Northern New England

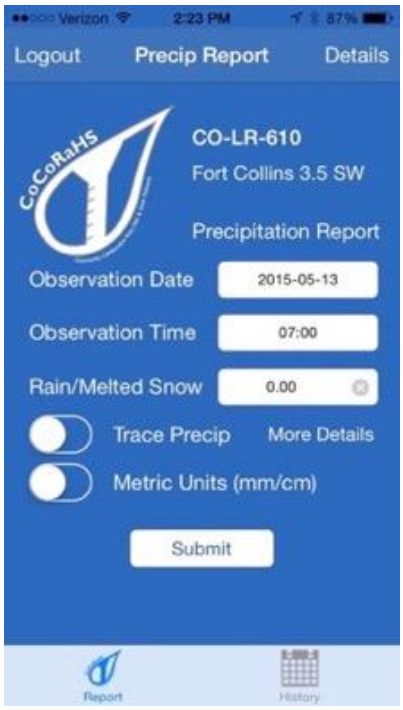
AUTUMN 2019

CoCoRaHS Visits Our Office!

Henry Reges, National Outreach Coordinator for CoCoRaHS, stopped by our office on the morning of August 23 to give a presentation and visit with our team. It was an exciting opportunity to share thoughts and ideas about all things CoCoRaHS. Thank you for visiting WFO Gray, Henry!

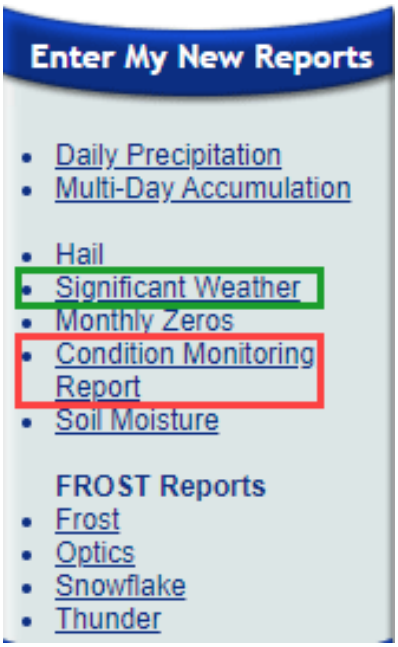
Left to right: Hendricus Lulofs, Maura Casey, Nikki Becker, Derek Schroeter, Justin Arnott, William Watson, Henry Reges

As a result of Henry's visit, we will lead off with some information about some aspects of CoCoRaHS that you may not be familiar with but may find informative:



The CoCoRaHS App: The app can be used to submit precipitation reports, including flooding information and any additional notes, and review your past reports. You can find the links to download the app directly on the front page of cocorahs.org on the right hand side under the "Things to know about…" links. One note: the app is not maintained by CoCoRaHS, so if you have any issues using it, please contact its developer.

Condition Monitoring Reports: In addition to your regular daily precipitation reports, you can submit a condition monitoring report. CoCoRaHS suggests completing these reports on a regular basis (weekly, monthly, etc.) to provide additional information about how precipitation (or the lack thereof) at your location is affecting your interests. Condition monitoring reports are used at the national (U.S. Drought Monitor) and regional (American Association of State Climatologists) level for drought forecasting. You can find more information about condition monitoring reports here.



Significant Weather Reports: You can submit a significant weather report when heavy rain or snow is or has been falling at your location. But why submit this type of report? Two reasons: 1) A significant weather report allows you to specify the duration (hours or minutes) of the heavy precipitation and 2) we will see your significant weather report here at the office in real time! So if you are seeing heavy rain, flooding or heavy snow at your location in the future, consider submitting a significant weather report; it may provide the necessary information for us to make a decision on a warning or advisory!

NEW Quality Control Training Video: CoCoRaHS recently released an animated training video about the quality assurance and quality control process of CoCoRaHS reports. As a reminder, your reports are not only checked on a daily basis by us at the office, but they also go through a QA/QC process at CoCoRaHS. The video, along with many other CoCoRaHS training animations, can be found here. Please remember that if your report is in question and you are contacted about it, it is important that you respond so we can work through the issue together!

Water Year 2019 Comes to an End

Remember that a water year runs from October through September, so the 2019 water year officially came to an end on September 30. You should have received an email from CoCoRaHS about your certificate and water year summary; it is also a good time to review your data for errors and submit any reports you may have missed. We also want to take the opportunity to show our appreciation for all of our CoCoRaHS volunteers in Maine and New Hampshire…**thank you!!!** And a very special thank you to the volunteers below who submitted a report every day over water year 2019!!!

ME-AN-40	NH-BK-2
ME-CM-3	NH-BK-12
ME-CM-54	NH-CR-27
ME-HN-2	NH-CH-20
ME-LN-1	NH-CS-10
ME-LN-21	NH-GR-1
ME-SM-3	NH-MR-6
ME-WS-31	NH-MR-11
ME-YK-3	NH-RC-17
ME-YK-28	NH-RC-18
ME-YK-52	

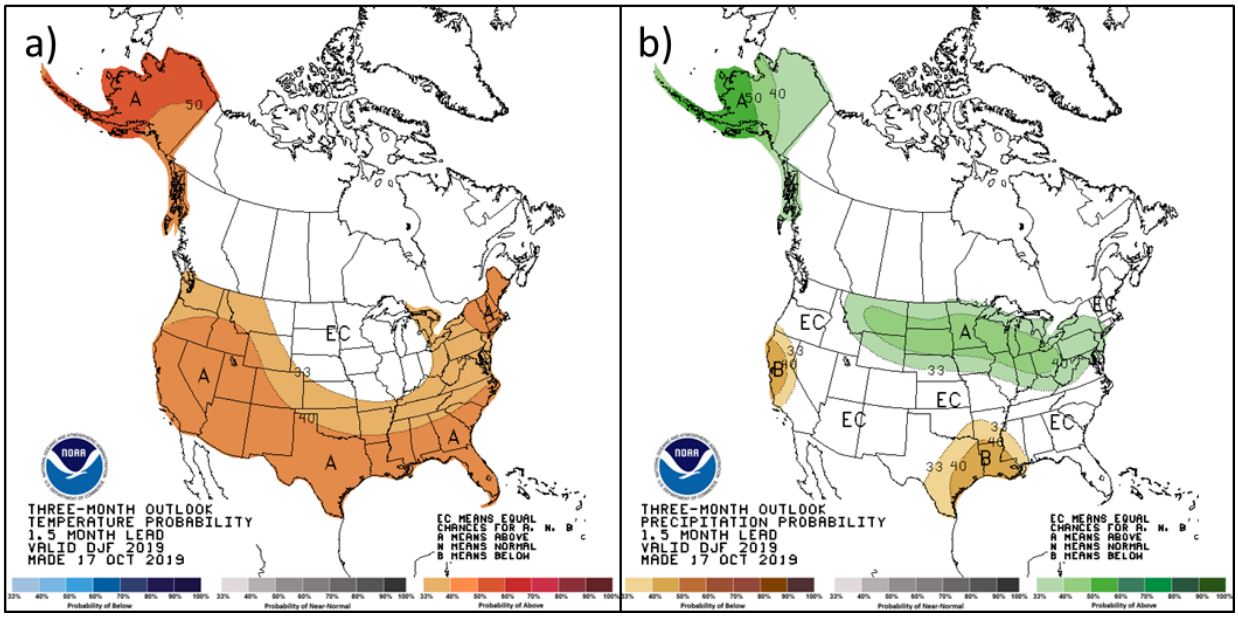
A New Face on Our CoCoRaHS Team

We would like to introduce a new CoCoRaHS team member (and a new meteorologist in our office)! Michael Clair grew up in Biddeford, Maine with a lifelong passion for weather and forecasting. He spent much of his time at Old Orchard Beach, both in the summertime and during winter storms. He would go on to lifeguard there for seven summers, and enjoyed watching the waves and the weather each day. Michael attended school at Plymouth State University in Plymouth, New Hampshire, and earned his Bachelor's in Meteorology in May 2016. He then worked as a Marine Meteorologist at Weather Routing Inc. in Glens Falls, New York, before returning to Plymouth State in the fall of 2017 to earn his Master's degree in Applied Meteorology. While at Plymouth, Michael focused his Master's thesis on freezing rain and sleet across the coastal plain of Maine and New Hampshire. The study built a 30 year climatology of events and aimed to aid in forecasting during different types of mixed precipitation events.

During the summer of 2018, Michael worked as a volunteer intern at WFO Gray. He learned about the day-to-day duties of the office as well as procedures during severe weather in the summertime. He was elated at the opportunity to work at his home National Weather Service office in Gray and joined us at the end of September 2019. He's looking forward to being involved with the CoCoRaHS program and having the opportunity to work with all the members involved.

2019-20 Winter Outlook

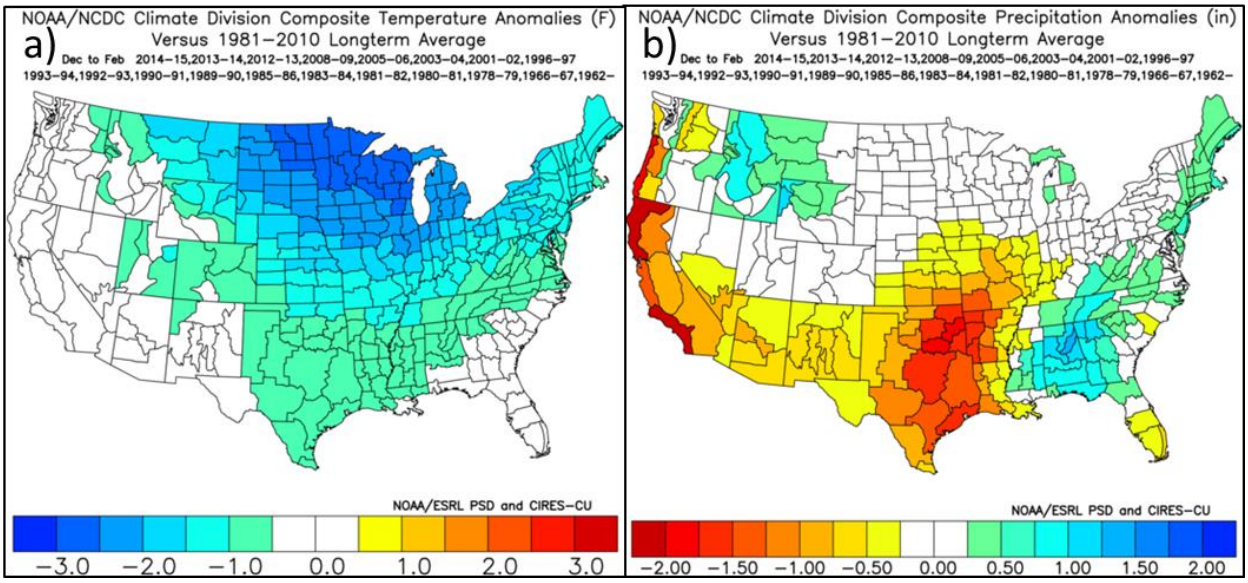
As the leaves and temperatures continue to fall, it's usually around this time of the year that people start to wonder what may be in store for the upcoming winter. Our partners at the Climate Prediction Center (CPC) have released their winter outlook. The outlook they have released is for the meteorological winter months of December, January, and February, and should be read as the likelihood of a certain outcome occurring. The outlook is found below, with figure a) being the temperature outlook, and figure b) being the precipitation outlook.



Across Maine and New Hampshire, there is a 40-50% chance of temperatures being above normal. This means the most likely single outcome is that temperatures will be above normal, even if the chances of this occurring do not constitute the majority of the outcomes. The CPC precipitation forecast for Maine and New Hampshire is what is referred to as "equal chances", meaning that there is an equal chance of precipitation being below normal, near normal, or above normal.

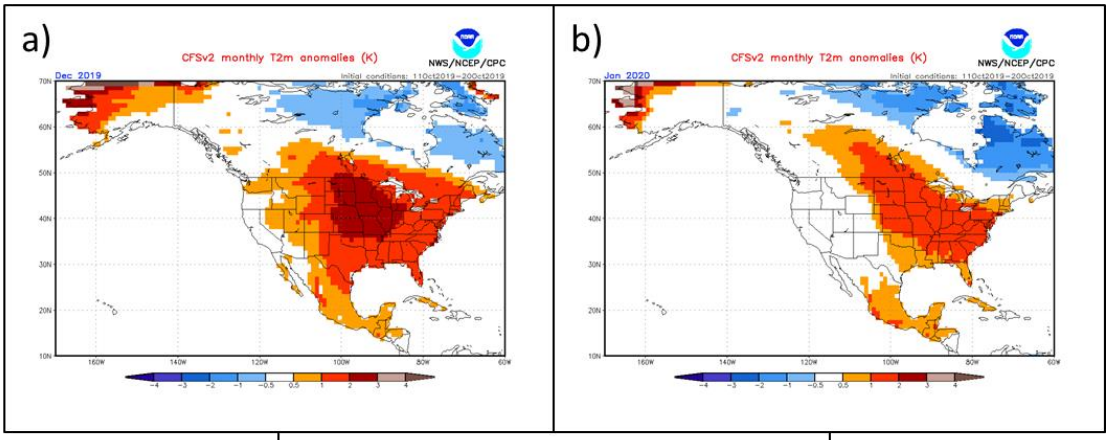
One factor that plays into these seasonal forecasts is the El Niño-Southern Oscillation (ENSO) index. The strength of the ENSO index is determined by sea surface temperature (SST) anomalies in eastern equatorial Pacific. Currently, the forecast is for neutral conditions with neither El Niño nor La Niña likely to develop this winter. The same way that El Niño and La Niña winters have a historical pattern to the winter's outcome, so do neutral ENSO winters. Below is a composite of the

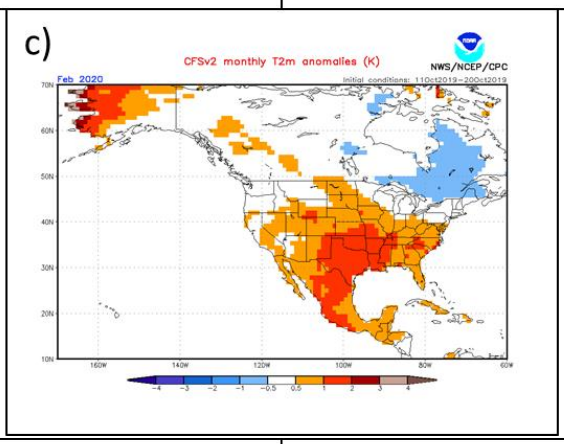
average a) temperature anomaly, and b) precipitation anomaly for the US during neutral ENSO years, courtesy of NWS Newport/Morehead City, NC.

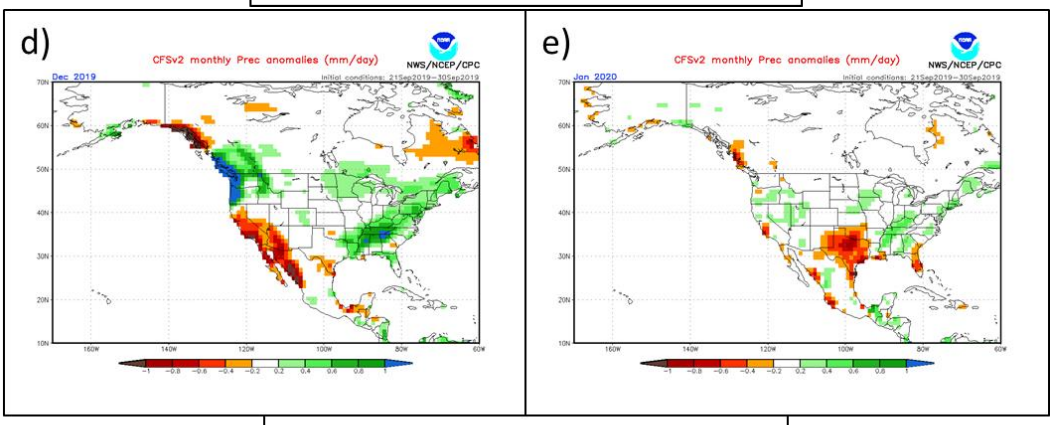


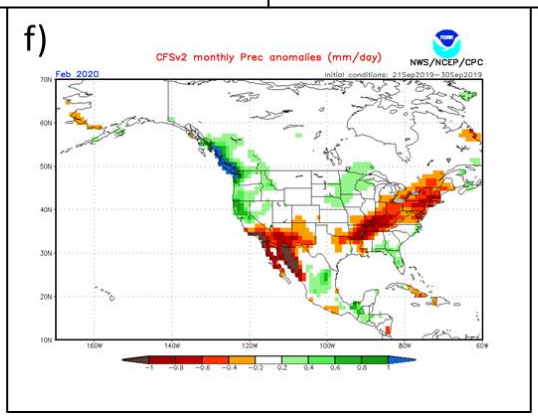
Historically speaking, neutral ENSO winters are well correlated with below normal temperatures and above normal precipitation in Maine and New Hampshire. However, ENSO is not the only factor that influences winter or winter forecasts. Another important aspect to winter forecasts is available model data from long range weather models. One of these US-based weather models is the Climate Forecast System Version 2 (CFSv2). The model outputs monthly temperature anomaly forecasts, as well as monthly precipitation anomaly forecasts. These temperature anomaly forecasts are shown for a) December, b) January, and c) February. The precipitation anomaly forecasts are shown for d) December, e) January, and f) February. (All images on following page.)

The CFSv2 is predicting above normal temperatures for December in Maine and New Hampshire, near to above normal in January, and near to below normal for February, which overall averages out to a forecast of slightly above normal. For precipitation, it is predicting above normal for December, near to above normal for January, and below to well below normal for February, which roughly averages out to a forecast of near normal precipitation.


a)
CFSv2 monthly T2m anomalies (K)
NWS/NCEP/CPC
Dec 2019
b)
CFSv2 monthly T2m anomalies (K)
NWS/NCEP/CPC
Jan 2020


c)
CFSv2 monthly T2m anomalies (K)
NWS/NCEP/CPC
Feb 2020


d)
CFSv2 monthly Prec anomalies (mm/day)
NWS/NCEP/CPC
Dec 2019
e)
CFSv2 monthly Prec anomalies (mm/day)
NWS/NCEP/CPC
Jan 2020


f)
CFSv2 monthly Prec anomalies (mm/day)
NWS/NCEP/CPC
Feb 2020

Long range forecasts are tricky. There are many factors that influence a winter's outcome, some of which are not even present at the time a forecast is made. It becomes even trickier when the models are in disagreement with what has happened historically. These signals sometimes become stronger the closer we get to the heart of the winter season, but it remains to be seen if that's the case with this winter. The only thing that's certain is that winter will be here before we know it!

It's Time for Measuring Snow!

The leaves are just about done falling, which means that it won't be long until we're back to dealing with the white stuff. Before winter's grip takes hold, we thought it would be beneficial to go over the proper techniques for measuring snowfall and snow depth. In order for the data quality to be consistent for various locations, a set of guidelines and procedures have been adopted at CoCoRaHS. There are four main measurements that are taken for snow. They are…

1. Measuring freshly fallen snow.
2. Taking the water equivalent of the fresh snow.
3. Measuring the total snow depth.
4. Taking the liquid equivalent of the total snow depth.

Procedures for taking these four measurements are discussed below.

Before the flakes start flying, you should place your snowboard outside. The board should be at least 16" x 16" in size, and painted white to minimize heat absorption and extra snow melt. Place the board in an open area, and if possible in an area

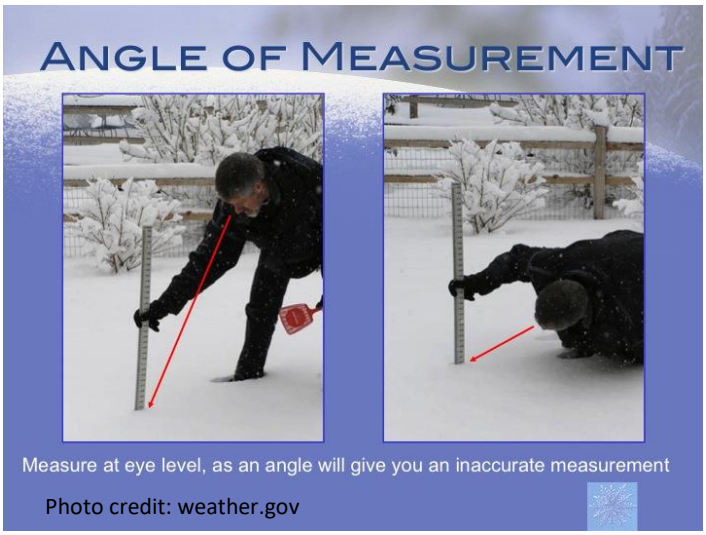
where minimal drifting occurs. When it snows, measure the amount on this board at your usual measuring time. If possible, take the snow measurement right after the snow stops falling to minimize any settling of the snow. If this is not possible, don't worry, the normal measuring time is still fine. Report the snowfall to the nearest tenth of an inch. Clear the board off after each measurement, and place it on top of the snow.

If there is any blowing or drifting of the snow, it is important to take multiple measurements. It's best to take at least three measurements that are representative of the area, being careful to avoid drifts or man-made snow piles, as well as areas where most of the snow was blown away. It will be necessary to make these measurements off of the snow board. Then, take the average of the measurements, and report the average as the snowfall total.

Another aspect of taking snowfall measurements is taking the water equivalent of the snow. The proper procedure for doing this is to remove the funnel and the inner tube from your four inch rain gauge, and allow the snow to fall into the outside cylinder. If snow accumulates on the upper rim of the cylinder, press straight down on the snow with a spatula, or similar tool, so that the snow suspended above the inside portion of the cylinder falls in, and that suspended over the outside of the cylinder falls to the ground. Then, take the cylinder inside, measure a certain amount of warm water in the inner cylinder, write this amount down, and pour the warm water into the snow in the outer cylinder. Let the snow melt, and then measure the amount of water from the melted snow and added water. Subtract the amount of warm water added and you have the amount of water that is in the snowfall to the nearest hundredth of an inch.

If the snow that is in the cylinder does not appear representative to the amount of snow that actually fell, empty the cylinder, and press the open end down onto your snowboard, put your spatula, or similar tool, on the open end at the bottom of the

snow, and flip it over so the snow falls and stays in the cylinder. You can then proceed with the melting procedure described above.



The most common daily measurement taken is the snow depth measurement. This is the amount of snow on the ground, whether it snowed in the previous 24 hours or not. This measurement should be calculated by taking multiple measurements (at least three) and then taking the average of the measurements. It should be reported to the nearest half inch. There will be times, especially after periods of melting, that there will be bare spots. These spots are important, and account for a measurement of zero. If roughly half the area has no snow, then half of the values going into the calculation should be zero.

The final measurement of discussion is the snow depth water equivalent. Taking this measurement is optional, but is extremely useful information. This is done by pressing your outer cylinder into the snowpack in a place that has the same depth as your average snow depth. Then, take it inside and proceed how you normally would for taking the snow water equivalent for a new snowfall.

Finally…another THANK YOU for your contributions! Look for our next newsletter in spring 2020!

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