Section 7

NAMELIST RECORDS

This section lists the variables that are contained in the four NAMELIST records $OPARAM, $PPARAM, $LPARAM, and $FPARAM. The definition, dimension, and units for all variables (listed alphabetically for each record) are given along with a brief description of the record's general contents.

7.1 OPARAM

$OPARAM contains variables used mainly for selection of options regarding model output.

IFPRT	is printer output desired, (0=no;1=yes).
IFREST	is this run restarted from a saved file, (.T. or. F.).
IFSAVE	will a saved file will be written for restart, (.T. or .F.).
IFTAPE	will output be saved on files for INTERP, (0=no;1=yes).
ISFOUT	will output of surface/terrain parameters be printed (**IFPRT**=1), (0=no;1=yes).
IXTIMR	restart time (min) into forecast.
LEVIDN	(**MAXSES**); nest level.
MASCHK	time-step frequency for printout of mass conservation information.
NUMNC	(**MAXSES**); mother domain.
PRTFRQ	interval (min) for printer output (**IFPRT**=1).
SAVFRQ	interval (min) between save operations (**IFSAVE**=.T.).
TAPFRQ	interval (min) of output data for INTERP (**IFTAPE**=1).

7.2 PPARAM

$PPARAM contains variables used for selection of options related to physical processes, model numerics, and vertical resolution.

ALBLND albedo over land, used when **ISFPAR** = 0.

CONF condensation threshold (= 1.).

IABSOR sponge absorber at top of model, (0=no;1=yes).

IFEED feedback option:
= 0; one-way.
= 1; MM4 method.
= 2; no smoothing.
= 3; light smoothing.

ISOLVE = 1 (standard numerics).

PTOP pressure (cb) at the top of the model.

QCK1 constant autoconversion rate (= 1.E-3 kg kg^{-1} s^{-1}).

QCTH threshold for the onset of autoconversion (kg kg^{-1}).

SIGMA (**KXP1**); full-sigma levels.

THINLD thermal inertia over land when **ISFPAR** = 0 (cal cm^{-2} K^{-1} $s^{-1/2}$).

TIMAX maximum forecast time (min).

TISTEP model **DT**, use 3*__DX__ for ISOLVE = 1.

XMAVA moisture availability, used when **ISFPAR** = 0.

ZZLND roughness length (m) over land, used when **ISFPAR** = 0.

ZZWTR roughness length (m) over water, used when **ISFPAR** = 0.

7.3 LPARAM

$LPARAM contains variables (mainly integers) pertaining to selection of options regarding physical processes, boundary conditions, nested domain specifications, PBL processes, and printer output.

HYDPRE (**MAXSES**); will water-loading effects be considered in hydrostatic equation (**IMOIST**=2), (0=no;1=yes).

IACTIV (**MAXSES**); is nested domain active, (0=no;1=yes).

IBLIQ are **QCTEN** and **QRTEN** at nested boundary available:
= 0; no, when **IDRY**(1) = 1, or when **IDRY**(1) = 0 and **IMOIST**(1) = 1.
= 1; yes, when **IDRY**(1) = 0 and **IMOIST**(1) = 2.

IBLTYP (**MAXSES**); will bulk PBL or Blackadar PBL be used in the model:
= 0; frictionless.
= 1; bulk PBL.
= 2; multi-level Blackadar PBL.

IBMOIST will initial and boundary conditions be provided for water/ice variables, (0=no;1=yes).

IBOUDY (**MAXSES**); indicates type of lateral boundary conditions:
= 0; fixed.
= 1; relaxation.
= 2; time dependent (from observations or large-scale model).
= 3; time and inflow/outflow dependent. Nonhydrostatic boundary conditions.
= 4; sponge.

IBVAP is **QVTEN** at the nested boundaries available:
= 0; no when **IDRY**(1) = 1.
= 1; yes when **IDRY**(1) = 0.

ICDCON (**MAXSES**); are drag coefficients constants when using bulk PBL, (0=no;1=yes--function of terrain height only).

ICLOUD (**MAXSES**); will the radiation effects due to clouds be considered. Used if surface heat and moisture fluxes are calculated (**ISFFLX**=1) and ground temperature is predicted from the budget (**ITGFLG**=1), (0=no;1=yes).

ICOR3D will full Coriolis force including vertical component be considered (nonhydrostatic option only), (0=no;1=yes).

ICUPA (**MAXSES**); what type of cumulus parameterization will be employed:
= 1; none.
= 2; Anthes-Kuo scheme.
= 3; Grell-type scheme.
= 4; Arakawa-Schubert scheme.

ICUSTB will the stability check in the Kuo cumulus parametrization scheme be activated, (0=no;1=yes).

IDRY (**MAXSES**); is this run a moist or dry forecast, (0=moist;1=dry).

IEVAP (**MAXSES**); will evaporation effects be considered (**IMOIST**=2):
< 0; The evaporation of rainwater is not considered.
= 0; The evaporation is not considered for cloud or rain.
> 0; The evaporation is considered.

IEXICE will explicit moisture scheme with simple ice-physics effects be used, (0=no;1=yes).

IFDRY is this a fake dry run (no latent heat release), (0=no;1=yes).

IFRAD will radiative cooling of the atmosphere be considered:
= 0; no.
= 1; use simple radiation routine.
= 2; use full radiation (LWRAD and SWRAD).

IFSNOW (**MAXSES**); will snow-cover data be considered, (0=no;1=yes).

IFUPR will upper radiative boundary conditions be used, (0=no;1=yes).

IMOIAV (**MAXSES**); is moisture availability a function of time, (0=no;1=yes).

IMOIST (**MAXSES**); will explicit moisture be used:
= 0; dry case with passive, moisture variables (including q_v, q_c, q_r).
= 1; no explicit moisture.
= 2; explicit moisture.

IMOVCO (**MAXSES**); counter for how often nest is moved.

IMOVE (**MAXSES**); will nest be moved, (0=no;1=yes).

IMOVEI (**MAXSES**, 10); how many grid points to move nest in the **I**-direction.

IMOVEJ (**MAXSES**, 10); how many grid points to move nest in the **J**-direction.

IMOVET (**MAXSES**, 10); at what time will nest be moved.

IMVDIF will moist-adiabatic vertical diffusion in clouds be included, (0=no:1=yes).

IOVERW (**MAXSES**); will interpolated nested domain be over-written with user's own analysis, (0=no;1=yes).

ISFFLX (**MAXSES**); will surface heat and moisture fluxes be calculated, (0=no;1=yes).

ISFPAR (**MAXSES**); are surface/land-use parameters variable or constant. Used only if (**ISFFLX** = 1 and **ITGFLG**=1), (0=constant;1=variable).

ISHALLO (**MAXSES**); will shallow convection be used, (0=no;1=yes).

ITGFLG (**MAXSES**); indicates method for calculating ground temperature (**ISFFLX**):
= 1; it will be calculated from the budget.
= 2; it will be calculated from a sinusoidal function.
= 3; it will be determined from specified constants.

ITQPBL tendencies at the boundaries will be computed in HIRPBL (**IBLTYP**=2) when **IBOUDY** = 1, 2, 3, or 4, (0=no;1=yes).

IVMIXM (**MAXSES**); will vertical mixing of momentum be considered (**IBLTYP**=2), (0=no;1=yes).

JXSEX (**MAXSES**); **J**-index of the north-south vertical slice for printer output.

KXOUT (**MAXSES**); **K**-level of the horizontal slice for printer output.

NESTI (**MAXSES**); origin location of nest in **I**-direction in mother domain.

NESTIX (**MAXSES**); **I**-dimension of nest.

NESTJ (**MAXSES**); origin location of nest in **J**-direction in mother domain.

NESTJX (**MAXSES**); **J**-dimension of nest.

RADFRQ frequency (min) that solar radiation is computed, (**ISFFLX**=1;**ITGFLG**=1).

XENNES ending time of computations for a given nest.

XMOIST (**MAXSES**); will moisture effects be used in the thermodynamic equation, (0=no;1=yes).

XSTNES beginning time of computations for a given nest.

7.4 FPARAM

$FPARAM contains variables used for selection of FDDA options. (For arrays with second index = 2 this varies over type of analysis nudging: 1 = 3-D analysis nudging, 2 = surface analysis nudging within PBL).

DIFTIM (**MAXNES**, 2); time (min) between input analyses for analysis nudging.

DPSMX maximum p* change (cb) allowed within influence range of a surface observation used for observation nudging.

FDAEND	(**MAXSES**); time (min) for termination of FDDA.
FDASTA	(**MAXSES**); time (min) for initiation of FDDA.
GIQ	(**MAXSES**); observation-nudging coefficient (s^{-1}) for mixing ratio.
GIT	(**MAXSES**); observation-nudging coefficient (s^{-1}) for temperature.
GIV	(**MAXSES**); observation-nudging coefficient (s^{-1}) for wind.
GQ	(**MAXSES**, 2); analysis-nudging coefficient (s^{-1}) for mixing ratio.
GR	(**MAXSES**, 2); analysis-nudging coefficient (m^2 s^{-1}) for vorticity.
GT	(**MAXSES**, 2); analysis-nudging coefficient (s^{-1}) for temperature.
GV	(**MAXSES**, 2); analysis-nudging coefficient (s^{-1}) for wind.
I4D	(**MAXSES**, 2); will FDDA analysis nudging be employed, (0=no;1=yes).
I4DI	(**MAXSES**); will FDDA observation nudging be employed, (0=no;1=yes).
IMOIS	(**MAXSES**, 2); will the mixing ratio be nudged from analyses, (0=no;1=yes).
INONBL	(**MAXSES**, 4); will PBL fields be nudged from 3-D analyses when not using surface-analysis nudging within PBL. (0=yes; 1=exclude certain variables depending on integer value of second index).
IONF	observation-nudging frequency in coarse grid time steps for observation-nudging calculations.
IROT	(**MAXSES**); will vorticity be nudged from analyses, (0=no;1=yes).
ISMOIS	(**MAXSES**); will the mixing ratio be nudged from observations, (0=no;1=yes).
ISTEMP	(**MAXSES**); will the temperature be nudged from observations, (0=no;1=yes).
ISWIND	(**MAXSES**); will the wind field be nudged from observations, (0=no;1=yes).
ITEMP	(**MAXSES**, 2); will the temperature be nudged from analyses, (0=no;1=yes).
IWIND	(**MAXSES**, 2); will the wind field be nudged from analyses, (0=no;1=yes).
IWINDS	(**MAXSES**, 2); will logarithmic-wind adjustment of analyzed surface wind speed be used before applying it throughout the PBL, (0=no;1=yes).

NPFG	coarse-grid time-step frequency for select diagnostic print of analysis nudging.
NPFI	coarse-grid time-step frequency for select diagnostic print of observation nudging.
PFREE	user-defined pressure level (cb) where terrain effect becomes small.
RINBLW	radius of influence (km) for surface-analysis nudging where the horizontal weighting function depends on surface data density.
RINFMN	multiplier for observation-nudging influence radius (**RINXY**) at the surface.
RINFMX	multiplier for observation-nudging influence radius (**RINXY**) at the **PFREE** level.
RINSIG	vertical radius of influence (on sigma) for distance-weighted nudging corrections (for observation nudging).
RINXY	default horizontal radius of influence (km) for distance-weighted nudging corrections (for observation nudging).
TWINDO	(time window)/2 (min) over which an observation will be used for nudging.