**RELEASE NOTES**

**Model:** nhc\_wsp\_v1.10.0

**Released to NCO on:** 2/21/2025

**Purpose:**  The National Hurricane Center utilizes the wind speed probability model to provide probabilities of 34-kt, 50-kt, and 64-kt winds associated with tropical cyclones. The model output is used for graphical products on the NHC website, and is utilized by Weather Forecast Offices as well. This release includes annual updates to address coefficient file updates, minor code updates, and fixes a minor bug in the algorithm

**Primary developers:** Matt Onderlinde/NHC/TSB, Pablo Santos/NHC/TSB, Alan Brammer/CIRA/CSU, Mark DeMaria/CIRA/CSU, Andrea Schumacher/CIRA/CSU and other contributors

**Runs on:** The National Weather Service (NWS) Weather and Climate Operational Supercomputing System (WCOSS). The wind speed probability model runs for storms in the Atlantic, East Pacific, Central Pacific, and West Pacific that are forecast by NHC/CPHC/JTWC. The WSP model runs 8 times per day at 1 min past 03, 09, 15 and 21 UTC when the NHC advisories are issued, with early runs 60 min before those when the preliminary NHC forecasts are issued.

**Release tag:** git@git.nhc.noaa.gov:nhc\_wsp.git, tag/v1.10.0

**External software used:**

*Compilers*:

* ftn

*Modules:*

* *To build code:*
* PrgEnv-intel/8.1.0
* intel/19.1.3.304
* craype/2.7.17
* w3nco/2.4.1
* g2/3.4.5
* bacio/2.4.1
* jasper/2.0.25
* libpng/1.6.37
* zlib/1.2.11
* *To run JNHC\_WINDPROB:*
* intel/19.1.3.304
* libjpeg/9c
* grib\_util/1.2.4
* wgrib2/2.0.8

**Package modifications:**

Minor changes were made to update the annual error coefficient files, improve Makefile target coverage, and remove a single Go To statement. Remaining Go Tos are in code that will be replaced in a future major update.

* doc/
* Removed all previous documentation
* Added nhc\_wsp\_v1.10.0\_release-notes.pdf
* Added nhc\_wsp\_v1.10.0\_implementation-instructions.pdf
* Added nhc\_wsp\_v1.10.0\_test-plan.pdf
* Added nhc\_wsp\_v1.10.0\_production-overview.pdf
* ecf/
* Added on-demand scripts
* jobs/
* Added on-demand scripts
* parm/
* Updated all mc\*1923\*.dat files to mc\*2024\*.dat
* scripts/
* No modifications
* sorc/
* prob\_single\_storm.fd/mc\_prob.f90
* Minor update
* test/
* No modifications
* versions/
* No modifications

**Input:**

No modifications were made to input data listed below, other than paths to their location. Note that NHC is still in the process of transitioning from SSH keys to LDM. The delivered package is based on the existing SSH key delivery method - it is presently unknown if additional changes will be required once dataflow is reconfigured.

*NHC Provided Inputs:*

* NHC and CPHC compute files (.../nhc/save/guidance/storm-data/zcom). Naming format is bbnnyyyy.com where bb is the storm basin (CP, EP or AL), nn is the storm number, yyyy is the year.

**Output:**

No modifications were made to output with this release. The primary output $COMOUT data is listed below. Additional output not listed below is stored if KEEPDATA=”YES”

* YYYYMMDDHH.corners
* tpcprblty.YYYYMMDDHH.grib1
* tpcprblty.YYYYMMDDHH.[grib1|grib2|g227.2|g204.2].gz
* tpcprblty.YYYYMMDDHH.[g231.2|g204.2]
* tpcprblty.YYYYMMDDHH.[g231.2|g227.2|g204.2].grib
* tpcprblty.YYYYMMDDHH.[g227.2|g204.2].packed
* tpcprblty.YYYYMMDDHH.tenth.packed.gz
* wmo/tpcprblty.tHHz.[g204.2|g227.2|g231.2].grib

**Resources:**

No changes with this release.

PBS entries in ecFlow submission scripts were created with the previous release with the following resource information:

*nhc\_windprob\_early.ecf:* select=1:ncpus=2:mem=1GB, serial job *nhc\_windprob.ecf:* select=1:ncpus=2:mem=1GB, serial job

* Note: each job runs at once per cycle four times daily (8 total runs per days)

**Runtime:**

No changes with this release for cron jobs on WCOSS. However, on-demand WSP is now available. See below.

The primary mc\_prob subroutine runs separately for each active storm in each of the four basins, each storm runs in series under the single main process. The maximum number of storms that could exist is about 10, although usually it’s much less. Each individual run takes about 1 minute of CPU time. Thus, the process may take up to around 10 minutes. The merging and product generation processing takes an additional few minutes.

**On-Demand Runs:**

Extra early runs of WSP are now possible via a button launcher on ATCF desktops. This launcher will open a terminal that requests the TCID (eg, al05). This will send the fst input file and a trigger file to WCOSS and initiate an extra-early run of WSP. The output of this run will come back only to NHC via /localapps/runtime/dbnet\_scripts/sort\_wsp.bash . Forecasters can use this output in AWIPS to assist in identifying regions for watches/warnings.

The WSPonDemand button on the ATCF desktops will trigger the following sequence:
1) ${ATCFSCRIPTS}/wspOnDemand.bash (determines synoptic cycle, checks for inputs)
2) ${ATCFSCRIPTS}/wcossLDMcomms.bash (ssh’s to ldm and inserts input files)
3) A cron (managed by WCOSS) monitors /lfs/h1/ops/prod/dcom/nhc/atcf/zfst/ondemand/ on wcoss for the trigger file that wcossLDMcomms.bash has just sent up
4) ecflow (managed by WCOSS) triggers the run

**Disk space:**

No changes with this release.

100 Mbyte per cycle per active tropical cyclone. An upper bound per day is about 10 active TCs x 4 cycles per day x 100 Mbyte = 4 Gbyte

**Dissemination:**

No changes with this release.

Model output is sent via dbnet and scp-ed to the NHC RZDM (NCEP FTP). NHC also uses SSH keys to pull the early run, change the process ID for AWIPS, and disseminate via the NCEP FTP to WFOs (plans underway to change this prior to the 2022 hurricane season).

**HPSS storage:**

No changes with this release.

There is no HPSS archive of this model.