

National Weather Service Weather Prediction Center Survey Data Summary

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Arlington, VA



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NOAA National Weather Service
www.weather.gov



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This product was prepared by Eastern Research Group, Inc. under contract to NOAA's National Weather Service.

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Overview of WPC Survey Results

Who took the survey?

Eastern Research Group, Inc. (ERG) received responses from 431 participants, of which 412 were deemed viable for analysis. The remaining 19 entries were eliminated because they had no data (17 entries) or just one answer (two entries) that did not provide sufficient information about the respondents' demographic or professional background for a meaningful analysis.

Among the viable sample, the respondents were **predominantly male** (74.51 percent) and **age 55 or older** (47.57 percent). About half of the respondents work at a **local level** (25.97 percent) or **national level** (21.36 percent). Respondents from the **government sector** (30.58 percent) make up the highest percent of the sample, followed by the private sector (20.88 percent). Among the **government sector, an overwhelming majority do not work at the NWS** (80.83 percent). Among the non-NWS government users, local partners comprised the highest portion (29 percent) followed by national users (24 percent). Combining this with the workshop feedback, FEMA and military personnel depend on WPC's products and services, which may describe some of the non-NWS sample.

A detailed breakdown of the sample's demographic information is represented in Figures 1–4 below.

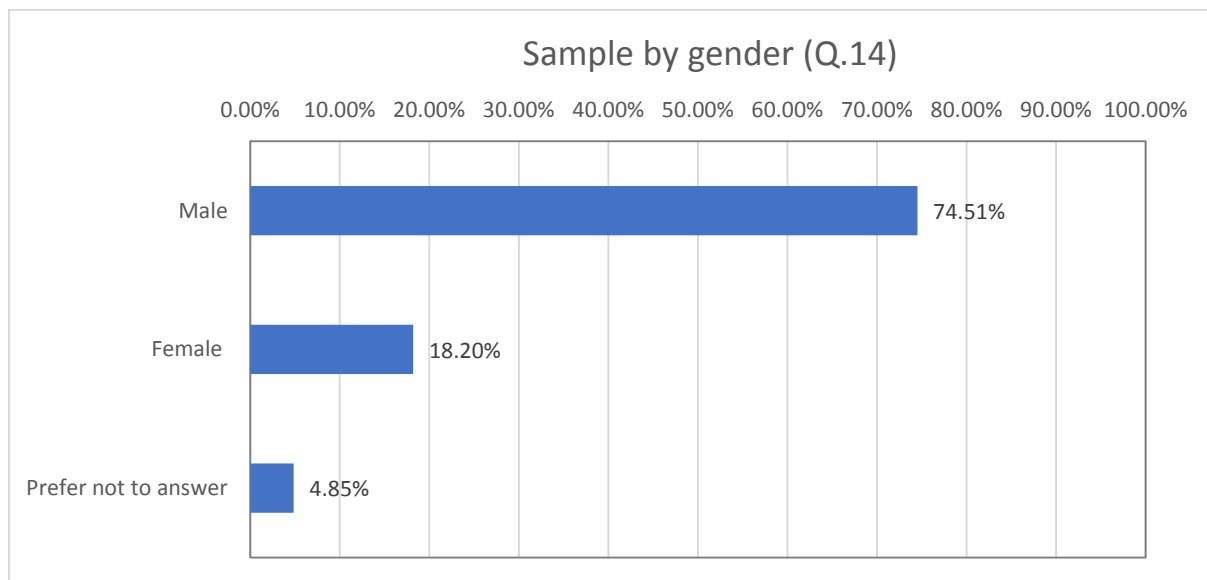


Figure 1. Sample breakdown by gender

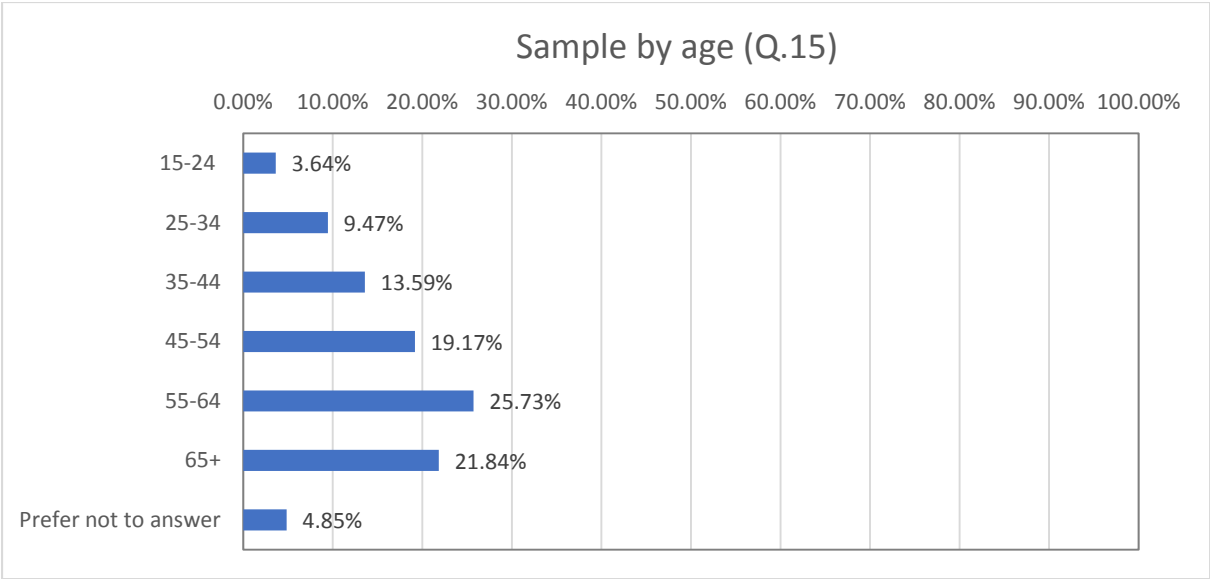


Figure 2. Sample breakdown by age

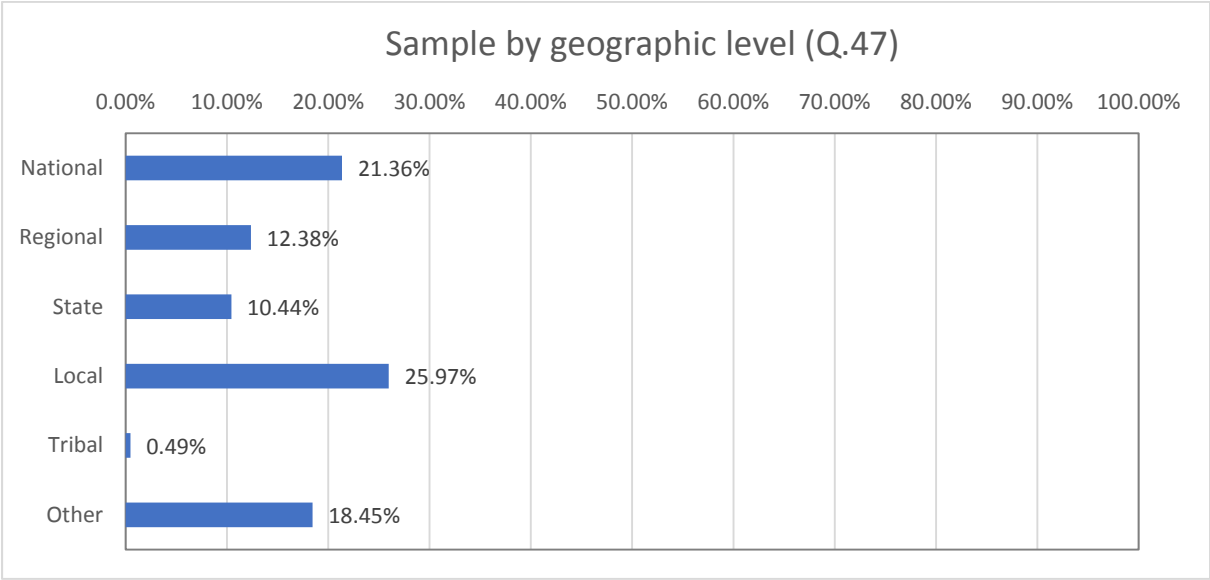


Figure 3. Sample breakdown by geographic level

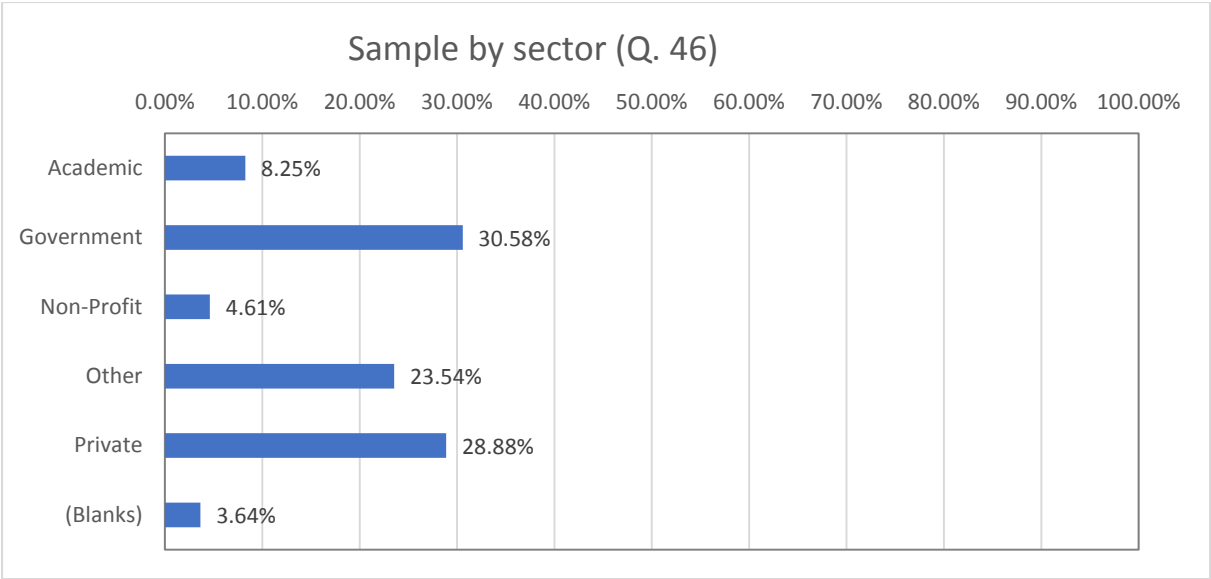


Figure 4. Sample breakdown by sector

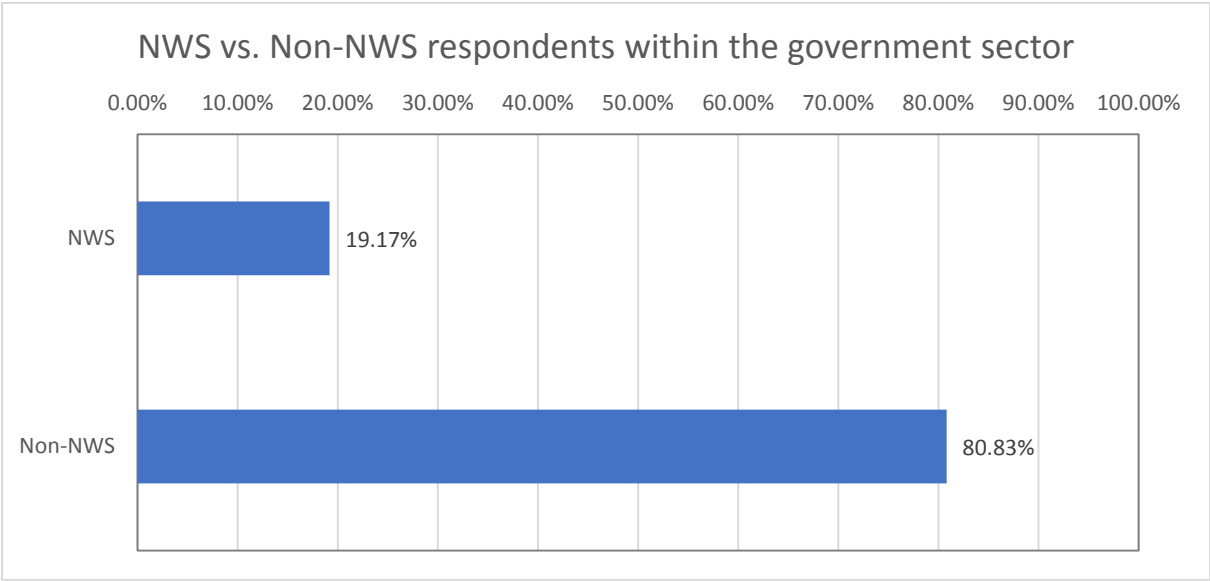


Figure 5. Breakdown of NWS and non-NWS respondents within the government sector

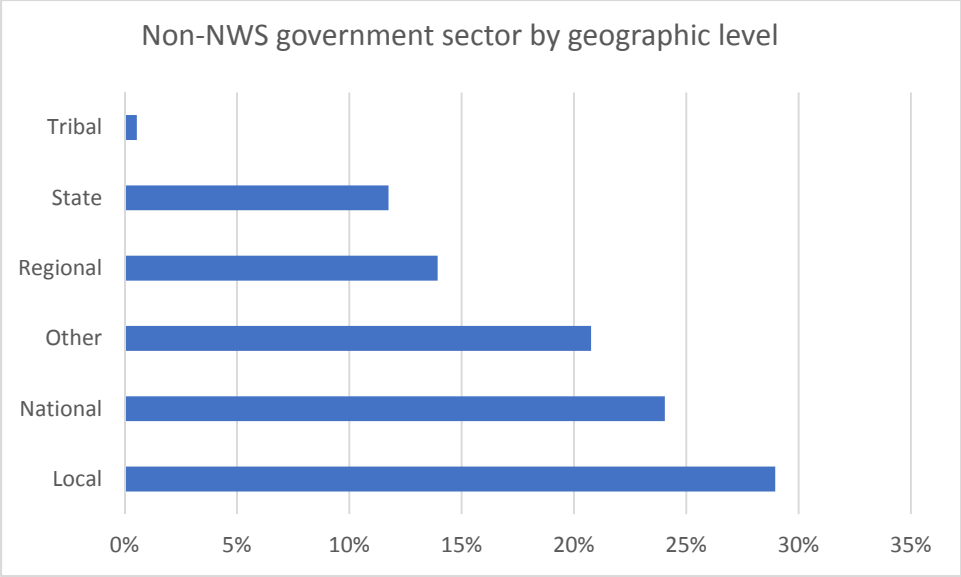


Figure 6. Breakdown of the non-NWS government users by geographic level

Who is using which products?

In the next level of our analysis, our primary research question was to find out who is using WPC products and which products they are using the most.

To find out, we looked at five product-specific questions related to precipitation (Q.33), winter (Q.35), medium range (Q.38), surface analysis (Q.30), and text/discussion (Q.40). To identify who is using these products, we broke out responses to these questions by sector (Q. 46). The questions as they appeared in the survey are below.

1. [Graphical Precipitation] Q.33 How often do you use the following WPC graphical products:

(Graphical precipitation products)	Daily (1)	Weekly (2)	Monthly (3)	Occasionally (4)	Only during specific weather events (5)	Never (6)	N/A (7)
Quantitative Precipitation Forecasts (http://www.wpc.ncep.noaa.gov/#page=qpfi) (39)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Probabilistic QPF (http://www.wpc.ncep.noaa.gov/pqpf/conus_hpc_pqpf.php) (40)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
National Forecast Map/Chart (http://www.wpc.ncep.noaa.gov/#page=ovw) (41)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surface Analysis (http://www.wpc.ncep.noaa.gov/index.shtml#page=sfc) (42)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Significant River Flood Outlook (http://www.wpc.ncep.noaa.gov/nationalfloodoutlook/index.html) (43)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Excessive Rainfall Outlook (http://www.wpc.ncep.noaa.gov/index.shtml#page=ero) (44)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. [Graphical Winter] Q.35 How often do you use the following WPC graphical products:

	Daily (1)	Weekly (2)	Monthly (3)	Occasionally (4)	Only during specific weather events (5)	Never (6)	N/A (7)
Low Track Graphics (http://www.wpc.ncep.noaa.gov/lowtracks/lowtrack_ensembles.gif)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Snowfall Probability Forecast (http://www.wpc.ncep.noaa.gov/pwpf/wwd_accum_probs.php)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Freezing Rain Probability Forecast (http://www.wpc.ncep.noaa.gov/pwpf/wwd_accum_probs.php)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Winter Weather Outlook http://www.wpc.ncep.noaa.gov/wwd/pwpf_d47/pwpf_moder.php	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. [Graphical Medium Range] Q.38 How often do you use the following WPC graphical products:

	Daily (1)	Weekly (2)	Monthly (3)	Occasionally (4)	Only during specific weather events (5)	Never (6)	N/A (7)
CONUS Fronts and Pressures (http://www.wpc.ncep.noaa.gov/medr/5dayfcst_wbg_conus.gif) (24)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CONUS Temperatures and Weather (http://www.wpc.ncep.noaa.gov/5km_grids/5km_gridsbody.html) (25)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alaska Fronts and Pressures (http://www.wpc.ncep.noaa.gov/alaska/ak_5dayfcst_wbg.gif) (26)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alaska Temperatures and Weather (www.wpc.ncep.noaa.gov/alaska/ak_5km_gridsbody.html) (27)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. [Graphical Surface Analysis] Q.30 How often do you use the following WPC graphical products:

	Daily (1)	Weekly (2)	Monthly (3)	Occasionally (4)	Only during specific weather events (5)	Never (6)	N/A (7)
National Forecast Chart (http://www.wpc.ncep.noaa.gov/national_forecast/natfcst.php) (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surface Analysis (http://www.wpc.ncep.noaa.gov/index.shtml#page=sfc) (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Short Range Fronts and Weather (http://www.wpc.ncep.noaa.gov/index.shtml#page=frt) (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. [Discussion/Text] Q.40 How often do you use the following WPC discussion/text products:

	Daily (1)	Weekly (2)	Monthly (3)	Occasionally (4)	Only during specific weather events (5)	Never (6)	N/A (7)
Short Range Public Forecast Discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Excessive Rainfall Discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Heavy Snow Discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Model Diagnostic Discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Storm Summaries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quantitative Precipitation Forecast Discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mesoscale Precipitation Forecast Discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CONUS Medium Range Forecast Discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
National High and Low Temperature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alaska Medium Range Forecast Discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Graphical Products Use

The following findings represent stakeholder use of WPC graphical products. The data show that stakeholders use graphical products more consistently than they use discussion products. Many stakeholders use these products on a daily and weekly basis as compared to discussion products, which are more event-dependent.

The overarching open-ended feedback on the graphical products includes improving the look and feel, increasing resolution, and providing background data. The findings below include summaries of stakeholder comments by product suite as well as tables showing product use by sector.

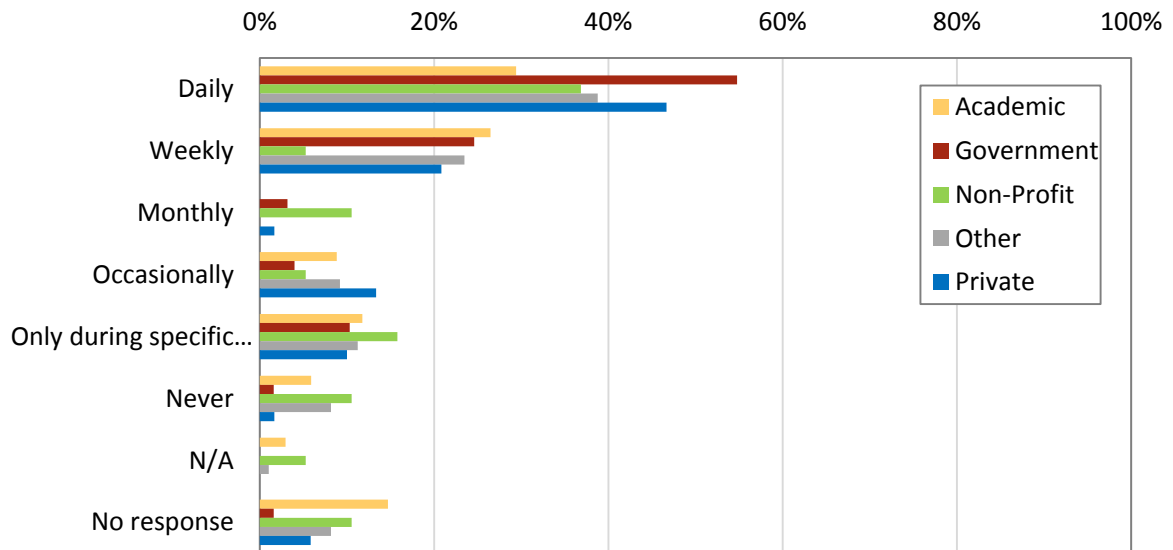
Precipitation

WPC's graphical precipitation products provide essential information to stakeholders. One survey respondent described the graphics as critical to inform colleagues and federal stakeholders about potential flooding, especially before storm events. The respondent explained, "People usually do not think about rain until local roadways are flooded, and operations are impacted." The comments indicate that WPC's precipitation products provide valuable information that influences stakeholder decision-making.

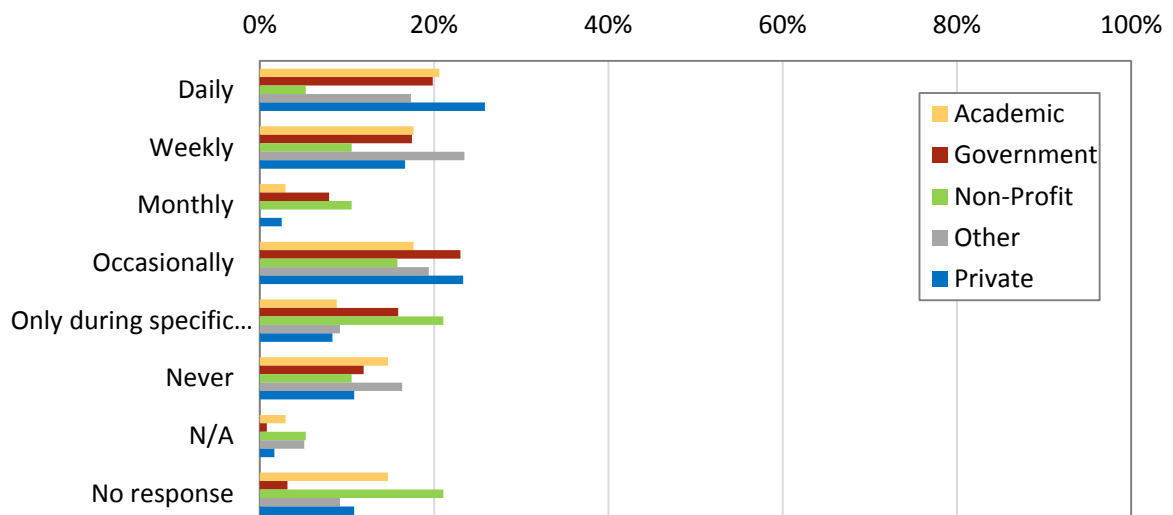
Although the products are valuable, stakeholders suggested many improvements, namely around the look and feel of the graphics. Recommendations include making graphics zoomable and less cluttered, simplifying the look and feel, increasing the resolution and spatial detail, adding city layers, and offering the raw data/grids behind the graphics. Other stakeholders inquired about verification statistics and possible model improvements. One comment describes that the QPF day 5–7, for example, conveys a "doom and gloom" outlook, but over time the amounts decrease. Other comments expressed concern for conveying the precipitation risk too far in advance stating, "As soon as the bullseye for QPF shows up on day 6–7, the expectation for the forecast is set." There is also similar concern with having individuals anchor to the maximum value on the QPF thinking "the entire region is going to receive that much precipitation." The challenge, then, is communicating to stakeholders that the forecast changes as the event approaches.

The graphs beginning on the next page represent the close-ended survey results regarding precipitation graphical product use by sector.

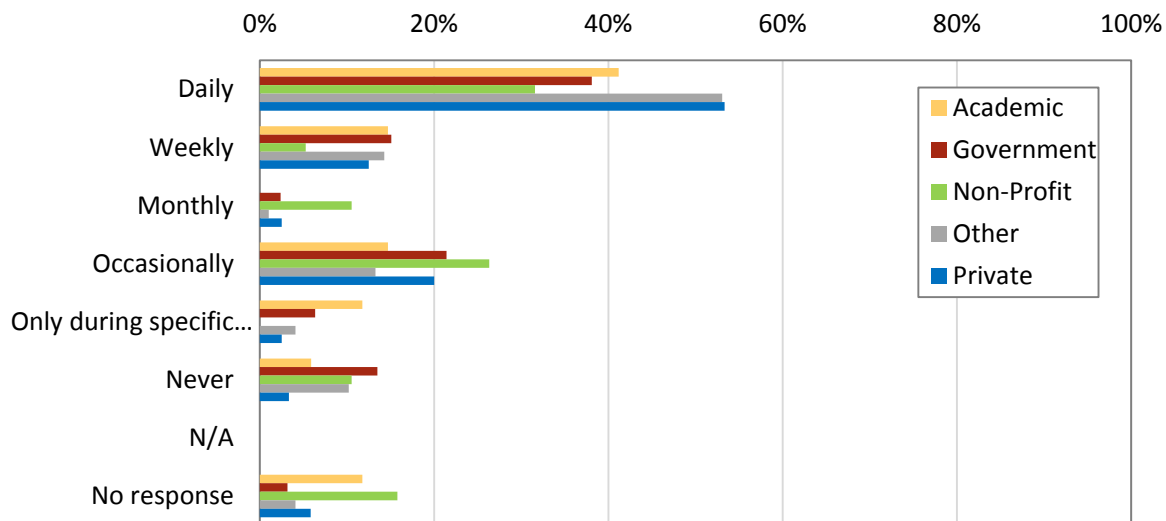
**How often do you use the:
Quantitative Precipitation Forecasts
(<http://www.wpc.ncep.noaa.gov/#page=qpf>)**



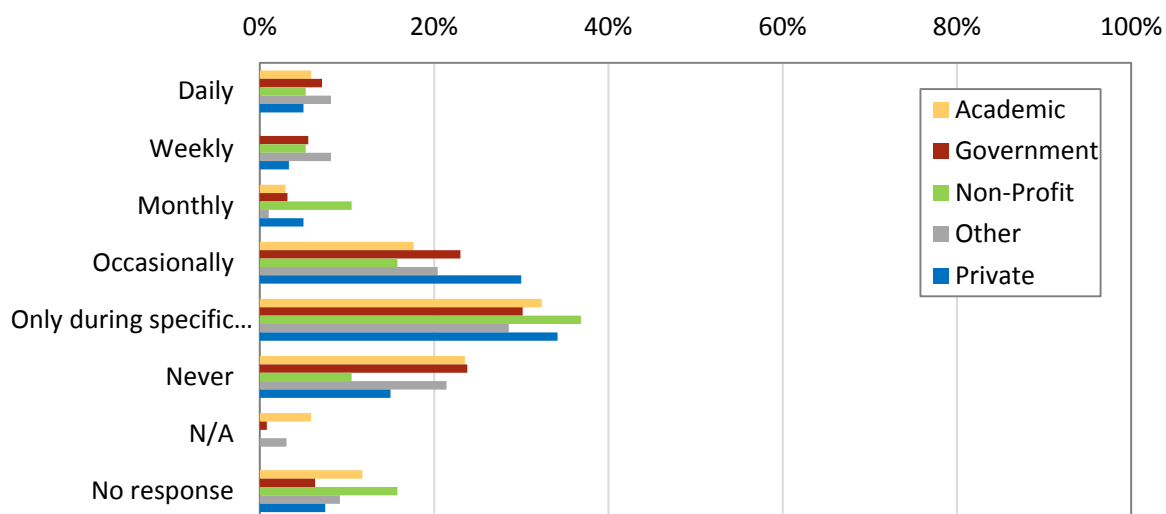
**How often do you use the following:
Probabilistic QPF
(http://www.wpc.ncep.noaa.gov/pqpf/conus_hpc_pqpf.php)**

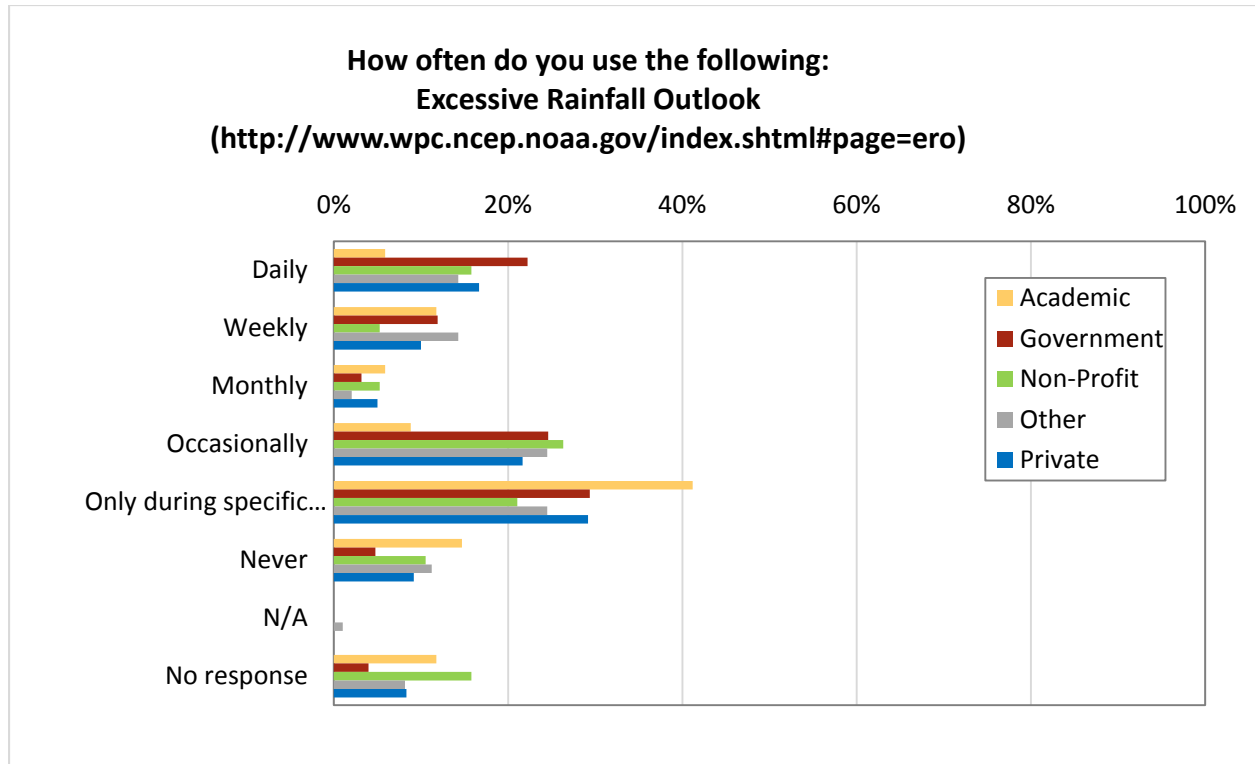


**How often do you use the following:
National Forecast Map/Chart
(<http://www.wpc.ncep.noaa.gov/#page=ovw>)**



**How often do you use the following:
Significant River Flood Outlook
(<http://www.wpc.ncep.noaa.gov/nationalfloodoutlook/index.html>)**





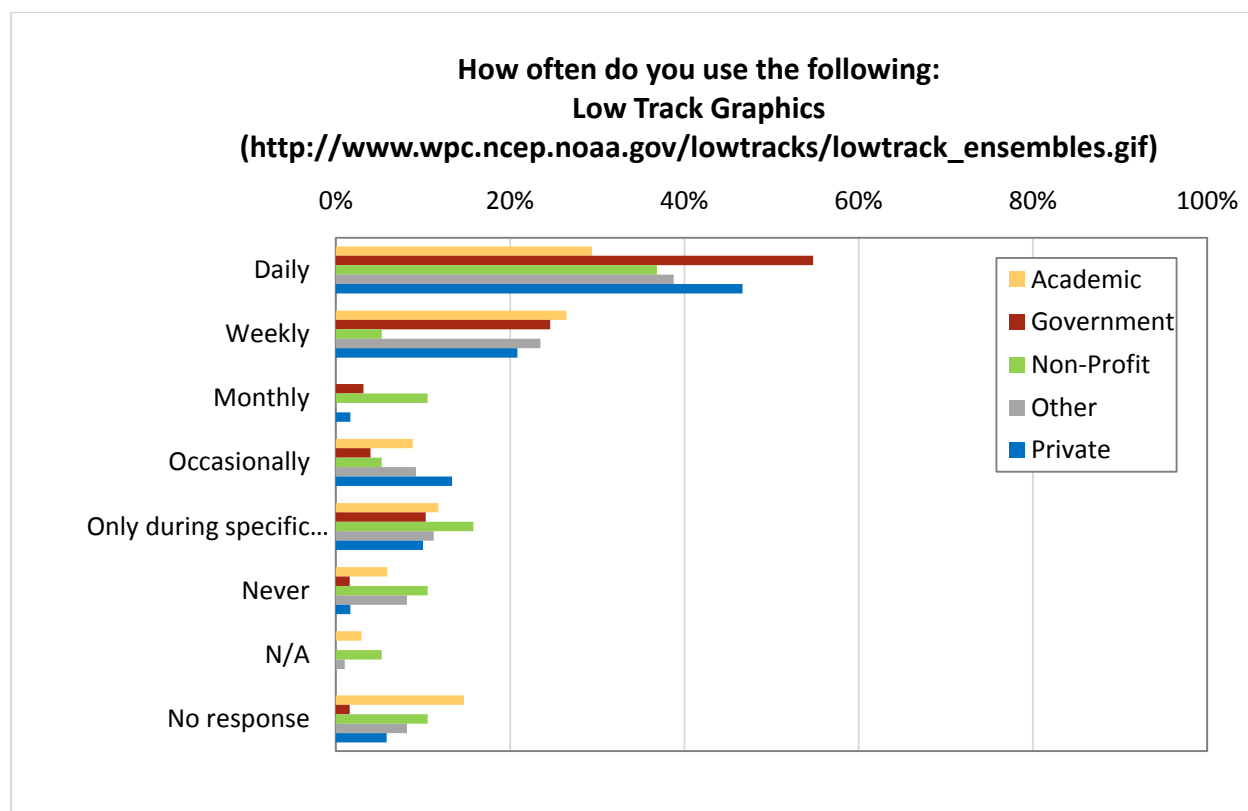
Winter

Given the seasonal nature of this precipitation type, WPC's winter weather precipitation products play a critical role during events, rather than for daily use. Many positive comments describe the products as helpful, informative, and detailed. Some survey takers want to see even more, asking for smaller timescales for the three-day probabilistic snowfall probabilities with frequent map updates throughout the day.

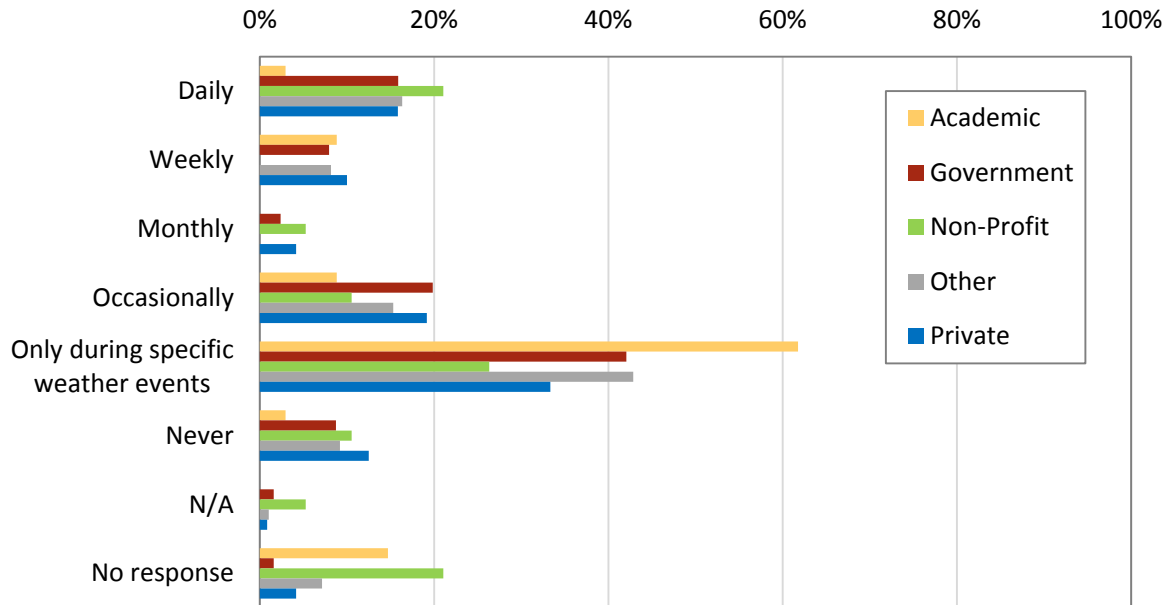
Though the products are useful, many survey comments remarked that they are unaware of some WPC products. The low track graphic, for example, was the least known winter weather product according to all the open-ended responses. Many simply did not know the graphic existed until this survey. Others stated that the website design prevents them from finding products. Within this product category, many of the comments urged WPC to market and conduct outreach to increase product awareness. These comments indicate that the survey results measured current use of the products, but not the current value.

Other comments clustered around the look and feel of the products and include making graphics zoomable, decreasing computer memory space for downloads, increasing time intervals, and making language on the graphics more publicly accessible. The winter weather outlook, for example, describes the probability of a $\frac{1}{4}$ inch of liquid equivalent. One suggestion was to make this language more public-friendly, such as "the probability of 4" or more of snowfall or $\frac{1}{4}$ of an inch of ice or more."

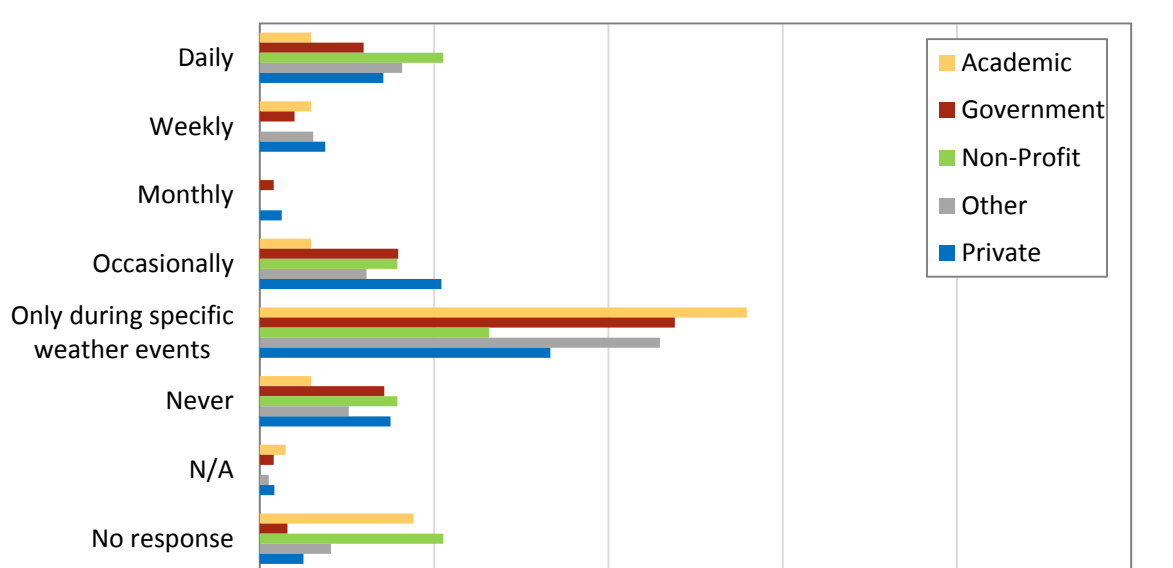
The following graphs represent the close-ended survey results regarding winter weather precipitation graphical product use by sector.

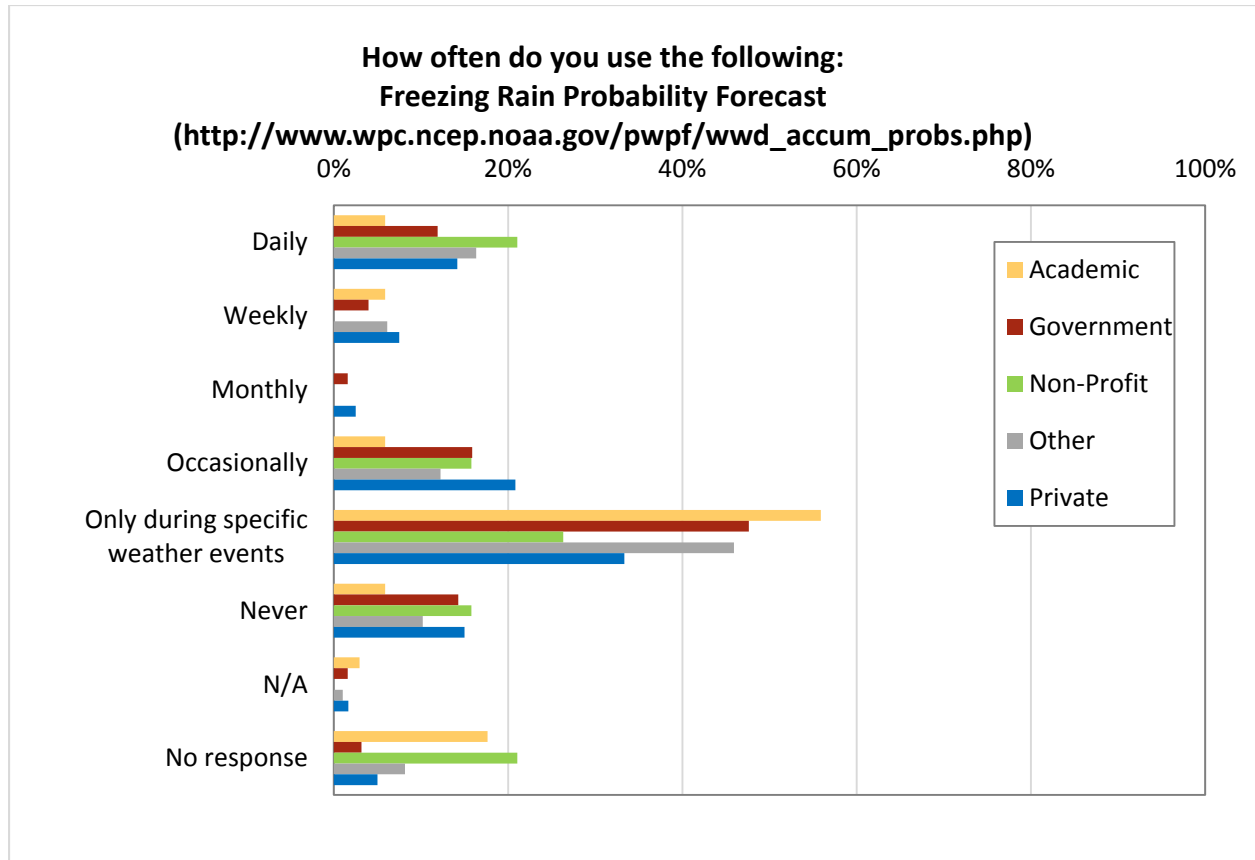


**How often do you use the following:
Snowfall Probability Forecast**
(http://www.wpc.ncep.noaa.gov/pwpf/wwd_accum_probs.php)



**How often do you use the following:
Freezing Rain Probability Forecast**
(http://www.wpc.ncep.noaa.gov/pwpf/wwd_accum_probs.php)





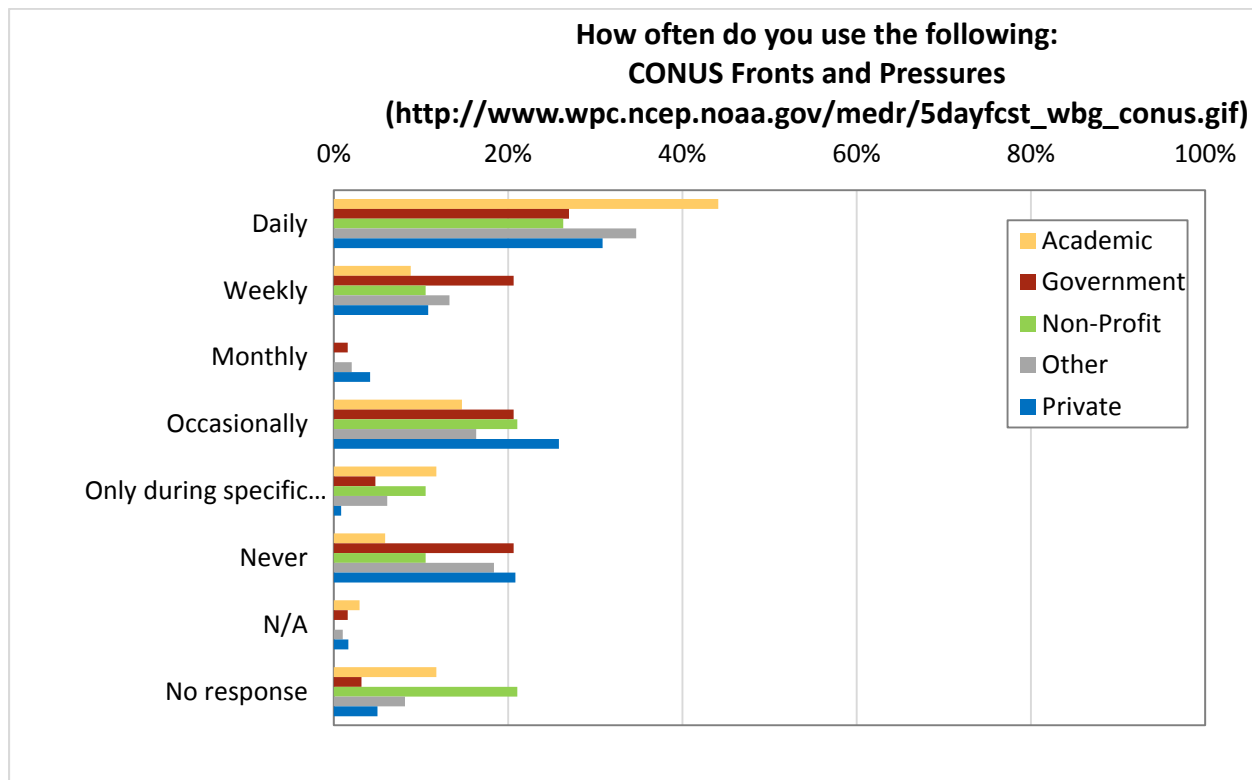
Medium Range

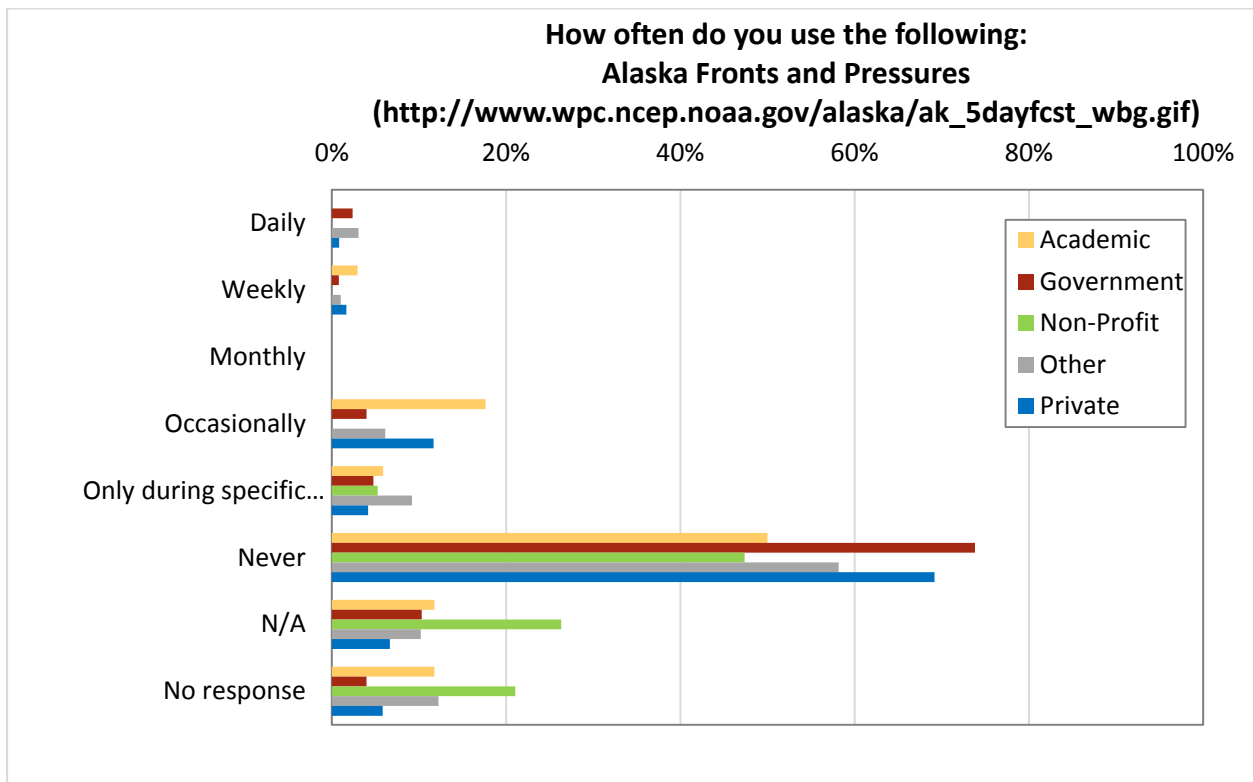
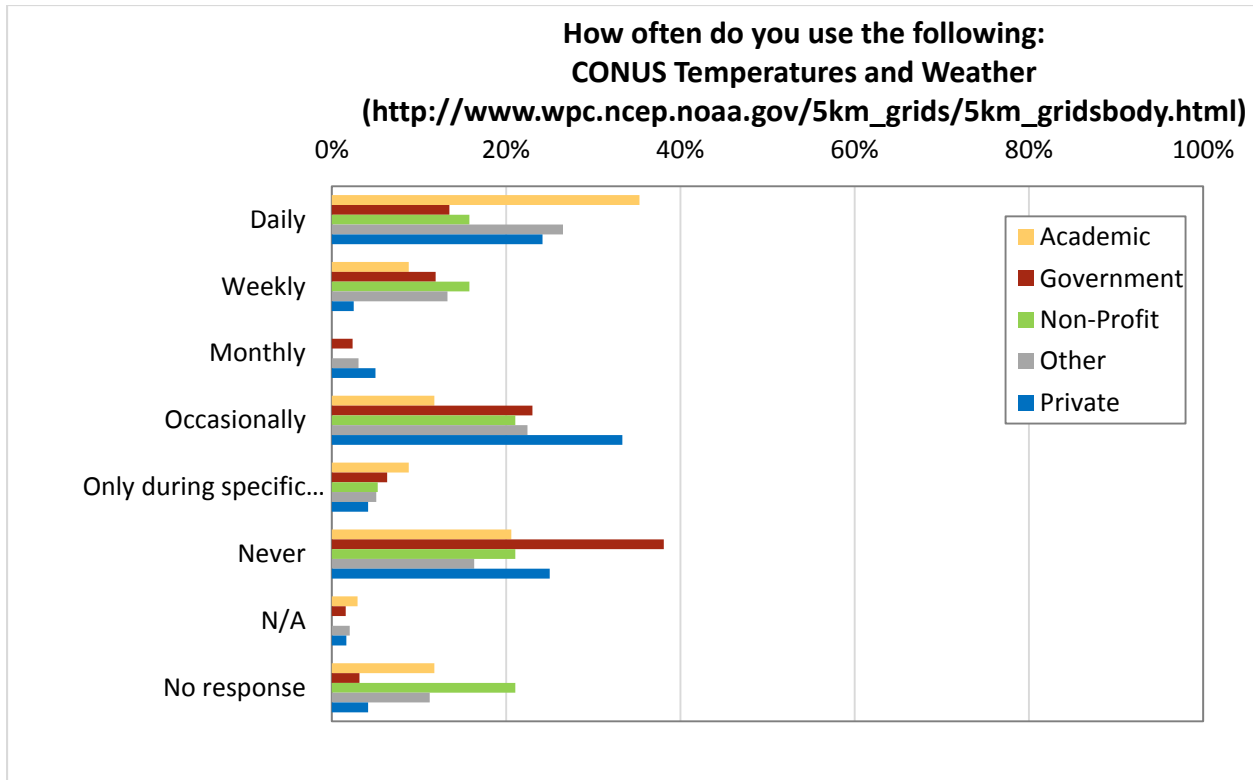
The survey results indicate lower use of medium range products. However, the survey results taken individually may not provide an adequate picture of the value of these products. Survey comments describe that the medium range graphics allow partners to highlight the potential for weather events or allow them to provide the “setup” for the next few days. The discussion at the WPC stakeholder workshop resonates with these findings. Workshop attendees use the fronts and pressure graphics to convey multiday outlooks, for example.

Given that these graphics have use during event briefings days in advance, improving the look and feel was a primary focus. Comments included providing the GIS data for the graphics, allowing partners to massage their own look and feel. Others simply stated to make them “more modern looking” and to increase the temporal and especially the spatial resolution.

The data do not show high use of the Alaska graphical products. The sample does not include much representation from Alaska, and thus the use data on the Alaska graphical products is *not* representative of actual use. Therefore, the data in this section may show lower use, but this is *not* necessarily a measure of the product's value.

The following graphs represent the close-ended survey results regarding medium range graphical product use by sector.





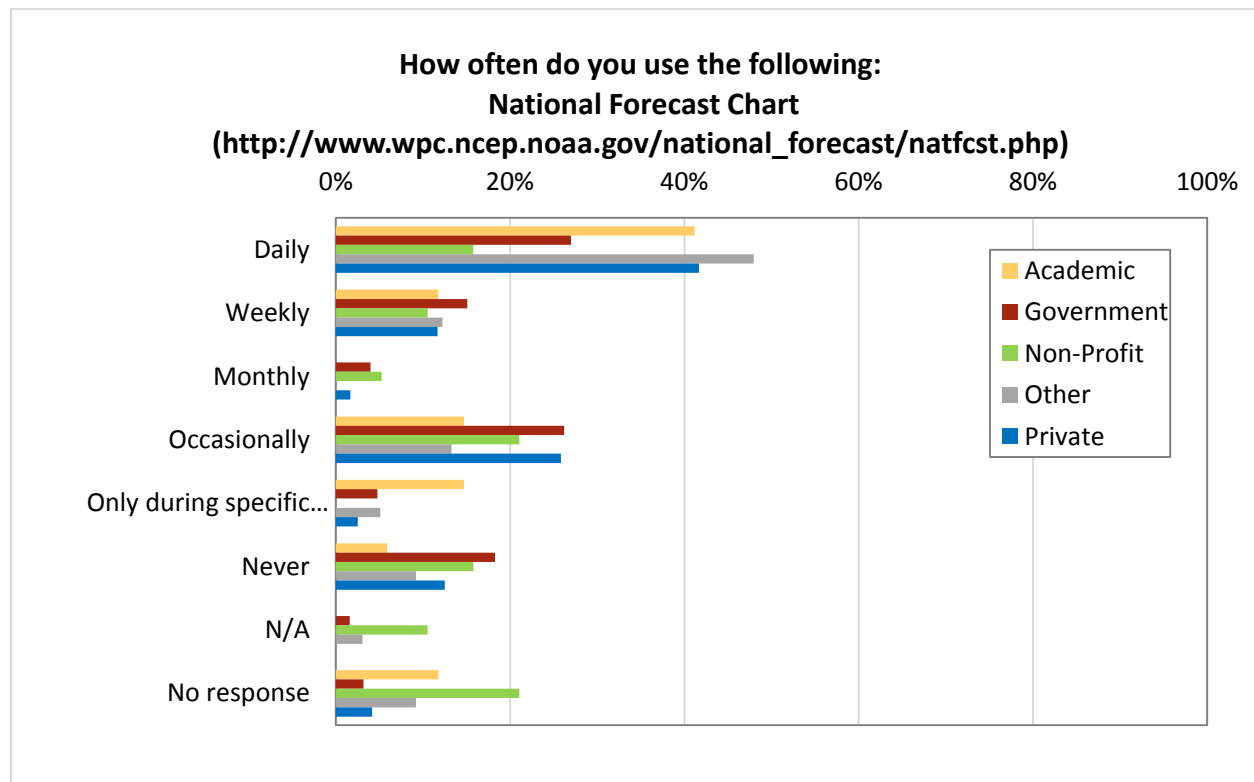
Surface Analysis

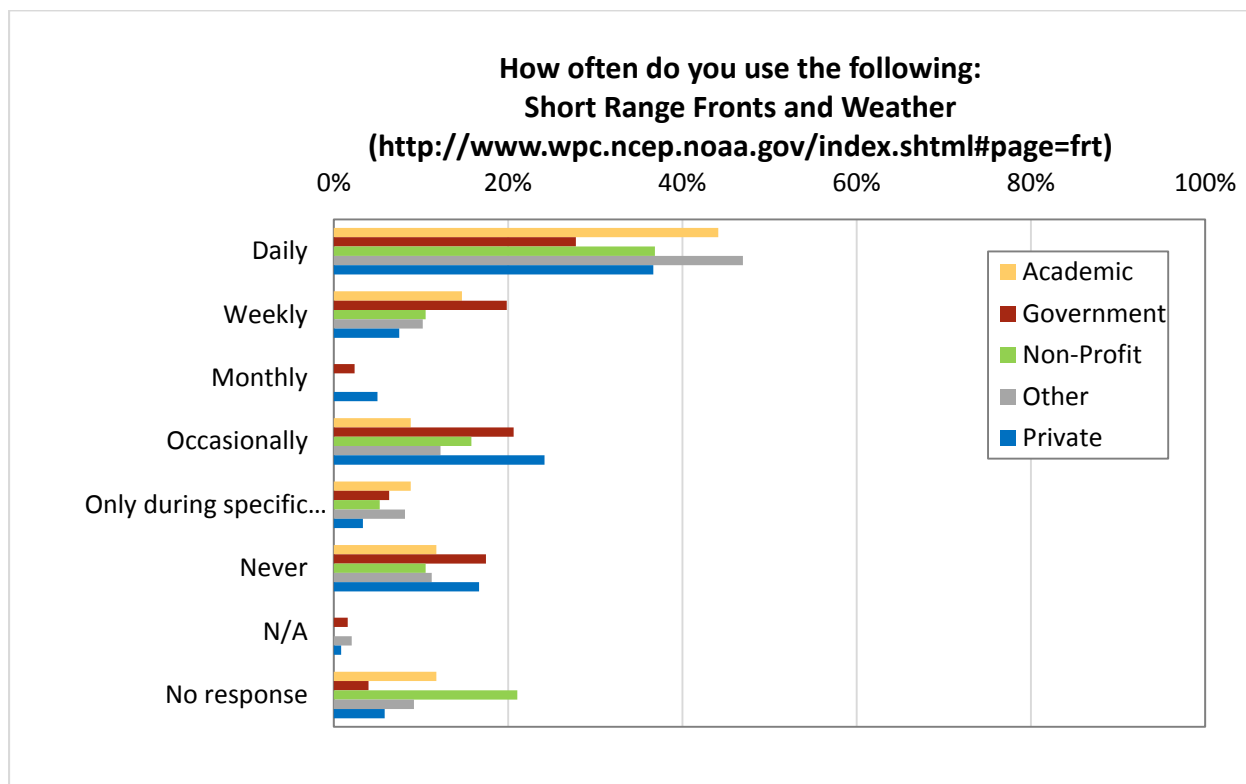
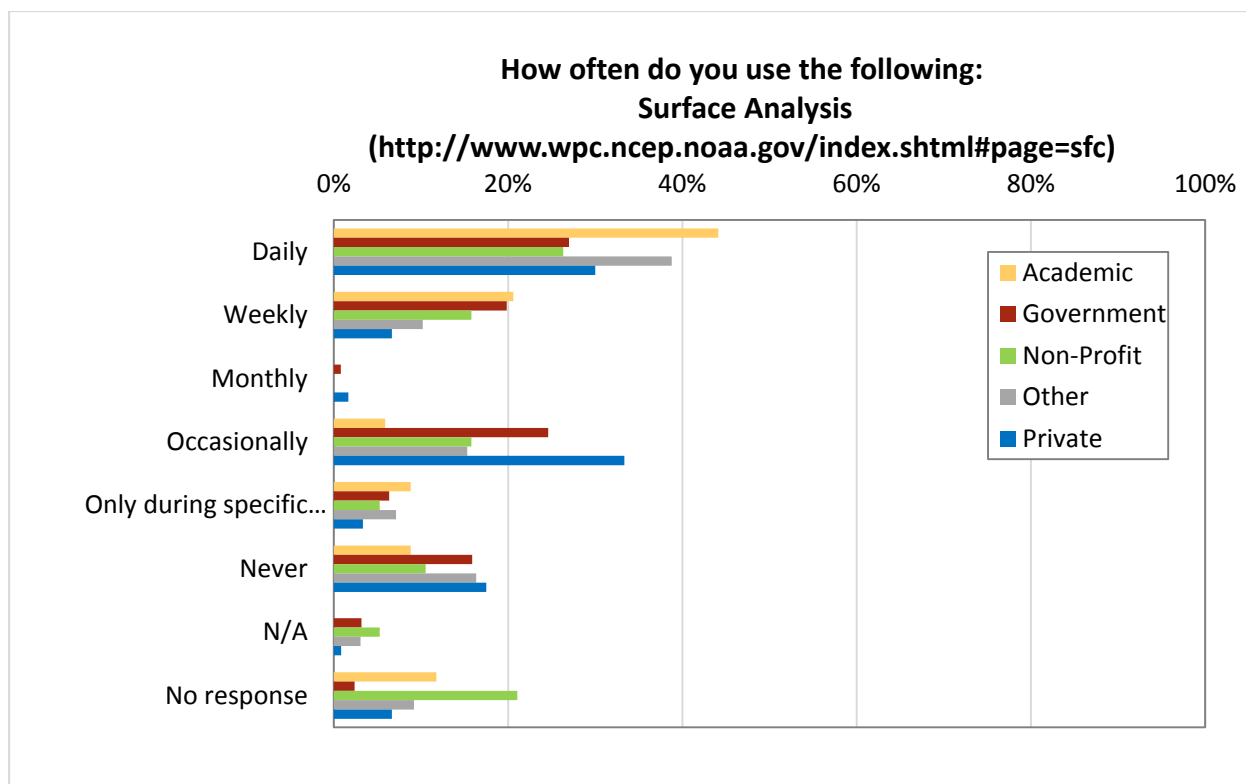
The survey results indicate consistent use of these graphical products. However, the open-ended comments suggest that there are two divergent groups: those that use these graphical products for daily situational awareness, and those that would rather see WPC focus on other products.

Stakeholders who depend on these graphics daily find them very useful for describing the weather pattern over the course of the next three days. Positive comments include, "Good quality graphics with excellent zoom details. Appreciate the archival database." Although the products are useful, comments also included constructive criticism, such as needing larger graphics that take advantage of modern computer monitors. Others suggested a total rebuild, suggesting the products have lower utility in their current form. One survey participant stated that the graphics are not conducive for copying and pasting into briefings, for example. Fortunately, WPC is already developing a new experimental National Forecast Chart.

Many survey comments explained that they would rather see WPC focus on other product areas, such as QPF and winter weather. The WPC stakeholder workshop report echoes these sentiments. The workshop found that there are two distinct user types for WPC products: highly technical and non-technical partners. The open-ended survey results suggest that the highly technical partners do not see as much value in the surface analysis products and, as such, would rather see WPC advance other more technical product areas such as QPF and winter weather.

The following graphs represent the close-ended survey results regarding surface analysis graphical product use by sector.





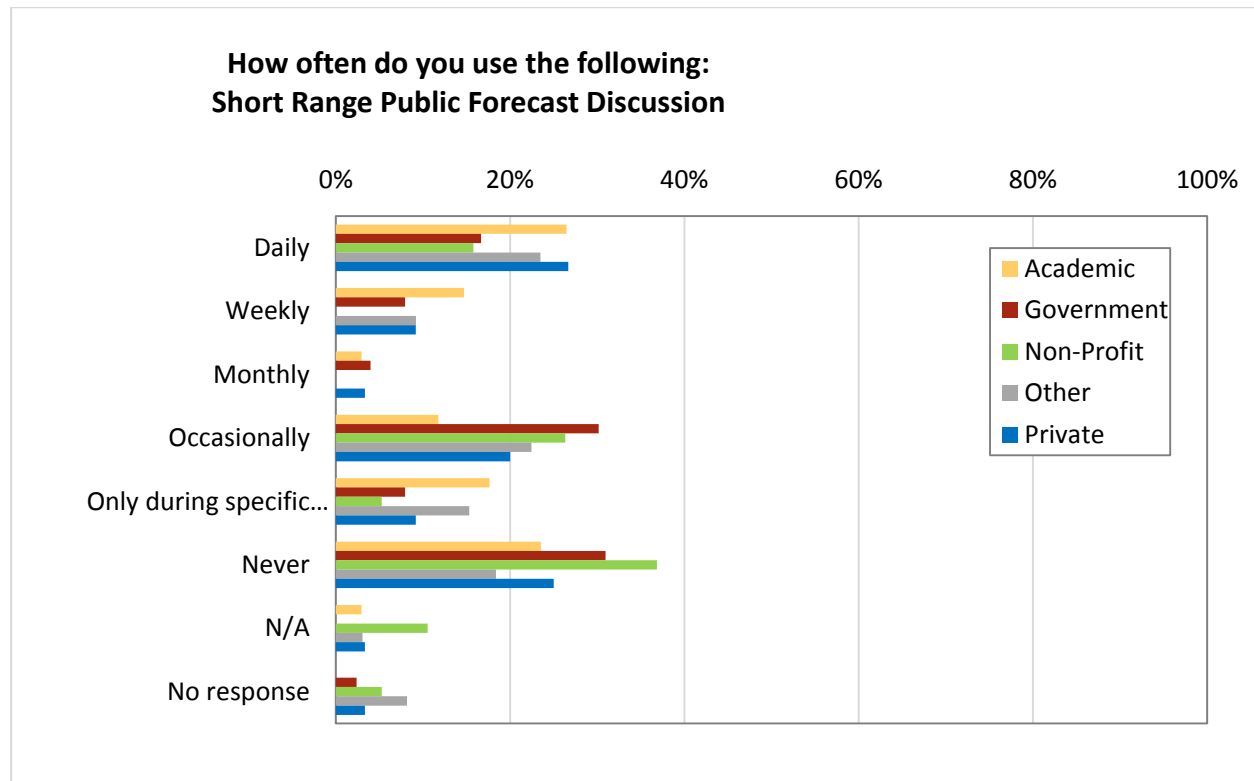
Discussion Products

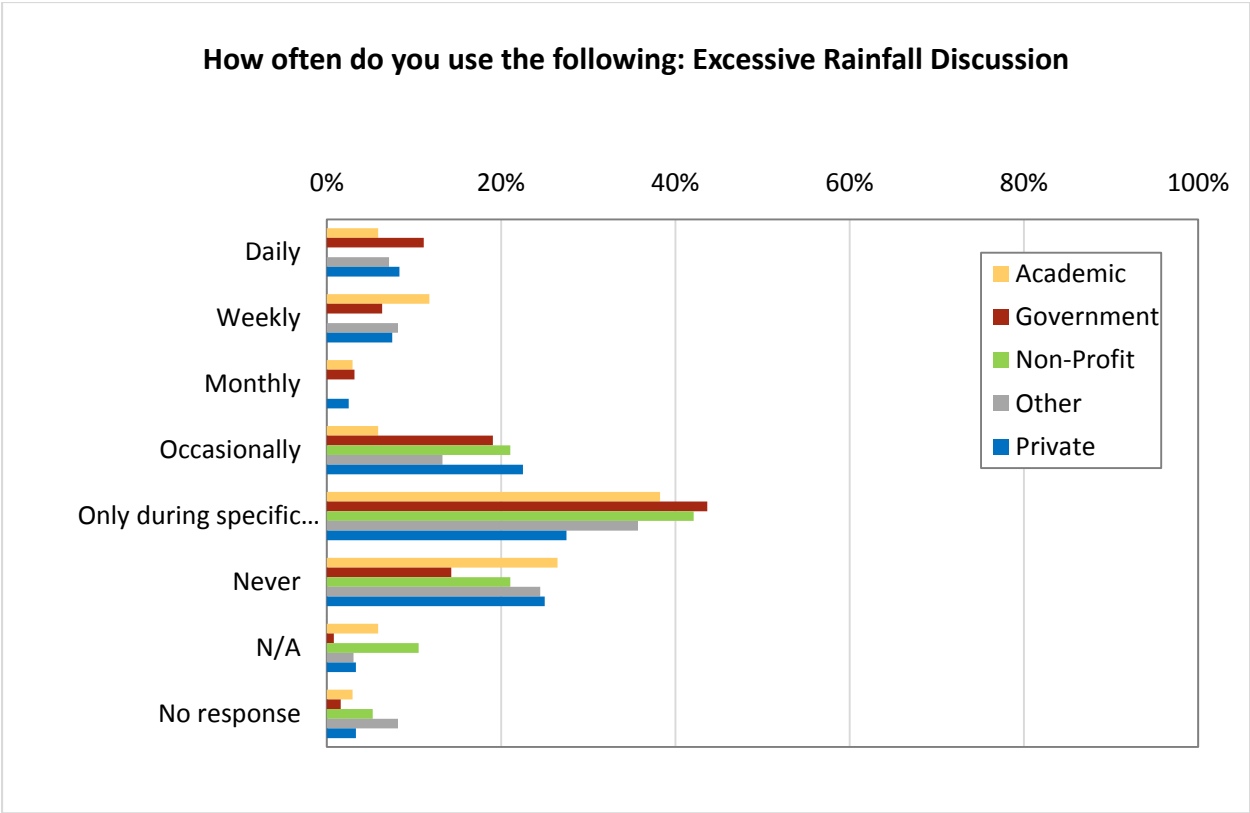
The data show that stakeholders primarily use discussion products during events. For example, the Excessive Rainfall and Heavy Snowfall Discussions have higher use during events compared to every day. This indicates that these stakeholders receive cues from other sources that prompt them to seek additional WPC information.

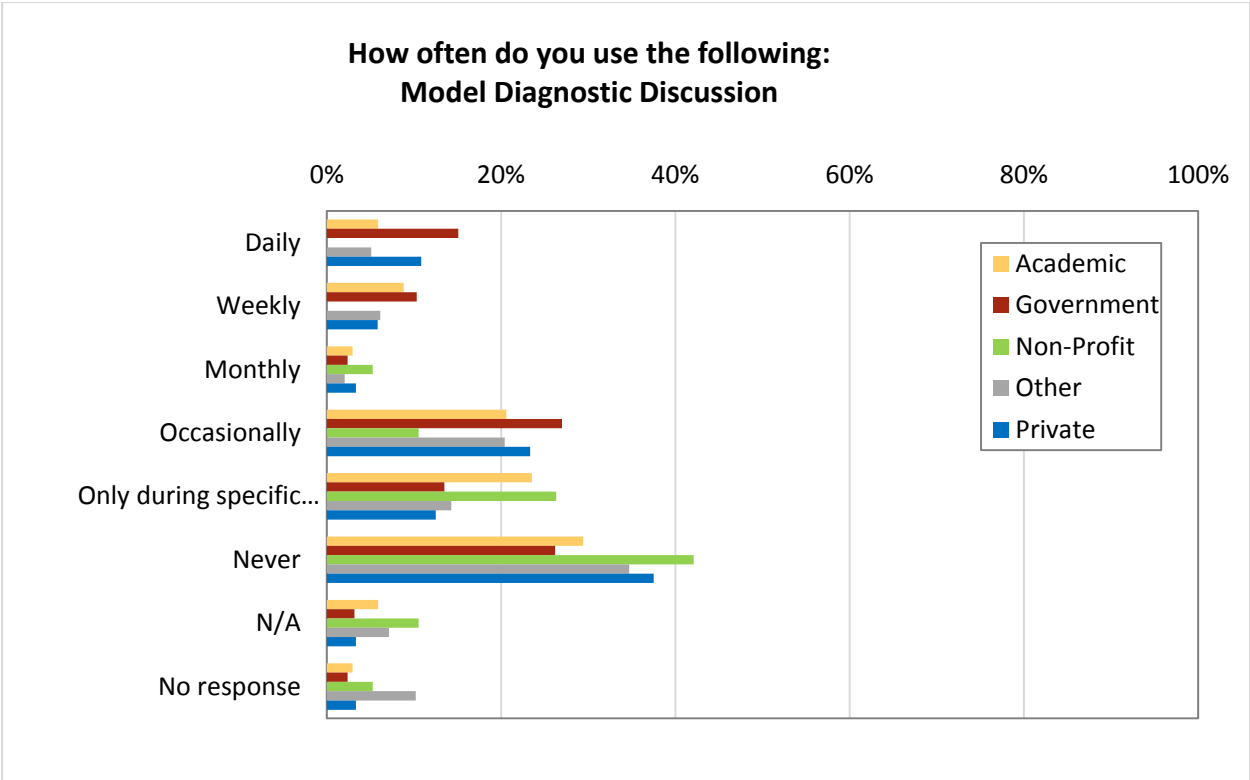
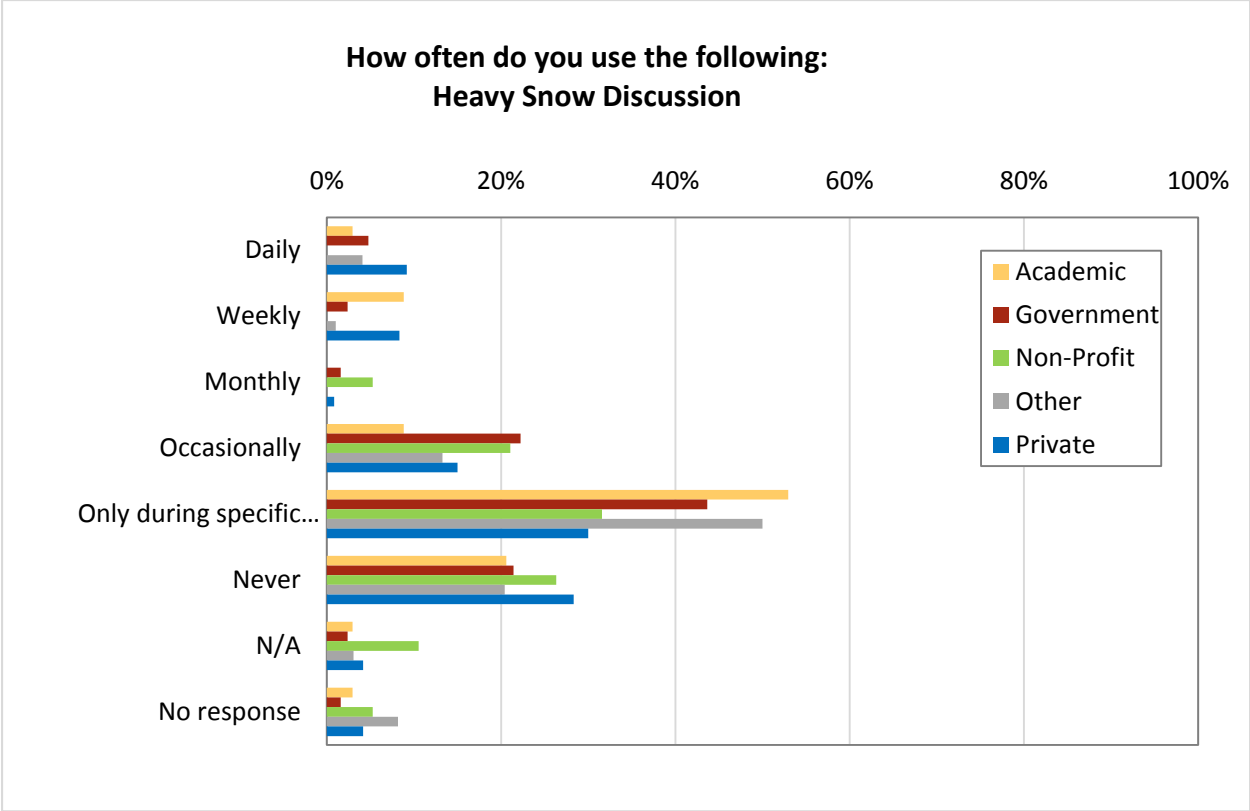
Some discussions have slightly lower use than others, such as the Model Diagnostics and Storm Summaries Discussions, for example. The open-ended feedback, however, indicates that stakeholders were not aware of all WPC products. Additionally, the sample does not include much representation from Alaska, and thus the use data on the Alaska Medium Range is *not* representative of actual use. Thus, the data in this section may show lower use, but this is *not* a measure of the product's value.

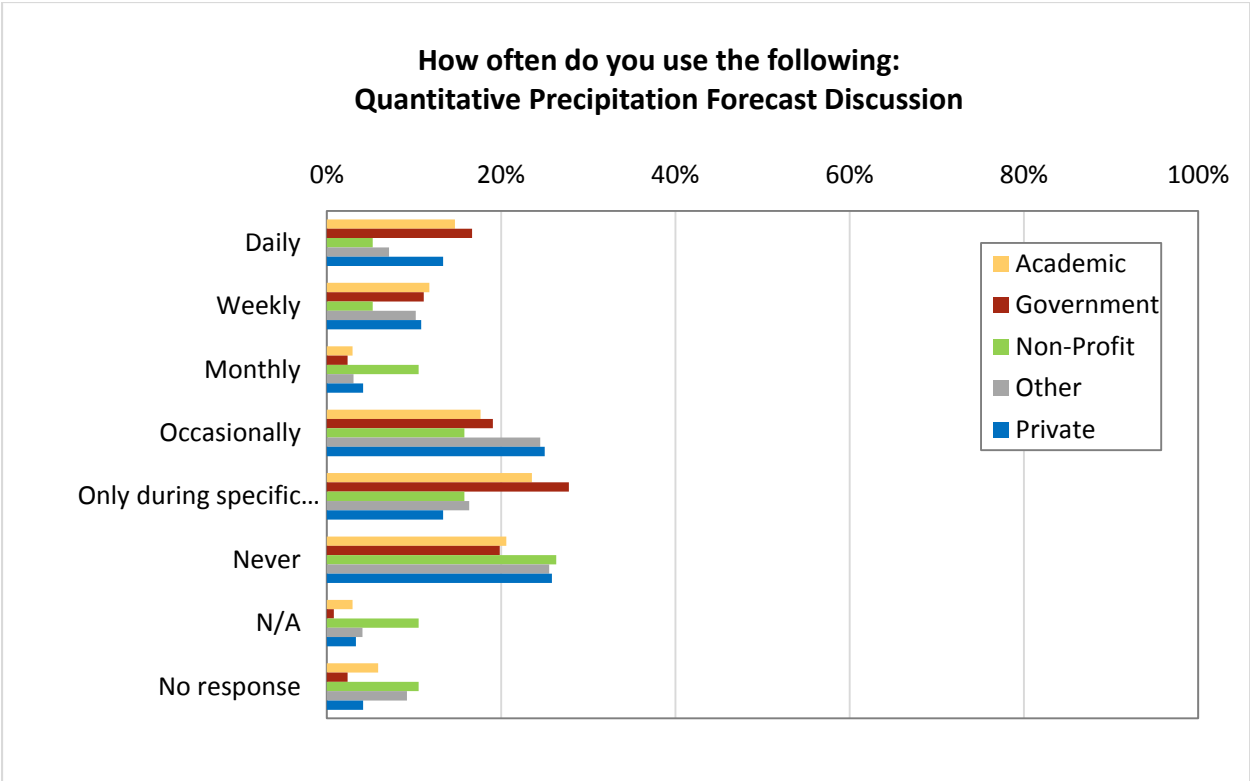
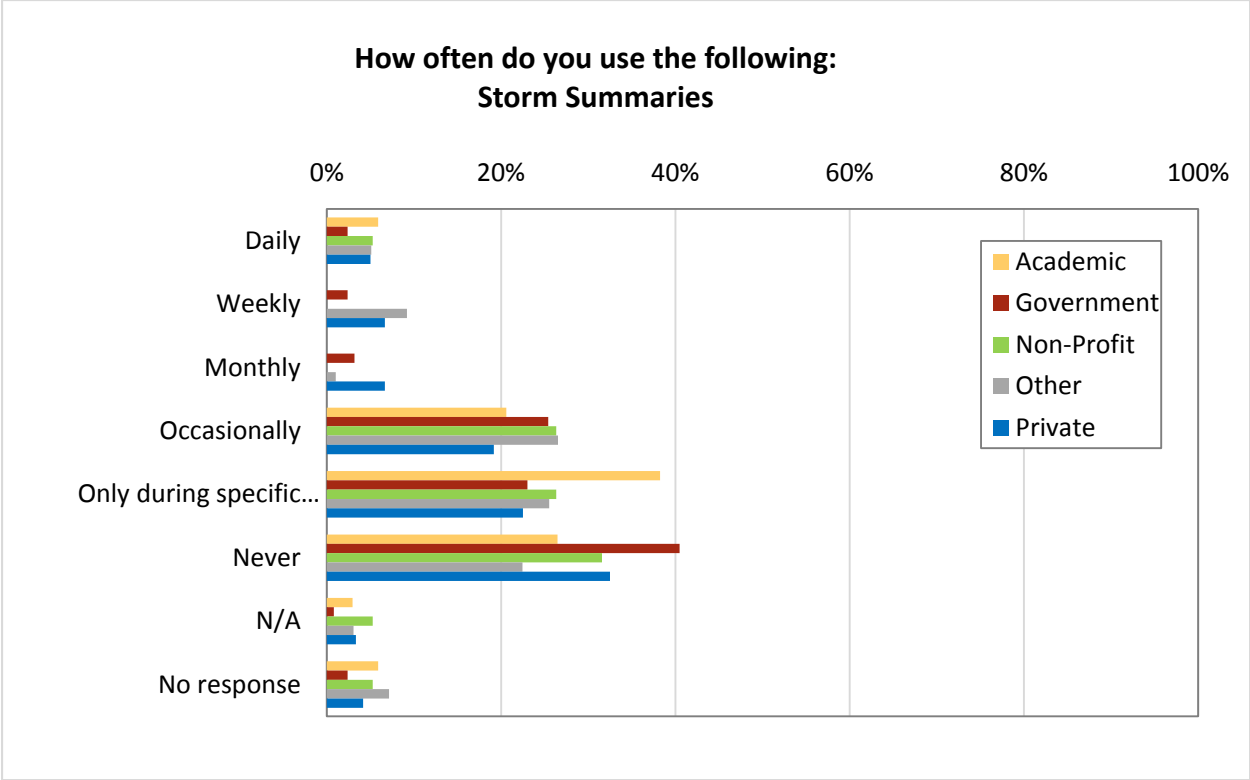
In fact, interview results from the first phase of this effort offer improvements to these products. FEMA partners, for example, requested *more* storm summaries, citing their value for documenting a storm as well as for insurance purposes. Workshop participants also emphasized adding a short overview paragraph using lay language at the top of each discussion. Stakeholders respected the technical nature of the discussions while also wanting to make them more accessible to non-technical users. Thus, the survey results in this section are *not* an *adequate* measure of the product's value, but rather a snapshot of current use.

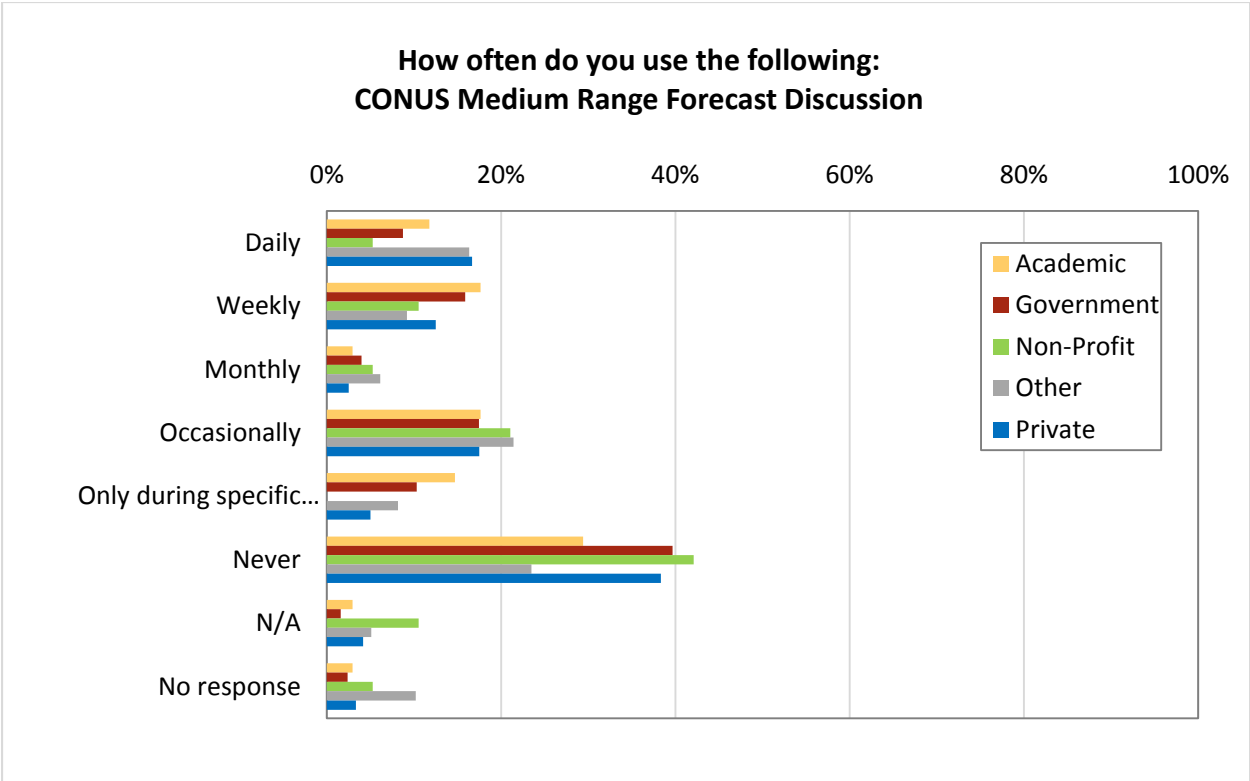
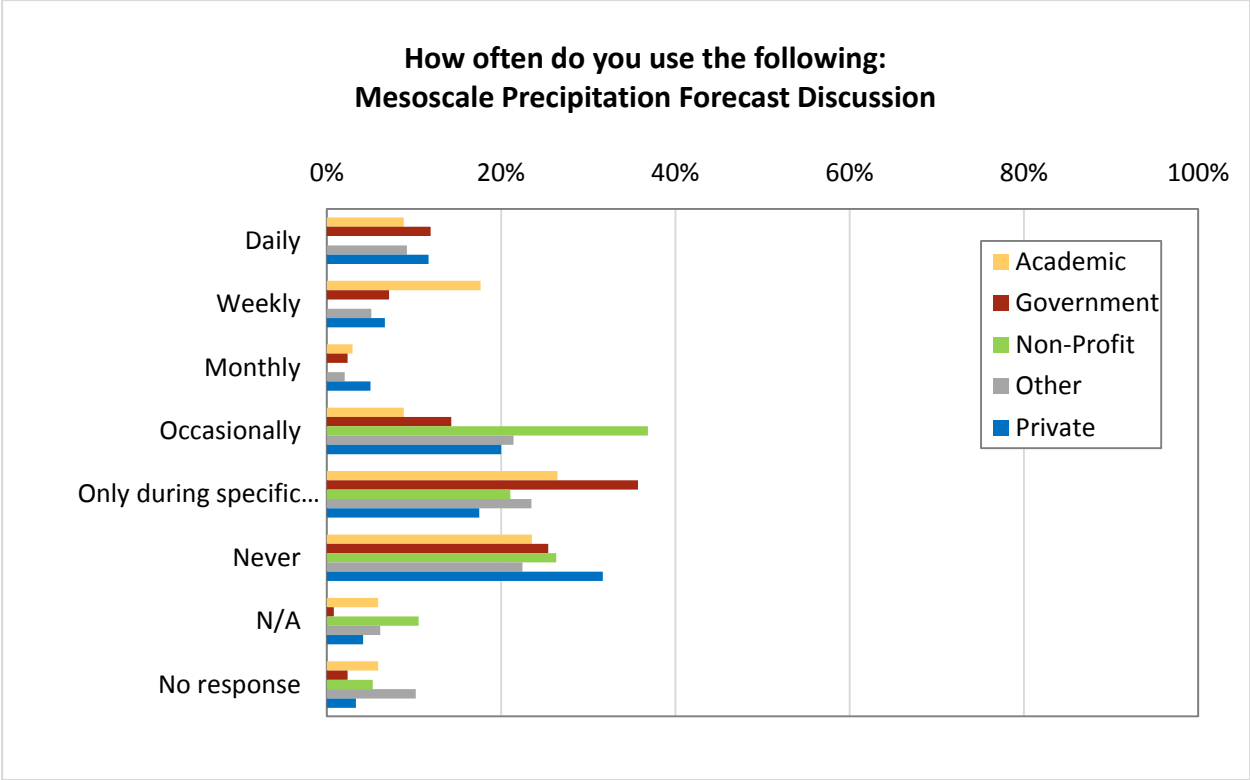
The following graphs represent the close-ended survey results regarding discussion product use by sector.

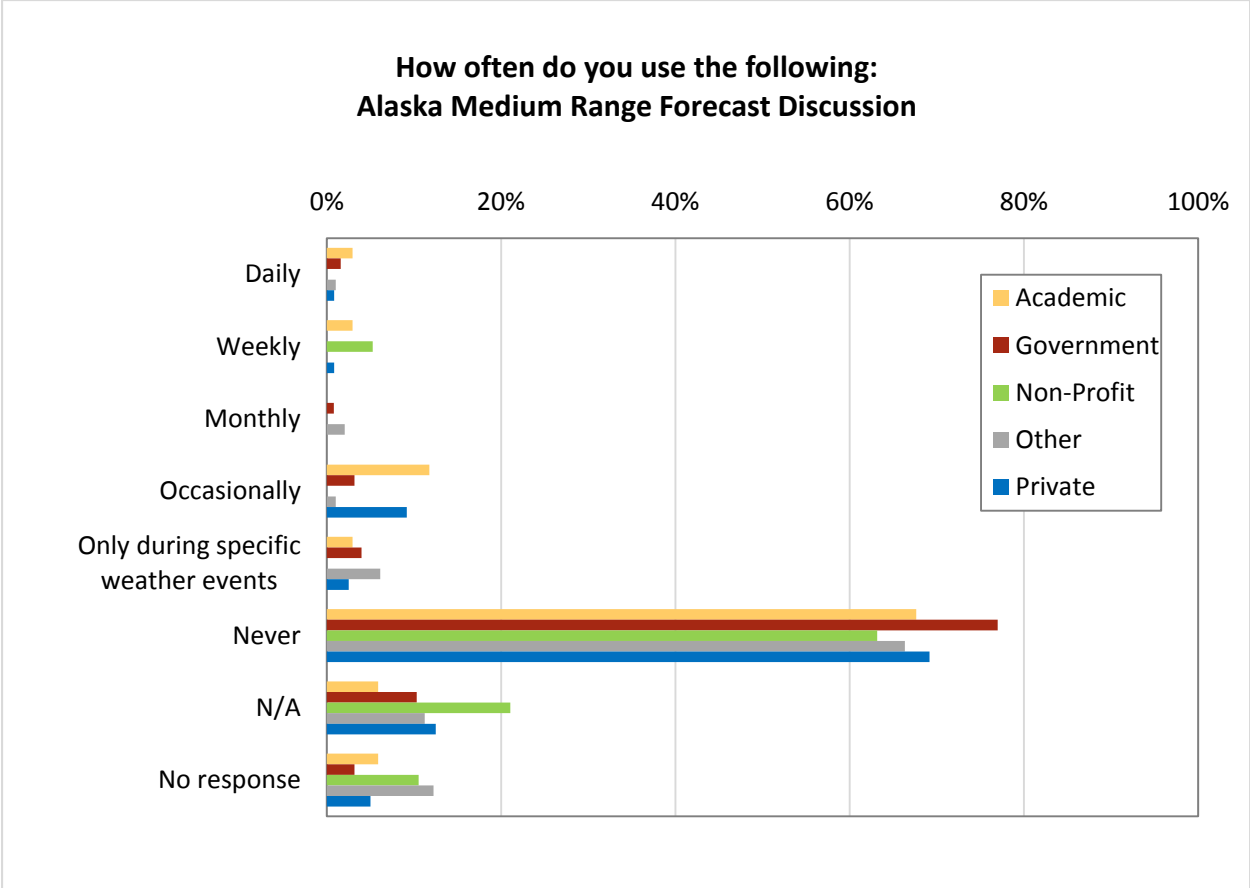
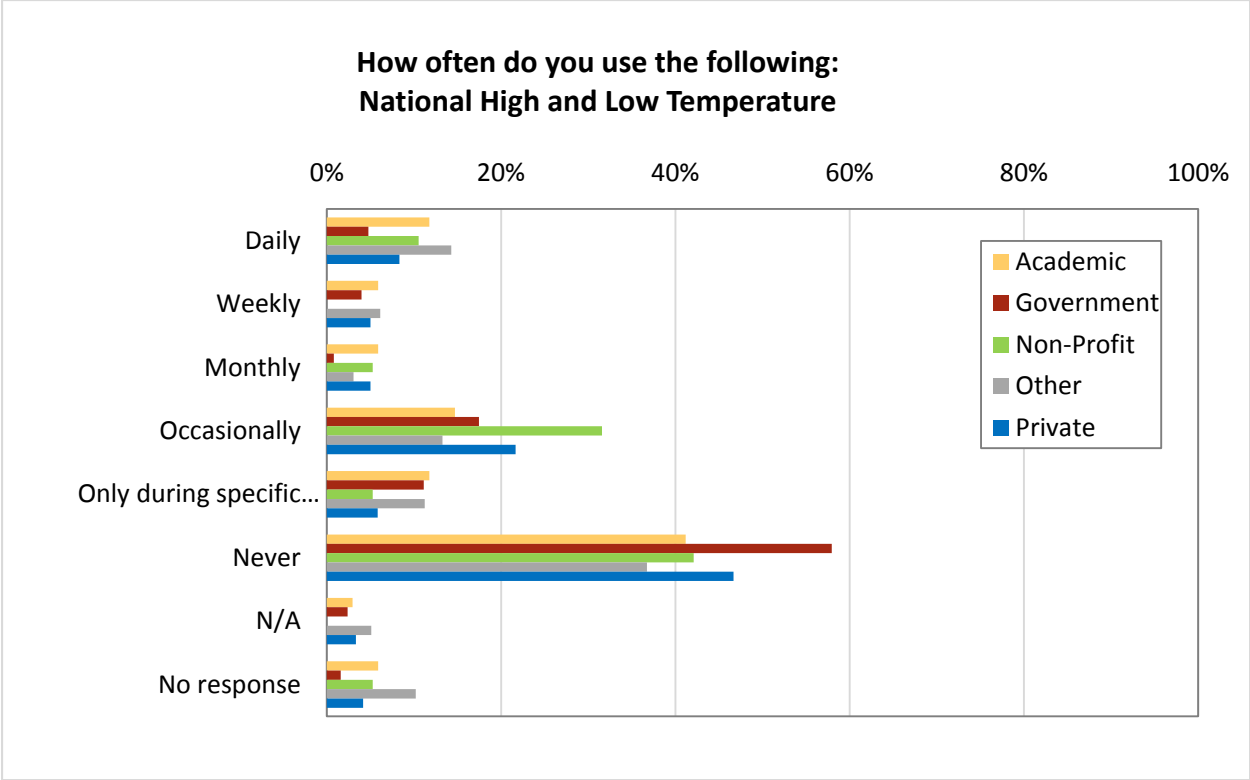












Appendix A. WPC Least-Used Products

To get an idea about the least-used WPC products, ERG created the table below, which depicts the percent of respondents that never use various products. It should be noted, however, that the table provides contextual information about product *use*, not product *value*. Given the timing of the survey, stakeholders may not have had a chance to use a specific product thus limiting the generalizability of the data.

Therefore, ERG does not recommend that WPC use this information to eliminate any of the products. Any potential product elimination needs to follow WPC's customer feedback process.

Percent of Respondents That Never Use Various WPC Products						
Product	Academic	Govt.	Nonprofit	Other	Private	All Sectors
QPF	7%	2%	12%	9%	2%	4%
PQPF	17%	12%	13%	18%	12%	14%
National Forecast Map/Chart	7%	14%	13%	11%	4%	9%
Surface Analysis	13%	19%	19%	16%	11%	16%
Significant River Flood Outlook	27%	25%	13%	26%	16%	22%
Excessive Rainfall Outlooks	17%	5%	13%	12%	10%	10%
Short-Range Fronts and Weather	13%	18%	13%	12%	18%	16%