TRANSCRIPT

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Sandy (operator):

Welcome and thank you for standing by. Participants are in the listen-only mode until the question-answer session of today's call. At that time, please press star one on your phone to ask a question. In addition, this call is being recorded. If you have any objections, you may disconnect at this time. I would now like to turn the call over to your host, Mr. John Bateman. Thank you, and you may begin.

John Bateman:

Thank you, Sandy. Good morning and thank you for joining this monthly climate update call, part of the suite of climate services that NOAA provides to government, business, academia, the media and the public to support informed decision-making. I'm John Bateman with NOAA Communications and I'll be facilitating the call today. If you have any additional questions after the conclusion of today's call, my colleague John Leslie and I can both be reached by email at, and I will spell it, N-E-S-D-I-S, dot, P-A at N-O-A-A, dot, G-O-V. That is nesdes.pa, as in public affairs, @NOAA.gov. Today's update will feature three short presentations followed by an operator-assisted question and answer session at the end, and a copy of the presentation our speakers will be following can be downloaded from the link in the media advisory.

With that, I will introduce our speakers today. Our first presenter is Karin Gleason, monitoring section chief from NOAA's National Centers for Environmental Information, or NCEI, who will provide a summary of the January US and global climate report, as well as the latest Drought Monitor update. Our second presenter is Boyin Huang, an oceanographer with NOAA NCEI, who will discuss NOAA's updated global temperature dataset, which now uses artificial intelligence to improve vital global climate monitoring. Our third presenter is Dan Collins, a meteorologist with NOAA's Climate Prediction Center who will provide the latest El Nino update, and also the US temperature, precipitation, and drought outlooks for March, April and May. Our first speaker will be Karin Gleason from NOAA NCEI. Karin.

Karin Gleason:

Thank you, John, and thanks to everyone for joining the call today. Let's begin by looking at the global temperature data for January 2024 on slide number two. And the first thing I want to point out is that

NCEI has transitioned its global temperature dataset to NOAA Global Temp version 6.0 with the January 2024 release. And with version 6.0 there are improvements and enhancements in data, methodology, and performance over prior versions, which our guest speaker will cover in more detail here shortly. While anomaly values and ranks might differ slightly from previous versions, the main conclusions regarding the overall trends and global temperatures are very similar to the previous version. In fact, the warmest 10 years on record in the previous operational version are the same 10 years with this new version. Now let's turn our attention to the global temperature maps we see, and the global surface temperature anomaly for January 2024 was 1.27 degrees Celsius, or 2.29 degrees Fahrenheit above the 20th century average, making this the warmest January on record, and the eighth consecutive month of record warm global temperatures.

This departure value was four hundredths of a degree Celsius above the previous record from January of 2016. Global ocean temperatures in January set a record for the 10th consecutive month with a departure value of 1.03 degrees Celsius, or 1.85 degrees Fahrenheit above the long-term mean. And when looking at land only, we see that the 1.82 degrees Celsius or 3.28 degrees Fahrenheit positive warm anomaly value tied with 2007 for third-warmest January on record. Looking at the temperature departure map on the left and the corresponding percentiles in the map on the right, we see that temperatures were above average throughout the Arctic. Most of Northeastern North America, central Russia, Southern Asia, Africa, South America and Australia. Sea surface temperatures were above average across much of the northern, western, and equatorial Pacific Ocean, as well as parts of the Western Indian Ocean. Much of the central Atlantic Ocean was record warm for the month.

Much of northwestern North America, the central and southern United States, Northern and Northeastern Europe, northeastern Asia and Antarctica experienced near to or cooler than average temperatures during January. Sea surface temperatures were near to below average over parts of the southeastern Pacific Ocean, the Southern Ocean and southwestern Indian Ocean. Looking at continental temperatures, South America and Africa ranked warmest on record for January, with Australia and Oceania ranking third-warmest. Asia ranked ninth-warmest, Europe's 19th warmest, and North America's 20th warmest on record. Record warm temperatures, which can be seen in the dark red areas in the percentile map on the right, covered approximately 12.3% of the world's surface, which is the highest percentage for January since the start of these records in 1951, and was 2.5% higher than the previous record of 9.8% in 2016. Shifting our attention now to slide number three, we see the January 2024 global temperature departure value compared to the year-to-date plots for the 10 warmest years on record, as well as the temperature ranking outlook for the year.

Looking at the time series of the 10 warmest years on record, we see that 2023 has taken 2016's slot for the warmest year on record. We also see that January 2024, which is depicted by the black bar on the upper left-hand side of this plot, is the warmest January amongst the warmest 10 years on record, and was slightly warmer than January of 2016. And according to NCEI's temperature ranking outlook, statistical analysis, as depicted in the bar plot on the bottom of this slide, there is approximately a 22% chance that 2024 will end as the warmest year on record, and about a 99% chance of a top five warm year. Moving on to slide number four, we see the January temperatures and precipitation for the United States, for the contiguous US, and temperature averaged 31.8 degrees Fahrenheit, which was 1.6 degrees Fahrenheit above the long-term mean.

Looking at the 130-year period of record, this falls into a near average category. Looking at the temperature ranks map on the left, we see that in general temperatures were above average across the upper Midwest, the great Lakes, much at the east coast from North Carolina to Maine, and across portions of the western US. Wisconsin had its 10th warmest January on record. Precipitation across the contiguous U.S averaged 3.18 inches for the month of January, which is 87 hundredths of an inch above the long-term mean. This translates to a rank of 10th wettest for the month.

Looking at the precipitation map on the right, precipitation was above average across much of the central to eastern US and in parts of the west. Conversely, precipitation was below average from parts of the northern Rockies to portions of the upper Midwest. Massachusetts and Connecticut were each third-wettest on record for January, while North Dakota was 10th driest. And now turning our attention to slide number five and the latest US drought monitor map, which was just released this morning. We see that approximately 19.5% of the contiguous US is in drought, which is down about 13.5% since early January.

This is the smallest drought footprint observed across the contiguous US since May of last year. Drought conditions lessened or diminished across the northwest, the southwest, the Midwest and the central plains, and significant drought contraction occurred in central Texas and from the lower Mississippi River Valley to Virginia. And this was due to the active storm track throughout the month of January across the south and the southeast. Drought conditions expanded or intensified across the northern Rockies and outside of the contiguous US, we saw drought coverage lessen across Hawaii and expand across Puerto Rico. And with that I'll turn the presentation over to Boyin for the background on NCEI's transition to NOAA Global Temp version 6.0.

Boyin Huang:

Thanks. So it's my turn. Let me introduce the NOAA Global Temp version six on slide six. So we just immediate turn to the next slide seven. It's about NOAA Global Temp. So NOAA Global Temp is a fundamental data set for research and assessment. Basically it's a consistent sea surface air temperature over land, and also the Arctic, which is very special. Originally Arctic was using sea surface temperature, but now because of the sensitivity of the climate change, we use it as a sea surface air temperature instead of sea surface temperature. And otherwise, over the ocean we're using the sea surface temperature. The data set has global coverage as shown in the map, and has a five degree grid solution. The time period is start from 1850 all the way to the present at a monthly solution. And please move on the slide eight.

NOAA Global Temp has a wider application, for example for the scientific research, and the climate monitoring, and climate assessment. The typical example as a kind of two producers, NCEI climate monitoring, WMO, state of the global climate, and IPCC Leopold. And next slide is nine, slide nine. So the reason we are motivated for the version six is the following. On the left side is typically the observations from over the globe. So over the land surface and some islands, the purpose is we want to see over fill the gap region. For example, over the Arctic and Antarctica, we have very fast observations. Our purpose is try to have a good method to fill these data gap region in the Arctic and Antarctica, and also some regional gaps so that we have a global covered data set. So the reason here is in the previously we using called EOT, it's called Empirical Orthogonal Teleconnection method to fill the gap.

Now we are using the ANN method, that's called Artificial Neural Network method to fill the gap. So that's the motivation of this version six. The reason is why and we think that the reason next is that we have kind of advanced the technology application, and we seeing the improvements over the data set. So here is the slide 10. We have the ANN system schematically on the left side, we have a three-layer neural network. On the left side is the input, in the middle is the hidden layer. It's kind of dragging, and the output is the global field grid point. So based on this neural network system, we using the data set schematically on the right side, we needed to change the system using the data set. Then we have the validation and independent observation to validate the system, and then we interpolate or fill the gaps of the global data set.

The next is the slide 11, just the example to demonstrate the improvement of the version six over version five. On the top panel, seeing the observations over the Antarctic region on the September long,

this means that August 2023 example of that month. So from the left to the right is September 4th, September 8th and September 16th. We think that observation data set increase gradually from the left to the right size. Then using this observation data set, we do these reconstructions with the Empirical Orthogonal Teleconnection, EOT method on the middle law, seen in the Antarctic region on the red box earlier. We think the positive anomaly in the early times September 4th, but gradually it becomes negative anomalies, and by the time of September 16th, the middle September, we seen the stabilized negative anomaly. But situation is changed, in the bottom panel using the AI method, we were seeing even as early as September 4th, once we seen the negative anomalies using the ANN method, which was very stable throughout the day eight and day 16 analysis.

So that implication means that we can release the NOAA Global Temp maybe earlier. Right now we release the dataset as basic things, as this picture showing that we may be able to release the dataset a week earlier. Over the ocean basically we are using the NOAA NCEI's, ERSSTv5. So that's the example of the oceans, we have the temperature. Every month, the coverage is thin. Combined with the... Oh, sorry, this is slide 12. And now move on to slide 13.

By combining the SST over oceans and the land surface air temperatures over the continents and arctic regions, we monitor the production of NOAA Global Temp. This is the global mean on the right side. Seeing the difference between the version five on the black line and the version six on the green line, at the early stage like January 3rd and January 5th, you're seeing that a very clear difference between the V4 and V5, and you'll be wondering which one actually is good. But as the observation increases as mentioned in the previous slide, by time of January 13, as the observations coming from the global stations and observations. Then we see that eventually V5 actually merges with V6, and also you're seeing that from version six, you seeing the stability and the very consistent global average after January 5th.

So as I mentioned, we may be able to release the NOAA Global Temp a week earlier in comparison with V5. And in addition to these improvements, but if we look at the long-term average on slide the 14th, global mean temperature, one concern is the long-term trend. In compare with the long-term trend between V5 and V6, we basically saying that the trend is very consistent, because of the reconstruction is mostly focused on the anomaly, but for the long-term trend it does not change much. So here is a summary on slide 15, and basically we have two kind of summaries. One is the NOAA Global Temp has been now released in version six, and the V6 has enhanced the data set and methodology, and as well as the performance over the previous version, typical V5. That's all from my side and let's move on. Let's turn off to Dan. Thank you.

Dan Collins:

Thank you, Boyin. This is Dan Collins of the NOAA Climate Prediction Center. I will now provide the latest El Nino, La Niña update and the climate outlooks for the next three months, and we'll begin by looking at slide 16, with the current conditions in the tropical Pacific Ocean and the forecast of the El Nino Southern Oscillation, or ENSO. So sea surface temperature anomalies averaged over the last four weeks are shown on the map on the left. Above normal sea surface temperatures continues across much of the Pacific Ocean, with larger anomalies in the central and eastern Pacific Ocean near the equator. Both ocean and atmosphere conditions reflect climate state known as El Nino, which accompanies warmer than average ocean temperatures in the Eastern tropical Pacific. The figure on the right shows the probability of El Nino, or warmer than normal tropical Pacific Ocean temperatures in red bars, neutral conditions in gray bars, and the probabilities of cooler than normal temperatures, or La Niña conditions, with blue bars for each of the three months overlapping seasons, beginning with January, February, March, and ending with September, October, November.

El Nino is expected to quickly transition to neutral conditions in spring, and then as sea surface temperatures cool, La Niña is likely to be in place in the end of summer or autumn. A La Niña watch has been issued by the NOAA Climate Prediction Center, as the probability of La Niña exceeds 50% for several overlapping seasons. I'll now turn to slide 17, and this is the temperature and precipitation outlooks for the month of March, shown in the maps on the left for temperature and precipitation on the right.

In the map on the left, shades of orange and red are where above normal temperatures are more likely to occur than below normal, and shades of blue are where below normal temperatures are more likely to occur than above normal. Above normal temperatures are most likely across Alaska and much of the northern United States, including Central and Northern California, the Pacific Northwest, the Northern Plains, and the mid-Atlantic and Northeast states. Below normal temperatures are more likely across much of the south, including parts of the southwest, Texas, and the Gulf coast states. In the map on the right, shades of brown show where below normal precipitation is more likely, and shades of green indicate where above normal precipitation is more likely than below normal. Above normal precipitation is more likely for the south coast of Alaska.

Above normal precipitation is also more likely than below normal from California into the interior west and the Central Plains, as storms into the West Coast are predicted to continue into the month of March. Below normal precipitation is favored for parts of the Pacific Northwest, as well as West Texas and Northern Michigan. Above normal precipitation is likely along parts of the Gulf and Atlantic coasts, which is a typical impact of El Nino. Turning now to slide 18, this shows the average temperature and precipitation outlooks for the three months of March, April and May together in the maps on the left and on the right. On left, above normal seasonal mean temperatures are more likely across most of the Northern US, as well as Alaska. The highest probabilities for above normal temperatures exceed 60% in the Pacific Northwest related to the current El Nino. El Nino was a factor in reducing likelihood of above normal temperatures over the Southern US, where the changing climate favors above normal temperatures. However, El Nino historically would favor near or below normal temperatures.

This increases the uncertainty in the outlook and equal chances of above, near, and below normal temperatures are forecast in those areas in white. Looking to the map on the right, above normal precipitation is favored for northern Alaska, as well as the south coast of mainland Alaska. Also, for a large area of the southeastern United States from the central and lower Mississippi Valley, eastward to the Atlantic coast. Below normal precipitation is favored for the Pacific Northwest.

These patterns of precipitation as stated above, are generally consistent with the impacts of El Nino. In particular, the above normal precipitation in the southeast and the below normal precipitation in the Pacific Northwest are related to El Nino. Below normal precipitation is favored for parts of the southwest near the Rio Grande Valley. With the transition to ENSO neutral conditions over the next couple of months, forecasts favor drier conditions across much of the west. However, March is predicted to have above normal precipitation into central areas of the west, as shown earlier in the March outlook. This leads to uncertainty in the outcome for the three-month season ending with May.

Turning to slide 19, this is the drought outlook for the end of February into March, April and May. This map indicates expected changes in drought conditions by the end of May relative to the drought monitor, which was shown earlier in this presentation, and including the next couple of weeks of February. Areas of persistent drought where it is already present are indicated in brown, areas of predicted drought development are shown in yellow, expected drought improvement is shown in gray, and areas of expected drought removal are shown in green.

Drought is expected to worsen or persist in the northern US, as well as in the southwest. This is related to areas of predicted below normal seasonal precipitation, as well as predicted above normal

temperatures. And also, including forecasts of temperature and precipitation for the end of February are considered in this outlook, as changes are predicted from the current drought conditions through the end of May. You also note that drought is expected to improve or be removed in parts of the central plains and the lower Mississippi Valley. This is due to the seasonal above normal precipitation forecasts. That concludes our look at the climate outlooks. I'll now turn the call back over to John.

John Bateman:

Thanks so much, Dan. We'll now take specific questions from the call participants. Please be sure to identify who you would like to answer the question if possible. And Sandy, could you please remind the call participants how they can ask a question, and then please queue up the first question?

Sandy (operator):

Certainly. We will now begin this question answer session. If you'd like to ask a question, please press star one, unmute your phone, and record your name. Once again, that is star one, unmute your phone, and record your name. If you need to withdraw your question, press star two. One moment while we wait for the first question to come in. Our first question comes from James Dineen. You may go ahead, sir.

James Dineen:

Thank you very much. My question is for the first speaker, you mentioned that there's projecting a 22% chance that 2024 average temperatures will be the hottest year on record. And I'm wondering if you can speak to why you're just giving just a 22% chance that 2024 will be the hottest year on record, given that there's a historical pattern of the year following El Nino's development being warmer than the initial El Nino year.

Karin Gleason:

Yes, this is Karin Gleason with NCEI. The temperature ranking outlook tool is a diagnostic tool. We look backwards at the historical record, rather than looking at forecasts moving forward. And so, based on the way that the temperature anomalies has behaved historically, the percentage is based on thousands of simulations of possibilities, of outcomes through the end of the year. And the conclusion based on those simulations looking at the historical data is that the percent chance is 22. So it isn't necessarily, it knows in the recent past it's been extremely warm. And so, as each month progresses throughout 2024, clearly the margin of error starts to close in on itself. And if you recall, or if you were aware that at the end of '23 when we had our media briefing in January, there was a one in three chance that 2024 would be warmest on record.

So that percentage has dropped a little bit since then. And as far as years following El Nino years being warmer, certainly it's starting that way. I don't know if in the simulations it also is aware that following strong El Nino, sometimes you have rebound effects with La Niñas developing later in the year. And so, depending how quickly, if it does develop, and how it develops, and how strong it is before the end of the year, it's possible that even with a lag that there may be some cooling effect that might happen towards the end of the year. It's possible that this model has picked up on that signal from other strong El Nino years, followed by La Niña episodes. So it really is just, we're going to have to watch as the year progresses to see how this shakes out. But 22% is still, I think the largest percent I've seen in the recent past since we've had this tool operational. So it's still a significant probability for warmest year, but it is looking at the historical data rather than at the forecast in particular. So just to keep that clear.

James Dineen:

Thank you very much.

John Bateman:

Yeah, thank you.

Sandy (operator):

The next question comes from Eric Niiler. You may go ahead, sir.

Eric Niiller:

Hi, can you hear me?

Sandy (operator):

Yes.

Eric Niiler:

A question for Dan Gleason about the, I'm looking at the ice cover over the Great Lakes. There was some information that it's at a record low. I'm sorry, Dan Collins from NOAA. I'm curious what's influencing this aside from just warm temperatures and how do you see things moving forward as you see a transition from El Nino to La Niña conditions here sort of late winter?

Dan Collins:

Well, yes, this is Dan Collins. To answer your question about the ice conditions of the Great Lakes. Absolutely, of course, it's partly by the temperatures that have occurred over that region over the winter months. However, I would have to say that, how things would change going forward. This is not something that is part of our seasonal outlooks or our monthly outlook, the ice conditions, that's a specialized area of NOAA. And I think that if you want more information about what you expect for ice conditions over the lakes, we'll have to put you in touch with another segment of NOAA.

Eric Niiler:

Okay, thank you.

John Bateman:

Hi, Eric, this-

Karin Gleason:

I was going to say this is Karin Gleason. I might be able to shed maybe a little bit of insight. Certainly December and January have been warm across the Great Lakes, which is a large, I mean, it's a significant factor in why the ice is so low. In fact, during January when we had that cold spell, there was a rapid growth of ice for that period of time, where we had those record to near record cold temperatures across the central and eastern US. But certainly after that cold spell, it got really warm again, and we rebounded and had record warm temperatures, and near record warmth across quite a bit of the Great Lakes. And so, all of that ice growth then eroded and it melted. So really the question is, going into

February and maybe March, because then at that point we start coming out of the cold season, and so it isn't likely that La Niña will transition anytime in that timeframe.

So we might miss that opportunity if it stays warm. And I don't know that it will, but if it were to stay warm throughout the remaining part of the cold season, those record to near record ice levels on the Great Lakes likely would persist. But if we transition into a La Niña going into next fall and winter, it could be a whole different scenario. So we'll have to see how that plays out. But we are going to slowly depart away from the cold season and enter the warm season. So ice opportunities, climatologically speaking, are going to start dwindling over the course of the next couple of months.

Eric Niiler:

Thank you.

Sandy (operator):

There are no additional questions.

John Bateman:

All right, thanks so much, Sandy, then I will wrap up the call. First, I'd like to thank all of our speakers for their time and to everyone else for participating in this conference call. I will end by reminding you to mark your calendar for a few upcoming events. The release of the February US Climate Report and Billion Dollar Disaster summary for the US is scheduled for March 8th. The release of the February 2024 Global Climate Report is scheduled for March 14th. And in lieu of our monthly climate call next month, NOAA will host its US Spring Outlook on March 21st. Again, the US Spring Outlook will be next month on March 21st. A media advisory will be sent out and posted to NOAA.gov about a week before that briefing. Lastly, an audio file of this call will be posted on the NOAA.gov Media Advisory webpage later this afternoon. If you have any further informational needs, please feel free to email me, John Bateman. Again, my contact information is available at the top of the Media Advisory. Thanks, everyone.

Sandy (operator):

Thank you for joining today's conference call. You may now disconnect and have a wonderful rest of your day. Speakers, please stand by.