Department of Commerce ▪ National Oceanic & Atmospheric Administration ▪ National Weather Service

NATIONAL WEATHER SERVICE CENTRAL REGION SUPPLEMENT 02-2002
APPLICABLE TO NWSI 10-922
MARCH 27, 2014

Operations and Services
Hydrologic Services Program, NWSPD 10-9

Weather Forecast Office Hydrologic Products Specification, NWSI 10-922

WEATHER FORECAST OFFICE HYDROLOGIC PRODUCTS

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SUMMARY OF REVISIONS: This supplement supersedes NWS Central Region Supplement 02-2002, dated December 8, 2009. The following revisions were made to this supplement:

1. Updated references to the Hydrologic Outlook (ESF) to reflect new format for the Probabilistic Hydrologic Outlook.
2. Added section on Water Supply Outlook.

/signed/ 3/11/14
Teri Schwein Date
Acting Director, Central Region

Weather Forecast Office Hydrologic Products

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1. Introduction. The purpose of this supplement is to provide additional instructions pertaining to Central Region Weather Forecast Office hydrologic products, which are not addressed in NWSI 10-922; and to provide guidance on the types of hydrologic products to issue under various circumstances.

1.1 Use of Abbreviations in Products. Abbreviations or acronyms in text product tables, such as FS for Flood Stage, will be defined within the product. Commonly known abbreviations such as FT (feet) do not need to be defined within the product. The location of the placement of the abbreviation definition will typically be at the bottom of the table or product, however, local discretion to meet customer needs is allowed. Examples of defined abbreviations include:

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FS - FLOOD STAGE
7AM STG - OBSERVED STAGE AT 7 AM LOCAL TIME
24HR CHG - CHANGE IN STAGE OVER LAST 24 HOURS /7AM-7AM/
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2. Outlooks, Watches, Warnings and Advisories Defined. The National Weather Service uses outlooks, watches, warnings and advisories to convey the severity and timing of a forecast hazard, as well as impart a certain level of confidence to the occurrence of that hazard. Flood and Flash Flood Warnings and Advisories convey a high degree of confidence, Flood Watches a medium degree of confidence and Hydrologic Outlooks a lower level of confidence. The level of confidence typically decreases the further in time a forecast is projected. This is reflected in the suggested time periods for which to issue some of the products (e.g., Hydrologic Outlooks generally beyond 24 hours of the event occurring, Flood Watches typically 12 - 48 hours prior to the event).

Using the "Ready, Set, Go" concept, WFO staff should strive to issue products in the outlook, watch, warning order. Since the possibility for flooding as stated in Hazardous Weather Outlooks, Hydrologic Outlooks, and/or Flood Watches is lower than for Flood and Flash Flood Warnings and Advisories, it is not certain that a warning or advisory will always follow an outlook and/or a watch. When issuing hydrologic products, the use of confidence levels should be similar to those used in other NWS Outlook/Watch/Warning products. The following are guidelines to assist the forecaster in the decision making process:

- Include flood potential information in the Hazardous Weather Outlook (HWO) for 30 % or greater chance of hazardous flooding in the 1 to 7-day time frame.
- Issue a Hydrologic Outlook for a 30 %-50% chance of flooding and/or where more detail is deemed necessary than what is stated in the HWO. The ESF is not mandatory if the information is adequately presented in the HWO.
- Issue a Flood Watch for a 50-80% chance of flooding.
- Issue a Flood or Flash Flood Warning for an 80% or greater chance of flooding that is expected to reach warning criteria (e.g., flood stage or fast-flowing water at least six inches in depth).
- Issue a Flood Advisory for an 80% or greater chance of flooding that is not expected to reach warning criteria but could cause significant inconvenience, and if caution is not exercised, could lead to situations that may threaten life and/or property.

A warning may be issued at any time without a prior outlook or watch when a high level of confidence exists, or flooding is already occurring.

3. Call to Action Statements (CTAs) and Flood Safety Rules. NOAA General Counsel

advised against the use of CTAs or safety rules that suggest certain courses of action for persons caught in flood waters. Therefore, CR WFO flood and flash flood warnings, statements and safety rules will not suggest action if a person is already caught in high water. Rather, warnings and statements should continue to emphasize not entering the water at all, using phrases such as, "Turn around, Don't Drown" or "Move to higher ground immediately." Per NOAA General Counsel, suggesting a course of action only "seems to undermine our original advice to avoid the situation all together."

4. Low Water Crossings. Low water crossings are typically low dips in the road that cross a dry creek bed. During times of intense rainfall, these crossings may fill with rapidly rising, fast-flowing water and become life-threatening. Warnings may be issued and verified for known low water crossings containing swiftly flowing water of six inches or more in depth (per NWSI 10-1605). For low water crossings that are flooded with water that does not pose a threat to life if caution is used (less than three feet of depth per NWSI 10-1605), a Flood Advisory may be issued. Each WFO should work closely with their Emergency Managers to assess whether there is a need to warn for known low water crossings.

5. Outlooks.

5.1 Hydrologic Outlook (ESF) and Hazardous Weather Outlook (HWO). Hydrologic Outlooks (ESF) are issued to provide information on hydrometeorological conditions which could cause flooding in the near term, generally within 1-7 days. River Forecast Center (RFC) forecast guidance may be included in the ESF if available. Hazardous Weather Outlooks will also include information regarding a 30% or greater chance of hazardous flooding through a 7-day period, but would be more general in nature (ref. NWSI 10-517 and accompanying Central Region Supplement). A Hydrologic Outlook (ESF) is not necessary if flood potential is adequately covered in the HWO, unless it is a known customer need.

5.2 Hydrologic Outlook (ESF) and Drought Information Statement (DGT). A Hydrologic Outlook may contain drought information but does not replace the Drought Information Statement. If drought information is included in the ESF, there should be a reference to the DGT, if one exists.

5.3 Probabilistic Hydrologic Outlook (ESF). When long range probabilistic forecasts are provided by the servicing RFC as an ESG or ESP product, the WFO will issue the information as a plain text product using the Probabilistic Hydrologic Outlook (ESF) product identifier and MND header. Where RFCs provide probabilistic forecasts for specific probabilities (e.g., 5, 10, 25, 50, 75, 90 and 95%) and flood category levels, the format of the ESF will follow the format shown in Appendices C and D.

Event-driven updates may be issued depending on customer needs as well as RFC workload and concurrence. Certain antecedent conditions do not work well with probabilistic updates. WFOs and RFCs should coordinate with the best service to the public in mind. An example of a needed

update would be if hydrologic conditions changed enough to alter the outlook's probability values for risk levels that would cause customers and partners to modify flood response according to their mitigation plans.

For implementation of new probabilistic river forecast points that get added to the ESF, the standard notification of service can be provided (ref. CR Supplement for new or expanded hydrologic services).

5.4 Spring Flood and Water Resources Outlook (ESF). Prior to the annual national press briefing for spring floods and drought, all WFOs will issue an ESF with product name, Probabilistic Hydrologic Outlook or Water Supply Outlook, depending on applicable RFC guidance. This ESF will have the following headline:

…SPRING FLOOD AND WATER RESOURCES OUTLOOK…

This outlook may contain drought information but does not replace a Drought Information Statement. If drought information is included in the ESF, there should be a reference to the DGT, if one exists. Format and content guidelines for the SPRING FLOOD AND WATER RESOURCES OUTLOOK can be found in Appendix D.

5.5 Water Supply Outlook (ESF). Where RFCs provide water supply forecasts, WFOs will use the RFC forecasts in the Water Supply Outlook. Other agency forecasts, such as those issued by the National Resources Conservation Service (NRCS), may be used where RFC forecasts are not available, or where RFCs collaborate with NRCS on the final product. Adjustments will not be made to the RFC forecasts without the RFC's concurrence.

6. Flood Watch (FFA) and NWR-SAME codes. There are two NWR-SAME codes available for Flood Watches: FFA and FLA (reference NWSI 10-1710). Use of SAME codes for flood watches is at WFO discretion. If SAME codes are used, the FFA code should be used for Flood Watches with headlines that state a Flash Flood Watch is in effect, and the FLA code should be used for all other flood watches.

7. Flood Advisories (FLS). Flood Advisories may be issued in the near-term situation where confidence is high that flooding will occur but will not meet warning criteria. Flood Advisories are typically issued for urban areas and rural roads where the public should exercise caution. Similar to various winter weather advisories, Flood Advisories are issued for conditions that could cause significant inconvenience and could lead to situations that may threaten life and/or property if caution is not exercised. Flood Advisories may be upgraded to a Flood Warning per instructions in NWSI 10-922.

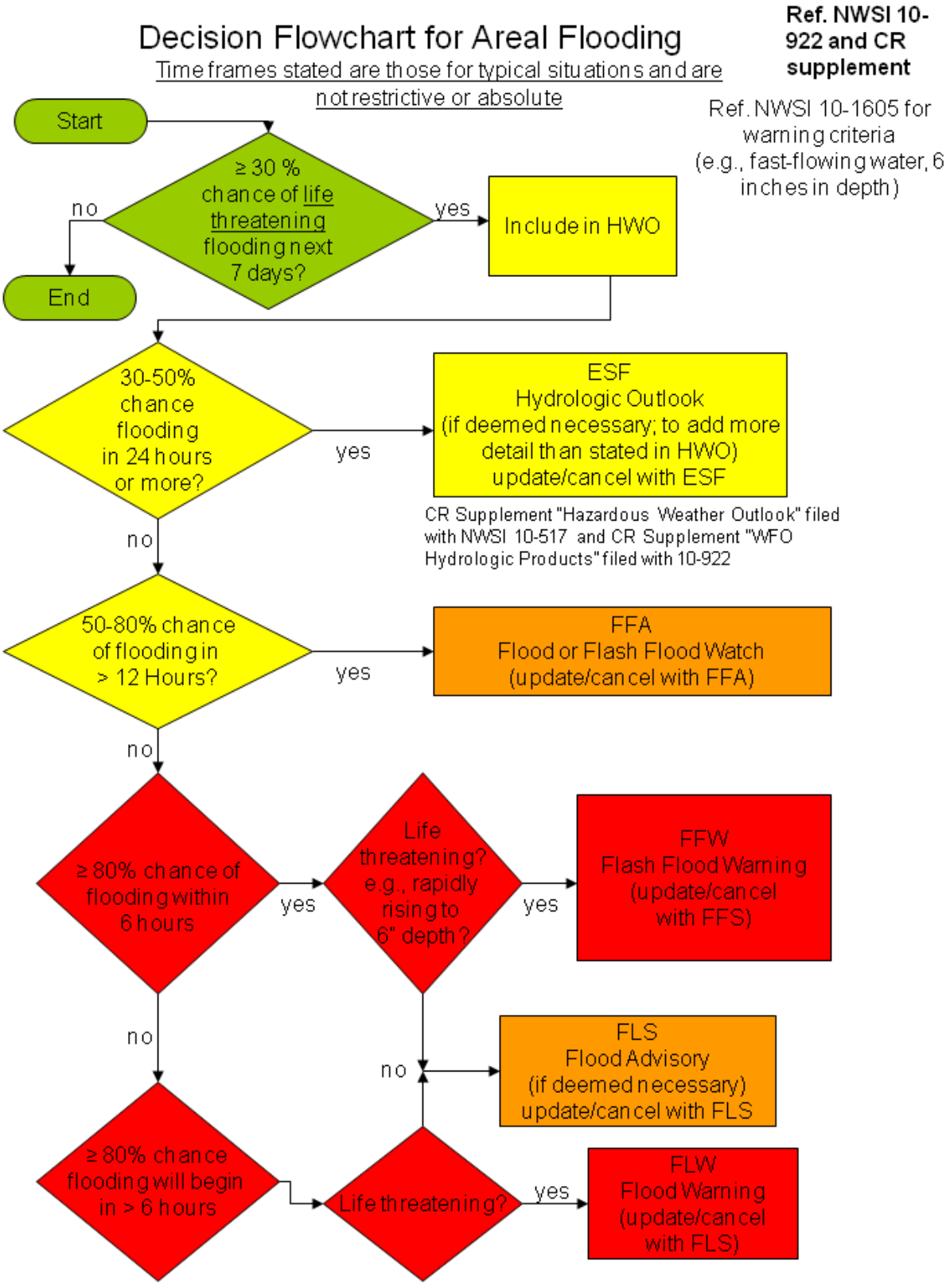
7.1 Flood Advisory (FLS) for River Forecast Points and Hydrologic Statement (RVS). For river forecast points (including headwater or local river forecast points), a Flood Advisory (FLS) may be issued when the stream is above or forecast to rise above bankfull or some other locally designated "Advisory Level," but remain below flood stage, and conditions warrant that the

public should use caution to avoid risk to life and/or property. Flood Advisories for river forecast points may also be issued when the river has fallen below flood stage but will remain above bankfull or some other designated advisory level. This would typically be done in cases where a slow recession causes prolonged flooding below flood stage. Not all river forecast points may warrant the need for Flood Advisories to be issued; this should be determined locally.

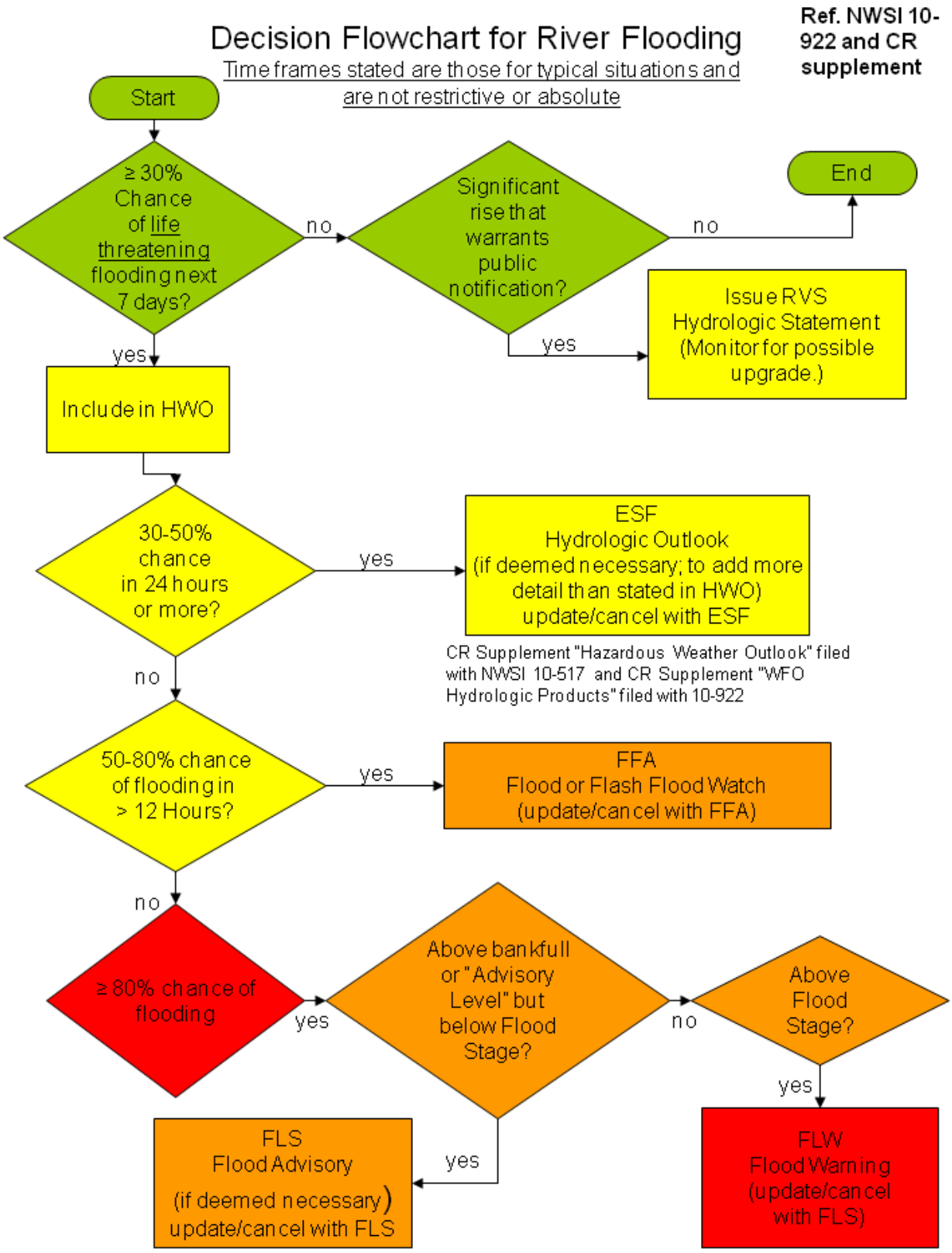
For significant rises below flood stage that warrant public notification but do not pose a hazard, a Hydrologic Statement (RVS) may be issued.

8. Long-term Duration Phrases in Flood Warnings (FLW) and Flood Statements (FLS). When the event ending date/time group and the flood end date/time group are coded with ten zeros (000000T0000Z), a long-term duration phrase such as “UNTIL FURTHER NOTICE” is used for the effective time of the warning. To avoid confusion as to whether or not the warning is in effect or cancelled, the phrase "“...OR UNTIL THE WARNING IS CANCELLED” will not be used. Other long-term phrase examples include: "FOR THE NEXT WEEK," "AT LEAST THROUGH THE END OF THE WEEK" and "FOR SEVERAL WEEKS."

Appendix A


Decision Flowchart for Areal Flooding
Time frames stated are those for typical situations and are not restrictive or absolute
Ref. NWSI 10-922 and CR supplement
Ref. NWSI 10-1605 for warning criteria (e.g., fast-flowing water, 6 inches in depth)
Start
≥ 30 % chance of life threatening flooding next 7 days?
no
yes
End
Include in HWO
30-50% chance flooding in 24 hours or more?
yes
ESF
Hydrologic Outlook
(if deemed necessary; to add more detail than stated in HWO)
update/cancel with ESF
CR Supplement "Hazardous Weather Outlook" filed with NWSI 10-517 and CR Supplement "WFO Hydrologic Products" filed with 10-922
no
50-80% chance of flooding in > 12 Hours?
yes
FFA
Flood or Flash Flood Watch
(update/cancel with FFA)
no
≥ 80% chance of flooding within 6 hours
yes
Life threatening? e.g., rapidly rising to 6" depth?
yes
FFW
Flash Flood Warning
(update/cancel with FFS)
no
no
FLS
Flood Advisory
(if deemed necessary)
update/cancel with FLS
≥ 80% chance flooding will begin in > 6 hours
Life threatening?
yes
FLW
Flood Warning
(update/cancel with FLS)

Appendix B


Decision Flowchart for River Flooding
Time frames stated are those for typical situations and are not restrictive or absolute
Ref. NWSI 10-922 and CR supplement
Start
≥ 30% Chance of life threatening flooding next 7 days?
no
Significant rise that warrants public notification?
no
End
yes
Issue RVS Hydrologic Statement (Monitor for possible upgrade.)
yes
Include in HWO
30-50% chance in 24 hours or more?
yes
ESF Hydrologic Outlook (if deemed necessary; to add more detail than stated in HWO) update/cancel with ESF
CR Supplement "Hazardous Weather Outlook" filed with NWSI 10-517 and CR Supplement "WFO Hydrologic Products" filed with 10-922
no
50-80% chance of flooding in > 12 Hours?
yes
FFA Flood or Flash Flood Watch (update/cancel with FFA)
no
≥ 80% chance of flooding
yes
Above bankfull or "Advisory Level" but below Flood Stage?
no
Above Flood Stage?
yes
FLW Flood Warning (update/cancel with FLS)
yes
FLS Flood Advisory (if deemed necessary) update/cancel with FLS

Appendix C - Examples of Hydrologic Outlooks

Table of Contents:

1. Examples of Hydrologic Outlooks. The following examples have been taken from actual products. Repetitive sections were omitted while still preserving the overall format.

1.1 Probabilistic Hydrologic Outlook. This example includes the chances to reach flood categories.

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FGUS73 KPAH 292006
ESFPAH
ILC003-047-055-059-065-069-077-081-087-127-145-151-153-165-181-
185-191-193-199-INC051-125-129-147-163-173-KYC007-033-035-039-047-
055-059-075-083-101-105-107-139-143-145-149-157-177-219-221-225-
233-MOC017-023-031-035-133-143-157-181-201-207-223-221200-

PROBABILISTIC HYDROLOGIC OUTLOOK
NATIONAL WEATHER SERVICE PADUCAH KY
247 PM CDT MON OCT 29 2012

IN TABLE 1 BELOW...THE CURRENT (CS) AND HISTORICAL (HS) OR NORMAL
PROBABILITIES OF EXCEEDING MINOR...MODERATE...AND MAJOR FLOOD STAGES
ARE LISTED FOR THE VALID TIME PERIOD.

CS VALUES INDICATE THE PROBABILITY OF REACHING A FLOOD CATEGORY
BASED ON CURRENT CONDITIONS.

HS VALUES INDICATE THE PROBABILITY OF REACHING A FLOOD CATEGORY
BASED ON HISTORICAL OR NORMAL CONDITIONS.

WHEN THE VALUE OF CS IS MORE THAN HS...THE PROBABILITY OF
EXCEEDING THAT LEVEL IS HIGHER THAN NORMAL. WHEN THE VALUE OF CS IS
LESS THAN HS...THE PROBABILITY OF EXCEEDING THAT LEVEL IS LOWER
THAN NORMAL.

...TABLE 1--PROBABILITIES FOR MINOR...MODERATE AND MAJOR FLOODING...
                    VALID PERIOD:  10/29/2012 - 1/27/2013

                                       :    CURRENT AND HISTORICAL
                                       :     CHANCES OF EXCEEDING
                                       :       FLOOD CATEGORIES
                                       :      AS A PERCENTAGE (%)
```

LOCATION	CATEGORICAL FLOOD STAGES (FT) MINOR	MOD	MAJOR	MINOR CS	MINOR HS	MODERATE CS	MODERATE HS	MAJOR CS	MAJOR HS
:OHIO RIVER									
EVANSVILLE	42.0	48.0	52.0	9	10	<5	<5	<5	<5
GOLCONDA	40.0	50.0	55.0	15	16	<5	<5	<5	<5
MOUNT VERNON	35.0	45.0	52.0	28	35	<5	<5	<5	<5
NEWBURGH DAM	38.0	48.0	56.0	39	46	<5	<5	<5	<5
OWENSBORO	40.0	45.0	49.0	13	15	<5	<5	<5	<5
SHAWNEETOWN	33.0	43.0	53.0	43	51	10	12	<5	<5
J.T. MYERS DAM	37.0	50.0	60.0	35	37	<5	<5	<5	<5
:WABASH RIVER									
NEW HARMONY	15.0	20.0	23.0	47	42	6	7	<5	<5

[additional forecast points omitted]

:BIG MUDDY RIVER									
PLUMFIELD	20.0	25.0	34.0	30	18	8	5	<5	<5
MURPHYSBORO	22.0	28.0	36.0	45	36	13	10	<5	<5

LEGEND
CS = CONDITIONAL SIMULATION (CURRENT OUTLOOK)
HS = HISTORICAL SIMULATION
FT = FEET

IN TABLE 2 BELOW...THE 95 THROUGH 5 PERCENT COLUMNS INDICATE THE PROBABILITY OF EXCEEDING THE LISTED STAGE LEVELS (FT) FOR THE VALID TIME PERIOD.

...TABLE 2--EXCEEDANCE PROBABILITIES...

CHANCE OF EXCEEDING STAGES
AT SPECIFIC LOCATIONS
VALID PERIOD: 10/29/2012 - 1/27/2013

LOCATION	95%	90%	75%	50%	25%	10%	5%
:OHIO RIVER							
EVANSVILLE	17.3	24.4	27.8	33.0	37.1	41.7	43.6
GOLCONDA	29.9	30.8	33.4	34.7	37.5	41.3	44.2
MOUNT VERNON	24.0	26.1	28.0	31.6	35.5	40.6	43.5
NEWBURGH DAM	18.5	26.9	29.6	36.7	39.8	44.4	45.4
OWENSBORO	19.2	24.7	27.3	32.8	35.5	41.3	43.0
SHAWNEETOWN	19.9	23.6	28.8	31.4	37.8	43.2	46.2
J.T. MYERS DAM	20.4	24.7	30.9	33.9	39.2	43.3	45.7
:WABASH RIVER							
NEW HARMONY	4.4	7.0	11.6	14.8	17.3	19.4	20.2

[additional forecast points omitted]

:BIG MUDDY RIVER							
PLUMFIELD	6.3	7.4	14.1	18.0	20.4	23.2	27.4
MURPHYSBORO	6.6	8.4	14.7	21.5	25.1	29.3	33.7

IN TABLE 3 BELOW...THE 95 THROUGH 5 PERCENT COLUMNS INDICATE THE PROBABILITY OF FALLING BELOW THE LISTED STAGE LEVELS (FT) FOR THE VALID TIME PERIOD.

...TABLE 3--NONEXCEEDANCE PROBABILITIES...

CHANCE OF FALLING BELOW STAGES
AT SPECIFIC LOCATIONS
VALID PERIOD: 10/29/2012 - 1/27/2013

LOCATION	95%	90%	75%	50%	25%	10%	5%
:BIG MUDDY RIVER							
PLUMFIELD	2.8	2.7	2.5	2.5	2.5	2.4	2.4
MURPHYSBORO	4.6	4.4	4.2	3.9	3.9	3.7	3.7

THESE LONG-RANGE PROBABILISTIC OUTLOOKS CONTAIN FORECAST VALUES THAT ARE CALCULATED USING MULTIPLE SEASON SCENARIOS FROM 30 OR MORE YEARS OF CLIMATOLOGICAL DATA...INCLUDING CURRENT CONDITIONS OF THE RIVER...SOIL MOISTURE...SNOW COVER...AND 30 TO 90 DAY LONG-RANGE OUTLOOKS OF TEMPERATURE AND PRECIPITATION. BY PROVIDING A RANGE OF PROBABILITIES...THE LEVEL OF RISK ASSOCIATED WITH LONG-RANGE PLANNING DECISIONS CAN BE DETERMINED. THESE PROBABILISTIC FORECASTS ARE PART OF THE NATIONAL WEATHER SERVICE'S ADVANCED HYDROLOGIC PREDICTION SERVICE.

VISIT OUR WEB SITE WEATHER.GOV/PAH FOR MORE WEATHER AND WATER INFORMATION.

THE NEXT OUTLOOK WILL BE ISSUED NOVEMBER 22.

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1.2 Hydrologic Outlook for Possible Heavy Rain Event

FGUS73 KFSD 011510
ESFFSD
HYDROLOGIC OUTLOOK
NATIONAL WEATHER SERVICE SIOUX FALLS SD
1010 AM CDT THU MAY 01 2008

...HEAVY RAIN COULD CAUSE RIVER FLOODING IN THE NEXT FEW DAYS...

.THE FOLLOWING RIVER INFORMATION IS BASED ON FUTURE PREDICTED RAINFALL. THE EXACT AMOUNT...INTENSITY...TIMING...AND LOCATION OF THE RAIN THAT WILL OCCUR IS STILL UNCERTAIN. THESE OUTLOOK STAGES ARE PROVIDED TO SHOW WHAT MAY BE EXPECTED IF THE FORECAST PRECIPITATION OCCURS. ONCE THERE IS MORE CERTAINTY ABOUT THE RIVER FORECASTS...A FLOOD WARNING OR STATEMENT WILL BE ISSUED IF THE THREAT MATERIALIZES.

A STRONG SPRING STORM SYSTEM WILL BE MOVING ACROSS SOUTH DAKOTA TODAY THROUGH FRIDAY NIGHT. WIDESPREAD HEAVY RAINFALL IS EXPECTED

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ACROSS MOST OF EASTERN SOUTH DAKOTA TONIGHT THROUGH FRIDAY NIGHT.
RAINFALL FROM THIS SYSTEM COULD RANGE FROM AS LITTLE AS 0.50 INCH TO
AS MUCH AS 3 INCHES. CURRENTLY...THE MOST LIKELY RAINFALL WILL BE
AROUND 1 TO 2 INCHES IN SOUTHEASTERN SOUTH DAKOTA.

ADDITIONAL INFORMATION IS AVAILABLE AT

HTTP://WWW.CRH.NOAA.GOV/AHPS2/INDEX.PHP?WFO=FSD

STAY TUNED FOR FURTHER UPDATES BY LISTENING TO NOAA WEATHER RADIO...
OR YOUR LOCAL RADIO AND TV STATIONS.

SDC005-021510-
1010 AM CDT THU MAY 01 2008

...FOR THE JAMES RIVER AT HURON...

* THE STAGE AT 9 AM THURSDAY WAS 9.3 FEET...
* FLOOD STAGE IS 11.0 FEET...
* BASED ON THE RANGE OF PRECIPITATION FORECAST TO FALL IN THE NEXT 60
  HOURS...THE RIVER IS FORECAST TO CREST BETWEEN 9.3 FEET AND 14.8
  FEET. AT THIS TIME...THE MOST LIKELY CREST IS FORECAST TO BE NEAR
  10.2 FEET.
* THIS OUTLOOK IS BASED SOLELY ON MODEL GUIDANCE AND SHOULD ONLY BE
  USED TO APPROXIMATE THE POTENTIAL RANGE OF RIVER LEVELS BASED ON
  VARIOUS PRECIPITATION TOTALS.

$$

SDC111-021510-
1010 AM CDT THU MAY 01 2008

...FOR THE JAMES RIVER NEAR FORESTBURG...

* THE STAGE AT 7 AM THURSDAY WAS 5.1 FEET...
* FLOOD STAGE IS 12.0 FEET...
* BASED ON THE RANGE OF PRECIPITATION FORECAST TO FALL IN THE NEXT 60
  HOURS...THE RIVER IS FORECAST TO CREST BETWEEN 5.4 FEET AND 16.4
  FEET. AT THIS TIME...THE MOST LIKELY CREST IS FORECAST TO BE NEAR
  9.4 FEET.
* THIS OUTLOOK IS BASED SOLELY ON MODEL GUIDANCE AND SHOULD ONLY BE
USED TO APPROXIMATE THE POTENTIAL RANGE OF RIVER LEVELS BASED ON
VARIOUS PRECIPITATION TOTALS.

$$

[additional segments omitted]

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&&

LOCATION FLOOD  LATEST OBSERVED   RANGE OF POSSIBLE CRESTS
         STAGE  STAGE  TIME       LOWEST   MEDIAN   HIGHEST

JAMES RIVER
HURS2    11.0    9.26 THU 9 AM     9.27    10.20    14.77
FORS2    12.0    5.14 THU 7 AM     5.41     9.40    16.38
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```
JRMS2    17.0   12.38 THU 10 AM   12.52    14.35    22.29
SCOS2    13.0    7.12 THU 10 AM    8.15     8.15    18.28

BIG SIOUX RIVER
BRKS2     9.0    5.89 THU 6 AM     7.62    11.29    13.34
DERS2    12.0    6.97 THU 9 AM     8.48    12.42    15.25
SFLS2    12.0   10.70 THU 7 AM    11.64    13.46    16.49
SXFS2    16.0    9.23 THU 8 AM    10.12    15.07    22.23
HAWI4    15.0       M             12.12    17.01    23.33
AKRI4    16.0   12.69 THU 10 AM   13.05    17.93    23.50

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MG
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1.3. Probabilistic Hydrologic Outlook - Spring Flood and Water Resources Outlook. This example includes the probabilities of reaching flood categories as well as the probabilities of falling below certain levels for low flow forecasts. It also includes a comparison to normal for each flood category.

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FGUS73 KDVN 251803
ESFDVN
IAC011-019-031-045-055-057-061-087-095-097-101-103-105-107-111-113-
115-139-163-177-183-ILC011-015-067-071-073-085-109-131-155-161-177-
187-195-MOC045-199-212100-

PROBABILISTIC HYDROLOGIC OUTLOOK
NATIONAL WEATHER SERVICE QUAD CITIES IA IL
102 PM CDT THU MAR dd yyyy

...SPRING FLOOD AND WATER RESOURCES OUTLOOK NUMBER 2...

THIS FLOOD OUTLOOK IS FOR THE QUAD CITIES HYDROLOGIC SERVICE
AREA...WHICH INCLUDES PORTIONS OF EASTERN IOWA...NORTHWESTERN
ILLINOIS...AND EXTREME NORTHEASTERN MISSOURI. THIS AREA ENCOMPASSES
THE MISSISSIPPI RIVER AND ITS TRIBUTARIES FROM BELOW GUTTENBERG LD10
IOWA TO BELOW GREGORY LANDING MISSOURI. THE OUTLOOK IS FOR THE TIME
PERIOD FROM TODAY THROUGH MID JUNE.

THIS OUTLOOK ASSUMES THAT NEAR NORMAL TEMPERATURES AND PRECIPITATION
WILL OCCUR DURING THE OUTLOOK TIME PERIOD. IF TEMPERATURES AND
PRECIPITATION ARE NOT NEAR NORMAL...THEN THE ACTUAL RISK OF FLOODING
MAY DIFFER FROM WHAT THE OUTLOOK CURRENTLY INDICATES.

...THERE IS A NEAR NORMAL RISK TO SLIGHTLY GREATER THAN NORMAL RISK
OF FLOODING ACROSS MUCH OF EASTERN IOWA AND FAR NORTHEASTERN
MISSOURI. THERE IS AN INCREASED RISK OF FLOODING ACROSS NORTHWESTERN
ILLINOIS...WHILE A SLIGHTLY BELOW NORMAL RISK EXISTS FOR PORTIONS OF
THE MAINSTEM MISSISSIPPI RIVER NORTH OF NEW BOSTON...

IN TABLE 1 BELOW, THE CURRENT (CS) AND HISTORICAL (HS) OR NORMAL
PROBABILITIES OF EXCEEDING MINOR...MODERATE...AND MAJOR FLOOD STAGES
ARE LISTED FOR THE VALID TIME PERIOD.

CS VALUES INDICATE THE PROBABILITY OF REACHING A FLOOD CATEGORY
BASED ON CURRENT CONDITIONS.
```

HS VALUES INDICATE THE PROBABILITY OF REACHING A FLOOD CATEGORY
BASED ON HISTORICAL OR NORMAL CONDITIONS.

WHEN THE VALUE OF CS IS GREATER THAN HS...THE PROBABILITY OF
EXCEEDING THAT LEVEL IS HIGHER THAN NORMAL. WHEN THE VALUE OF CS IS
LESS THAN HS...THE PROBABILITY OF EXCEEDING THAT LEVEL IS LOWER
THAN NORMAL.

...TABLE 1--PROBABILITIES FOR MINOR...MODERATE AND MAJOR FLOODING...
VALID PERIOD: mm/dd/yyyy - mm/dd/yyyy

	CATEGORICAL FLOOD STAGES (FT)			CURRENT AND HISTORICAL CHANCES OF EXCEEDING FLOOD CATEGORIES AS A PERCENTAGE (%)					
				MINOR		MODERATE		MAJOR	
LOCATION	MINOR	MOD	MAJOR	CS	HS	CS	HS	CS	HS
:MISSISSIPPI RIVER									
DUBUQUE LD11	16.0	17.0	20.5	20	52	13	20	3	<5
DUBUQUE	17.0	18.0	21.5	27	52	16	20	5	<5
BELLEVUE LD12	17.0	18.0	20.0	15	45	8	15	3	<5
FULTON LD13	16.0	18.0	20.0	28	50	11	16	5	<5
CAMANCHE	17.0	18.5	20.5	20	48	10	15	3	<5

[additional forecast points omitted]

LEGEND
CS = CONDITIONAL SIMULATION (CURRENT OUTLOOK)
HS = HISTORICAL SIMULATION
FT = FEET

IN TABLE 2 BELOW...THE 95 THROUGH 5 PERCENT COLUMNS INDICATE THE
PROBABILITY OF EXCEEDING THE LISTED STAGE LEVELS (FT) FOR THE VALID
TIME PERIOD.

...TABLE 2--EXCEEDANCE PROBABILITIES...

CHANCE OF EXCEEDING STAGES
AT SPECIFIC LOCATIONS
VALID PERIOD: mm/dd/yyyy - mm/dd/yyyy

LOCATION	95%	90%	75%	50%	25%	10%	5%
:MISSISSIPPI RIVER							
DUBUQUE LD11	9.1	10.0	11.6	14.0	15.7	18.4	19.2
DUBUQUE	10.7	11.8	13.2	15.4	17.3	20.0	20.8
BELLEVUE LD12	9.5	10.6	11.8	13.9	16.0	18.0	19.0
FULTON LD13	9.7	10.5	11.9	14.2	16.3	18.5	19.3
CAMANCHE	11.5	12.1	13.1	14.9	16.7	18.8	19.6

[additional forecast points omitted]

IN TABLE 3 BELOW...THE 95 THROUGH 5 PERCENT COLUMNS INDICATE THE
PROBABILITY OF FALLING BELOW THE LISTED STAGE LEVELS (FT) FOR
THE VALID TIME PERIOD.

...TABLE 3--NONEXCEEDANCE PROBABILITIES...

CHANCE OF FALLING BELOW STAGES
AT SPECIFIC LOCATIONS
VALID PERIOD: mm/dd/yyyy - mm/dd/yyyy

LOCATION	95%	90%	75%	50%	25%	10%	5%
:MISSISSIPPI RIVER							
DUBUQUE LD11	6.5	6.4	6.1	5.5	4.9	4.4	4.2
DUBUQUE	8.9	8.8	8.6	8.2	7.9	7.5	7.4
BELLEVUE LD12	7.1	7.0	6.6	5.6	4.7	4.0	3.8
FULTON LD13	7.2	7.1	6.5	5.5	4.9	4.5	4.3
CAMANCHE	9.9	9.8	9.5	9.2	8.9	8.6	8.4

[additional forecast points omitted]

THESE LONG-RANGE PROBABILISTIC OUTLOOKS CONTAIN FORECAST VALUES THAT ARE CALCULATED USING MULTIPLE SEASON SCENARIOS FROM 30 OR MORE YEARS OF CLIMATOLOGICAL DATA...INCLUDING CURRENT CONDITIONS OF THE RIVER...SOIL MOISTURE...SNOW COVER...AND 30 TO 90 DAY LONG-RANGE OUTLOOKS OF TEMPERATURE AND PRECIPITATION. BY PROVIDING THE COMPLETE RANGE OF PROBABILITIES...THE LEVEL OF RISK ASSOCIATED WITH LONG-RANGE PLANNING DECISIONS CAN BE DETERMINED. THESE PROBABILISTIC FORECASTS ARE PART OF THE NATIONAL WEATHER SERVICE'S ADVANCED HYDROLOGIC PREDICTION SERVICE.

...OUTLOOK SUMMARY...

THE RISK OF SPRING FLOODING HAS INCREASED SLIGHTLY DUE TO RECENT HEAVY RAINFALL AND ABOVE NORMAL SOIL MOISTURE ACROSS EASTERN IOWA...NORTHWESTERN ILLINOIS...AND FAR NORTHEASTERN MISSOURI. GREATER THAN NORMAL CHANCES OF EXCEEDING FLOOD STAGE NOW EXIST FOR RIVERS IN NORTHWESTERN ILLINOIS...INCLUDING PORTIONS OF THE ROCK...PECATONICA...GREEN...AND LA MOINE RIVERS. THE CHANCES FOR FLOODING ARE GENERALLY NEAR NORMAL FOR MUCH OF EASTERN IOWA...WITH SLIGHTLY GREATER THAN NORMAL CHANCES ON DOWNSTREAM PORTIONS OF THE RIVER BASINS TOWARD FAR EASTERN AND SOUTHEASTERN IOWA. THERE IS A SLIGHTLY BELOW NORMAL RISK FLOOD RISK FOR PORTIONS OF THE MAINSTEM MISSISSIPPI RIVER GENERALLY NORTH OF NEW BOSTON...AND NEAR NORMAL TO SLIGHTLY GREATER THAN NORMAL CHANCES FROM NEW BOSTON SOUTH.

MISSISSIPPI RIVER...THE MEDIAN OUTLOOK VALUES /THE 50 PERCENT LEVEL/ SUGGEST NO FLOODING FROM DUBUQUE DOWNSTREAM TOWARD NEW BOSTON...AND SUGGESTING MINOR FLOODING FROM NEW BOSTON DOWNSTREAM TO GREGORY LANDING. THE RISK OF REACHING FLOOD STAGE IS NEAR NORMAL TO ABOUT 15 PERCENT GREATER THAN NORMAL FROM NEW BOSTON DOWNSTREAM TO GREGORY LANDING...AND 10 TO 30 PERCENT BELOW NORMAL CHANCES UPSTREAM OF NEW BOSTON TO DUBUQUE.

IOWA TRIBUTARIES...THE MEDIAN OUTLOOK VALUES SUGGEST A RANGE FROM NO FLOODING TO MINOR OR MODERATE FLOODING. THE CHANCES FOR FLOODING ARE 10 TO 30 PERCENT GREATER THAN NORMAL FOR SOME OF THE FURTHER DOWNSTREAM SEGMENTS OF THE EASTERN IOWA RIVER BASINS...INCLUDING DOWNSTREAM PORTIONS OF THE WAPSIPINICON...IOWA...NORTH SKUNK...SKUNK...AND DES MOINES RIVERS. FURTHER UPSTREAM PORTIONS OF THESE RIVER BASINS...IN ADDITION TO THE MAQUOKETA AND CEDAR RIVER BASINS...GENERALLY HAVE A NEAR NORMAL FLOOD RISK.

ILLINOIS TRIBUTARIES...THE MEDIAN OUTLOOK VALUES SUGGEST MINOR FLOODING IN MOST LOCATIONS...WITH MODERATE TO MAJOR FLOODING FOR THE DOWNSTREAM PORTIONS OF THE ROCK RIVER. THE RISK OF REACHING FLOOD STAGE RANGES FROM 10 TO 15 PERCENT ABOVE NORMAL ON THE PECATONICA...GREEN AND LA MOINE RIVERS. THERE ARE INCREASED CHANCES FOR FLOODING ON THE ROCK RIVER...WITH ABOUT 30 TO 50 PERCENT ABOVE NORMAL CHANCES OF EXCEEDING FLOOD STAGE.

MISSOURI TRIBUTARIES...THE MEDIAN OUTLOOK VALUES SUGGEST NO FLOODING ON THE FOX RIVER. THE RISK OF FLOODING ON THIS RIVER IS NEAR NORMAL.

...RECENT CONDITIONS...

PRECIPITATION HAS AGAIN BEEN ABOVE NORMAL OVER THE PAST 90 DAYS. PRECIPITATION ACROSS EASTERN IOWA...NORTHWESTERN ILLINOIS...AND FAR NORTHEASTERN MISSOURI HAS BEEN GENERALLY 150 TO 200 PERCENT OF NORMAL. OVERALL TEMPERATURES OVER THE PAST 90 DAYS HAVE BEEN GENERALLY 2 TO 4 DEGREES BELOW NORMAL.

...CURRENT CONDITIONS...

SNOW COVER AND LIQUID WATER EQUIVALENT...SIGNIFICANT SNOWMELT THAT OCCURRED IN FEBRUARY HAS RESULTED IN LITTLE TO NO SNOW COVER OR ASSOCIATED LIQUID WATER EQUIVALENT REMAINING ACROSS THE HYDROLOGIC SERVICE AREA. THE SOUTHERN EXTENT OF THE SNOW COVER IS GENERALLY NORTH OF THE EASTERN IOWA AND NORTHWESTERN ILLINOIS RIVER BASINS.

SOIL MOISTURE...THE SOIL MOISTURE REMAINS ABOVE NORMAL ACROSS EASTERN IOWA...NORTHWESTERN ILLINOIS AND FAR NORTHEASTERN MISSOURI. WIDESPREAD MODERATE TO HEAVY RAIN FELL ACROSS MUCH OF THE HYDROLOGIC SERVICE AREA AT THE SECOND WEEK IN MARCH. THE HEAVIEST BAND OF 4 TO 6 INCHES OF RAIN FELL FROM SOUTHEASTERN IOWA ACROSS NORTHERN ILLINOIS. THIS RAINFALL WAS SOME 3 TO 5 INCHES ABOVE NORMAL. THE RAINFALL EARLIER IN MARCH HAS CONTRIBUTED TO INCREASED SOIL MOISTURE WHERE THE GROUND WAS AT LEAST PARTIALLY THAWED.

STREAM LEVELS...AVERAGE STREAMFLOW CONDITIONS OVER THE PAST 7 DAYS GENERALLY RANGED FROM MUCH ABOVE NORMAL TO HIGH. THE INCREASED STREAMFLOWS FOR AREA RIVERS WERE IN RESPONSE TO THE EXCESSIVE RUNOFF FROM WIDESPREAD MODERATE TO HEAVY RAINFALL ON NEARLY SATURATED OR FROZEN GROUND EARLIER IN MARCH. AREA RIVERS HAVE CRESTED AND ARE EXPECTED TO RECEDE OVER THE NEXT WEEK OR SO...WITH LIMITED CHANCES FOR ADDITIONAL RAINFALL.

...WEATHER OUTLOOK...

THE 8 TO 14 DAY OUTLOOK INDICATES SLIGHTLY INCREASED CHANCES OF BELOW NORMAL PRECIPITATION ACROSS EASTERN IOWA AND NORTHWESTERN ILLINOIS. THERE ARE SLIGHTLY INCREASED CHANCES OF ABOVE NORMAL TEMPERATURES FROM SOUTHERN IOWA AND FROM CENTRAL ILLINOIS SOUTHWARD. THERE IS SOME INDICATION THAT PRECIPITATION CHANCES MAY INCREASE SLIGHTLY AT THE END OF MARCH...AND TEMPERATURES CHANCES MAY RETURN TOWARD NORMAL.

THE THREE MONTH OUTLOOK FOR THE PERIOD THROUGH MID MAY CALLS FOR EQUAL CHANCES OF ABOVE...BELOW...OR NEAR NORMAL CONDITIONS FOR BOTH TEMPERATURE AND PRECIPITATION ACROSS THE AREA.

...ADDITIONAL INFORMATION...

THE NEXT SPRING FLOOD AND WATER RESOURCES OUTLOOK WILL BE ISSUED ON FRIDAY...MARCH dd yyyy.

VISIT OUR WEB SITE WWW.WEATHER.GOV/QUADCITIES FOR MORE WEATHER AND FLOOD INFORMATION.

$$

MAS

Appendix D - Guidelines for the Annual *Spring Flood and Water Resources Outlook*

Table of Contents:

1. Introduction. The Spring Flood and Water Resources Outlook is divided into the sections described in this appendix. The order of items in sections 6-10 may be changed at local discretion and text within those sections is free format.

2. WMO Heading, AWIPS Identifier, UGC, product expiration time and MND header block*.

FGA_1A_2ii Kccc ddhhmm (BBB)	(*WMO heading*)
ESFxxx	(AWIPS identifier)
st<C>XXX-XXX>XXX-ddhhmm-	(*UGC Type: county*)

The product expiration time, ddhhmm, may be up to 30 days from issuance.

PROBABILISTIC HYDROLOGIC OUTLOOK	(*MND Product Type Line*)
[or WATER SUPPLY OUTLOOK if applicable]	
NATIONAL WEATHER SERVICE <WFO location>	(*Issuing Office*)
Time am/pm time_zone mon dd yyyy	(*Issuance time/date*)

3. Primary Headline. (Mandatory) – may include an identifying number.

...SPRING FLOOD AND WATER RESOURCES OUTLOOK…

or

...SPRING FLOOD AND WATER RESOURCES OUTLOOK NUMBER x…

4. Description of Hydrologic Service Area

Example:

```
THIS FLOOD OUTLOOK IS FOR THE QUAD CITIES HYDROLOGIC SERVICE
AREA...WHICH INCLUDES PORTIONS OF EASTERN IOWA...NORTHWESTERN
ILLINOIS...AND EXTREME NORTHEASTERN MISSOURI. THIS AREA ENCOMPASSES
THE MISSISSIPPI RIVER AND ITS TRIBUTARIES FROM BELOW GUTTENBERG LD10
IOWA TO BELOW GREGORY LANDING MISSOURI. THE OUTLOOK IS FOR THE TIME
PERIOD FROM TODAY THROUGH MID JUNE.
```

5. Secondary Headline(s). (Optional) Define the type of flooding and category (if available) or water resources issue being addressed.

Examples of secondary headlines:

...MINOR SPRING SNOWMELT FLOODING POSSIBLE IN THE MAUMEE RIVER BASIN...
...NO FLOODING EXPECTED THROUGH MID-APRIL BASED ON CURRENT CLIMATOLOGICAL CONDITIONS...
...MODERATE DROUGHT TO CONTINUE...

6. Outlook Tables of Forecasts with description to help interpret table

Example:

```
...TABLE 1--PROBABILITIES FOR MINOR...MODERATE AND MAJOR FLOODING...
                    VALID PERIOD:  mm/dd/yyyy - mm/dd/yyyy

                                        :    CURRENT AND HISTORICAL
                                        :     CHANCES OF EXCEEDING
                                        :       FLOOD CATEGORIES
                                        :      AS A PERCENTAGE (%)
                      CATEGORICAL       :
                   FLOOD STAGES (FT)    :   MINOR    MODERATE   MAJOR
LOCATION           MINOR   MOD   MAJOR : CS   HS   CS   HS   CS   HS
--------           -----  -----  ----- : ---  ---  ---  ---  ---  ---
:MISSISSIPPI RIVER
DUBUQUE LD11        16.0   17.0   20.5 :  20   52   13   20    3   <5
DUBUQUE             17.0   18.0   21.5 :  27   47   16   20   <5   <5
BELLEVUE LD12       17.0   18.0   20.0 :  15   45    8   15    3   <5
FULTON LD13         16.0   18.0   20.0 :  28   50   11   16    5   <5
CAMANCHE            17.0   18.5   20.5 :  20   48   10   15    3   <5

[additional forecast points omitted]


LEGEND
CS = CONDITIONAL SIMULATION (CURRENT OUTLOOK)
HS = HISTORICAL SIMULATION
```

FT = FEET

IN TABLE 2 BELOW...THE 95 THROUGH 5 PERCENT COLUMNS INDICATE THE PROBABILITY OF EXCEEDING THE LISTED STAGE LEVELS (FT) FOR THE VALID TIME PERIOD.

...TABLE 2--EXCEEDANCE PROBABILITIES...

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[additional forecast points omitted]

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FULTON LD13	7.2	7.1	6.3	5.5	4.9	4.5	4.3
CAMANCHE	9.9	9.8	9.5	9.2	8.9	8.5	8.4

[additional forecast points omitted]

7. Outlook Summary and definition of Flood Categories. If flood categories are used, include the definitions in the outlook. Ref. NWSI 10-950 at http://www.nws.noaa.gov/directives/010/pd01009050a.pdf .

Example 1:

THIS OUTLOOK CALLS FOR MINOR FLOODING DUE TO THE COMBINATION OF

THE CURRENT SNOW PACK...ABOVE NORMAL TEMPERATURES TO ENHANCE SNOW MELT AND EXPECTED PRECIPITATION THROUGH APRIL. MINOR FLOODING MEANS MINIMAL OR NO PROPERTY DAMAGE...BUT POSSIBLY SOME PUBLIC THREAT OR INCONVENIENCE.

Example 2:

THE RELATIVE ABSENCE OF SNOW OVER CENTRAL AND SOUTHERN MINNESOTA AND WEST CENTRAL WISCONSIN COUPLED WITH THE VERY DRY FALL PERIOD ARE RESULTING IN REDUCED CHANCES FOR FLOODING ON RIVERS THIS SPRING.

8. Current Hydrologic and Climatological Conditions. Whether or not conditions favor flooding, drought or something in between; address aspects which may have impacts during the outlook period. Provide pertinent climate information concerning past temperatures and precipitation compared to normal (percentages of normal if available), and how those contributed to current hydrologic conditions. Hydrologic conditions may include: soil moisture, soil temperature/frost depth, ground water (if applicable), snow pack (depth and water equivalency), current drought conditions, reservoir levels, ice and river conditions. This information can be gathered from RFC guidance, CPC products, NOHRSC, regional climate center data, and from cooperators such as the Natural Resources Conservation Service (SNOTEL observations) and the U.S. Bureau of Reclamation. The Hydrologic Program Manager, Climate Focal Point or others as designated, should collaborate on information to include in the outlook. Links may be added to the product if desired. Some sources are:

http://www.nohrsc.nws.gov/
http://mcc.sws.uiuc.edu/
http://www.hprcc.unl.edu/maps/current/
http://water.usgs.gov/
http://waterdata.usgs.gov/nwis/rt/
http://www.nrcs.usda.gov/feature/highlights/snoserv.html
http://www.usbr.gov/uc/water/index.html

Example 1:

ABOVE NORMAL TEMPERATURES AND BELOW NORMAL PRECIPITATION FROM NOVEMBER THROUGH JANUARY AS WELL AS LINGERING DRYNESS THROUGH 2003 HAVE LED TO DROUGHT CONDITIONS ACROSS THE AREA. THE DROUGHT MONITOR HAS DESIGNATED MOST OF THE AREA AS D2. THIS IS A SEVERE DROUGHT THAT HAS IMPACTED STREAM FLOWS...RESERVOIRS LEVELS AND STORAGE...AND AGRICULTURE IN THE AREA. ACCORDING TO THE JANUARY USDA CROP BULLETIN...RANGE LAND REMAINS SEVERELY DEPLETED AND SOIL MOISTURE POOR TO VERY POOR FOR 74% OF THE AREA. FOR ADDITIONAL INFORMATION GO TO HTTP://WWW.CPC.NCEP.NOAA.GOV/PRODUCTS/EXPERT_ASSESSMENT/DROUGHT_ASSESSMENT.HTML .

Example 2:

THE MISSISIPPI RIVER NORTH OF CLINTON...IOWA...IS 3 TO 5 FEET BELOW NORMAL. THE AMOUNT OF WATER IN THE CURRENT SNOW PACK OF THE QUAD CITIES SERVICE AREA RANGES FROM A MAXIMUM OF 0.5 TO 0.8 INCHES NORTH OF U.S. HIGHWAY 30 TO ZERO ACROSS THE SOUTH. SOIL MOISTURE LAST FALL WAS WELL BELOW NORMAL AND REMAINS WELL BELOW NORMAL. PRECIPITATION CONTINUES BELOW NORMAL FOR MUCH OF THE REGION. AS OF FEB 15, PRECIPITATION TOTALS SINCE JANUARY 1 WERE 50% OF NORMAL. TEMPERATURES HAVE BEEN NEAR NORMAL SINCE JANUARY 1. SOIL IS FROZEN EXCEPT FOR SOUTH OF U.S. HIGHWAY 34 WHERE MINOR THAWING HAS OCCURRED. THE MISSISSIPPI RIVER NORTH OF CLINTON IS ALMOST ENTIRELY ICE COVERED WITH AROUND 30 PERCENT ICE COVERAGE FROM CLINTON TO MUSCATINE AND LESS THAN 30 PERCENT ICE COVERAGE FROM MUSCATINE SOUTH.

9. Climatological Outlook and Forecast Conditions. There are many information sources and quite a lot of data to ingest for the outlook period. The key point is to determine what outlook information most impacts the people in your local area. Include a summary of the present forecast (days 1-5), the 6 to 10/8-14 day outlook, either the 30 day or 90 day outlook, river forecasts and outlooks (ESGs and RVFs), water supply outlooks (mainly for the western states) and the Drought Outlook. Include any significant upstream information that is likely to impact the local area. Again, links may be added to explain where this information came from and/or where one could go to get more information. Some links include:

http://www.cpc.ncep.noaa.gov/products/forecasts/
http://www.drought.unl.edu/dm/monitor.html
http://www.usbr.gov/uc/water/index.html

Example 1:

BASED UPON FORECAST INFORMATION FOR THE NEXT TWO WEEKS...TEMPERATURE AND PRECIPITATION SHOULD REMAIN NEAR NORMAL. NORMAL HIGH TEMPERATURES FOR THIS TIME OF YEAR ARE AROUND 40 DEGREES WITH LOWS NEAR 20. PRECIPITATION FROM ONE HALF TO THREE QUARTERS OF AN INCH IS ALSO CONSIDERED NORMAL. THE 90 DAY EXTENDED OUTLOOK CALLS FOR TEMPERATURES TO BE ABOVE NORMAL (ABOUT A 50% CHANCE OF ABOVE, 33% CHANCE OF NEAR NORMAL AND 17% CHANCE OF BEING BELOW NORMAL) AND PRECIPITATION TO FALL BELOW NORMAL OVER THE 90 DAY PERIOD (ABOUT A 40% CHANCE OF ABOVE... 33% CHANCE OR NEAR NORMAL AND A 27% CHANCE OF BELOW NORMAL. FOR ADDITIONAL INFORMATION GO TO HTTP://WWW.CPC.NCEP.NOAA.GOV/PRODUCTS/FORECASTS/

SNOW PACK AND WATER SUPPLY CONDITIONS FOR THE MISSOURI RIVER DRAINAGE BASIN SHOW BELOW NORMAL TOTALS FOR THE YEAR SO FAR. (add link for SNOTEL and reservoir levels or water supply report, etc.). WITH THE PRESENT CONDITIONS UPSTREAM AND THE CURRENT SITUATION IN THIS AREA...CONTINUING DROUGHT IMPACTS ARE LIKELY TO CONTINUE OR WORSEN. THEREFORE...A [monthly, weekly, every other week] SYNOPSIS OF HYDROLOGIC AND CLIMATOLOGICAL CONDITIONS WILL CONTINUE FOR THE FORESEEABLE

FUTURE.

Example 2:

THE 6 TO 10 DAY OUTLOOK INDICATES ABOVE NORMAL TEMPERATURES (link) AND NEAR NORMAL PRECIPITATION (link) ACROSS THE QUAD CITIES SERVICE AREA. DURING THIS TIME...NORMAL AVERAGE TEMPERATURES ARE IN THE LOW TO MID 40S AND NORMAL PRECIPITATION IS AROUND 0.50 TO 0.75 INCHES.

THE 30-DAY OUTLOOK INDICATES NEAR NORMAL TEMPERATURES (link) AND NEAR NORMAL PRECIPITATION (link). DURING THIS TIME...NORMAL AVERAGE TEMPERATURES ARE AROUND 45 TO 50 DEGREES AND NORMAL PRECIPITATION IS AROUND 1.00 TO 1.50 INCHES.

GIVEN THE CURRENT AMOUNT OF WATER IN THE SNOW PACK (link)...BELOW NORMAL RIVER LEVELS AND SOIL MOISTURE COMBINED WITH NORMAL PRECIPITATION THROUGH THE NEXT 30 DAYS...NO FLOODING IS FORECAST. ABOVE NORMAL TEMPERATURES MAY CAUSE A MORE RAPID MELT OF THE SNOW PACK...HOWEVER THE AMOUNT OF WATER IN THE SNOW PACK COMBINED WITH A NORMAL AMOUNT OF PRECIPITATION WILL NOT RESULT IN FLOODING.

10. Closing statement indicating when additional information will be provided. Give date of next outlook or state this is the final one planned for this year.

Example:

THE NEXT OUTLOOK WILL BE ISSUED [date].

11. Reference to WFO homepage. Include the sentence, VISIT OUR WEB SITE AT WWW.CRH.NOAA.GOV/LOCAL OFFICE/ FOR MORE WEATHER AND WATER INFORMATION.

12. Sample Water Supply Outlook. Please refer to Appendix C for a sample Spring Flood and Water Resources Outlook. Following is an example of a Water Supply Outlook

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FGUS75 KBOU 111754
ESFBOU
COC001-005-013-014-019-031-035-039-047-049-057-
059-069-073-075-087-093-095-115-117-121-123-010000-

WATER SUPPLY OUTLOOK
NATIONAL WEATHER SERVICE DENVER CO
1154 AM MDT WED APR 11 2012

NATIONAL WEATHER SERVICE/NATURAL RESOURCES CONSERVATION SERVICE
STREAMFLOW FORECASTS FOR NORTH CENTRAL AND NORTHEAST COLORADO AS OF
APRIL 2012.

WITH THE DEPLETION OF MOUNTAIN SNOWPACK SINCE EARLY MARCH...THE
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HEADWATERS OF THE SOUTH PLATTE RIVER IN THE SOUTH PARK AREA...NORTH PLATTE RIVER IN THE NORTH PARK AREA...AND MUDDY CREEK IN WESTERN GRAND COUNTY ARE ALL FORECAST TO HAVE STREAMFLOWS IN THE LOWER 25 PERCENT OF HISTORICAL FLOWS.

MOUNTAIN SNOWPACK...THE SNOWPACK HAS RAPIDLY DECLINED THE PAST MONTH AND A HALF DUE TO A COMBINATION OF A DRY...WINDY AND VERY WARM CONDITIONS. THE UPPER COLORADO AND NORTH PLATTE RIVER BASINS HAD THEIR LOWEST APRIL 10TH SNOWPACK IN THE PAST 25 YEARS...A MEAGER 37 AND 51 PERCENT OF AVERAGE...RESPECTIVELY. THE SNOWPACK IN THE SOUTH PLATTE RIVER BASIN WAS ONLY 53 PERCENT OF AVERAGE. THIS IS THE SECOND LOWEST APRIL 10TH SOUTH PLATTE BASIN SNOWPACK IN THE PAST 25 YEARS...SLIGHTLY HIGHER THAN 47 PERCENT OF AVERAGE OCCURRING IN 2002.

RESERVOIR STORAGE...DUE IN LARGE PART TO THE HIGH SNOWPACK DURING THE SPRING OF 2011...COMBINED RESERVOIR STORAGE AT THE END OF MARCH 2012 REMAINED IN GOOD SHAPE AT 120 AND 104 PERCENT OF AVERAGE...RESPECTIVELY IN THE UPPER COLORADO AND SOUTH PLATTE BASINS.

STREAMFLOW FORECASTS...BELOW TO MUCH BELOW AVERAGE VOLUMES ARE FORECAST FOR THE UPCOMING SPRING AND SUMMER IN ALL BASINS. THE STREAMFLOW FORECASTS RANGE FROM AN EXTREMELY LOW VOLUME OF 21 PERCENT ON THE NORTH PLATTE RIVER NEAR NORTHGATE IN JACKSON COUNTY UP TO 71 TO 75 PERCENT OF AVERAGE FOR CREEKS IN BOULDER COUNTY.

FOLLOWING ARE STREAMFLOW FORECASTS FOR SELECTED LOCATIONS:

		MOST PROBABLY FORECAST	
		VOLUME	PERCENT
STREAM AND STATION	PERIOD	1000 AF	OF AVG
SOUTH PLATTE RIVER			
ANTERO RESERVOIR INFLOW	APR-SEP	13	60
SPINNEY MTN RES INFLOW	APR-SEP	32	46
11-MILE CANYON RES INFLOW	APR-SEP	32	44
CHEESMAN LAKE INFLOW	APR-SEP	65	46
SOUTH PLATTE	APR-SEP	118	46
BEAR CREEK			
EVERGREEN ABV	APR-SEP	16	64
MORRISON	APR-SEP	19	60
CLEAR CREEK			
GOLDEN	APR-SEP	90	67
ST VRAIN CREEK			
LYONS	APR-SEP	77	71
BOULDER CREEK			
ORODELL	APR-SEP	45	75
SOUTH BOULDER CREEK			

```
 ELDORADO SPRINGS          APR-SEP      34          74

BIG THOMPSON RIVER
 CANYON MOUTH              APR-SEP      79          66

[additional forecast points omitted]

THESE FORECASTS REFLECT NATURAL FLOW ONLY.  ACTUAL OBSERVED FLOW
WILL LIKELY BE AFFECTED BY UPSTREAM WATER MANAGEMENT.

ADDITIONAL SUPPORTIVE INFORMATION (WEB ADDRESSES ARE IN LOWER CASE):
-VISIT OUR WEB SITE AT WWW.WEATHER.GOV/BOU FOR MORE LOCAL
WEATHER...CLIMATE AND STREAM INFORMATION.
-LONG RANGE PRECIPITATION AND TEMPERATURE OUTLOOKS ARE AVAILABLE AT
HTTP://WWW.CPC.NCEP.NOAA.GOV/PRODUCTS/PREDICTIONS/.
-SNOWPACK AND RESERVOIR DATA ARE AVAILABLE FROM THE NATURAL RESOURCES
CONSERVATIONS SERVICE AT HTTP://WWW.CO.NRCS.USDA.GOV/SNOW/.
-THE U.S. DROUGHT MONITOR IS AVAILABLE AT
HTTP://DROUGHT.UNL.EDU/DM/MONITOR.HTML.

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