

NOUS41 KWBC 191800
PNSWSH

TECHNICAL IMPLEMENTATION NOTICE 05-80
NATIONAL WEATHER SERVICE HEADQUARTERS WASHINGTON DC
100 PM EST MON DEC 19 2005

TO: SUBSCRIBERS:
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FROM: PAUL HIRSCHBERG
CHIEF...SCIENCE PLANS BRANCH
OFFICE OF SCIENCE AND TECHNOLOGY

SUBJECT: NEW CALCULATION OF CAPE IN NCEP NAM MODEL: EFFECTIVE FEBRUARY 7
2006 AT 1200 UTC

EFFECTIVE FEBRUARY 7 2006...BEGINNING WITH THE 1200 COORDINATED UNIVERSAL
TIME /UTC/ RUN...THE NATIONAL CENTERS FOR ENVIRONMENTAL PREDICTION /NCEP/
WILL CHANGE THE COMPUTATION OF THE SURFACE-BASED CONVECTIVE AVAILABLE
POTENTIAL ENERGY /CAPE/ AND CONVECTIVE INHIBITION /CIN/ PARAMETERS IN THE
NORTH AMERICAN MESOSCALE /NAM/ MODEL. THE CURRENT FORMULATION SEARCHES
THE LOWEST 70 MILLIBARS /MB/ FOR THE LEVEL WITH THE HIGHEST EQUIVALENT
POTENTIAL TEMPERATURE /THETA-E/. THIS PARCEL IS THEN LIFTED TO GENERATE
VALUES FOR CAPE AND CIN.

VARIOUS NWS OFFICES AND THE NCEP STORM PREDICTION CENTER HAVE SUGGESTED
THIS FORMULATION OCCASIONALLY RESULTS IN A PARCEL BEING LIFTED THAT IS NOT
REPRESENTATIVE OF TRUE SURFACE CONDITIONS. SEVERAL CASES HAVE BEEN
IDENTIFIED IN WHICH CONDITIONS AT THE SURFACE WERE NOT
UNSTABLE...HOWEVER...THE CALCULATION GENERATED A HIGH VALUE OF CAPE BY
LIFTING A PARCEL WELL ABOVE THE GROUND. BECAUSE THE NAM OFFERS SEVERAL
CAPE/CIN COMPUTATIONS TO REPRESENT ELEVATED INSTABILITY...NWS DECIDED THE
CURRENT DETERMINATION OF A SURFACE-BASED PARCEL SHOULD BE REVISED TO MORE
ACCURATELY REPRESENT LOW-LEVEL CONDITIONS.

THE REVISED COMPUTATION WILL SEARCH FOR THE HIGHEST THETA-E AT EACH GRID
POINT OVER A DEPTH SMALLER THAN THE 70 MB CURRENTLY USED. THE PRECISE
DEPTH WILL BE BASED ON THE SURFACE PRESSURE TO MAKE SURE THAT A LEVEL
CLOSE TO THE GROUND IS USED AT LOW ELEVATIONS...WHILE ABLE TO SEARCH OVER
A LARGER DEPTH AT HIGHER ELEVATIONS WHERE THE FIRST MODEL LEVEL ABOVE THE
GROUND IS OFTEN MUCH HIGHER ABOVE THE SURFACE. THIS FORMULATION LEADS TO
A RANGE OF DEPTHS FROM ABOUT 10 MB AT SEA LEVEL TO AS MUCH AS 50 MB OVER
THE HIGHEST TERRAIN.

PLEASE NOTE THAT THERE ARE CURRENTLY FOUR SETS OF CAPE/CIN COMPUTATIONS IN
THE NAM:

THE SURFACED-BASED FIELDS:

- BEST CAPE/CIN COMPUTED BY FINDING THE HIGHEST THETA-E IN THE SIX MIXED 30 MB DEEP LAYERS CLOSEST TO THE GROUND.
- MIXED LAYER CAPE/CIN COMPUTED BY TAKING THE AVERAGE THERMODYNAMIC PROPERTIES IN THE LOWEST 90 MB.
- BEST CAPE/CIN COMPUTED BY FINDING THE LEVEL IN THE LOWEST 300 MB WITH THE HIGHEST THETA-E.

THIS CHANGE WILL AFFECT ONLY THE FIRST ITEM IN THE LIST ABOVE. DAILY PLOTS OF ALL OF THESE FIELDS CAN BE VIEWED AT /USE LOWER CASE LETTERS/:

[HTTP://WWW.EMC.NCEP.NOAA.GOV/MMB/NAMSVRFCST](http://www.emc.ncep.noaa.gov/MMB/NAMSVRFCST)

IF YOU HAVE QUESTIONS CONCERNING THIS CHANGE...CONTACT:

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NATIONAL TECHNICAL IMPLEMENTATION NOTICES ARE ONLINE AT /USE LOWER CASE/:

[HTTPS://WWW.WEATHER.GOV/NOTIFICATION/ARCHIVE](https://www.weather.gov/notification/archive)

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