New Features in Version 3.4

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WRF Community Model

- Version 1.0 WRF was released December 2000
- Version 2.0: May 2004 (NMM added, EM nesting released)
- Version 2.1: August 2005 (EM becomes ARW)
- Version 2.2: December 2006 (WPS released)
- Version 3.0: April 2008 (add global ARW version)
- Version 3.1: April 2009
- Version 3.2: April 2010
- Version 3.3: April 2011
  - Version 3.3.1: September 2011
- Version 3.4: April 2012

V3.3 Highlights (2011)

- Microphysics option: Stony Brook University (Lin and Colle) (mp_physics=13)
- CESM (Climate model) Physics:
  - Zhang-McFarlane cumulus parameterization (cu_physics=7)
  - Bretherton-Park (UW) PBL (bl_pbl_physics=9)
  - Park-Bretherton (UW) shallow cumulus (shcu_physics=2)
- Radiation option: New Goddard longwave and shortwave (ra_lw_physics = 5, ra_sw_physics = 5)
- PBL option: TEMF (Angevine et al.) PBL (bl_pbl_-physics=10)
- Cumulus options: SAS added for ARW (cu_physics=4), NSAS (cu_physics=14), Tiedtke (cu_physics=6)

Other New Options in V3.3

- New Kain-Fritsch trigger option
- Wind farm parameterization
- Stochastic KE backscatter perturbation method
- Idealized tropical cyclone case
- Regional climate diagnostics (daily max, etc.)

WRF-Chem options added to existing schemes

  - Morrison microphysics
  - RRTMG longwave and shortwave

New in Version 3.4

- NSSL microphysics (mp_physics=17)
  - 2-moment, 4-ice scheme (adds hail)
  - Also idealized CCN option (mp_physics=18)
  - Provided by Ted Mansell (National Severe Storms Lab)
  - Ref: Mansell. Ziegler and Bruning (2010, JAS)
- WENO advection (option 3):
  - Weighted Essentially Non-Oscillatory method (also provided by Ted Mansell)

New in Version 3.4

- Fu-Liu-Gu (UCLA) radiation option (ra_sw_physics=7, ra_lw_physics=7)
- Simple SiB (SSiB) land-surface model (sf_surface_physics=8) from Y. Xue and F. de Sales (UCLA)
- Both from physics used in UCLA global climate model

New in Version 3.4

- New Version of QNSE PBL (bl_pbl_physics=4)
  - Developed with Eddy-Diffusivity-Mass-Flux (EDMF) convective BL method
  - From Julien Pergaud (Numtech, France)
  - Old version kept as option bl_pbl_physics=94

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- Noah MP (multi-physics) land-surface model (sf_surface_physics=4)
  - Jointly developed at NCAR and Guo-Ye Niu (U. Texas/U. Arizona)
  - Advanced snow model and other features
- seaice_albedo_opt=1
  - Allows variation of sea-ice albedo with T
  - For Noah and Noah MP in new shared sea-ice module

New in Version 3.4

- New version of surface-layer physics (sf_sfclay_physics=11)
  - Modifies and cleans up sfclay option 1 code and should replace it in the future
  - Ref: Jimenez et al. (2012, MWR)
- New option to improve topographic effects on surface wind (topo_wind=1)
  - Ref: Jimenez and Dudhia (2012, JAMC)

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Planned

- CESM microphysics Morrison-Gettelman (mp_physics=11)
  - From CESM climate model
  - Interacts with WRF-Chem

Contributions for next release

- New options for contribution should come to NCAR by October 2012
- Code freeze and final test phase starts December 2012
- Release planned for April 2013

Thanks