

RAP Parameter Changes

Additional RAP Parameters

The following new parameters are available in various RAP output grids. In the list below, the letters in parentheses indicate on which grid the parameter is available:

130p = 13 km pressure level output on grid 130

130b = 13 km native level output on grid 130

200 = 16 km output on grid 200

13p = 13 km pressure level output on native grid

13b = 13 km native level output on native grid

Height of -10 Degree Celsius Level (130p, 13p)

Height of -20 Degree Celsius Level (130p, 13p)

Full vertical profile of Cloud Cover (13b)

Full vertical profile of Cloud Fraction (13b)

Full vertical profile of Number Concentration

for Cloud Water Droplets (130b, 13b)

Full vertical profile for Fine Particulate

Matter (130b, 13b)

Full vertical profile for Coarse Particulate

Matter (130b, 13b)

Equilibrium Level Height (200)

Height of Convective Cloud Top (200)

Categorical Rain (200)

Total Accumulated Precipitation (13b)

Total Accumulated Snowfall (130b, 130p, 13b, 13p)

Accumulated Graupel (labeled as Frozen Rain) (130b, 130p, 13b, 13p)

Ground Heat Flux (13b)

Cloud Ceiling Height (this is contained in the current RAPv2 but labeled as cloud base height) (13b)

Visible Beam Downward Solar Flux (13b)

Visible Diffuse Downward Solar Flux (13b)

Absolute Vorticity at all levels (13p)

Full Vertical Profile of Dew Point (13p)

Vertically Integrated Liquid (13p)

Eliminated RAP Parameters:

Three parameters are removed from the 13 and 20 km native level output and the 13 km native level output on the native grid. They are direct soil evaporation, canopy water evaporation, and plant transpiration. In addition, humidity mixing ratio has been removed from the 13 km native output on the native grid.

HRRR Parameter Changes

Changes to HRRR pressure level files:

The HRRR pressure level files (hrrr.tXXz.wrfprsfHH.grib2) have the following changes:

- convective cloud layer is removed
- the lightning flash rate (Discipline 0, Category 17, Number 192): The fixed surface type is changed from 1 (Surface) to 10 (Entire Atmosphere).
- The sea level pressure field (Discipline 0, Category 3, Number 1) is replaced by alternate sea level pressure field (Discipline 0, Category 3, Number 198) to be consistent with the RAP.
- The following new parameters are added
 - Accumulated Snowfall
 - Baseflow-Ground Water Runoff
 - Storm-Surface Runoff
 - Plant Canopy Surface Water
 - Downward Longwave Radiative Flux at Surface
 - Upward Longwave Radiative Flux at Surface
 - Upward Shortwave Radiative Flux at Surface
 - Visible Beam Downward Solar Flux at Surface
 - Visible Diffuse Downward Solar Flux at Surface
 - Friction Velocity
 - Height of Lowest Freezing Level
 - Height of -10 Degree Celsius Level
 - Height of -20 Degree Celsius Level

Height of Highest Freezing Level
Pressure of Highest Freezing Level
Latent Heat Flux at Surface
Sensible Heat Flux at Surface
Ground Heat Flux at Surface
Roughness Length
2-m Potential Temperature
2-m Relative Humidity
Reflectivity at -10 Degree Celsius Level
Relative Humidity at Freezing Level
Relative Humidity Computed with respect to Precipitable Water
Satellite Brightness Temperature for Goes 11, Channel 3
Satellite Brightness Temperature for Goes 11, Channel 4
Satellite Brightness Temperature for Goes 12, Channel 3
Satellite Brightness Temperature for Goes 12, Channel 4
Accumulated Graupel (available as 1-hr and run total accumulations). This parameter is labeled as “frozen rain” (Discipline 0, Category 1, Number 227) due to no parameter currently existing for graupel.

Changes to HRRR surface files:

The HRRR surface files, which include surface and near-surface parameters as well as a very limited set of upper-level parameters (hrrr.tXXz.wrfsfcfHH.grib2) have the following changes:

- All changes listed in the above section for the HRRR pressure level files apply to the surface files. In addition, the following fields are added:

U-Component of Wind at 250 hPa

V-Component of Wind at 250 hPa

Changes to HRRR native files:

The HRRR native level files (hrrr.tXXz.wrfnatfHH.grib2), have all of the changes to the pressure level files listed above as well as the following additions:

Full vertical profile (50 levels) of Cloud Fraction

Full vertical profile of Number Concentration for Ice Particles
Full vertical profile of Number Concentration for Cloud Water Droplets
Full vertical profile for Number Concentration of Rain Drops
Full vertical profile for Fine Particulate Matter
Full vertical profile for Coarse Particulate Matter

Changes to HRRR Sub-Hourly Files:

The HRRR sub-hourly files, which contain a small set of parameters at 15-minute forecast increments (hrrr.tXXz.wrfsubhfHH.grib2) have the following new parameters:

2-m Specific Humidity
5-Minute Averaged 10-meter Wind Speed
5-Minute Averaged 10-meter U-Wind Component
5-Minute Averaged 10-meter V-Wind Component
Satellite Brightness Temperature for Goes 11, Channel 3
Satellite Brightness Temperature for Goes 11, Channel 4
Satellite Brightness Temperature for Goes 12, Channel 3
Satellite Brightness Temperature for Goes 12, Channel 4
Visible Beam Downward Solar Flux at Surface
Visible Diffuse Downward Solar Flux at Surface
15-Minute Averaged Downward Short Wave Flux at Surface
Downward Long Wave Flux at Surface
Upward Short Wave Flux at Surface
Upward Long Wave Flux at Surface
15-Minute Averaged Visible Beam Downward Solar Flux at Surface