# **Lab 11: Forecasting - Numerical Weather Prediction**

You will be using the following website <a href="http://mag.ncep.noaa.gov/">http://mag.ncep.noaa.gov/</a> for many questions. Open up a few tabs of this site because you will be doing some side-by-side comparisons of forecasts.

### **Question 2:**

Use <u>www.wunderground.com</u> instead. Write down the forecasted values and their typical error <u>with proper units</u> 5 days from now (i.e., 04/30) (for e.g., high temperature of  $70^{\circ}$ F with typical error of  $\pm 4^{\circ}$ F).

### **Question 3:**

http://mag.ncep.noaa.gov/

Click through "Model Guidance  $\rightarrow$  Model Area (NAMER)  $\rightarrow$  Model Type (GFS)  $\rightarrow$  Cycles (Select 04/25/2019 06UTC, make sure to check that the correct cycle is selected since this may be updated as the lab progresses)  $\rightarrow$  1000\_500\_thick  $\rightarrow$  1 Day

### **Question 4:**

**Correction**: Select "3 Day" instead of "Loop All."

### **Question 5:**

In an extra browser tab, redo the steps for Question 3 in the manual, but <u>select NAM for Model Type</u> instead of GFS this time. Cycle: 04/25/2019 06UTC (<u>make sure to check that the correct cycle is selected since</u> this may be updated as the lab progresses). Perform loop simulations for both GFS and NAM side-by-side; note the differences between the two models <u>for 1 Day and 3 Days loop.</u>

#### **Question 6:**

• How to read a MOS table?

http://www.nws.noaa.gov/mdl/synop/mavcard.php

<u>Correction</u>: <u>Do not look up MOS tables. Use the ones I have provided below for Questions 6-8</u>.

For this question, near-term forecast means the forecast <u>for the next day</u> (i.e., April 26, 2019). Answer for **both** GFS and NAM models. Probabilities in the MOS table are shown as digits but are actually percentages. Also note that times are in UTC (which is 4 hours ahead of Eastern Time). Finally, be sure to differentiate between the *probability* of rain and *expected* amount of rain in your answer.

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#### **Question 7:**

Use **Chart 1** on the worksheet I have distributed. Look at the forecasts for **April 27**<sup>th</sup>. High temperature and low temperature must be found by looking at the X/N row for the last day on the MOS map. **For precipitation, wind, and cloud cover, a short description is required,** i.e., not just a single value.

Sample response for precipitation: High probability of rain (72% probability) between 6 UTC and 12 UTC; it will likely rain between 0.1 to 0.25 inches before noon.

# **Question 8:**

Use **Chart 2** and answer the question below it. The third-row entry "Forecast" refers to the human-generated forecast for the same day (April 27<sup>th</sup>), which can be obtained from: <a href="https://www.weather.gov">https://www.weather.gov</a>. Enter "KBWI" for Location.

# **Question 9:**

In an extra browser tab, follow the steps written in question 3 in the manual, but select "GEFS-SPAG" for Model Type instead of GFS this time. Click on **500\_516\_558\_ht**. Click "Loop All."

Click "stop" and use the arrow to manually progress through the model. Tell me **where** (geographic location) the model STARTS showing uncertainty as well as **when** (in UTC) this happens. Are there also other areas that are still easier to predict?

### **Question 11:**

In an extra browser tab, follow the steps written in question 3 in the manual, but select "GEFS-SPAG" for Model Type instead of GFS this time. Click on the "mslp 1008 1048 iso" map. Click "Loop All."

Click "stop" and use the arrow to manually progress through the model. Answer the questions in the manual.

Additionally, give me 2 timestamps (in UTC): (i) When does the model first START showing uncertainty, (ii) When does the model output become totally meaningless?

# **Question 12:**

Go to <a href="https://weather.gc.ca/ensemble/naefs/cartes\_e.html">https://weather.gc.ca/ensemble/naefs/cartes\_e.html</a> instead of the website the manual tells you to go to.

Forecast Day should be 5 days from now (i.e., the 120-hour forecast) or 2019-04-30.

When looking at these maps, the "means" are the contour lines and the "spreads" are the filled-in colors.

Fill in your answers in the box on the next page for College Park, MD. WRITE PROPER UNITS.

Correction for the Table: The left column of the box should be as follows

Rain (Chart type: Precipitation)

Surface Temperature (Chart type: Surface Temperature)

Wind at 200 hPa (Chart type: Wind at 200 hPa)

Surface Wind Speed (Chart type: Surface Wind Speed)