

Convective Indices - Gauges for measuring the thunderstorm environment

Only three ingredients are needed by the atmosphere to spawn thunderstorms.

- Moisture
- Instability
- A lifting mechanism

Sounds pretty simple. Yeah, about as simple as saying flying is a balance of thrust versus drag, and lift versus gravity.

The atmosphere's performance is analogous to that of an aircraft. The performance of each aircraft has been thoroughly researched on computers, studied in wind tunnels, and tested in actual flight. The result is a performance envelope that helps the pilot predict performance as well the limits of safety. Too much weight and even maximum lift won't keep an aircraft aloft. Flap and slat settings, along with power settings, will help the pilot establish a beautiful approach.

Thunderstorms have a performance envelope which forecasters use on a daily or even hourly basis. It's a thermodynamic diagram or sounding chart called a

SkewT-Log P, or simply SkewT. These tools are available on the web. They do take some training to use, but computers do much of the analysis and produce several convective indices.

Thunderstorm forecasting is a "what-if" game.

Much like a pilot studies the performance envelope of an aircraft to see what combination of settings influence the aircraft's performance, forecasters study computer-generated SkewT diagrams to see how the balance of moisture, instability, and wind shear, will influence thunderstorm growth and strength.

Moisture - The fuel for fireworks.

At any temperature, the air can hold a certain amount of moisture or water vapor. The dew point represents the amount that is present. Condensation of this moisture occurs when the air temperature cools to the dew point. Warmer air can hold more water vapor than cold air.

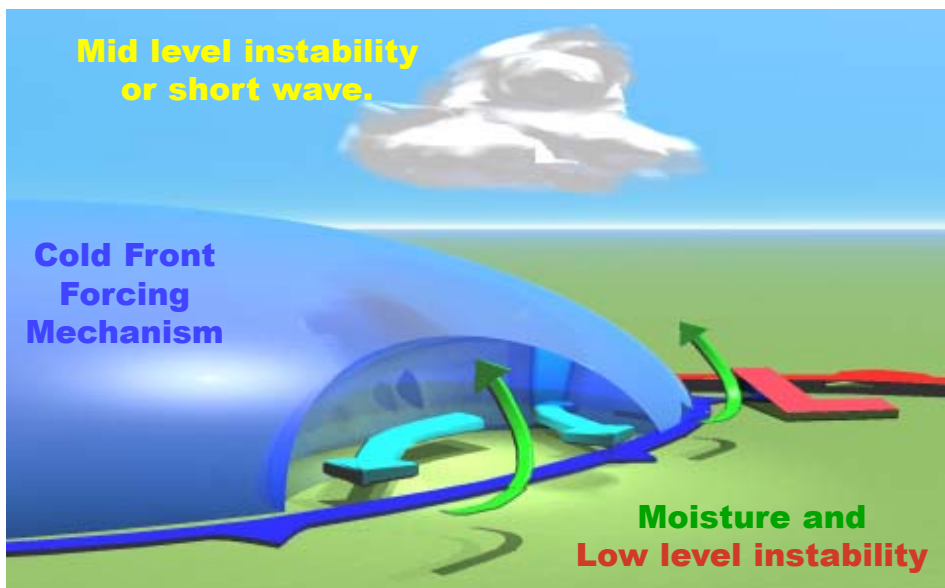


Figure 1. Many properties of the atmosphere come together to initiate or to enhance convection. Forecasters look for the areas where these properties overlap or are at a maximum. Here a cold front portion of a low pressure system acts as a forcing mechanism.

In this issue:

The three ingredients all thunderstorms need.

Three popular indices used by forecasters to predict the onset and strength of thunderstorms.

The Convective Outlook from the Storm Prediction Center, the key for locating potential thunderstorm development.

Gravity waves - the stealthy offspring of thunderstorms that produce turbulence.

An abridged glossary of acronyms used by the Storm Prediction Center and the Aviation Weather Center.

Mission Statement

To enhance aviation safety by increasing the pilots' knowledge of weather systems and processes and National Weather Service products and services.

When water vapor changes to liquid water, the latent heat stored in the water vapor is released. It is this latent heat that plays such a significant role in thunderstorm development.

**Stable air or Unstable air?
That is the question.**

An invisible air parcel that is forced to rise, cools independently from the surrounding atmosphere at the dry lapse rate of about -3 degrees C per 1000 feet. This is a thermodynamic principle. It does this in Orlando, Florida, Bessemer, Michigan, and Wichita Falls, Texas. The lapse rate of temperature in a layer of surrounding air will likely be, and usually is different than the dry rate. As a result, the parcel's temperature usually will be different than the surrounding air, and the parcel may be stable or unstable as shown. See Figure 2.

A key player in convection is latent heat stored in water vapor. To create water vapor, evaporation must first occur. A pan of water on the stove receives heat from the burner. This heat is stored in the water vapor as the water evaporates. This heat is not lost. It's just "stored" for later use in the water vapor molecules.

When water condenses back into visible cloud droplets, the latent heat that was stored in the molecules during evaporation is now released. This heat warms the independent air parcel, but it does not warm the surrounding air by any meaningful amount. See Figure 3. The parcel now cools at about -2 degrees C per 1000 feet. As a result, the parcel is potentially more buoyant than the surrounding air through which it moves. The parcel continues to rise until it reaches a level in the atmosphere where its temperature becomes the same or cooler than the surrounding air. Vertical motion stops at that point.

Upward motion will stop when the parcel temperature becomes equal to or cooler than the surrounding air. Temperature inversions which are layers of air where temperature increases with height do this very well. The tropopause, around 39,000 feet, is just such an inversion. The large volume of the rising air spreads out at the tropopause, and forms a fibrous anvil.

The Convective Outlook holds the buzz words for convection.

Forecasters use SkewT diagrams to determine the potential energy and buoy-

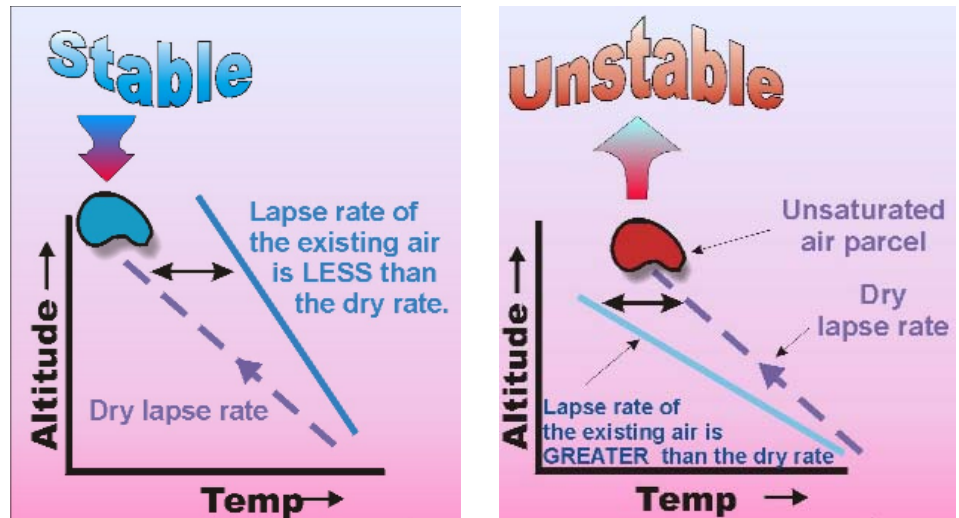


Figure 2. A rising parcel of air will become stable if it reaches a level in the atmosphere where it becomes colder than the surrounding air. Likewise, the atmosphere is considered unstable if a rising parcel becomes warmer than the surrounding air.

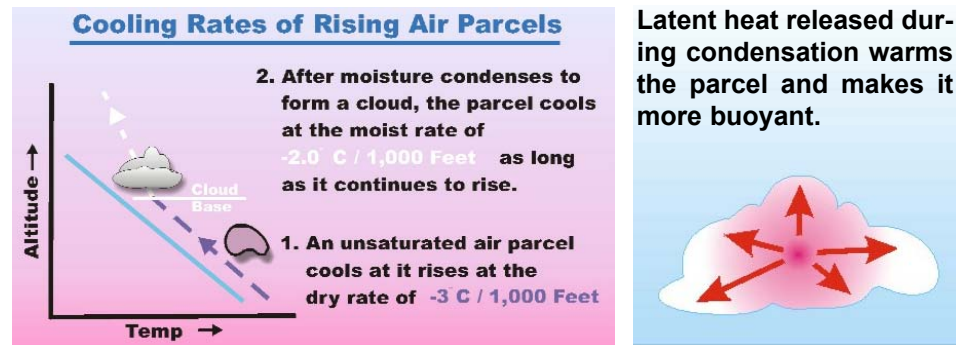


Figure 3. When clouds form latent heat stored in the the water vapor is released and warms the parcel. This makes it more buoyant than the air through which it moves.

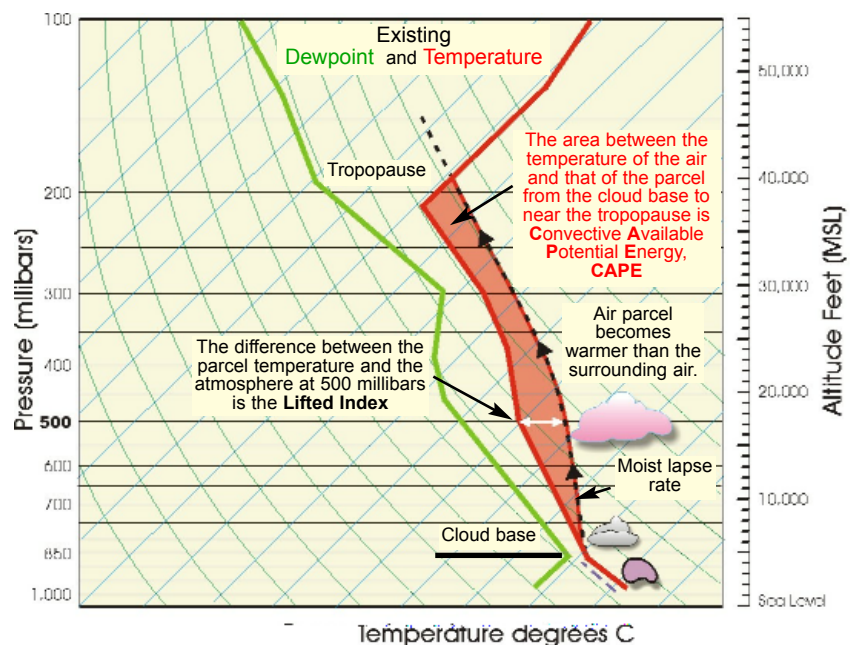


Figure 4. Plotting an air parcel's ascent through the existing atmosphere is like using the performance chart for an aircraft. Forecasters determine the convective performance of the atmosphere and derive a number of convective indices. These indices change as temperature, wind, and humidity in the atmosphere change.

any of air parcels and their possible evolution into thunderstorms. A number of indices derived from the SkewT are evaluated by forecasters at the SPC and are discussed in their Convective Outlook. See Figure 5. Three of the most popular indices for the pre-ignition stage of thunderstorms are LI, CAPE, and CIN.

The Lifted Index - *Ole reliable*

Figure 4 is an example of how storm development is studied using a SkewT.

An air parcel is assumed to be lifted by one of the forcing mechanisms such as strong heating, a cold front, or upper level disturbance. The air parcel obeys the laws of thermodynamics and cools as it rises and expands. At 500 millibars, or about 18,000 feet the calculated parcel temperature is compared with that of the surrounding air. The difference between these two temperatures is the LI and is a measure of the buoyancy of an air parcel. A negative number implies that the surrounding air is cooler than the lifted parcel. In other words, the parcel would be warmer and more buoyant compared the surrounding air.

LI was developed years ago and is still a very reliable index of instability. LIs are calculated hourly. They can be calculated using surface METAR reports and the 500 millibar temperature forecasted by the atmospheric models. Or LIs can be calculated using another level of the atmosphere as the starting point. The choice rests with the forecaster.

CAPE

The total package

CAPE, is related to LI, but is a more complete measure of the atmosphere's energy. CAPE reflects the strength of a thunderstorm updraft, and depicts the energy in the atmosphere from the point where clouds form and will be uninhibited by any inversion, up to the tropopause. The units for CAPE are Joules per kilogram or sometimes just mentioned as Joules in discussions from the Storm Prediction Center. CAPE is depicted by the red shaded area on the SkewT in Figure 4.

Area on a SkewT is equivalent to energy. The red shaded area representing convective energy in the atmosphere can be expanded in two ways. One is to cool the air aloft so that the red temperature line on the chart is displaced to the left. This can be done by a short wave trough

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STORM PREDICTION CENTER...NWS/NCEP...NORMAN OK
DAY 1 CONVECTIVE OUTLOOK...REF AWIPS GRAPHIC PGWE46 KWNS.

VALID 111300Z - 121200Z

THERE IS A SLGT RISK OF SVR TSTMS TO THE RIGHT OF A LINE FROM DUA 50 SSW ADM
30 S SPS 50 SE CDS CDS 25 NNW GAG 40 NNW P28 SLN 35 NNE MHK 35 N STJ 35 NE
MKC JLN MKO DUA.

GEN TSTMS ARE FCST TO THE RIGHT OF A LINE FROM 35 WSW ERI CAK ZZV LOZ CSV
CHA RMG LGC CSG ABY MGR VLD 30 ENE GNV ORL AGR 60 S FMY...CONT... 40 ESE 7R4
HEZ GLH MEM EVV 45 SSW HUF MTO 45 NNW SLO BLV 55 N HOT 45 N TYR 30 NNE ACT
BWD 50 NE BGS 25 WNW CDS 50 NE AMA 25 NNE CAO TAD 25 WNW PUB FCL CYS 40
SSW BFF SNY 35 SW IML 40 SW MCK 40 N HLC EAR BUB ANW PHP Y22 40 ENE DIK 65
WSW DVL JMS 45 NE ATY 40 NE RWF 40 NNW IWD.

--- SYNOPSIS ---
PROGRESSIVE UPPER AIR PATTERN FORECAST TO CONTINUE ACROSS CONUS. PRIMARY
PERTURBATION WILL BE SHORTWAVE TROUGH NOW EVIDENT ON MOISTURE CHANNEL
IMAGERY FROM NM NWD TO ERN MT...AND FORECAST TO DEAMPLIFY SLIGHTLY ON
SRN END AS IT MOVES EWD ACROSS GREAT PLAINS TODAY. AT SURFACE...WAVY
FRONT -- NOW ANALYZED FROM WRN WI SWWD ACROSS ERN NEB TO NEAR CO/OK
BORDER -- IS FORECAST TO MOVE SLOWLY SWD ACROSS TX/OK PANHANDLES TODAY
AND EWD OVER CENTRAL PLAINS/LOWER MO VALLEY. MEANWHILE...VERTICAL MIXING
SHOULD SHIFT DRYLINE EWD ACROSS PANHANDLES TO NEAR 100W LONGITUDE...WITH
TRIPLE POINT SOMEPLACE OVER NWRN OR FAR W-CENTRAL OK BY 00Z.

--- SRN PLAINS ---
WIDELY SCATTERED TO SCATTERED TSTMS POSSIBLE INVOF AND NE OF TRIPLE POINT
BY 00Z...COVERAGE ISOLATED TO WIDELY SCATTERED FARTHER S ALONG/E OF DRY-
LINE. WITH PERSISTENT WLY MID LEVEL FLOW OVER REGION AND SEVERAL DAYS OF
HEATING ALREADY GENERATING ELEVATED/MIXED LAYER...CAPPING IS A CONCERN S
OF TRIPLE POINT. HOWEVER...PRIND WEAK COOLING IN CAP LAYER...
INCREASING DIABATIC HEATING AS W EDGE OF CIRROFORM CLOUD SHIELD PASSES
EWD...AND CONVERGENCE/LIFT ALONG FRONT AND DRYLINE SHOULD BE SUFFICIENT
FOR RISK OF TSTMS. GIVEN
PROGGED FAVORABLE VERTICAL SHEAR PROFILES...SEVERAL SUPERCELLS WITH
LARGE HAIL AND SEVERE DOWNDRAFTS ARE FORECAST.

STEEP LAPSE RATES SHOULD BE MAINTAINED BY MERIDIONAL PLUME OF LARGE
SCALE DPVA/ASCENT IN 18-00Z TIME FRAME -- AHEAD OF TROUGH LEAVING ROCKIES --
COMBINING WITH PRIMARILY MID-UPPER 50S SURFACE DEW POINTS TO YIELD SBCAPE
APPROXIMATELY 2000 J/KG. VERTICAL SHEAR WILL BE FAVORABLE WITH 150-250 J/KG
SRH...40-50 KT 0-6 KM VECTOR SHEAR...AND SR FLOWS GENERALLY AOA 15 KT
THROUGHOUT TROPOSPHERE. HOWEVER...RELATIVELY HIGH CLOUD BASES EXPECTED
INITIALLY FOR CELLS FROM TRIPLE POINT REGION SWD INVOF DRYLINE...GIVEN FORE-
CAST SURFACE
DEW POINT DEPRESSIONS...CONTRIBUTING TO POTENTIAL FOR COLD STORM OUT-
FLOWS AND LOW TORNADO PROBABILITIES. TORNADO POTENTIAL MAY BE ENHANCED
FOR ANY DISCRETE CELLS REMAINING 2-3 HOURS AFTER INITIAL DEVELOPMENT WHICH
MOVE EWD INTO COOLER AND MORE MOISTURE-RICH LOW LEVEL AIR MASS...ESPE-
CIALLY INVOF BOUNDARIES.

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Figure 5. Convective outlooks from the Storm Prediction Center are the emerging method used by the Aviation Weather Center as the outlook for Convective SIGMETs. This ACUS01 KWNS product mentions the indices that forecasters are monitoring.

or upper level disturbance bringing a pocket of cooler air into the region.

The other way is to make the temperature of the rising parcel warmer than the surrounding air. Condensing more water vapor from the parcel will add more heat and buoyancy for the parcel. Higher dew points represent that increased available water vapor. Forecasters look for high dewpoints on hourly surface charts and METAR reports because this is the gasoline thunderstorms guzzle as they prepare for battle with air traffic system. Terms like moisture plume or surface dew points

are used by SPC to focus on this energy source. Injecting more moisture into a potential thunderstorm environment would cause the dashed path of the rising parcel in Figure 4 to move to the right and produce more CAPE.

CAPE can be calculated from any level. Surface based CAPE or SBCAPE uses hourly METAR temperatures, but can over estimate conditions. Mixed Layer CAPE or MLCAPE uses conditions in a shallow layer above the surface. MUCAPE or Most Unstable CAPE is a type that represents the worst case sce-

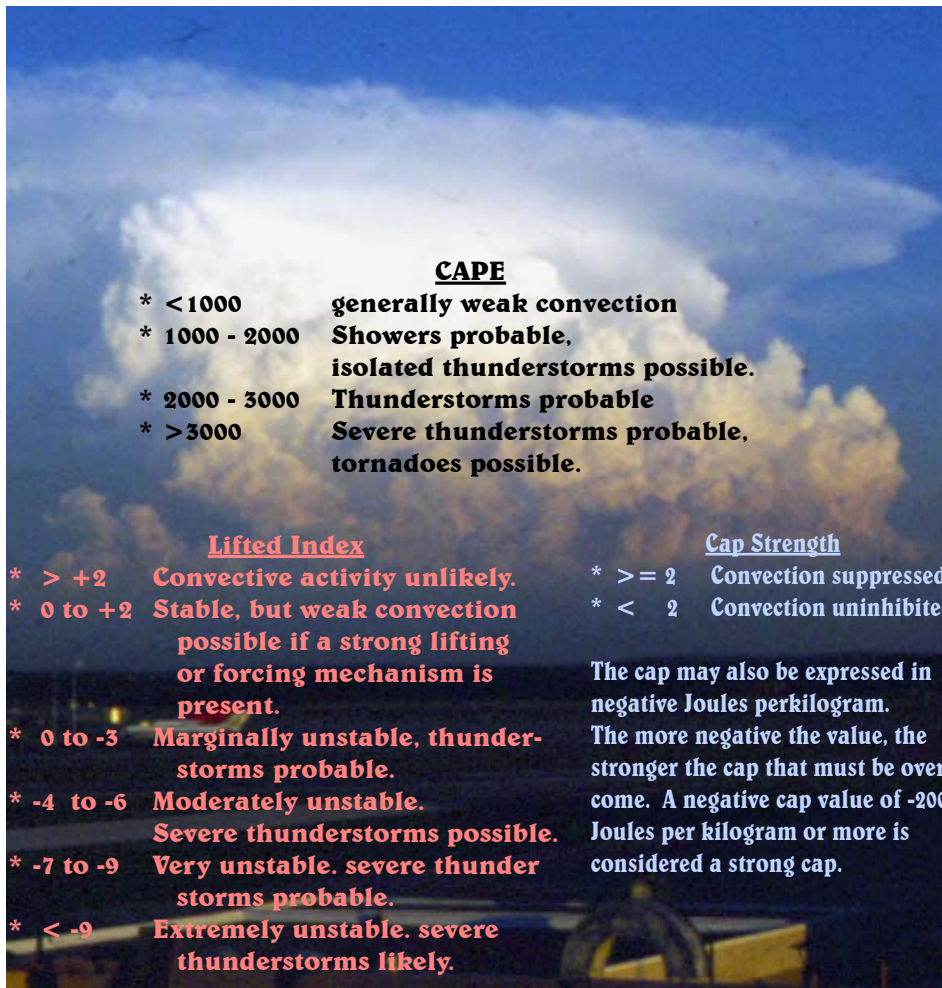


Figure 6. Thunderstorms develop as a result of the temperature structure or instability aloft. A number of indices, derived from that structure, are used by forecasters to determine the growth potential and severity of thunderstorms.

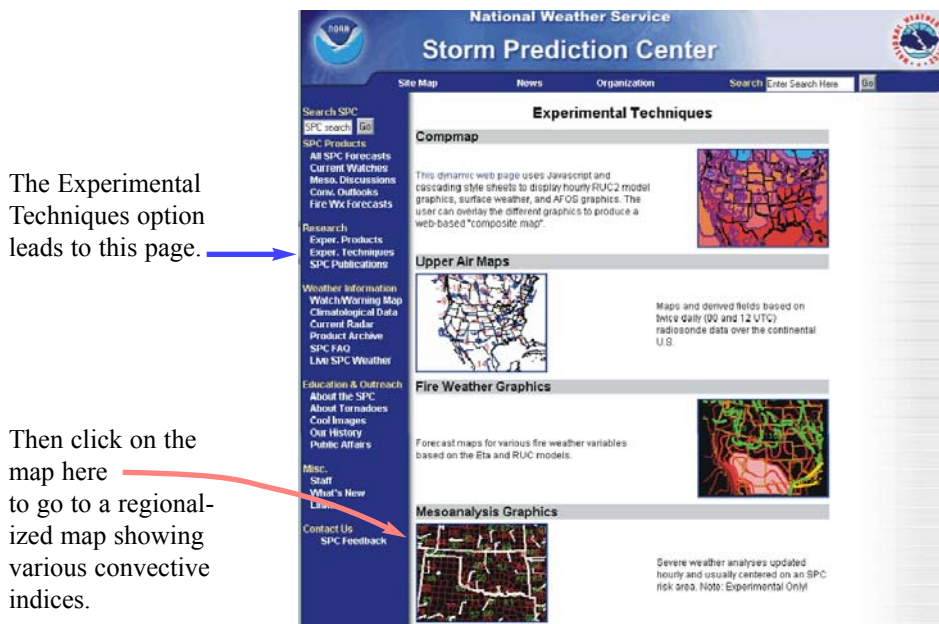


Figure 8. The Storm Prediction center has a number of links to hourly maps of the most often used indices. The Experimental Techniques page, specifically the experimental Mesoanalysis Graphics option links to a page with which you can monitor hourly trends in CAPE, Cap Strength and Lifted Index. The direct link is: www.spc.noaa.gov/exper/mesoanalysis/

nario. SPC forecasters select the appropriate type of CAPE for the day.

In a general sense, values of Lifted Index and CAPE have been associated with the severity of thunderstorms. Those general rankings are shown in Figure 6. It should be noted that these CAPE values cannot be applied the same throughout the country. They are most applicable to the central U.S. Low values of CAPE which would not lead to violent thunderstorms in the midwest may produce strong thunderstorms along the west coast or in higher terrain.

The Cap Putting a lid on convection

Cap Strength is an inhibiting factor for thunderstorms. Some days the atmosphere is hot and muggy and just seems right for massive storms, but nothing happens. This may be due to a temperature inversion between 2000 and 5000 feet above ground level caused by warm air being brought into the area by the wind. The process is called warm air advection. Any air parcel rising into this inversion would become cooler than the surrounding layer of warm air and would sink or cease to rise. The cap can be expressed in degrees C or in negative Joules per kilogram of energy.

In Figure 7, an inversion is present. As the air parcel rises, it enters the warm layer and is now cooler than the surrounding air. The air parcel sinks. Convection caused by surface heating now ceases.

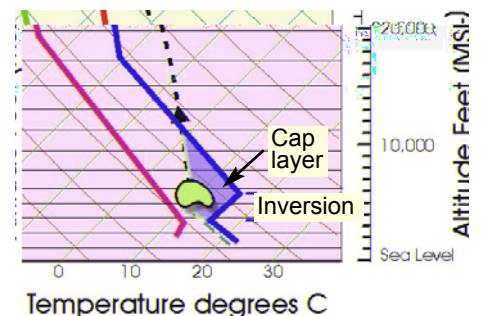


Figure 7. The Cap is a warm temperature inversion layer. A parcel rising into this inversion will be cooler than the surrounding air and will sink.

Convective Outlooks and Mesoscale Convective Discussions from the SPC may reference a cap when forecasting the onset of convection. Terms such as ‘strong cap’ or ‘a weakening cap’ may also be used. A cap can be expressed as a temperature or as negative Joules per

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 00 hr
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 06 hr
 09 hr
 12 hr
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[850 mb Temps](#)
[850 mb Winds](#)

Composites:
[925/850 Mixing ratio](#)
[+ 700/500 Vert motion](#)
[925-500 Temps/Humidity](#)

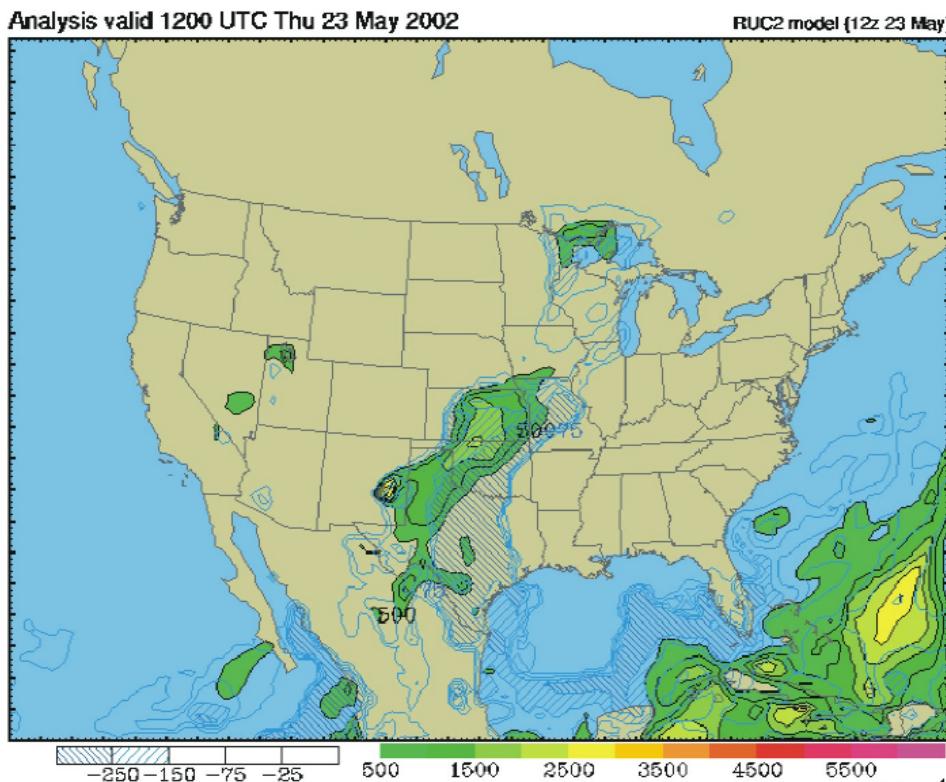
Clouds: all levels
[Clouds: below 6,000 ft](#)
[Clouds: 6,000 - 12,000 ft](#)
[Clouds: 12,000 - 18,000 ft](#)
[Clouds: above 18,000 ft](#)

Severe indices:
[CAPE/CIN](#)
[M-Conv/LI](#)
[Helicity](#)

Current and Forecast Convective Indices

Figure 9. The SPC page links to the NOAA University Corporation for Atmospheric Research (UCAR), and the Realtime Analysis and Prediction (RAP) pages. Forecasts for CAPE, CIN, and Lifted Index are available at frequent intervals. For near term forecasts, out to 12 hours, use the RUC model. For longer term forecasts from 12 to 48 hours, the ETA model is a good choice.

CAPE / CIN (J/kg)



Convective Inhibition, or CIN is indicated by blue-outlined clear or hatched areas. The more negative numbers imply capping.

Convective Available Potential Energy, or CAPE is a good indicator of buoyant energy of an air parcel which would strengthen the thunderstorm updraft.

Figure 10. Tracking CAPE and CIN hourly draws attention to potential thunderstorm development. It is these values, plus LI, that forecasters use often. CIN is important to monitor because the atmosphere may be unstable aloft, but low level stability inferred by CIN may delay or even prevent convection.

kilogram of energy needed to overcome it.

Lapse rates

Figure 2 showed how the temperature structure of the atmosphere, or lapse rate determines whether an air parcel is going to be stable or unstable relative to its surroundings. The rate at which the atmosphere cools with altitude is called the lapse rate. The SPC often mentions lapse rates in Convective Outlooks and Mesoscale Convective Discussions.

The term steep lapse rate indicates that temperature of the air decreases rapidly with height. A parcel rising through a layer with a steep lapse rate would see the temperature of the surrounding air become rapidly cooler as the parcel rises. So the parcel would be much warmer and more buoyant.

As stated earlier, warm air advection in the lower layers of the atmosphere can create an inversion or cap aloft which inhibits surface based convection. However, just above that inversion steep lapse rates develop which are favorable for convection.

Forecasters may mention elevated convection in these situations. That means that strong or severe thunderstorms are possible if a forcing mechanism like a front or upper level disturbance moves through the region to lift the air to that elevated region that is unstable. So when the the atmosphere indicates high CAPE values, but is capped, strong convection is still possible if a forcing mechanism moves through.

Let me draw you a picture

Maps of computed indices are available every hour on the web. The SPC page tracks hourly values of Lifted Index, CAPE, and cap strength, or Convective Inhibition (CIN). See Figure 8. The page is available at:

www.spc.noaa.gov/exper/mesoanalysis/

The map zooms in on the portion of the country that is facing the greatest severe convective potential. Your particular part of the country may not be shown.

NOAA's UCAR RAP page shown in Figure 9 provides full national coverage of convective indices. That page is available at:

www.rap.ucar.edu/weather/model/

The Rapid Update Cycle, RUC,

model is good for near term, hourly tracking of convective indices. The RUC is run every hour using forecast model data but also uses hourly METAR reports to supply updates on surface conditions from which convection might start.

Another model choice on the UCAR RAP page is the ETA. This is an accurate atmospheric model widely used by forecasters.

The RAP page allows the pilot to build a set of forecast maps. Select the desired parameters, such as CAPE and dew point, and the number of hours in the future. Those hours are the valid times after the run time of the model. The ETA is run every 6 hours. So be sure to check the valid times in the map header to make sure when the forecast is valid.

Other valuable data for pilots is available on the UCAR RAP page in Figure 9. Color maps of temperatures and winds aloft are a click away using the list of options under the "Aloft Plots" header.

Even though the elite Storm Prediction Center is on top of the daily convection, it's nice to have maps depicting the most-used convective indices so pilots and dispatchers can keep tabs on developing danger spots. Tie these in with AWC's Collaborative Convective Forecast Product and SPC's Convective Outlook, and Mesoscale Discussions, and you'll be adequately equipped for what lies ahead.

Besides the immediate and obvious threat that thunderstorms pose, their rapid development can produce other unexpected hazards.

The following article is from Warren L. Qualley, Manager of Weather Services at American Airlines. The opinions and suggestions reflect operating practices at American Airlines. Your company or agency policies may be different.

Turbulence and Thunderstorm Season!

Warren L. Qualley
Manager Weather Services
American Airlines

Most of us assume that turbulence is a wintertime phenomenon. And in the case of true clear air turbulence, or that caused by mountain waves, that's a pretty accurate statement. However, turbulence can and does occur every month of the

year. In reviewing several years worth of turbulence reporting records in the commercial aviation industry, it turns out that the greatest number of incidents occur in April, followed by December, January, March and October.

Why April, March and October? Two reasons: first, the real clear air turbulence season is just ending (March and April) or just beginning (October) and, second, the main part of thunderstorm season gets into full swing in March (southern U.S. and Caribbean) and April, and is just ending in October.

The next question you might ask is "what do thunderstorms and clear air turbulence have to do with one another?". The answer to that is the bumpy air due to what we will call Convective-Induced Turbulence or CIT. Now every pilot knows that one of the by-products of thunderstorms is turbulence of varying intensities. But thunderstorms also produce gravity waves that spread outward, upward and downward from the thunderstorm cloud itself. There have been reports of turbulence encounters as high as 15,000 feet in the clear air above thunderstorm clouds and horizontally as far away as 100 miles from the storm. This turbulence can be amplified if it occurs near the tropopause level, since the trop traps the gravity wave as it spreads outward from the thunderstorm.

Before pilots start avoiding individual thunderstorms by the distances described above, they should know that turbulence doesn't occur in the same way or the same distance away from each thunderstorm. And unfortunately, there's no operational tool currently available that tactically measures and predicts any type of turbulence, including CIT.

Pilots should be particularly aware of their environment relative to thunderstorms by actively and aggressively using their on-board radar. Some of the more serious CIT encounters have occurred when a flight is in the clear on top of a cirrus cloud and a developing thunderstorm punches up from underneath. The experience is not unlike hitting a speed bump on a road while traveling at 60 mph.

Suffice it to say that when in a thunderstorm environment, even when not in clouds, there may be light to moderate, or even greater, turbulence due to Convective Induced Turbulence.

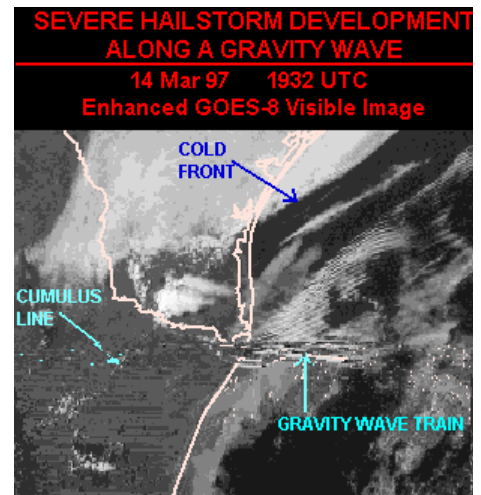


Figure 11. Gravity waves develop as a result of strong convection. The result is much like releasing an air bubble from the bottom of a calm container of water. The gravity waves produce turbulence, and they can sometimes be seen well on satellite imagery. They can even produce new convection where they intersect other existing boundaries. This gravity wave was documented by Roger Edwards of the Storm Prediction Center.

Coming up next time...

- A visit to the FAA nerve center in Herndon Virginia.
- A message from Jack May, Director of the Aviation Weather Center.
- Terminal Aerodrome Forecast (TAF) verification program of the National Weather Service.

The editors welcome comments and concerns from our readers, and we will respond to any question or comment. Some responses may be delayed in order to ensure that the content of that response is consistent with government policy. Thank you.

We are pleased to announce the addition of our new associate editor, Jim Roets, Forecaster at the Aviation Weather Center. Jim brings a wealth of experience, talent and initiative, and quality focus.

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The Front is published bimonthly and is available on the NWS Central Region aviation page at:

www.crh.noaa.gov/crh/aviation/thefront.html

Appendix

Contractions used by the NWS and its national prediction centers.

The list contains most of the contractions used operationally in SPC's Convective Outlooks, Mesoscale Discussions, and by AWC's AIRMETs, SIGMETs, Convective SIGMETs, and Area Forecasts.

Contractions most commonly used
by NWS national prediction centers

- A -

ABNDT Abundant
ABNML Abnormal
ABT About
ABV Above
AC Convective Outlook
ACCAS Altocumulus
Castellanus
ACCUM Accumulate
ACFT Aircraft
ACLT Accelerate
ACLTD Accelerated
ACLTG Accelerating
ACLTS Accelerates
ACPY Accompany
ACRS Across
ACSL Altocumulus Standing
Lenticularus
ACTV Active
ACTVTY Activity
ACYC Anticyclone
ADJ Adjacent
ADL Additional
ADQT Adequate
ADQTLY Adequately
ADRNDCK Adirondack
ADVCT Advect
ADVCTD Advected
ADVCTG Advecting
ADVCTN Advection
ADVCTS Advects
ADVN Advance
ADVNG Advancing
ADVY Advisory
ADVYS Advisories
AFCT Affect
AFCTD Affected
AFCTG Affecting
AFDK After dark

AFT After
AFTN Afternoon
AGL Above ground level
AGN Again
AGRD Agreed
AGRS Agrees
AGRMT Agreement
AHD Ahead
AK Alaska
AL Alabama
ALF Aloft
ALG Along
ALGHNY Allegheny
ALQDS All quadrants
ALSTG Altimeter setting
ALTA Alberta
ALTHO Although
ALTM Altimeter
ALUTN Aleutian
AMD Amend
AMDD Amended
AMDG Amending
AMDT Amendment
AMP Amplify
AMPG Amplifying
AMPLTD Amplitude
AMS Air mass
AMT Amount
ANLYS Analysis
ANS Answer
AOA At or above
AOB At or below
AP Anomolous
Propagation
APCH Approach
APCHG Approaching
APCHS Approaches
APLCN Appalachian
APLCNS Appalachians
APPR Appear
APPRG Appearing
APPRS Appears
APRNT Apparent
APRNTLY Apparently
APRX Approximate

APRXLY Approximately
AR Arkansas
ARND Around
ARPT Airport
ASAP As soon as possible
ASL Above Sea Level
ASMD As amended
ASOS Automated Surface
Observing System
ASSOCD Associated
ASSOCN Association
ATLC Atlantic
ATTM At this time
ATTN Attention
AVBL Available
AVG Average
AVN Aviation Model
AWIPS Advanced Interactive
Weather Processing
System
AWOS Automated Weather
Observing System
AWT Awaiting
AZ Arizona
AZM Azimuth

- B -

BACLIN Baroclinic
BAJA Baja California
BATROP Barotropic
BC Patches (METAR code)
BC British Columbia
BCH Beach
BCKG Backing
BCM Become
BCMG Becoming
BCMS Becomes
BD Blowing dust
BDA Bermuda
BDRY Boundary
BFDK Before dark
BFR Before
BGN Begin

BGNG Beginning
BGNS Begins
BHND Behind
BINOVC Breaks in overcast
BKN Broken
BL Blowing (METAR code)
BLD Build
BLDG Building
BLDS Builds
BLDUP Buildup
BLKHLS Black Hills
BLKT Blanket
BLKTG Blanketing
BLKTS Blankets
BLO Below
BLZD Blizzard
BN Blowing sand
BND Bound
BNDRY Boundary
BNDRYS Boundaries
BNTH Beneath
BOOTHEEL Bootheel
BR Mist ($\geq 5/8$ SM)
(METAR code)
BR Branch
BRG Branching
BRS Branches
BRF Brief
BRK Break
BRKG Breaking
BRKHIC Breaks in higher clouds
BRKS Breaks
BRKSHR Berkshire
BRKSHRS Berkshires
BRM Barometer
BS Blowing snow
BTWN Between
BYD Beyond

- C -

C Celsius
CA California
CAA Cold Air Advection

DTRTG Deteriorating
DTRTS Deteriorates
DU Widespread dust
(METAR code)
DURG During
DURN Duration
DVLPG Developed
DVLPG Developing
DVLPM Development
DVLPS Develops
DVRG Diverge
DVRGG Diverging
DVRGNC Divergence
DVRGS Diverges
DVV Downward vertical
velocity
DWNDFTS Downdrafts
DWPNT Dewpoint
DWPNTS Dewpoints
DX Duplex
DZ Drizzle (METAR code)

- E -

E East
EBND East bound
EFCT Effect
ELNGT Elongate
ELNGTD Elongated
ELSW Elsewhere
EMBDD Embedded
EMERG Emergency
ENCTR Encounter
ENDG Ending
ENE East-northeast
ENELY East-northeasterly
ENERN East-northeastern
ENEWD East-northeastward
ENHNC Enhance
ENHNCD Enhanced
ENHNCG Enhancing
ENHNCS Enhances
ENHNCMNT Enhancement

ENTR Entire
ERN Eastern
ERY Early
ERYR Earlier
ESE East-southeast
ESELY East-southeasterly
ESERN East-southeastern
ESEWD East-southeastward
ESNTL Essential
ESTAB Establish
ESTS Estimates
ETA Eta model
ETC Et cetera
ETIM Elapsed time
EVE Evening
EWD Eastward
EXCLV Exclusive
EXCLVLY Exclusively
EXCP Except
EXPC Expect
EXPCD Expected
EXPCG Expecting
EXTD Extend
EXTDD Extended
EXTDG Extending
EXTDS Extends
EXTN Extension
EXTRAP Extrapolate
EXTRAPD Extrapolated
EXTRM Extreme
EXTRMLY Extremely
EXTSV Extensive

- F -

F Farenheit
FA Aviation area forecast
FAH Farenheit
FAM Familiar
FC Funnel cloud
(METAR code)
+FC Tornado/waterspout
(METAR code)
FCST Forecast

FCSTD Forecasted
FCSTG Forecasting
FCSTR Forecaster
FCSTS Forecasts
FG Fog (< 5/8SM)
(METAR code)
FIG Figure
FILG Filling
FIRAV First available
FL Florida
FLG Falling
FLRY Flurry
FLRYS Flurries
FLT Flight
FLW Follow
FLWG Following
FM From
FMT Format
FNCTN Function
FNT Front
FNTL Frontal
FNTS Fronts
FNTGNS Frontogenesis
FNTLYS Frontolysis
FORNN Forenoon
FPM Feet per minute
FQT Frequent
FQTLY Frequently
FRM Form
FRMG Forming
FRMN Formation
FROPA Frontal passage
FROSFC Frontal surface
FRST Frost
FRWF Forecast wind factor
FRZ Freeze
FRZN Frozen
FRZG Freezing
FT Feet
FT Terminal forecast
FTHR Further
FU Smoke (METAR code)
FVRBL Favorable
FWD Forward
FYI For your information

FZ Freezing
(METAR code)

- G -

G Gust
GA Georgia
GEN General
GENLY Generally
GEO Geographic
GEOREF Geographical reference
GF Ground fog
GICG Glaze icing
GLFALSK Gulf of Alaska
GLFCAL Gulf of California
GLFMEX Gulf of Mexico
GLFSTLAWR Gulf of St. Lawrence
GND Ground
GNDFG Ground fog
GOES Geostationary Opera-
tional Environmental
Satellite
GR Hail (METAR code)
GRAD Gradient
GRDL Gradual
GRDLY Gradually
GRT Great
GRTLY Greatly
GRTR Greater
GRTST Greatest
GRTLKS Great Lakes
GS Small hail/snow pellets
(METAR code)
GSTS Gusts
GSTY Gusty
GV Ground visibility

- H -

HAZ Hazard
HCVIS High clouds visible
HDFRZ Hard freeze
HDSVLY Hudson Valley
HDWND Head wind

HGT Height
 HI High
 HIER Higher
 HIFOR High level forecast
 HLF Half
 HLTP Hilltop
 HLSTO Hailstones
 HLYR Haze layer aloft
 HND Hundred
 HPC Hydrometeorological Prediction Center
 HR Hour
 HRS Hours
 HRZN Horizon
 HTG Heating
 HURCN Hurricane
 HUREP Hurricane report
 HV Have
 HVY Heavy
 HVYR Heavier
 HVYST Heaviest
 HWVR However
 HWY Highway
 HZ Haze (METAR code)

- I -

IA Iowa
 IC Ice crystals (METAR code)
 IC Ice
 ICG Icing
 ICGIC Icing in clouds
 ICGIP Icing in precipitation
 ID Idaho
 IL Illinois
 IMDT Immediate
 IMDTLY Immediately
 IMPL Impulse
 IMPLS Impulses
 IMPT Important
 INCL Include
 INCLD Included
 INCLG Including

INCLS Includes
 INCR Increase
 INCRD Increased
 INCRG Increasing
 INCRGLY Increasingly
 INCRS Increases
 INDC Indicate
 INDCD Indicated
 INDCG Indicating
 INDCS Indicates
 INDEF Indefinite
 INFO Information
 INLD Inland
 INSTBY Instability
 INTCNTL Intercontinental
 INTL International
 INTMD Intermediate
 INTMT Intermittent
 INTMTLY Intermittently
 INTR Interior
 INTRMTRGN Intermountain region
 INTS Intense
 INTSFCN Intensification
 INTSFY Intensify
 INTSFYD Intensified
 INTSFY Intensifying
 INTSFYS Intensifies
 INTSTY Intensity
 INTVL Interval
 INVRN Inversion
 IOVC In overcast
 INVOF In vicinity of
 IP Ice pellets
 IPV Improve
 IPVG Improving
 IR Infrared
 ISOL Isolate
 ISOLD Isolated

- J -

JCTN Junction
 JTSTR Jet stream

- K -

KFRST Killing frost
 KLYR Smoke layer aloft
 KOCTY Smoke over city
 KS Kansas
 KT Knots
 KY Kentucky

- L -

LA Louisiana
 LABRDR Labrador
 LAPS Local Analysis and Prediction System
 LAMP Local AWIPS MOS Program
 LAT Latitude
 LCL Local
 LCLY Locally
 LCTD Located
 LCTN Location
 LCTMP Little change in temperature
 LEVEL Level
 LFTG Lifting
 LGRNG Long range
 LGT Light
 LGTR Lighter
 LGWV Long wave
 LI Lifted Index
 LIS Lifted indices
 LK Lake
 LKS Lakes
 LKLY Likely
 LLJ Low Level Jet
 LLWS Low Level Wind Shear
 LLWAS Low level wind shear alert system
 LMTD Limited
 LMTG Limiting
 LMTS Limits
 LN Line
 LNS Lines

LO Low
 LONG Longitude
 LONGL Longitudinal
 LRG Large
 LRGLY Largely
 LRGR Larger
 LRGST Largest
 LST Local standard time
 LTD Limited
 LTG Lightning
 LTGCC Lightning cloud-to-cloud
 LTGCG Lightning cloud-to-ground
 LTGCCCCG Lightning cloud-to-cloud cloud-to-ground
 LTGCW Lightning cloud-to-water
 LTGIC Lightning in cloud
 LTL Little
 LTLCG Little change
 LTR Later
 LTST Latest
 LV Leaving
 LVL Level
 LVLS Levels
 LWR Lower
 LWRD Lowered
 LWRG Lowering
 LYR Layer
 LYRD Layered
 LYRS Layers

- M -

MA Massachusetts
 MAN Manitoba
 MAX Maximum
 MB Millibars
 MCD Mesoscale discussion
 MD Maryland
 MDFY Modify
 MDFYD Modified

MDFYG	Modifying	MTNS	Mountains	NMRS	Numerous	OCLD	Occlude
MDL	Model	MULT	Multiple	NNE	North-northeast	OCLDS	Occludes
MDLS	Models	MULTLVL	Multi-level	NNELY	North-northeasterly	OCLDD	Occluded
MDT	Moderate	MXD	Mixed	NNERN	North-northeastern	OCLDG	Occluding
MDTLY	Moderately			NNEWD	North-northeastward	OCLN	Occlusion
ME	Maine		- N -	NNW	North-northwest	OCNL	Occasional
MED	Medium	N	North	NNWLY	North-northwesterly	OCNLY	Occasionally
MEGG	Merging	NAB	Not above	NNWRN	North-northwestern	OCR	Occur
MESO	Mesoscale	NAT	North Atlantic	NNWWD	North-northwestward	OCRD	Occurred
MET	Meteorological	NATL	National	NNNN	End of message	OCRG	Occurring
METRO	Metropolitan	NAV	Navigation	NOAA	National Oceanic and Atmospheric Administration	OCRS	Occurs
MEX	Mexico	NB	New Brunswick			OFC	Office
MHKVLY	Mohawk Valley	NBND	Northbound	NOPAC	Northern Pacific	OFF	Occluded frontal passage
MI	Shallow (METAR code)	NBRHD	Neighborhood	NPRS	Nonpersistent	OFSHR	Offshore
MI	Michigan	NC	North Carolina	NR	Near	OH	Ohio
MID	Middle	NCEP	National Center for En- vironmental Prediction	NRLY	Nearly	OK	Oklahoma
MIDN	Midnight	NCWX	No change in weather	NRN	Northern	OMTNS	Over mountains
MIL	Military	ND	North Dakota	NRW	Narrow	ONSHR	On shore
MIN	Minimum	NE	Northeast	NS	Nova Scotia	OR	Oregon
MISG	Missing	NEB	Nebraska	NTFY	Notify	ORGPHC	Orographic
MLTLVL	Melting level	NEC	Necessary	NTFYD	Notified	ORIG	Original
MN	Minnesota	NEG	Negative	NV	Nevada	OSV	Ocean station vessel
MNLND	Mainland	NEGLY	Negatively	NVA	Negative vorticity advection	OTLK	Outlook
MNLY	Mainly	NELY	Northeasterly	NW	Northwest	OTP	On top
MO	Missouri	NERN	Northeastern	NWD	Northward	OTR	Other
MOGR	Moderate or greater	NEWD	Northeastward	NWLY	Northwesterly	OTRW	Otherwise
MOS	Model Output Statistics	NEW ENG	New England	NWRN	Northwestern	OUTFLO	Outflow
MOV	Move	NFLD	Newfoundland	NWS	National Weather Service	OVC	Overcast
MOVD	Moved	NGM	Nested Grid Model			OVNGT	Overnight
MOVG	Moving	NGT	Night	NY	New York	OVR	Over
MOVMT	Movement	NH	New Hampshire	NXT	Next	OVRN	Overrun
MOVS	Moves	NHC	National Hurricane Center			OVRNG	Overrunning
MPH	Miles per hour					OVTK	Overtake
MRGL	Marginal	NIL	None			OVTKG	Overtaking
MRGLLY	Marginally	NJ	New Jersey			OVTKS	Overtakes
MRNG	Morning	NL	No layers	OAT	Outside Air Temperature		- P -
MRTM	Maritime	NLT	Not later than	OBND	Outbound	PA	Pennsylvania
MS	Mississippi	NLY	Northerly	OBS	Observation	PAC	Pacific
MSG	Message	NM	New Mexico	OBSC	Obscure	PBL	Planetary boundary layer
MSL	Mean sea level	NMBR	Number	OBSCD	Obscured	PCPN	Precipitation
MST	Most	NMBRS	Numbers	OBSCG	Obscuring		
MSTLY	Mostly	NML	Normal	OCFNT	Occluded front		
MSTR	Moisture						
MT	Montana						
MTN	Mountain						

PD	Period	PROGD	Forecasted	QSTNRY	Quasistationary	REPL	Replace
PDS	Periods	PROGS	Forecasts	QUAD	Quadrant	REPLD	Replaced
PDMT	Predominant	PRSNT	Present	QUE	Quebec	REPLG	Replacing
PEN	Peninsula	PRSNTLY	Presently			REPLS	Replaces
PERM	Permanent	PRST	Persist			REQ	Request
PGTSND	Puget Sound	PRSTS	Persists			REQS	Requests
PHYS	Physical	PRSTNC	Persistence	R	Rain	REQSTD	Requested
PIBAL	Pilot balloon observation	PRSTNT	Persistent	RA	Rain (METAR code)	RESP	Response
PIBALS	Pilot balloon reports	PRVD	Provide	RADAT	Radiosonde observation data	RESTR	Restrict
PIREP	Pilot weather report	PRVDD	Provided	RAOB	Radiosonde observation	RGD	Ragged
PIREPS	Pilot weather reports	PRVDG	Providing	RAOBS	Radiosonde observations	RGLR	Regular
PL	Ice pellets (METAR code)	PRVDS	Provides			RGN	Region
PLNS	Plains	PS	Plus			RGNS	Regions
PLS	Please	PSBL	Possible	RCH	Reach	RH	Relative Humidity
PLTO	Plateau	PSBLY	Possibly	RCHD	Reached	RIOGD	Rio Grande
PM	Post meridian	PSBLTY	Possibility	RCHG	Reaching	RLTV	Relative
PNHDL	Panhandle	PSG	Passage	RCHS	Reaches	RLTVLY	Relatively
PO	Well developed dust/sand whirls (METAR code)	PSN	Position	RCKY	Rocky	RMN	Remain
POS	Positive	PSND	Positioned	RCKYS	Rockies	RMND	Remained
POSLY	Positively	PTCHY	Patchy	RCMD	Recommend	RMNDR	Remainder
PPINE	PPI no echoes	PTLY	Partly	RCMDD	Recommended	RMNG	Remaining
PPSN	Present position	PTNL	Potential	RCMDG	Recommending	RMNS	Remains
PR	Partial (METAR code)	PTNLY	Potentially	RCMDS	Recommends	RNFL	Rainfall
PRBL	Probable	PTNS	Portions	RCRD	Record	ROT	Rotate
PRBLY	Probably	PUGET	Puget Sound	RCRDS	Records	ROTD	Rotated
PRBLTY	Probability	PVA	Positive vorticity advection	RCV	Receive	ROTG	Rotating
PRECD	Precede	PVL	Prevail	RCV	Received	ROTS	Rotates
PRECDD	Preceded	PVLD	Prevailed	RCVG	Receiving	RPD	Rapid
PRECDDG	Preceding	PVLG	Prevailing	RCVS	Receives	RPDLY	Rapidly
PRECDDG	Preceding	PVLS	Prevails	RDC	Reduce	RPLC	Replace
PRECDS	Precedes	PVLT	Prevalent	RDG	Ridging	RPLCD	Replaced
PRES	Pressure	PWR	Power	RDR	Radar	RPLCG	Replacing
PRESFR	Pressure falling rapidly	PY	Spray (METAR code)	RDVLP	Redevelop	RPLCS	Replaces
PRESRR	Pressure rising rapidly			RDVLPG	Redeveloping	RPRT	Report
PRIM	Primary			RDVLPMT	Redevelopment	RPRTD	Reported
PRIN	Principal			RE	Regard	RPRTG	Reporting
PRIND	Present indications are	QN	Question	RECON	Reconnaissance	RPRTS	Reports
PRJMP	Pressure jump	QPFERD	NCEP excessive rainfall discussion	REF	Reference	RPT	Repeat
PROC	Procedure	QPFHSD	NCEP heavy snow discussion	RES	Reserve	RPTG	Repeating
PROD	Produce	QPFSPD	NCEP special precip- itation discussion	RGN	Region	RPTS	Repeats
PRODG	Producing			RGT	Right	RQR	Require
PROG	Forecast			RI	Rhode Island	RQRD	Required
				RLBL	Reliable	RQRG	Requiring
						RQRS	Requires
						RS	Receiver station

RSG	Rising	SE	Southeast	SMK	Smoke	SRNDG	Surrounding
RSN	Reason	SEC	Second	SML	Small	SRNDS	Surrounds
RSNG	Reasoning	SELY	Southeasterly	SMLR	Smaller	SS	Sandstorm (METAR code)
RSNS	Reasons	SEPN	Separation	SMRY	Summary	SS	Sunset
RSTR	Restrict	SEQ	Sequence	SMS	Synchronus meteorological satellite	SSE	South-southeast
RSTRD	Restricted	SERN	Southeastern	SMTH	Smooth	SSELY	South-southeasterly
RSTRG	Restricting	SEWD	Southeastward	SMTHR	Smoother	SSERN	South-southeastern
RSTRS	Restricts	SFC	Surface	SMTHT	Smoothest	SSEWD	South-southeastward
RTRN	Return	SFERICS	Atmospherics	SMTM	Sometime	SSW	South-southwest
RTRND	Returned	SG	Snow grains	SMWHT	Somewhat	SSWLY	South-southwesterly
RTRNG	Returning	SGFNT	Significant	SN	Snow (METAR code)	SSWRN	South-southwestern
RTRNS	Returns	SGFNTLY	Significantly	SNBNK	Snow bank	SSWWD	South-southwestward
RUC	Rapid Update Cycle	SH	Showers (METAR code)	SND	Sand	ST	Stratus
RUF	Rough	SHFT	Shift	SNFLK	Snow flake	STAGN	Stagnation
RUFLY	Roughly	SHFTD	Shifted	SNGL	Single	STBL	Stable
RVS	Revise	SHFTG	Shifting	SNOINC	Snow increase	STBLTY	Stability
RVSD	Revised	SHFTS	Shifts	SNOINCRG	Snow increasing	STD	Standard
RVSG	Revising	SHLD	Shield	SNST	Sunset	STDY	Steady
RVSS	Revises	SHLW	Shallow	SNW	Snow	STFR	Stratus fractus
RW	Rain shower	SHRT	Short	SNWFL	Snowfall	STFRM	Stratiform
	- S -	SHRTLY	Shortly	SOP	Standard operating procedure	STG	Strong
S	South	SHRTWV	Shortwave	SP	Snow pellets	STGLY	Strongly
SA	Sand (METAR code)	SHRTWVS	Shortwaves	SPC	Storm Prediction Cent.	STGR	Stronger
SA	Surface observation	SHUD	Should	SPCLY	Epecially	STGST	Strongest
SAO	Surface observation	SHWR	Shower	SPD	Speed	STLT	Satellite
SAOS	Surface observations	SHWRS	Showers	SPDS	Speeds	STM	Storm
SASK	Saskatchewan	SIERNEV	Sierra Nevada	SPENES	Satellite precipitation estimate statement	STMS	Storms
SATFY	Satisfactory	SIG	Signature	SPKL	Sprinkle	STN	Station
SBND	South bound	SIGMET	Significant meteorological information	SPKLS	Sprinkles	STNS	Stations
SBSD	Subside	SIMUL	Simultaneous	SPLNS	Southern Plains	STNRY	Stationary
SBSDD	Subsided	SKC	Sky clear	SPRD	Spread	SUB	Substitute
SBSDNC	Subsidence	SKED	Schedule	SPRDG	Spreading	SUBTRPCL	Subtropical
SBSDS	Subsides	SLD	Solid	SPRDS	Spreads	SUF	Sufficient
SC	South Carolina	SLGT	Slight	SPRL	Spiral	SUFLY	Sufficiently
SCND	Second	SLGTLY	Slightly	SQ	Squall (METAR code)	SUG	Suggest
SCNDRY	Secondary	SLO	Slow	SQAL	Squall	SUGG	Suggesting
SCSL	Standing lenticular stratocumulus	SLOLY	Slowly	SQLN	Squall line	SUGS	Suggests
SCT	Scatter	SLOR	Slower	SR	Sunrise	SUP	Supply
SCTD	Scattered	SLP	Slope	SRN	Southern	SUPG	Supplying
SCTR	Sector	SLPG	Sloping	SRND	Surround	SUPR	Superior
SD	South Dakota	SLT	Sleet	SRNDG	Surrounded	SUPS	Supplies
		SLY	Southerly			SUPSD	Supersede
		SM	Statute mile			SUPSDG	Superseding
						SUPSDS	Supersedes

SVG Serving
 SVR Severe
 SVRL Several
 SW Southwest
 SWD Southward
 SWWD Southwestward
 SW- Light snow shower
 SW+ Heavy snow shower
 SWLG Swelling
 SWLY Southwesterly
 SWODY1 SPC Severe Weather
 Outlook for Day 1
 SWOMCD SPC Mesoscale
 Discussion
 SWRN Southwestern
 SX Stability index
 SXN Section
 SXNS Sections
 SYNOP Synoptic
 SYNS Synopsis
 SYS System

- T -

T Thunder
 TCNTL Transcontinental
 TCU Towering cumulus
 TDA Today
 TEMP Temperature
 THD Thunderhead
 THDR Thunder
 THK Thick
 THKNG Thickening
 THKNS Thickness
 THKR Thicker
 THKST Thickest
 THN Thin
 THNG Thinning
 THNR Thinner
 THNST Thinnest
 THR Threshold
 THRFTR Thereafter
 THRU Through
 THRUT Throughout

THSD Thousand
 THTN Threaten
 THTND Threatened
 THTNG Threatening
 THTNS Threatens
 TIL Until
 TMPRY Temporary
 TMPRYLY Temporarily
 TMW Tomorrow
 TN Tennessee
 TNDCY Tendency
 TNDCYS Tendencies
 TNGT Tonight
 TNTV Tentative
 TNTVLY Tentatively
 TOPS Tops
 TOVC Top of overcast
 TPG Topping
 TRBL Trouble
 TRIB Tributary
 TRKG Tracking
 TRML Terminal
 TRMT Terminate
 TRMTD Terminated
 TRMTG Terminating
 TRMST Terminates
 TRNSP Transport
 TRNSPG Transporting
 TROF Trough
 TROFS Troughs
 TROP Tropopause
 TRPCD Tropical continental
 TRPCL Tropical
 TRRN Terrain
 TRSN Transition
 TRW Thunderstorm
 TRW+ Thunderstorm with
 heavy rain shower
 TS Thunderstorm
 (METAR code)
 TS Thunderstorm
 with snow
 TS+ Thunderstorm
 with heavy snow
 TSFR Transfer

TSFRD Transferred
 TSFRG Transferring
 TSFRS Transfers
 TSHWR Thundershower
 TSHWRS Thundershowers
 TSNT Transient
 TSQLS Thundersqualls
 TSTM Thunderstorm
 TSTMS Thunderstorms
 TSW Thunderstorm
 with snow showers
 TSW+ Thunderstorm with
 heavy snow showers
 TURBC Turbulence
 TURBT Turbulent
 TWD Toward
 TWDS Towards
 TWI Twilight
 TWRG Towering
 TX Texas

- U -

UDDF Up and down drafts
 UN Unable
 UNAVBL Unavailable
 UNEC Unnecessary
 UNKN Unknown
 UNL Unlimited
 UNRELBL Unreliable
 UNRSTD Unrestricted
 UNSATFY Unsatisfactory
 UNSBL Unseasonable
 UNSTBL Unstable
 UNSTDY Unsteady
 UNSTL Unsettle
 UNSTLD Unsettled
 UNUSBL Unusable
 UP Unknown precipitation
 in automated
 observations
 (METAR code)
 UPDFTS Updrafts
 UPR Upper

UPSLP Upslope
 UPSTRM Upstream
 URG Urgent
 USBL Usable
 UT Utah
 UVV Upward vertical velocity
 UVVS Upward vertical
 velocities
 UWNDS Upper winds

- V -

VA Volcanic ash
 (METAR code)
 VA Virginia
 VAD Verlocity Azimuth
 Display
 VARN Variation
 VC Vicinity (METAR code)
 VCNTY Vicinity
 VCOT VFR conditions on top
 VCTR Vector
 VCTS Thunderstorms in the
 Vicinity
 VDUC VAS Data Utilization
 Center (NSSFC)
 VFY Verify
 VFYD Verified
 VFYG Verifying
 VFYS Verifies
 VLCTY Velocity
 VLCTYS Velocities
 VLNT Violent
 VLNTLY Violently
 VLY Valley
 VLYS Valleys
 VMC Visual meteorological
 conditions
 VOL Volume
 VORT Vorticity
 VR Veer
 VRG Veering
 VRBL Variable
 VRISL Vancouver Island, BC

VRS Veers
 VRT MOTN Vertical Motion
 VRY Very
 VSB Visible
 VSBY Visibility
 VSBYDR Visibility decreasing rapidly
 VSBYIR Visibility increasing rapidly
 VT Vermont
 VWP VAD Wind Profiler
 VV Vertical velocity

- W -

W West
 WA Washington
 WAA Warm Air Advection
 WBND West bound
 WDLY Widely
 WDSPRD Widespread
 WEA Weather
 WFO Weather Forecast Office
 WFOS Weather Forecast Offices
 WFP Warm front passage
 WI Wisconsin
 WIBIS Will be issued
 WINT Winter
 WK Weak
 WKDAY Weekday
 WKEND Weekend
 WKNG Weakening
 WKNS Weakens
 WKR Weaker
 WKST Weakest
 WKN Weaken
 WL Will
 WLY Westerly
 WND Wind
 WNDS Winds
 WNW West-northwest
 WNWLY West-northwesterly

WNWRN West-northwestern
 WNWWD West-northwestward
 WO Without
 WPLTO Western Plateau
 WRM Warm
 WRMG Warming
 WRN Western
 WRMR Warmer
 WRMST Warmest
 WRMFNT Warm front
 WRMFNTL Warm Frontal
 WRNG Warning
 WRNGS Warnings
 WRS Worse
 WSHFT Wind shift
 WSHFTS Wind Shifts
 WSR-88D NWS Dopplar Radar
 WSTCH Wasatch Range
 WSW West-southwest
 WSWLY West-southwesterly
 WSWRN West-southwestern
 WSWWD West-southwestward
 WTR Water
 WTRS Waters
 WTSPT Waterspout
 WTSPTS Waterspouts
 WUD Would
 WV West Virginia
 WVS Waves
 WW Severe Weather Watch
 WWAMKC SPC Status Report
 WWD Westward
 WWS Severe Weather Watches
 WX Weather
 WY Wyoming

- X -

XCP Except
 XPC Expect
 XPCD Expected
 XPCG Expecting
 XPCS Expects

XPLOS Explosive
 XTND Extend
 XTNDD Extended
 XTNDG Extending
 XTRM Extreme
 XTRMLY Extremely

- Y -

YDA Yesterday
 YKN Yukon
 YLSTN Yellowstone

- Z -

ZL Freezing drizzle
 ZN Zone
 ZNS Zones
 ZR Freezing rain