Department of Commerce · National Oceanic & Atmospheric Administration · National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-1005
JANUARY 2, 2019

Operations and Services
Climate Services, NWSPD 10-1005

LOCAL CLIMATE OUTLOOKS

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/

OPR: W/AFS23 (M. Timofeyeva)   **Certified by:** W/AFS23 (F. Horsfall)
Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive supersedes National Weather Service Instruction 10-1005, "Local Climate Outlooks," dated October 20, 2015.

The revision includes:

- Correction of the product expiration time in Section 2.2.5 from "…expires at the beginning of the valid time" to the "…expires at the end of the valid time".

- Change title of Figure 6 from **"**Example of L3MTO Temperature POE" to "Example of L3MTO Temperature Probability of Exceedance Table".

All other aspects of this instruction remain unchanged from the previous version.

(signed)   12/18/2018
Andrew D. Stern   Date
Director, of Analyze,
Forecast and Support Office

Table of Contents:

1.   Introduction. The NWS Climate Prediction Center (CPC) will produce Local Climate Outlooks for specific locations in the United States using NOAA's National Centers for Environmental Information (NCEI) data at stations and climate divisions. The National Centers for Environmental Prediction (NCEP) Shared Infrastructure Services Branch (SISB) web services will assist in dissemination and display of the outlooks. Weather Forecast Offices (WFO) will answer inquires, select locations, add supplemental information, and report production problems to CPC for outlooks in their area of responsibility. See Local 3-Month Temperature Outlook (L3MTO) Guidelines http://www.weather.gov/os/csd/pds/PCU4/L3MTO/Guidelines.pdf .

2.   Local 3-Month Temperature Outlooks (L3MTO). L3MTO is a probabilistic outlook for a specific location of the 3-month average daily temperature. The L3MTO available on the Internet (http://www.weather.gov/climate/l3mto.php) is based on:

   a. The 3-Month Outlook from CPC. For the contiguous U.S. (CONUS), this would be the CPC climate outlook for the CPC divisional area in which the site resides. See NWS Instruction 10-1001 (Climate Outlooks) for details.

   b. CONUS sites only: A correlation between 3-month data from the appropriate climatological reference period for a local site and its respective CPC climate outlook division climatology, using a regression equation.

   c. Alaska and Hawaii sites: Computations of L3MTO Alaska and Hawaii sites follow NWS Instruction 10-1001 (Climate Outlooks) for 3-month temperature outlooks. The format of the display for L3MTO Alaska and Hawaii sites follows this instruction.

2.1   Mission Connection. L3MTO provides information to decision makers with responsibility for activities sensitive to three month and intra-annual climate variation. L3MTO enhances the level of detail and usability of CPC's 3-month climate outlooks. Therefore these outlooks will **not** help people planning events for specific dates or sub- periods, nor those seeking forecasts of monthly temperature extremes. L3MTO will be of most use for economic and risk planning, particularly when used together with climatic reference material (see NWS Instruction 10-1004).

2.2   Issuance Guidelines.

2.2.1   Creation Software. Monthly L3MTOs are produced using a C-Shell (Linux based command language interpreter) script via a Linux platform automation process (i.e.: "cronjob"). The shell software collects/archives all data and executes programming functions written in Perl (an open source software program) to process all data and format output into Extensible Markup Language (XML).   XML files are parsed via Perl and graphics in the formats of Joint Photographic Experts Group (JPEG), Graphic Interchange Format (GIF), and Portable Network Graphics (PNG) are generated with ChartDirector and Imagemagic (both licensed software).

2.2.2   Issuance Criteria. These are scheduled products.

2.2.3   Issuance Time. L3MTO is issued on the internet concurrently with CPC's 3-month climate products on the third Thursday of each month around 8:30 a.m. Eastern local time.

2.2.4   Valid Time. L3MTO is issued for the 13 3-month outlook periods with lead times from 0.5 months to 12.5 months. For example, L3MTO issued in mid-March will be valid for April through June, May through July, and so on to April through June of the following year.

2.2.5   Product Expiration Time. The 0.5-month lead time outlook expires at the end of the valid time of the first 3-month outlook. The other outlooks expire when the next set of outlooks are issued (i.e. the third Thursday of the following month).

2.3.   Technical Description. L3MTO will consist of a variety of graphs and corresponding tables and text. All L3MTO products for each location can be accessed using several web navigational tools embedded in the graphics of national and local web pages and through the four main tabs located on each L3MTO web page (top of Figure 1).

The "National Outlook" Tab (upper left of Figure 1) contains the CPC 3-Month Outlook in map format with links to other seasons available using a dropdown menu. The "Local Outlook" tab (to the right of the "National Outlook" tab) provides access to L3MTO information in the formats described in the following sections.

2.3.1   Content.

    a. Three Category Outlook: CPC will express the outlook as forecasted probability (in percent) that the average 3-month temperature will fall into each of three categories: above, below, or near normal. CPC's reference to normal climatology comes from the 30-year mean 3-month temperature and category limits (See NWS Instruction 10-1004 for details). CPC defines the categories as climatologically equally likely; e.g., the top 10 cases of a thirty-year record define the above category, the middle 10 cases define the normal category, and the bottom 10 cases define the below category.

    b. Range Outlook. CPC will express the expected range of the average 3-month temperature. Expected range outlooks are produced for five confidence intervals or levels of expected chance: 99%, 95%, 90%, 75%, and 50%.

    c. Probability of Exceedence/non Exceedence (POE/PoNE) Outlooks. CPC will express the POE/PoNE outlooks as the expected chance of the average 3-month temperature exceeding or not exceeding a particular probability value. POE and PoNE are produced for 19 values: 99%, 98%, 97%, 96%, 95%, 90%, 80%, 70%, 60%, 50%, 40%, 30%, 20%, 10%, 5%, 4%, 3%, 2%, and 1%.
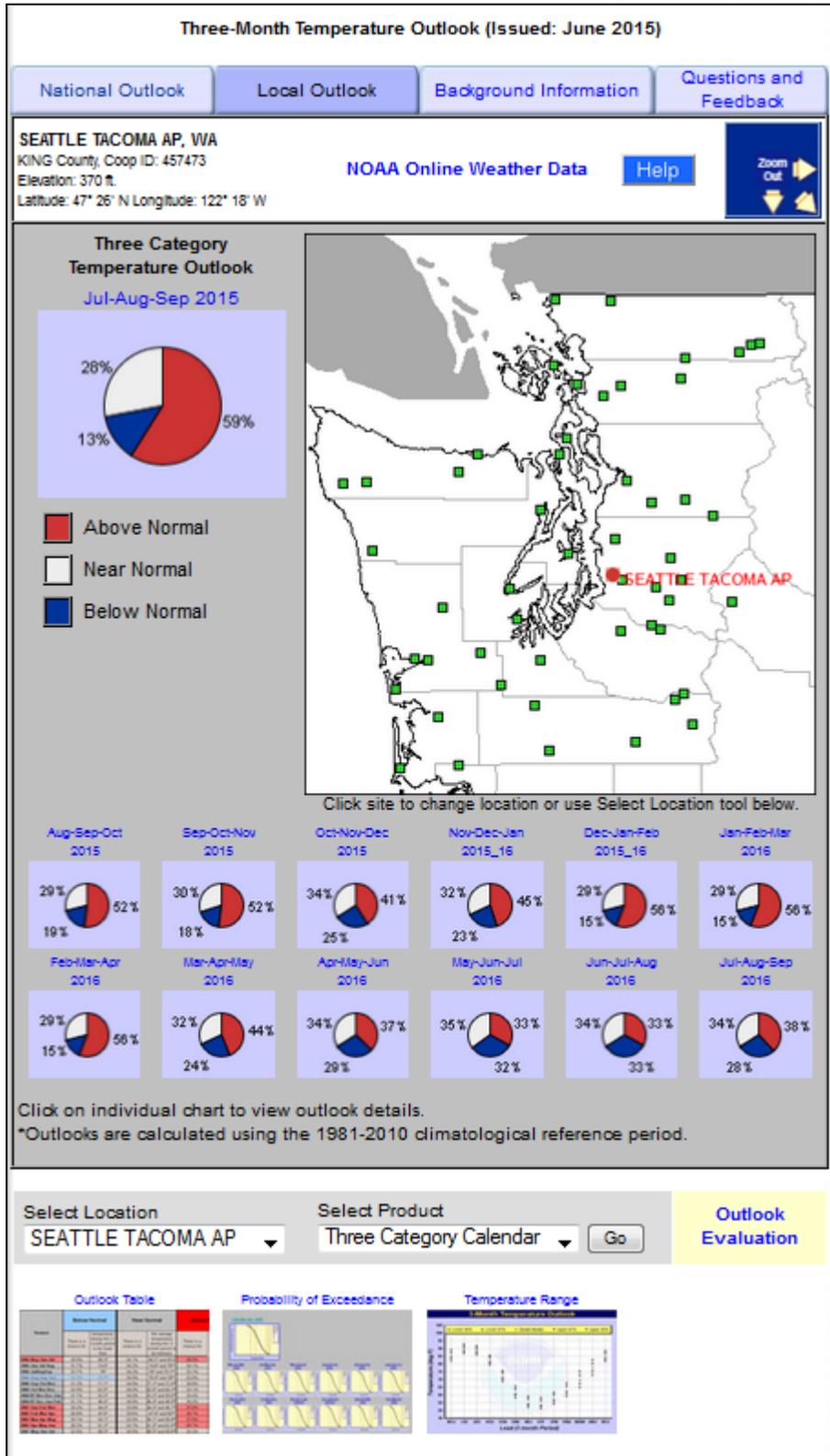
Figure 1. L3MTO web page example for Seattle Tacoma Airport, Washington

2.3.2 <u>Format</u>.

a. <u>Three Category Outlook examples</u>.
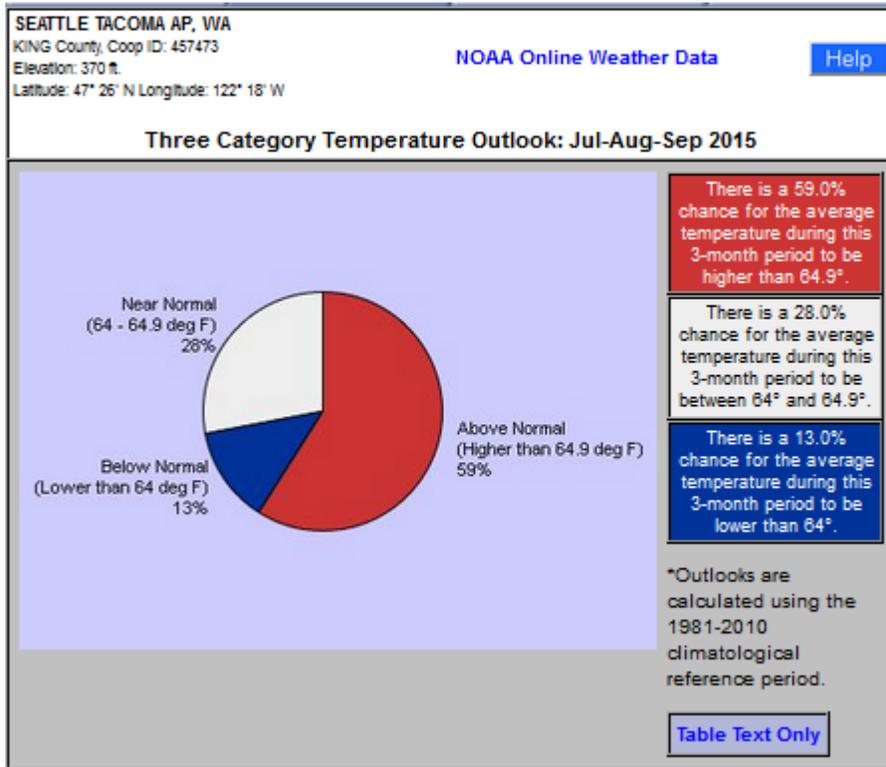
Figure 2. Example for L3MTO "Pie" Chart combining 2 formats: graph and text interpretation statement.

SEATTLE TACOMA AP, WA
KING County, Coop ID: 457473
Elevation: 370 ft.
Latitude: 47° 26' N Longitude: 122° 18' W

NOAA Online Weather Data   Help

Three Category Outlook Table

Season	Below Normal		Near Normal		Above Normal	
	There is a chance for	temperature during this 3-month period to be lower than	There is a chance for	the average temperature during this 3-month period to be between	There is a chance for	temperature during this 3-month period to be higher than
Jul-Aug-Sep 2015	13.0%	64°	28.0%	64° and 64.9°	59.0%	64.9°
Aug-Sep-Oct 2015	19.0%	59.7°	29.0%	59.7° and 60.5°	52.0%	60.5°
Sep-Oct-Nov 2015	18.0%	52.6°	30.0%	52.6° and 53.8°	52.0%	53.8°
Oct-Nov-Dec 2015	25.0%	45.7°	34.0%	45.7° and 46.9°	41.0%	46.9°
Nov-Dec-Jan 2015_16	23.0%	42°	32.0%	42° and 43.3°	45.0%	43.3°
Dec-Jan-Feb 2015_16	15.0%	41.2°	29.0%	41.2° and 42.8°	56.0%	42.8°
Jan-Feb-Mar 2016	15.0%	43.1°	29.0%	43.1° and 44.9°	56.0%	44.9°
Feb-Mar-Apr 2016	15.0%	46.1°	29.0%	46.1° and 47.5°	56.0%	47.5°
Mar-Apr-May 2016	24.0%	50.2°	32.0%	50.2° and 51.6°	44.0%	51.6°
Apr-May-Jun 2016	29.0%	55.1°	34.0%	55.1° and 56.4°	37.0%	56.4°
May-Jun-Jul 2016	32.0%	60.2°	35.0%	60.2° and 61.5°	33.0%	61.5°
Jun-Jul-Aug 2016	33.0%	63.8°	34.0%	63.8° and 64.8°	33.0%	64.8°
Jul-Aug-Sep 2016	28.0%	64°	34.0%	64° and 64.9°	38.0%	64.9°

Legend: Blue, Gray, or Red Shading indicate an enhanced chance for Below, Near, or Above Normal Category respectively.   Table Text Only

Legend: **Blue**, **Gray**, or **Red** Shadings indicate enhanced chances for **Below**, **Near**, or **Above** Normal Category respectively.

Figure 3. Example of L3MTO combining two formats: data table and text interpretation statements.

b. Range Outlook example.
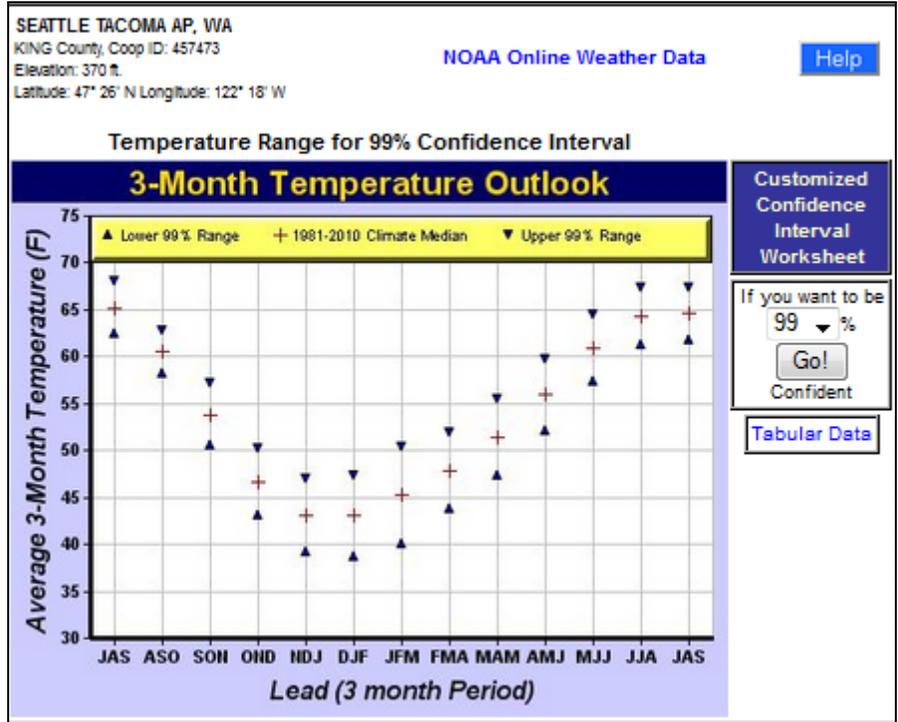
Figure 4. Example of L3MTO Temperature Range Plot uses graph, table and text interpretation formats

c. POE outlook example.

Figure 5. Example of L3MTO Probability of Exceedance graph presented as x-y plot.

SEATTLE TACOMA AP, WA
KING County, Coop ID: 457473
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Help

Probability of Exceedance Table

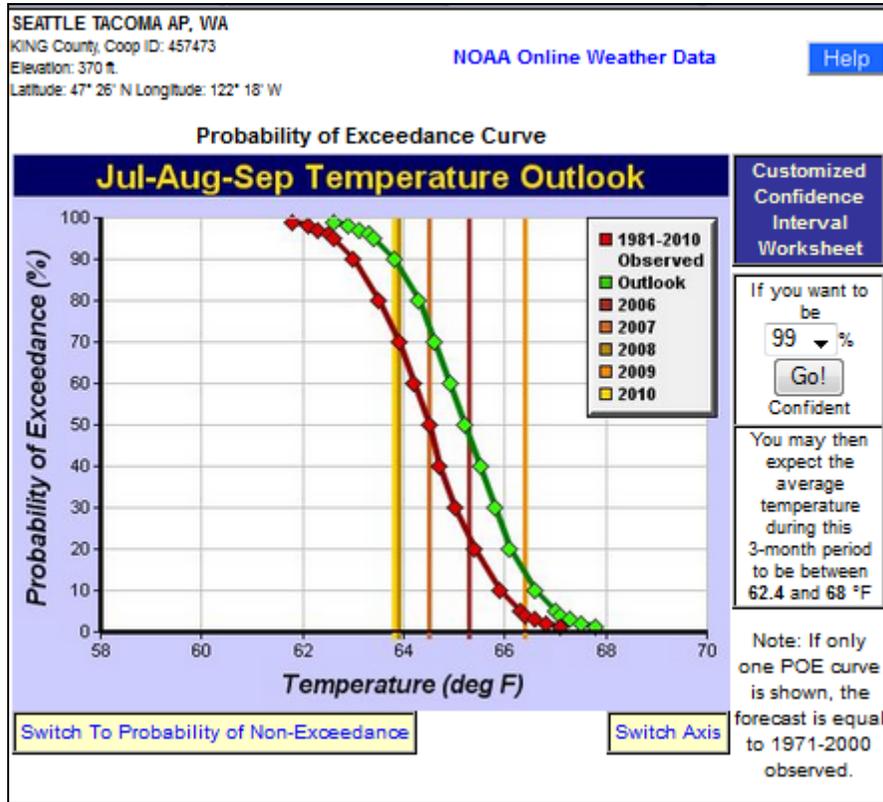|	JAS	ASO	SON	OND	NDJ	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS
**R	0.9	0.9	1.0	1.0	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9
99%	62.6	58.4	50.8	43.3	39.6	39.0	40.5	44.1	47.7	52.4	57.6	61.5	62.0
98%	62.9	58.7	51.1	43.7	40.0	39.5	41.1	44.5	48.1	52.8	58.0	61.8	62.3
97%	63.1	58.8	51.4	44.0	40.3	39.8	41.4	44.8	48.4	53.1	58.3	62.0	62.5
96%	63.3	58.9	51.5	44.1	40.5	40.0	41.7	45.0	48.6	53.3	58.4	62.2	62.7
95%	63.4	59.0	51.7	44.3	40.6	40.2	41.9	45.2	48.8	53.4	58.6	62.3	62.8
90%	63.8	59.3	52.1	44.8	41.2	40.8	42.6	45.7	49.3	54.0	59.1	62.8	63.2
80%	64.3	59.7	52.7	45.4	41.8	41.6	43.5	46.5	50.1	54.6	59.7	63.3	63.7
70%	64.6	60.0	53.1	45.9	42.3	42.1	44.2	47.0	50.6	55.1	60.2	63.7	64.0
60%	64.9	60.3	53.5	46.2	42.7	42.6	44.7	47.4	51.0	55.5	60.5	64.0	64.3
50%	65.2	60.5	53.8	46.6	43.1	43.0	45.2	47.8	51.4	55.9	60.9	64.3	64.6
40%	65.5	60.7	54.1	47.0	43.5	43.4	45.7	48.2	51.8	56.3	61.3	64.6	64.9
30%	65.8	61.0	54.5	47.3	43.9	43.9	46.2	48.6	52.2	56.7	61.6	64.9	65.2
20%	66.1	61.3	54.9	47.8	44.4	44.4	46.9	49.1	52.7	57.2	62.1	65.3	65.5
10%	66.6	61.7	55.5	48.4	45.0	45.2	47.8	49.9	53.5	57.8	62.7	65.8	66.0
5%	67.0	62.0	55.9	48.9	45.6	45.8	48.5	50.4	54.0	58.4	63.2	66.3	66.4
4%	67.1	62.1	56.1	49.1	45.7	46.0	48.7	50.6	54.2	58.5	63.4	66.4	66.5
3%	67.3	62.2	56.2	49.2	45.9	46.2	49.0	50.8	54.4	58.7	63.5	66.6	66.7
2%	67.5	62.3	56.5	49.5	46.2	46.5	49.3	51.1	54.7	59.0	63.8	66.8	66.9
1%	67.8	62.6	56.8	49.9	46.6	47.0	49.9	51.5	55.1	59.4	64.2	67.1	67.2
*Mean	65.2	60.5	53.8	46.6	43.1	43.0	45.2	47.8	51.4	55.9	60.9	64.3	64.6
StDev	1.1	0.9	1.3	1.4	1.5	1.7	2.0	1.6	1.6	1.5	1.4	1.2	1.1

Color Legend	Deviation from Climatology (deg F)
	< -2.5
	-2.0 thru -2.5
	-1.5 thru -2.0
	-1.0 thru -1.5

Color Legend	Deviation from Climatology (deg F)
	-0.5 thru -1.0
	-0.5 > deg F < 0.5
	0.5 thru 1.0
	1.0 thru 1.5

Color Legend	Deviation from Climatology (deg F)
	1.5 thru 2.0
	2.0 thru 2.5
	> 2.5

Table Text Only

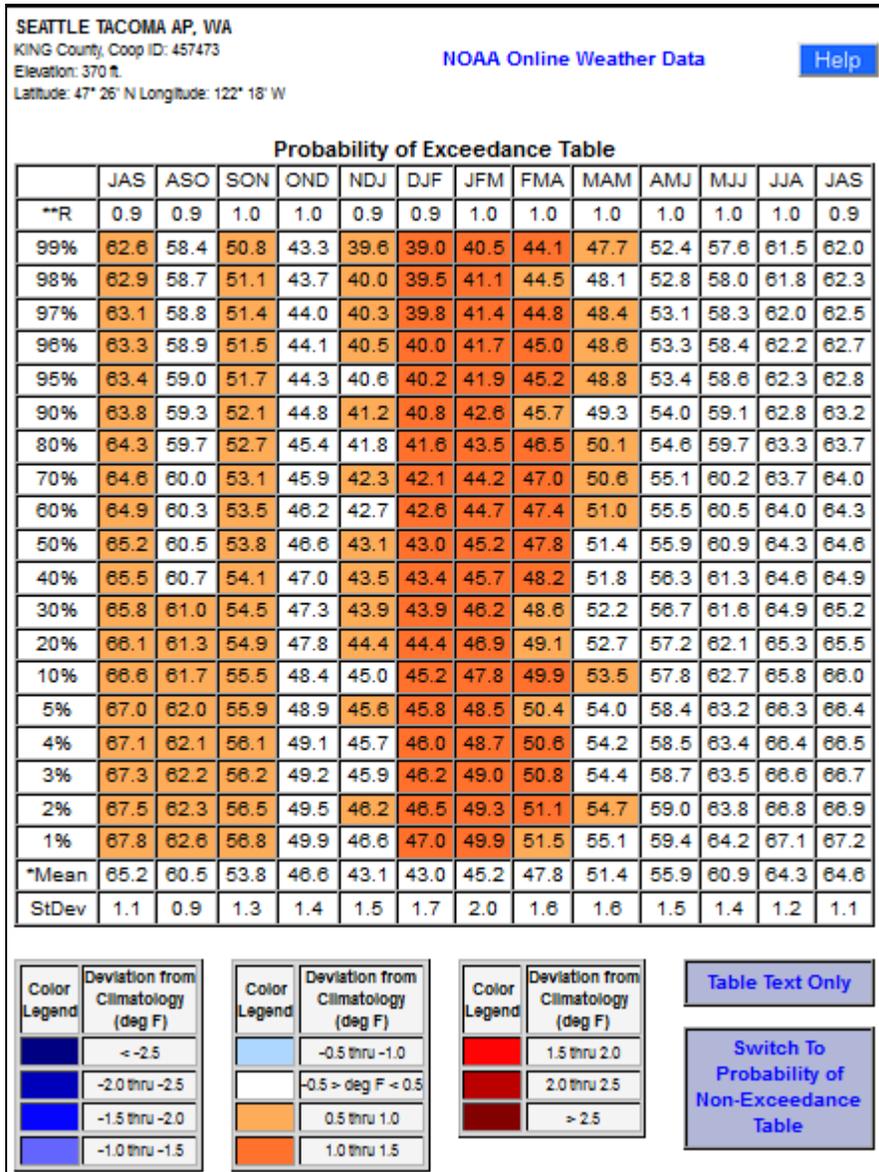Switch To Probability of Non-Exceedance Table

Figure 6. Example of L3MTO Temperature Probability of Exceedance Table.

2.4   Updates, Amendments, and Corrections. CPC will not issue updates or amendments.