**HourlyTemp Contract Terms and Conditions**

**Sample Question:** Will the temperature in [region] exceed [##] F at [time] on [date]?

**Variables:** [region]: The place named in the Contract. Each place settles at one grid point of the NCEP's 2.5 km analysis grid, designated by ForecastEx as described under Processing. [##]: The Contract's threshold, in degrees Fahrenheit. [time]: The top of an hour, in the location's local time with daylight saving time observed unless the Contract names another time zone, given with its offset from UTC. [date]: The Contract Date, the calendar date of [time] in the same time zone.

**Product Code:** Determined by ForecastEx

**Instructions:** This Contract resolves on the Resolution Value for the location at the time and on the Contract Date listed in the Contract. The Resolution Value is computed from the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) Real-Time Mesoscale Analysis (RTMA) at the location's National Digital Forecast Database (NDFD) grid point, following the steps under Processing, and ForecastEx displays it on the Resolution Display described below. NOAA's National Centers for Environmental Prediction (NCEP) produces the RTMA, publishes each hourly analysis within about an hour of its valid time. Other analyses of the same hour, including NCEP's Rapid Update RTMA, published sooner, and its Unrestricted Mesoscale Analysis (URMA), published later, and station observations do not change the Resolution Value, except where Processing step 6 takes a missing hour from the URMA. This Contract is not subject to early Resolution.

**Underlying:** The Contract is resolved based upon the temperature at the location's grid point in the hourly analysis valid at the time listed in the Contract on the date listed in the Contract. The Outcome is "Yes" when the Resolution Value is strictly greater than the threshold specified in the Contract. The Outcome is "No" when the Resolution Value is less than or equal to that threshold. Only the Resolution Value computed as described in these terms shall be used to resolve the Contract. No station observation, forecast, or other analysis, including the URMA except as Processing step 6 provides for a missing hour, and the Rapid Update RTMA, shall be used for Contract resolution.

All times will be determined using the local time applicable to the specified location unless a different time zone is specified in the Contract. If a different time zone is specified, the valid time of the applicable hourly analysis will be converted to the time zone specified in the Contract for purposes of determining the applicable hour.

**Resolution Dataset:** The RTMA is NCEP's hourly analysis of surface weather over the contiguous United States on the 2.5 km grid of the National Digital Forecast Database.

The Resolution Value is computed from the following field:

- File: rtma2p5.tHHz.2dvaranl_ndfd.grb2_wexp
- GRIB2 Field: TMP at 2 m above ground

- Units: kelvin

HH is the valid hour in UTC, and the file is in the directory rtma2p5.YYYYMMDD of its UTC date. The analysis file stores temperature to a hundredth of a kelvin. The analysis file is on the grid in the Appendix. Each analysis is NCEP's estimate of the temperature at its valid time, the top of hour HH, and not an average over the hour.

For an hour that Processing step 6 takes from the URMA, NCEP's Unrestricted Mesoscale Analysis, the same field is read from the URMA analysis file urma2p5.tHHz.2dvaranl_ndfd.grb2_wexp, in the directory urma2p5.YYYYMMDD of its UTC date. It is on the same grid, stores temperature in the same way, and is published about seven hours after its valid time.

**Direct Access to the Dataset:** The RTMA files are public and need no account.

- NOAA Open Data Dissemination on Amazon Web Services keeps the files in the bucket noaa-rtma-pds. An analysis file is at https://noaa-rtma-pds.s3.amazonaws.com/rtma2p5.YYYYMMDD/rtma2p5.tHHz.2dvaranl_ndfd.grb2_wexp. The registry entry is https://registry.opendata.aws/noaa-rtma/.

- NCEP's NOMADS server keeps about the last ten days of analysis files at https://nomads.ncep.noaa.gov/pub/data/nccf/com/rtma/prod/.

- The URMA analysis files are on the same two servers: on NOAA Open Data Dissemination in the bucket noaa-urma-pds, at https://noaa-urma-pds.s3.amazonaws.com/urma2p5.YYYYMMDD/urma2p5.tHHz.2dvaranl_ndfd.grb2_wexp, and on NCEP's NOMADS server at https://nomads.ncep.noaa.gov/pub/data/nccf/com/urma/prod/.

- NCEP documents the files at https://www.nco.ncep.noaa.gov/pmb/products/rtma/ and the analysis at https://www.emc.ncep.noaa.gov/emc/pages/numerical_forecast_systems/rtma.php.

A location's analysis value is at grid point k = j × 2345 + i of the field, counting from zero at the grid's first point, where i and j are the location's analysis grid point. ecCodes numbers the points the same way. For New York the analysis grid point is i 2010, j 857, grid point 2,011,675, centered at 40.7141°N, 74.0129°W. The temperature there at 18:00 UTC on 26 September 2026 was 291.01 K, which is 64.148°F.

**Processing: The Resolution Value is computed as follows.**

1. Grid point. Each location settles at the analysis grid point that ForecastEx designates for it. ForecastEx publishes each location's grid point (i, j), its center and the location's time zone in its location list and on the Resolution Display before the first Contract for the location is listed. The grid point stands for the 2.5 km square centered on it, and the Resolution Value uses the analysis at the grid point. A location's grid point does not change for a Contract once it is listed. ForecastEx may designate a different grid point for Contracts listed later, after publishing a notice to its website.

2. The hour of the Contract. Each Contract uses the one hourly analysis whose valid time is the time listed in the Contract on the Contract Date. On the day clocks move back, 1:00 AM occurs twice in the Contract's time zone, an hour apart, and the Contract's offset from UTC tells the two apart, so each is its own Contract. On the day clocks move forward, the hour the clocks skip does not occur

and no Contract names it.

3. Units. Each value is converted exactly and is not rounded at this step. Temperature converts from kelvin to degrees Fahrenheit as $(K - 273.15) \times 9/5 + 32$.

4. Rounding. The temperature is rounded once, half away from zero, to a whole degree Fahrenheit. So 70.5°F rounds to 71°F, 64.148°F rounds to 64°F, and −20.5°F rounds to −21°F. The rounded temperature is the Resolution Value. For New York at 2:00 PM EDT on 26 September 2026, 18:00 UTC, the temperature was 291.01 K, which is 64.148°F, and the Resolution Value is 64°F.

5. Final values. The Resolution Value is final when the applicable analysis file containing a valid temperature value for the specified location and hour is first published on NOAA Open Data Dissemination or NCEP's NOMADS server, or, if it is not published by the cut-off in step 6, once step 6 has filled the hour, and does not change afterwards. It is computed from the values in the file as first published, without adjustment. Once the Resolution Value has been determined using the first-published RTMA analysis or, where applicable, the URMA analysis specified in step 6, it shall not be changed by any subsequently published analysis or revision.

6. Missing files. An analysis file counts as published once it is available on NOAA Open Data Dissemination or NCEP's NOMADS server. The first version of a file published on either server is used, and no later copy or revision of it, on either server, changes the Resolution Value. If the file for the hour listed in the Contract, or the location's value in it, is not published by the cut-off, one hour and thirty minutes after the hour listed in the Contract, the Resolution Value waits for it until 24 hours after the cut-off. If a valid temperature value from the applicable RTMA analysis becomes available during the wait, it is used. If a valid temperature value from the applicable RTMA analysis remains unavailable at the end of the wait, the Resolution Value is computed from NCEP's URMA analysis file for the same valid time, at the location's grid point, as in steps 3 and 4. Only the first-published version of the applicable URMA analysis shall be used. Any RTMA analysis published after the end of the waiting period shall not change a Resolution Value determined using URMA. If NCEP changes the RTMA's or the URMA's files, grid or fields, and the field or grid point described in these terms can no longer be read, that file is treated as not published. If neither file provides a valid temperature value by the end of the wait, there is no Resolution Value, and ForecastEx may, at its sole discretion, initiate the event review process in accordance with ForecastEx Rule 415.

**Resolution Display:** ForecastEx will make available CSV files containing the temperature data used to determine the Resolution Value for each location and Contract Date. These files will be accessible through ForecastEx's weather data page which can be accessed here. From this page, users may select the city specified in the Contract and then the applicable Contract Date. For Hourly Temp Forecast Contracts, users may access the Hourly Temperature File, which contains a running record of the hourly temperature values for the specified location and Contract Date. This file is updated as each applicable hourly analysis is published by NOAA's National Centers for Environmental Prediction ("NCEP") and processed by ForecastEx in accordance with these Terms and Conditions. Each hourly Resolution Value becomes final when determined in accordance with Processing steps 5 and 6 and shall not be changed by subsequently published analyses or revisions. ForecastEx may change the location, format, or presentation of these files at any time without affecting the methodology used to determine the Resolution Value.

The CSV files are provided for informational and verification purposes only. The Resolution Value shall be determined solely in accordance with the calculation methodology and procedures specified in these Terms and Conditions. If any value displayed or published by ForecastEx differs from the Resolution Value computed in accordance with these Terms and Conditions, the computed Resolution Value shall govern.

No other data, tables, graphs, displays, downloadable files, or other information appearing on ForecastEx's website, or on any other weather service website or source, shall be used for Contract resolution, except as expressly provided in these Terms and Conditions. If the CSV files are temporarily unavailable, resolution shall proceed based on the Resolution Value computed in accordance with these Terms and Conditions. If the Resolution Value cannot be computed, ForecastEx may, at its sole discretion, initiate the event review process in accordance with ForecastEx Rule 415.

**Source Agency:** National Oceanic and Atmospheric Administration

**Minimum Tick:** The Minimum Tick size for the referred Contract shall be $0.01.

**Listing Cycle:** ForecastEx will list Contract expirations at its discretion.

**Thresholds:** For each Contract expiration, thresholds will be listed at ForecastEx's discretion.

**Position Accountability:** The position accountability level is 250,000 Contracts in any one Forecast Market.

**Last Trading Time:** One minute before the [time] listed in the Contract, on the [date] listed in the Contract.

**Payout Criteria:** The Settlement Value of each Contract is $1.00 or $0.00 depending on the Outcome of the Contract. If the Outcome of the Contract is "Yes", then holders of the "Yes" Position will be entitled to receive the Settlement Value of $1.00 per contract and holders of the "No" Position will receive $0.00. If the Outcome of the Contract is "No", then holders of the "No" Position will be entitled to receive the Settlement Value of $1.00 per contract and holders of the "Yes" Position will receive $0.00.

**Resolution Time:** The time at which the analysis file for the hour listed in the Contract is first published.

**Changes in Resolution Time:** The Resolution Time of a Forecast Contract is dependent on the time that the Source Agency releases the Underlying data. There are circumstances in which ForecastEx will change the Resolution Time of a Contract as described below:

1. **Delay by Source Agency:** If the Source Agency delays the release of the underlying data required for Resolution, ForecastEx will delay the Resolution Time of the Contract until such data is released. In these circumstances, ForecastEx will release a public notice to its website informing Market Participants that the Resolution of the Contract has been delayed and release a second notice to its website informing Market Participants when the Contract is resolved.

2. **Change in Release Schedule:** ForecastEx sets the Resolution Time of each Contract based on either the published or anticipated release schedule of the Source Agency for the underlying data. If the Source Agency amends its release schedule or announces that it will publish the underlying data at a different time than anticipated, ForecastEx may, at its sole discretion, amend the Resolution Time of the Contract to match the updated release schedule when doing so is necessary to ensure the accurate

and fair resolution of the contract. In these circumstances, ForecastEx will publish a public notice to its website informing Market Participants of the revised Resolution Time.

3. **Event Review Process:** In accordance with ForecastEx Rule 415, ForecastEx may, at its sole discretion, initiate the event review process prior to Settlement which may delay the Resolution of a Contract. In these cases, ForecastEx will publish a public notice to its website informing Market Participants that the Contract's Outcome is under review.

4. **Early Resolution:** If a Forecast Contract Resolves based on whether a specific event occurs before a defined point in time, it will be subject to early resolution. For these Contracts, if the Outcome of the contract becomes determinable prior to the scheduled Resolution Time – either because the event has occurred (resolving "Yes") or because it can no longer occur (resolving "No") – ForecastEx may, at its sole discretion accelerate the Resolution Time of the Contract in accordance with ForecastEx Rule 413. Whether or not this Contract is subject to early resolution is specified in the Instructions section.

**Expiration Time:** Same as Resolution time.

**Settlement Date:** Unless the Outcome of the Contract is under review in accordance with ForecastEx Rule 415, Settlement of the Contract will occur no later than the day following Expiration Time.

**Trading Restrictions:** In accordance with ForecastEx Rule 509(h), persons are prohibited from participating in Hourly Temp Forecast Contracts if they: possess any material non-public information regarding the Contract, are employees of the Source agency, or are decision-makers, who directly or indirectly have any influence on the Outcome of the Contract.

**Appendix. Grid**

The analysis files use the National Digital Forecast Database CONUS 2.5 km grid with its western expansion.

| **Parameter** | **Analysis grid** |
|---|---|
| Projection | Lambert conformal conic on a sphere of radius 6,371,200 m |
| Standard parallels | 25°N and 25°N |
| Orientation longitude | 265°E (95°W) |
| First grid point | 19.228976°N, 233.723448°E |
| Grid spacing | 2539.703 m in both directions |
| Size | 2345 columns (i) by 1597 rows (j) |
| Grid point number | $k = j \times 2345 + i$ |

"i" increases eastward along each row, and "j" increases northward, counting from zero.

**Contracts Governed by these Terms and Conditions:**

- New York, NY Hourly Temp Forecast Contract
- Los Angeles, CA Hourly Temp Forecast Contract
- Chicago, IL Hourly Temp Forecast Contract
- Dallas, TX Hourly Temp Forecast Contract
- Houston, TX Hourly Temp Forecast Contract
- Miami, FL Hourly Temp Forecast Contract
- Washington, DC Hourly Temp Forecast Contract
- Atlanta, GA Hourly Temp Forecast Contract
- Philadelphia, PA Hourly Temp Forecast Contract
- Phoenix, AZ Hourly Temp Forecast Contract
- Boston, MA Hourly Temp Forecast Contract
- Riverside, CA Hourly Temp Forecast Contract
- San Francisco, CA Hourly Temp Forecast Contract
- Detroit, MI Hourly Temp Forecast Contract
- Seattle, WA Hourly Temp Forecast Contract
- Minneapolis, MN Hourly Temp Forecast Contract
- Tampa, FL Hourly Temp Forecast Contract
- San Diego, CA Hourly Temp Forecast Contract
- Denver, CO Hourly Temp Forecast Contract
- Orlando, FL Hourly Temp Forecast Contract
- Charlotte, NC Hourly Temp Forecast Contract
- Baltimore, MD Hourly Temp Forecast Contract
- St. Louis, MO Hourly Temp Forecast Contract
- San Antonio, TX Hourly Temp Forecast Contract
- Austin, TX Hourly Temp Forecast Contract
- Portland, OR Hourly Temp Forecast Contract
- Sacramento, CA Hourly Temp Forecast Contract
- Pittsburgh, PA Hourly Temp Forecast Contract
- Las Vegas, NV Hourly Temp Forecast Contract
- Cincinnati, OH Hourly Temp Forecast Contract
- Kansas City, MO Hourly Temp Forecast Contract
- Columbus, OH Hourly Temp Forecast Contract
- Indianapolis, IN Hourly Temp Forecast Contract
- Cleveland, OH Hourly Temp Forecast Contract
- Nashville, TN Hourly Temp Forecast Contract
- San Jose, CA Hourly Temp Forecast Contract
- Norfolk, VA Hourly Temp Forecast Contract
- Jacksonville, FL Hourly Temp Forecast Contract
- Providence, RI Hourly Temp Forecast Contract
- Milwaukee, WI Hourly Temp Forecast Contract

- Raleigh, NC Hourly Temp Forecast Contract
- Oklahoma City, OK Hourly Temp Forecast Contract
- Louisville, KY Hourly Temp Forecast Contract
- Richmond, VA Hourly Temp Forecast Contract
- Memphis, TN Hourly Temp Forecast Contract
- Salt Lake City, UT Hourly Temp Forecast Contract
- Birmingham, AL Hourly Temp Forecast Contract
- Fresno, CA Hourly Temp Forecast Contract
- Grand Rapids, MI Hourly Temp Forecast Contract
- Hartford, CT Hourly Temp Forecast Contract
- Omaha, NE Hourly Temp Forecast Contract
- New Orleans, LA Hourly Temp Forecast Contract
- Albuquerque, NM Hourly Temp Forecast Contract
- Charleston, SC Hourly Temp Forecast Contract
- Boise, ID Hourly Temp Forecast Contract
- Little Rock, AR Hourly Temp Forecast Contract
- Des Moines, IA Hourly Temp Forecast Contract
- Wichita, KS Hourly Temp Forecast Contract
- Jackson, MS Hourly Temp Forecast Contract
- Portland, ME Hourly Temp Forecast Contract
- Manchester, NH Hourly Temp Forecast Contract
- Huntington, WV Hourly Temp Forecast Contract
- Sioux Falls, SD Hourly Temp Forecast Contract
- Fargo, ND Hourly Temp Forecast Contract
- Burlington, VT Hourly Temp Forecast Contract
- Billings, MT Hourly Temp Forecast Contract
- Cheyenne, WY Hourly Temp Forecast Contract