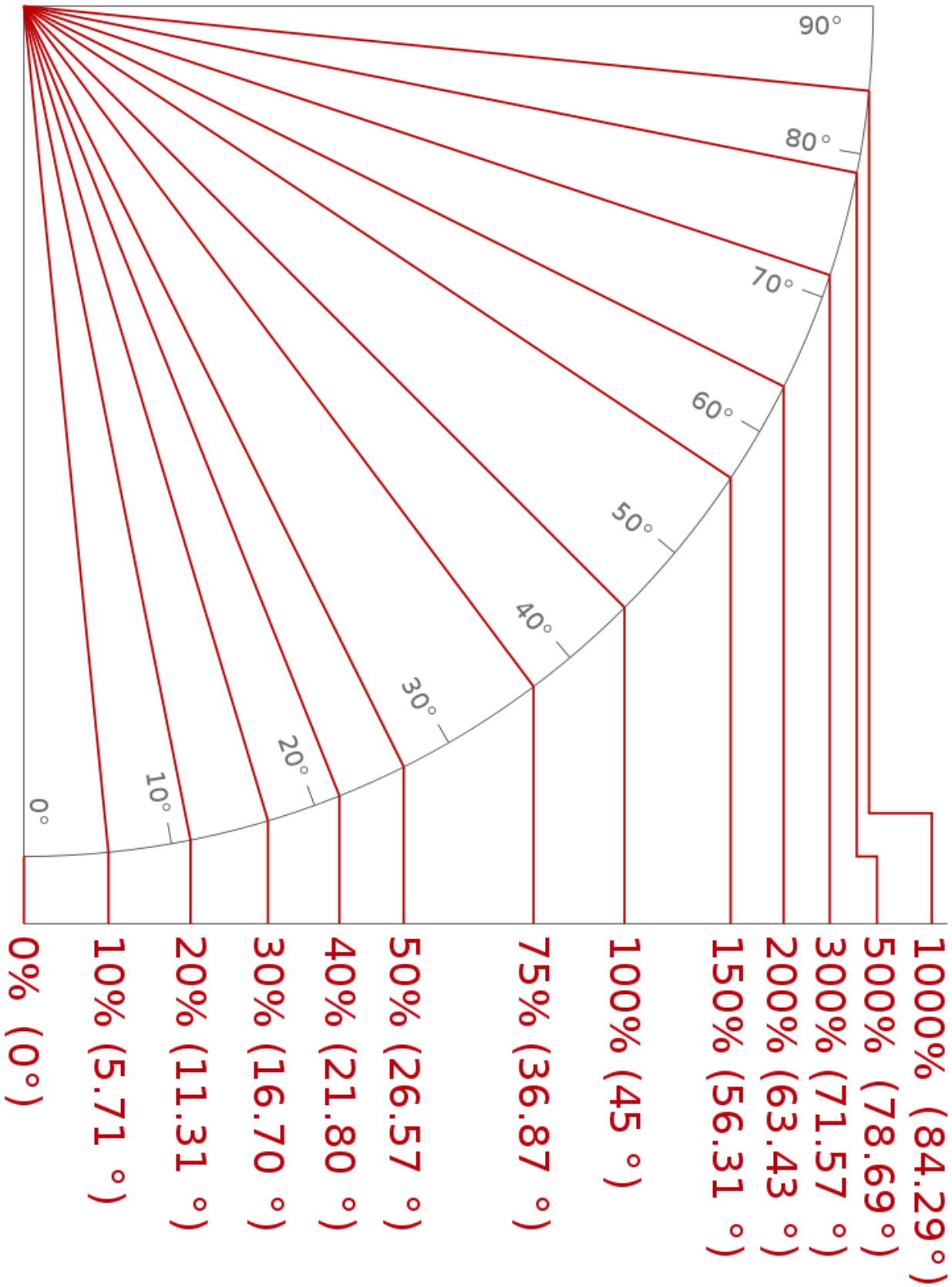
When communicating with a dispatch center/ ICP, consider the additional communication SOPs:

- Notify Dispatch when you begin your travel to and from the fire, when you begin driving and when you begin hiking. This may get redundant, but they'll at least know where you are.
- Let Dispatch know when you've arrived on the fire, and give them an estimate of when you'll provide a fire update.
- Communicate your info only when it's appropriate to do so: if other radio traffic exists, wait patiently for a break in radio traffic, and be only as a detailed as necessary with your update.
- Always be cordial and polite when communicating with dispatch centers.

ONE DAY ORDER AMOUNTS

ITEM	QUANTITY
Water, 5 gal cubie	½ per person
MRE's	4 per person
Batteries, AA	15 per radio
Toilet Paper	1 roll per 8 people
Fuel (unleaded)	5 gal = 20 hours chainsaw use
Bar Oil	10 qts = 20 hours chainsaw use
2 cycle mix	12.8 oz = 20 hours chainsaw use
Fuel (24:1)	Mark III 5 gal = 3 hours, Shindawa 5 gal = 10hrs

SLOPE


90°
80°
70°
60°
50°
40°
30°
20°
10°
0°
1000% (84.29°)
500% (78.69°)
300% (71.57°)
200% (63.43°)
150% (56.31°)
100% (45°)
75% (36.87°)
50% (26.57°)
40% (21.80°)
30% (16.70°)
20% (11.31°)
10% (5.71°)
0% (0°)