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GUIDELINES FOR INCLUSION OF ADDITIONAL SECTIONS WITHIN THE AREA FORECAST DISCUSSION PRODUCT

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

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SUMMARY: This Supplement establishes policy for the inclusion of Aviation, Marine, Key Messages, and Update sections within the Area Forecast Discussion Product. Requirements for each section are also included along with guidance on how to write Key Messages and leverage probabilistic information to aid in messaging.

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Guidelines for Inclusion of Additional Sections Within the Area Forecast Discussion Product

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1. **Purpose:** This Supplement provides additional guidance to that contained in Section 2 and associated Appendix of NWSI 10-503. All instructions contained in NWSI 10-503 remain valid. This supplement establishes the requirement for Central Region offices to include a .KEY MESSAGES… section, UPDATE… section, and .AVIATION… section, in the Area Forecast Discussion (AFD) product. In addition, this supplement establishes policy for the inclusion of a .MARINE… section in the AFD for WFOs Marquette, Milwaukee, and Detroit. It also establishes policy for inclusion and content of a .HYDROLOGY… section. This Supplement provides instruction on how to incorporate probabilistic information into the AFD and introduces the .KEY MESSAGES…section as an important communication feature.

2. **Central Region Policy:** AFDs issued by Central Region offices will include the following sections:
   - .AVIATION… section that will provide a brief meteorological explanation of the reasoning behind the aviation forecasts issued by that office. WFOs will update the .AVIATION… section in the AFD, at a minimum, four (4) times per day to communicate information about the routine TAF issuances of 00Z, 06Z, 12Z and 18Z. For offices that produce more frequent update cycles to TAFs, the

.AVIATION… section should be updated whenever a significant change is made that will impact normal aviation operations. WFOs should work with Center Weather Service Unit (CWSU) forecasters and aviation partners to understand what weather impacts aviation operations.

- .KEY MESSAGES… section at the top of the product that will provide a plain-language summation of relevant weather, water, and climate information ongoing or expected in the forecast area. WFO should keep the .KEY MESSAGES… section up to date in order to reflect the latest meteorological and hydrological trends.
- .UPDATE… section will be added when forecast messaging changes in between required AFD issuances as defined by NWSI 10-503. WFOs should proactively issue updates that reflect the latest forecast trends.
- .MARINE… section for those offices with open lake responsibility, which will include a brief meteorological explanation of the reasoning behind the marine forecasts issued by that office. Central Region offices with only near shore responsibility have the option of including a .MARINE… section in their AFD.

3. Philosophy, Content, Format, and Guidelines:

Philosophy: In Central Region, WFOs will use the AFD for Impact-Based Decision Support Services (IDSS) by providing end users with the information they require to make the best and most informed decisions. This should include the range of possible outcomes and their probabilities (i.e., explaining the reason for the uncertainty) to help better inform decision makers. Key Messages will help prioritize and define information, ensure consistency, continuity and accuracy, and help users and stakeholders focus on what is important.

Content: The AFD should be written using plain language, avoid jargon, and be free of spelling and grammar errors. All sections of the AFD should provide the scientific reasoning for a range of potential scenarios, focus on impacts, and limit Words of Estimative Probability (WEPs) such as "chance, possible, and likely" unless they are quantified with an associated numeric probability. See example below:

NBM 4.1 probabilities of heavy snow are notable as a result, with the current chance 6+" of snow in the 30 to 40% range for the period from next Tuesday through Friday. Indeed, there is about a 20% probability for high-end snow amounts over a foot.

Format: The AFD will be structured in the following order:

- Key Messages (required)
- Update or Mesoscale Discussion Section will be added when forecast messaging changes in between required AFD issuances as defined by NWSI 10-503.
- Short and Long Term Sections or a single Discussion Section addressing:
    - Current Conditions

    - Expected Synoptic Pattern and its Predictability
    - Each Key Message (recommend individual paragraphs)
    - Any other Messaging Opportunities
- Aviation Section (required)
- Marine (as needed per section 2)
- Other optional sections, e.g. Climate, Hydrology, Fire Weather

Guidelines: In order to properly provide a probabilistic-focused AFD, forecasters should leverage an understanding of conceptual models of the synoptic to mesoscale patterns, ensemble-based tools, and output from (but not limited to) the National Blend of Models, including member spread, percentiles, and quantitative probabilities of exceedance. Forecasters will include technical details of these conceptual models, interpretation of signals from ensemble-based tools, and their expert assessment in the AFD. If KEY MESSAGES, UPDATE or MESOSCALE DISCUSSION, AVIATION, MARINE, or HYDROLOGY sections are updated at a different time than other sections of the AFD, include the time issued directly below the topic divider.

3.1. KEY MESSAGES… Section: Key Messages will always be placed at the top of the AFD. Key Messages in the AFD will serve as a foundational product for other IDSS products that offices create. Key Messages are a means of communicating the main points of information to NWS partners, members of the media, and the public. They are succinct summations that articulate relevant weather, water, and climate information. Key message guidelines can be found below.

Key Messages should:

- Be kept as high-level talking points.
    - In general, try to write two to five statements, in bullet form, with a total word count of 25 to 125; write one to two sentences for each Key Message. Key Messages should be short enough to be read or spoken in 30 seconds or less.
- Define, differentiate, and address challenges or uncertainty.
- Address what users need to know - especially impacts. Describes the hazard, including location and timing.
- Use easy-to-understand language; avoid jargon and acronyms.
- Ensure that messages are easy to recall and repeat; avoid long, run-on sentences.
- Use active voice, not passive; do not use conjecture; convey uncertainty using plain language that utilizes probabilistic information.
- Communicate effectively with different target audiences by adapting language and depth of information.

3.2. UPDATE or MESOSCALE DISCUSSION… Section: If WFOs choose to use the AFD as a mechanism to discuss potential impacts, outcomes, and technical details on current and expected mesoscale evolution (such as for convective events in the 0-6 hour time frame),

meteorologists should include this information in an .UPDATE… section that is clearly marked as a "Mesoscale Discussion", as shown below:

.UPDATE…
Issued at <time/date>
** MESOSCALE DISCUSSION **

<Insert discussion on potential impacts, outcomes, and scientific reasoning of mesoscale evolution>

This format of providing mesoscale information will ensure WFOs follow the allowable formatting of NWSI 10-503 while ensuring that this information is readily identifiable by users of the AFD.

3.3. AVIATION… Section: Typical users include, but are not be limited to, Flight Service Station (FSS) personnel, dispatchers and other air carrier personnel, Center Weather Service Unit (CWSU) personnel, Aviation Weather Center (AWC) personnel, FAA air traffic controllers, commercial airline industry, airport management authorities, General Aviation (GA) pilots, staff of adjacent WFOs, and military units. There will always be an explanation of weather in the Aviation section of each AFD. The explanation and terms used should be geared toward the users. Collaboration between the WFO and CWSU is encouraged.

At higher traffic and larger hub airports, it is helpful to address issues specific to each location. The AFD should include separate sections specific to each major airport in order to focus on any operationally significant weather events for that location.

An outlook is also useful for future planning purposes. Although not required, inclusion should be considered based on user input and desired information. Outlooks will highlight weather events that could impact aviation operations.

3.4. MARINE… Section: Typical users of the marine section of the AFD are the U.S. Coast Guard (USCG), owners and operators of tugs, barges, boats, ships, marinas, shipping companies, recreational boaters and staff of adjacent WFOs. CR Great Lake offices may include local effects, such as rip currents if deemed appropriate. Forecasters should pay particular attention to upcoming major marine events that would cause the issuance of gale or storm warnings and highlight in their discussion. Other more short term hazards such as small craft advisory conditions, dense fog and freezing spray should also be emphasized.

3.5. HYDROLOGY… Section: The .HYDROLOGY section is optional, and should be included when appropriate, such as when hydrologic impacts are included in the Hazardous Weather Outlook, following the general guidelines below. The text is free-format; however, bullets can be used if desired.

General Guidelines: The .HYDROLOGY… section should highlight or emphasize hydrometeorological information for hydrologic impacts anticipated in the CWA. The focus should be on flood potential, low water or other hydrologic conditions. Information to consider includes, but is not limited, to the following:

- Expand on hydrometeorological conditions, such as soil moisture, snowpack water equivalent, state of frozen ground and ice jams.
- Quantitative Precipitation Forecasts (QPF)
- Significant changes to hydrologic/flood forecasts
- Areas or river basins of concern
- Areas of heightened flash flood concern
- River forecast flood challenges (e.g., general crest and timing information, categories/magnitude of impacts expected, QPF not included in the river forecast, etc)
- Probabilistic information (e.g., HEFS, pQPF, NAEFS, etc)
- Hydrologic/meteorological components influencing flash flood potential
- Confidence in the occurrence of flooding/flash flooding (reasoning could be informed by FLASH, WoFS, other model guidance, etc)
- The unusual nature of a hydrologic event

Avoid:

- Any specific river crest or forecast numbers which could become outdated or require an update in time with additional statements or warnings.
- Too much detail about meteorological components which would be part of the main discussion sections of the AFD

Do not include:

- Information for internal use only, that is not meant for public release.

Appendix A: AFD Examples

Key Messages Example 1

AREA FORECAST DISCUSSION
National Weather Service Kansas City/Pleasant Hill MO
327 PM CDT Mon Sep 5 2022

.KEY MESSAGES…
327 PM CDT Mon Sep 5 2022

-A significant warmup is expected Thursday and Friday with temperatures approaching daily records.

-Precipitation is looking more likely (greater than 70%) this weekend. Localized heavy rainfall could lead to minor street flooding and rises on small creeks and streams. The risk of widespread flooding is low (less than 10%).

&&

.DISCUSSION...
Issued at 642 PM CDT MON SEP 5 2022

<insert discussion here>

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Key Messages Example 2

Area Forecast Discussion
National Weather Service Omaha/Valley NE
1229 PM CDT Wed Aug 2 2023

.KEY MESSAGES…

-The heavy rain potential will continue through Wednesday morning, primarily focused across east central NE and southwest IA.

-There is the potential for strong to severe storms (30% chance) across the region Saturday afternoon/night.

-Cooler and drier conditions this weekend/early next week.

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.DISCUSSION...
Issued at 419 AM CDT Wed Aug 2 2023

<insert discussion here>

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Key Messages Example 3 - *Historic Winter Storm*

AREA FORECAST DISCUSSION
National Weather Service City in Louisville, KY
345 PM CDT Fri Feb 15 2021

.KEY MESSAGES…

-A historic winter storm is poised to impact central Kentucky, with impacts beginning as early as Saturday morning, continuing through Monday.

-Extremely cold temperatures, rivaling the December 1989 Arctic Outbreak, are forecast on Sunday and Monday, with prolonged below normal temperatures to continue through next week.

-Impacts resulting in severe stress to the region's infrastructure (particularly power, water, and highways). Prepare for delays to travel lasting several days.

-Additional sleet, snow, and freezing rain is forecast toward the middle of next week though it is too early to determine amounts at this time.

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.DISCUSSION...
Issued at 345 PM CDT Fri Feb 15 2021

<insert discussion here>

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Key Messages Example 4 - ***Historic Temperatures With Probabilistic Information***

AREA FORECAST DISCUSSION
National Weather Service City in Colorado, CO
327 AM CDT Sun Jul 23 2023

.KEY MESSAGES…

-Record breaking temperatures are likely (70% chance) Monday and Tuesday, with numerous locations across the plains exceeding 100 degrees. A few locations could potentially (30% chance) reach 110-115 degrees for highs.

-Colorado Springs and Pueblo have an approximately 10% chance of setting all-time record high temperatures. This event has the potential to be the most extreme heat event in at least the past 50 years.

-The extremely hot temperatures will pose a significant threat to those people outdoors or those that do not have air conditioning. The intense heat could also be dangerous for livestock and pets that are left outside.

-There is a 20% chance of thunderstorms Tuesday night when cooler air makes it into the state and brings an end to the extreme heat.

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.DISCUSSION...
Issued at 327 PM CDT Sun Jul 23 2023

<insert discussion here>

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Example 5 - ***Mesoscale-focused "Update" section***

.UPDATE...
Issued at 1127 PM CDT Sat Jul 9 2022

** MESOSCALE DISCUSSION **

The overall expectations stated in the previous update discussion remain on track. The northern half of the MCS in eastern Montana appears to have taken a linear storm mode, though there is some ambiguity due to the Glasgow radar outage. Wind gusts in the 60 to 70 mph range have consistently been reported from the Canadian border to the Missouri River. Further south, reports have been harder to come by due to sparse observations/population, but a cluster of discrete storms will soon be approaching I-94 between Miles City and Glendive. The downstream environment remains highly favorable for maintenance of severe convection, including 3000-4000 J/kg MUCAPE, effective bulk shear on the order of 50 kts, easterly low level flow opposing mean westerly storm motion, and DCAPE around 1000-1500 J/kg. The threat for damaging winds extends along the entire MCS, but storm mode dictates that the threat for large hail should be limited to the semi-discrete clusters on the southern end of the MCS. It is possible that the hail threat could be limited to portions of southwest North Dakota as upscale growth could transition storm mode to linear by the time convection reaches south central North Dakota.

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Example 6 - Marine Section

.MARINE...
Issued at 645 AM CDT Tue May 24 2022

Surface low pressure will continue to rotate northeast towards the eastern Great Lakes region into Monday. The tightening pressure gradient as the surface low moves across eastern portions of the Great Lakes region will increase northerly flow over the central Great Lakes today into Monday. With an increase in winds and waves, a Small Craft Advisory is currently in effect through Monday morning for the Saginaw Bay, and tonight into Monday morning for the Lake Huron nearshore waters as well as Lake St. Clair. Northerly flow will become westerly though the day on Monday as the low continues to work northeast. Periods of rain stick around as the surface low rotates around lower Michigan through the first half of the week.

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Example 7 - Aviation Section

.AVIATION /12Z TAFS THROUGH 12Z WEDNESDAY MORNING/...
Issued at 645 AM CDT Tue May 24 2022

Localized fog with IFR or lower conditions are forecast across northwest and parts of north central

North Dakota early this morning, but otherwise VFR conditions will prevail today and tonight across western and central North Dakota. VFR cumulus will develop with daytime heating today, and there is also a low (20 percent) chance of showers in western and parts of central North Dakota this afternoon and early evening.

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Example 8 - Hydrology Section

.HYDROLOGY...
Issued at 1107 AM CDT Fri Apr 21 2023

Hydro concerns over the next week continue to focus mainly on the Mississippi River, especially from Dubuque to the Quad Cities. This is due to a combination of heavy rain that fell across Minnesota and Wisconsin Wednesday, runoff from a melted snowpack, and a persistent wet pattern over the coming weeks. Current ensembles from the RFC are incorporating the combined flows, and do indicate river levels will be higher than what is in the current official forecast, but still only use the next 72 hours of QPF. Thus, when additional rainfall from later this week is included in the forecasts, river level forecasts should continue to trend higher. Confidence is low (less than 20%) on the amount of rain that will fall in the next several weeks so there remains considerable uncertainty with how high the river will get at all points. However, HEFS does indicate probabilities in the Most Likely category (25% to 75%) of levels rising above flood stage by the end of the 10 day window for the entire stretch of the river from Dubuque through the Quad Cities. Peak crests will be beyond 10 days from today, where the long range probabilities that were updated last week continue to show a 30% to 50% probability of peak crests exceeding major flood stage through this same stretch of the river. Please stay tuned to the latest products and information.

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