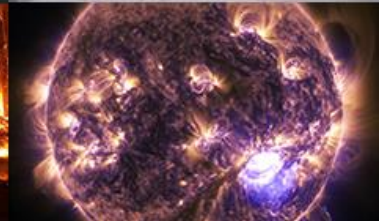
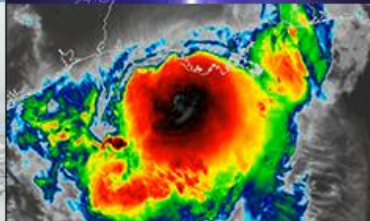


The Community Support of the GEFS Reforecast (GEFSv12/GEFSv13)

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Outline

1. General Usage of the GEFSSv12 Reforecast
2. The GEFSSv12 and planned GEFSSv13 Reforecast designs
3. Plan for GEFSSv13 Reforecast products
4. Summary

Users of the GEFsv12 Reforecast

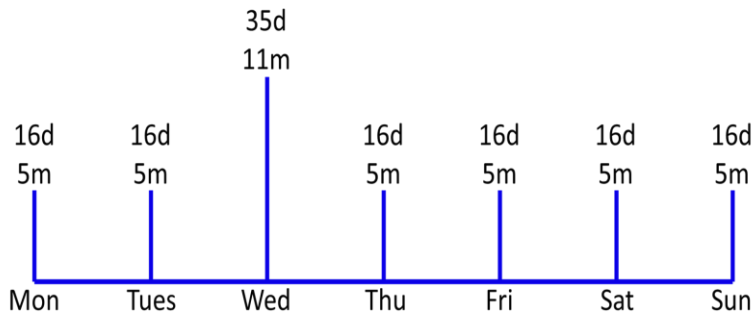
- Since the GEFsv12 reforecast became publicly available on AWS and the EMC FTP websites, EMC has been in communication with about 30 interested users.
- These reforecast users are from a variety of industries, including the public sector, private sector and academia.
- These users range from individual researchers to large organizations.
- Reforecast users are from a variety of countries.

General Uses from Major Stakeholders

Organization	Use of GEFsv12 Reforecast
OWP	Atmospheric forcing for the Hydrologic Ensemble Forecast Service (HEFS)
CPC	Bias-correction of subseasonal forecasts

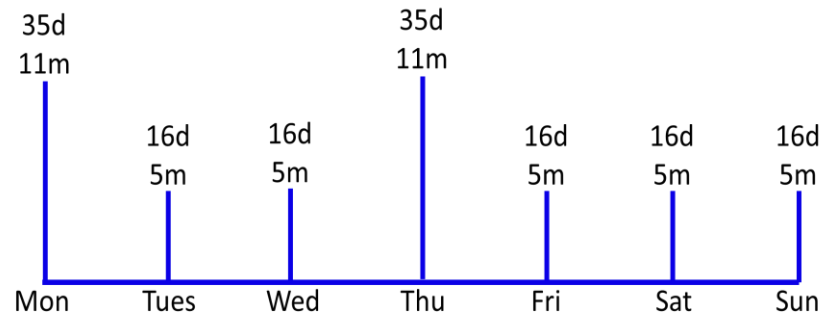
GEFSv12 Reforecast Design

	16-day forecast	35-day forecast
Ensemble Size	5 members	11 members
Forecast Frequency	Everyday except Wednesday	Every Wednesday
Reforecast Period	1989-2019 (31 years)	1989-2019 (31 years)



Plan for GEFSv13 Reforecast Design

	16-day forecast	35-day forecast
Ensemble Size	5 members	11 members
Forecast Frequency	Everyday except Monday and Thursday	Monday and Thursday
Reforecast Period	1994-2023 (30 years)	1994-2023 (30 years)



Upper Air

Upper Air Variables 55 variables +24 new variables	Days 1-16 (or Days 1-35)							
	1 degree							
	UGRD	VGRD	TMP	RH	HGT	VVEL	O3MR	
1 hPa	X	X	X					Daily-Averaged
2 hPa	X	X	X					
3 hPa	X	X	X					
5 hPa	X	X	X					
7 hPa	X	X	X					
10 hPa	X	X	X		X		X	
20 hPa	X	X	X					
30 hPa	X	X	X					
50 hPa	X	X	X		X		X	
70 hPa	X	X	X					
100 hPa	X	X	X		X		X	6-hourly
200 hPa	X	X	X	X	X			
250 hPa	X	X	X	X	X			
500 hPa	X	X	X	X	X			
700 hPa	X	X	X	X	X			
850 hPa	X	X	X	X	X	X		
925 hPa	X	X	X	X	X			
1000 hPa	X	X	X	X	X			
0.995 (hybrid)	X	X	X	X				

- Variables in blue are additional variables planned to be added to the GEFsV13 reforecast.

Stratosphere

- Total of 34 variables
- Variables are to be available in 1 degree
- Variables are to be daily-averaged

Troposphere

- Total of 45 variables
- Variables are to be available in 1 degree
- Variables are to be saved as 6-hourly

2D Atmosphere and Ocean Surface Variables

2D Atmosphere and Ocean Surface Variables 22 variables +17 new variables	Days 1-10: 0.25 degree, 3-hourly	
	Days 10-16 (or Days 10-35): 0.5 degree, 6-hourly	
PRMSL	CIN (180-0mb)	Freezing Level
PRES (surface)	TCDC (entire atmosphere)	6-hr Snowfall Accumulation
TMP (2m)	WEASD (surface)	PEVPR (surface)
Tmax (2m)	OLR (TOA)	WATR (surface)
Tmin (2m)	DLWRF (surface)	FDNSSTMP (foundation TMP)
RH (2m)	DSWRF (surface)	TMP (surface)
UGRD (10m)	ULWRF (surface)	Bucket Snowfall Accumulation
VGRD (10m)	USWRF (surface)	
APCP (surface)	LHTFL (surface)	
CRAIN (surface)	SHTFL (surface)	
CFRZR (surface)	SOILW (0.0m-0.1m)	
CICEP (surface)	SOILW (0.1m-0.4m)	
CSNOW(surface)	SOILW (0.4m-1.0m)	
PWAT (entire atmosphere)	SOILW (1.0m-2.0m)	
CAPE (180-0mb)	TSOIL (0.0m-0.1m)	
HLCY (3000-0m)	TSOIL (0.1m-0.4m)	

- Variables in blue are additional variables planned to be added to the GEFsV13 reforecast.
- Total of 39 variables
- For lead days 1-10, variables are to be 0.25 degrees and 3-hourly
- For Lead days greater than 10, variables are to be 0.5 degrees and 6-hourly

Ocean and Ice Variables

<u>Ocean Variables</u> +33 new variables	1 degree Daily-averaged	
SST	TMP (35 meters)	TMP (145 meters)
SSH	TMP (45 meters)	TMP (155 meters)
SSS	TMP (55 meters)	TMP (165 meters)
MLD_003	TMP (65 meters)	TMP (175 meters)
Taux	TMP (75 meters)	TMP (185 meters)
Tauy	TMP (85 meters)	TMP (195 meters)
SSU	TMP (95 meters)	TMP (205 meters)
SSV	TMP (105 meters)	TMP (215 meters)
TMP (5 meters)	TMP (115 meters)	TMP (225.9 meters)
TMP (15 meters)	TMP (125 meters)	TMP (241.1 meters)
TMP (25 meters)	TMP (135 meters)	TMP (266.5 meters)

<u>Ice Variables</u> +10 new variables
aiice_d (Sea Ice Concentration)
hi_d (Ice Thickness)
Tsfc_d (Ice/Snow Surface Temperature)
uvel_d (U Ice Velocity)
vvel_d (V Ice Velocity)
hs_d (Snow Depth on Ice)
albsni_d (Ice/Snow Albedo)
melts_d (Top Melt)
meltb_d (Bottom Melt)
frzmlt_d (Freeze-melt)

- Total of 33 ocean variables
- Total of 10 ice variables
- Ocean variables are daily-averaged and 1-degree
- Ice variables are daily-averaged and on their native grid (~0.25 degree)

- Variables in blue are additional variables planned to be added to the GEFSv13 reforecast.

Summary

- The GEFSv12 reforecast has been used for many purposes by a variety of users.
- For the GEFSv13 reforecast, it is planned that 84 additional variables will be available to users.
- The GEFSv13 reforecast will include not just atmosphere and surface variables, but also ocean and ice variables.

<u>Number of Variables</u>	GEFSv12	GEFSv13
Upper Air	55	79
Surface	22	39
Ocean	0	33
Ice	0	10
Total Variables	77	161

