Documentation of the Hourly Time Series from the NCEP Climate Forecast System Reanalysis (1979-2009)

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Layout of the 30 Hourly Time Series from the FLX file are given below:

Initial condition 1 Jan 1979, 0Z
Record 1: f00: forecast at first time step of 3 mins
Record 2: f01: forecast (either averaged over 0 to 1 hour, or instantaneous at 1 hour)
Record 3: f02: forecast (either averaged over 0 to 2 hours, or instantaneous at 2 hours)
Record 4: f03: forecast (either averaged over 0 to 3 hour, or instantaneous at 3 hours)
Record 5: f04: forecast (either averaged over 0 to 4 hours, or instantaneous at 4 hours)
Record 6: f05: forecast (either averaged over 0 to 5 hours, or instantaneous at 5 hours)
Record 7: f06: forecast (either averaged over 0 to 6 hours, or instantaneous at 6 hours)

Initial condition 1 Jan 1979, 6Z
Record 8: f00: forecast at first time step of 3 mins
Record 9: f01: forecast (either averaged over 0 to 1 hour, or instantaneous at 1 hour)
Record 10: f02: forecast (either averaged over 0 to 2 hours, or instantaneous at 2 hours)
Record 11: f03: forecast (either averaged over 0 to 3 hour, or instantaneous at 3 hours)
Record 12: f04: forecast (either averaged over 0 to 4 hours, or instantaneous at 4 hours)
Record 13: f05: forecast (either averaged over 0 to 5 hours, or instantaneous at 5 hours)
Record 14: f06: forecast (either averaged over 0 to 6 hours, or instantaneous at 6 hours)

Initial condition 1 Jan 1979, 12Z
Record 15: f00: forecast at first time step of 3 mins
Record 16: f01: forecast (either averaged over 0 to 1 hour, or instantaneous at 1 hour)
Record 17: f02: forecast (either averaged over 0 to 2 hours, or instantaneous at 2 hours)
Record 18: f03: forecast (either averaged over 0 to 3 hour, or instantaneous at 3 hours)
Record 19: f04: forecast (either averaged over 0 to 4 hours, or instantaneous at 4 hours)
Record 20: f05: forecast (either averaged over 0 to 5 hours, or instantaneous at 5 hours)
Record 21: f06: forecast (either averaged over 0 to 6 hours, or instantaneous at 6 hours)

Initial condition 1 Jan 1979, 18Z
Record 22: f00: forecast at first time step of 3 mins
Record 23: f01: forecast (either averaged over 0 to 1 hour, or instantaneous at 1 hour)
Record 24: f02: forecast (either averaged over 0 to 2 hours, or instantaneous at 2 hours)
Record 25: f03: forecast (either averaged over 0 to 3 hour, or instantaneous at 3 hours)
Record 26: f04: forecast (either averaged over 0 to 4 hours, or instantaneous at 4 hours)
Record 27: f05: forecast (either averaged over 0 to 5 hours, or instantaneous at 5 hours)
Record 28: f06: forecast (either averaged over 0 to 6 hours, or instantaneous at 6 hours)

Initial condition 2 Jan 1979, 0Z
Record 29: f00: forecast at first time step of 3 mins
Record 30: f01: forecast (either averaged over 0 to 1 hour, or instantaneous at 1 hour)
……… and so on, till the end of the month (31 Jan 1979, 18Z) with 868 records.

Note: The 2 Wind variables (WND) have the zonal component (U) and meridional component (V) interspersed one after the other, with a total of 1736 records.
30 Hourly Time Series from the FLX File

1. LHTFL (latent heat flux) : averaged
2. SHTFL (sensible heat flux) : averaged
3. WNDSTR (u and v stress) : averaged
4. PRATE (precipitation rate) : averaged
5. PRESSFC (Surface pressure) : instantaneous
6. PWAT (Precipitable Water) : instantaneous
7. TMP2M (2m air temperature) : instantaneous
8. TMPSFC (surface temperature) : instantaneous
9. TMPHY1 (temperature at hybrid level 1) : instantaneous
10. SNOHF (Snow phase-change heat flux) : averaged
11. WND10M (u and v at 10m) : instantaneous
12. DLWSFC (Downward LW at the surface) : averaged
13. DSWSFC (Downward SW at the surface) : averaged
14. ULWSFC (Upward LW at the surface) : averaged
15. ULWTOA (Upward LW at the top) : averaged
16. USWSFC (Upward SW at the surface) : averaged
17. USWTOA (Upward SW at the top) : averaged
18. SOILM1 (Soil Moisture Level 1) : instantaneous
19. SOILM2 (Soil Moisture Level 2) : instantaneous
20. SOILM3 (Soil Moisture Level 3) : instantaneous
21. SOILM4 (Soil Moisture Level 4) : instantaneous
22. SOILT1 (Soil Temperature Level 1) : instantaneous
23. GFLUX (Ground Heat Flux) : averaged
24. SWE (Snow Water Equivalent) : instantaneous
25. RUNOFF (Ground Runoff) : accumulation
26. ICECON (Ice concentration)
27. ICETHK (Ice Thickness)
28. Q2M (2m Specific Humidity)
29. TMIN (Minimum 2m air temperature)
30. TMAX (Maximum 2m air temperature)

Important Note: The forecast at the first time step (f00) of 3 minutes constitutes a spin up of the model physics, and extreme care should be taken when using it as a proxy of any type of validation. IT IS NOT THE ANALYSIS.
Layout of the 30 Hourly Time Series from the PGB and IPV files are given below:

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**Initial condition 1 Jan 1979, 0Z**

Record 1: anl: Analysis  
Record 2: f00: instantaneous forecast at first time step of 3 mins  
Record 3: f01: instantaneous forecast at 1 hour  
Record 4: f02: instantaneous forecast at 2 hours  
Record 5: f03: instantaneous forecast at 3 hours  
Record 6: f04: instantaneous forecast at 4 hours  
Record 7: f05: instantaneous forecast at 5 hours  
Record 8: f06: instantaneous forecast at 6 hours

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**Initial condition 1 Jan 1979, 6Z**

Record 9: anl: Analysis  
Record 10: f00: instantaneous forecast at first time step of 3 mins  
Record 11: f01: instantaneous forecast at 1 hour  
Record 12: f02: instantaneous forecast at 2 hours  
Record 13: f03: instantaneous forecast at 3 hours  
Record 14: f04: instantaneous forecast at 4 hours  
Record 15: f05: instantaneous forecast at 5 hours  
Record 16: f06: instantaneous forecast at 6 hours

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**Initial condition 1 Jan 1979, 12Z**

Record 17: anl: Analysis  
Record 18: f00: instantaneous forecast at first time step of 3 mins  
Record 19: f01: instantaneous forecast at 1 hour  
Record 20: f02: instantaneous forecast at 2 hours  
Record 21: f03: instantaneous forecast at 3 hours  
Record 22: f04: instantaneous forecast at 4 hours  
Record 23: f05: instantaneous forecast at 5 hours  
Record 24: f06: instantaneous forecast at 6 hours

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**Initial condition 1 Jan 1979, 18Z**

Record 25: anl: Analysis  
Record 26: f00: instantaneous forecast at first time step of 3 mins  
Record 27: f01: instantaneous forecast at 1 hour  
Record 28: f02: instantaneous forecast at 2 hours  
Record 29: f03: instantaneous forecast at 3 hours  
Record 30: f04: instantaneous forecast at 4 hours  
Record 31: f05: instantaneous forecast at 5 hours  
Record 32: f06: instantaneous forecast at 6 hours

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……… and so on, till the end of the month (31 Jan 1979, 18Z) with 992 records.

**Note:** The 5 Wind variables (WND) have the zonal component (U) and meridional component (V) interspersed one after the other, with a total of 1984 records.
30 Hourly Time Series from the PGB and IPV Files

1. Z200 (Geopotential at 200 hPa)
2. Z500 (Geopotential at 500 hPa)
3. Z700 (Geopotential at 700 hPa)
4. Z850 (Geopotential at 850 hPa)
5. Z1000 (Geopotential at 1000 hPa)
6. T2 (Temperature at 2 hPa)
7. T50 (Temperature at 50 hPa)
8. T200 (Temperature at 200 hPa)
9. T500 (Temperature at 500 hPa)
10. T700 (Temperature at 700 hPa)
11. T850 (Temperature at 850 hPa)
12. T1000 (Temperature at 1000 hPa)
13. WND200 (Zonal (u) and Meridional: (v) Wind at 200 hPa)
14. WND500 (Zonal (u) and Meridional: (v) Wind at 500 hPa)
15. WND700 (Zonal (u) and Meridional: (v) Wind at 700 hPa)
16. WND850 (Zonal (u) and Meridional: (v) Wind at 850 hPa)
17. WND1000 (Zonal (u) and Meridional: (v) Wind at 1000 hPa)
18. PSI200 (Streamfunction at 200 hPa)
19. PSI850 (Streamfunction at 850 hPa)
20. CHI200 (Velocity Potential at 200 hPa)
21. CHI850 (Velocity Potential at 850 hPa)
22. VVEL500 (Vertical Velocity at 500 hPa)
23. Q500 (Specific Humidity at 500 hPa)
24. Q700 (Specific Humidity at 700 hPa)
25. Q850 (Specific Humidity at 850 hPa)
26. Q925 (Specific Humidity at 925 hPa)
27. PRMSL (Mean Sea Level Pressure)
28. IPV450 (Potential Vorticity at 450 K Isentropic Level)
29. IPV550 (Potential Vorticity at 550 K Isentropic Level)
30. IPV650 (Potential Vorticity at 650 K Isentropic Level)

Important Note: The forecast at the first time step (f00) of 3 minutes constitutes a spin up of the model physics, and extreme care should be taken when using it as a proxy of any type of validation. **IT IS NOT THE ANALYSIS.**
Layout of the 13 Hourly Time Series from the OCN files are given below:

**Initial condition 1 Jan 1979, 0Z**
- Record 1: f01: forecast averaged over 0 to 1 hour
- Record 2: f02: forecast averaged over 1 to 2 hours
- Record 3: f03: forecast averaged over 2 to 3 hours
- Record 4: f04: forecast averaged over 3 to 4 hours
- Record 5: f05: forecast averaged over 4 to 5 hours
- Record 6: f06: forecast averaged over 5 to 6 hours

**Initial condition 1 Jan 1979, 6Z**
- Record 7: f01: forecast averaged over 0 to 1 hour
- Record 8: f02: forecast averaged over 1 to 2 hours
- Record 9: f03: forecast averaged over 2 to 3 hours
- Record 10: f04: forecast averaged over 3 to 4 hours
- Record 11: f05: forecast averaged over 4 to 5 hours
- Record 12: f06: forecast averaged over 5 to 6 hours

**Initial condition 1 Jan 1979, 12Z**
- Record 13: f01: forecast averaged over 0 to 1 hour
- Record 14: f02: forecast averaged over 1 to 2 hours
- Record 15: f03: forecast averaged over 2 to 3 hours
- Record 16: f04: forecast averaged over 3 to 4 hours
- Record 17: f05: forecast averaged over 4 to 5 hours
- Record 18: f06: forecast averaged over 5 to 6 hours

**Initial condition 1 Jan 1979, 18Z**
- Record 19: f01: forecast averaged over 0 to 1 hour
- Record 20: f02: forecast averaged over 1 to 2 hours
- Record 21: f03: forecast averaged over 2 to 3 hours
- Record 22: f04: forecast averaged over 3 to 4 hours
- Record 23: f05: forecast averaged over 4 to 5 hours
- Record 24: f06: forecast averaged over 5 to 6 hours

…….. and so on, till the end of the month (31 Jan 1979, 18Z) with 744 records.
13 Hourly Time Series from the OCN Files

1. OCNDT20C (Depth of 20C Isotherm)
2. OCNHEAT (Ocean Heat Content)
3. OCNSLH (Sea Level Height)
4. OCNSST (Ocean Potential Temperature at depth of 5m)
5. OCNU5 (Ocean Zonal Current at depth of 5m)
6. OCNV5 (Ocean Meridional Current at depth of 5m)
7. OCNSAL5 (Ocean Salinity at depth of 5m)
8. OCNU15 (Ocean Zonal Current at depth of 15m)
9. OCNV15 (Ocean Meridional Current at depth of 15m)
10. OCNT15 (Ocean Potential Temperature at depth of 15m)
11. OCNSAL15 (Ocean Salinity at depth of 15m)
12. OCNVV55 (Ocean vertical velocity at depth of 55 m)
13. OCNMLD (Ocean Mixed Layer Depth)