

***NATIONAL WEATHER SERVICE CENTRAL REGION SUPPLEMENT 02-2002
APPLICABLE TO NWSI 10-922***

May 11, 2005

***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 February 9, 2004. The following revisions were made to this supplement:

1. Added NOAA General Counsel advice regarding Call to Action statements.
2. Added guidance regarding issuance of advisories and warnings for flooded low water crossings.
3. Refined differences noted between the Hazardous Weather Outlook and the Hydrologic Outlook, particularly with respect to required issuance.
4. Defined difference in use of Flood Advisory (FLS) and Hydrologic Statement (RVS).
5. Updated decision tree flowcharts to include the Hydrologic Statement.
6. Added guidance for the format of the Spring Flood and Water Resources Outlook (ESF).

(Signed by)

May 2, 2005

Gary S. Foltz

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.

2. Outlooks, Watches, Warnings and Advisories. The National Weather Service uses outlooks, watches and warnings 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 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, it is not certain that a warning 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:

- Include flood potential information in the Hazardous Weather Outlook (HWO) for any possibility (>0-100%) of flooding that could impact life or property 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% chance or greater 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% chance or greater of flooding that is not expected to reach warning criteria but where caution should be exercised.

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.

2.1 Call to Action Statements (CTAs) and Flood Safety Rules. NOAA General Counsel advises 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."

2.2 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 begin to fill with rapidly rising, fast-flowing water. Since swiftly flowing water, six inches deep can knock a person of his/her feet and begin to cause some cars to move out of control (reference NWSI 10-1605), warnings should be issued for known low water crossings that would meet this criteria during or shortly after an intense rainfall. After the event, for low water crossings with ponded water that is not a threat to life if caution is used (less than three feet of depth per NWSI 10-1605), a Flood Advisory may be issued.

3. Universal Geographic Code (UGC). Weather Forecast Office hydrologic products will contain a UGC (reference NWSI 10-1702). Hydrologic products and UGC type (county or zone) are listed in NWSI 10-922. Table 1, below, specifies UGCs that Central Region WFOs will use for those products which NWSI 10-922 leaves to regional discretion.

Table 1. UGC for Hydrologic Products

PRODUCT NAME	PRODUCT CATEGORY	UGC TYPE
Hydrologic Outlook	ESF	County
Flood Watch	FFA	Zone
Flood Warning	FLW	County
Flood Statement/Advisory	FLS	County
Hydrologic Statement	RVS	County
Hydrologic Summary	RVA	County
Daily River and Lake Summary	RVD	County
Hydrometeorological Data Products	RRx*	County
Hydrometeorological Data Summary	HYx	County

*UGC for this product is not mandatory but if included, use the code listed.

4. Hydrologic Outlook (ESF) and Hazardous Weather Outlook (HWO)

Hydrologic Outlooks (ESF) are issued to provide information on hydrometeorological conditions which could cause flooding, affect water supply, or impact droughts. The ESF is issued for a time period typically beyond 24 hours. River Forecast Center (RFC) forecast guidance may be included in the ESF if available. Hazardous Weather Outlooks will also include information regarding any possibility of flooding through a 7-day period, but would be more general in nature (ref. NWSI 10-517 and accompanying Central Region Supplements). A Hydrologic Outlook (ESF) is not necessary if flood potential is adequately covered in the HWO, unless it is a known customer need.

5. Hydrologic Outlook (ESF) with Probabilistic Forecasts. Where probabilistic river forecasts are available in Standard Hydrometeorological Exchange Format (SHEF), WFOs will issue text versions using the Hydrologic Outlook (ESF) product identifier and MND header. An AWIPS application, ahps tg, is available on the Local Application Database to create probabilistic forecast products. This product is typically issued once monthly following issuance of the Climate Prediction Center’s monthly outlooks and subsequent River Forecast Center guidance. 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 antecedent conditions changed which could change forecast probability values to levels that would cause customers and partners to modify mitigation plans.

6. Spring Flood and Water Resources Outlook (ESF). Prior to the annual national press briefing on the outlook for spring floods and drought, all WFOs will issue a Hydrologic Outlook

(ESF) with the following headline: “...SPRING FLOOD AND WATER RESOURCES OUTLOOK...” Format and content guidelines can be found in Appendix C.

7. 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.

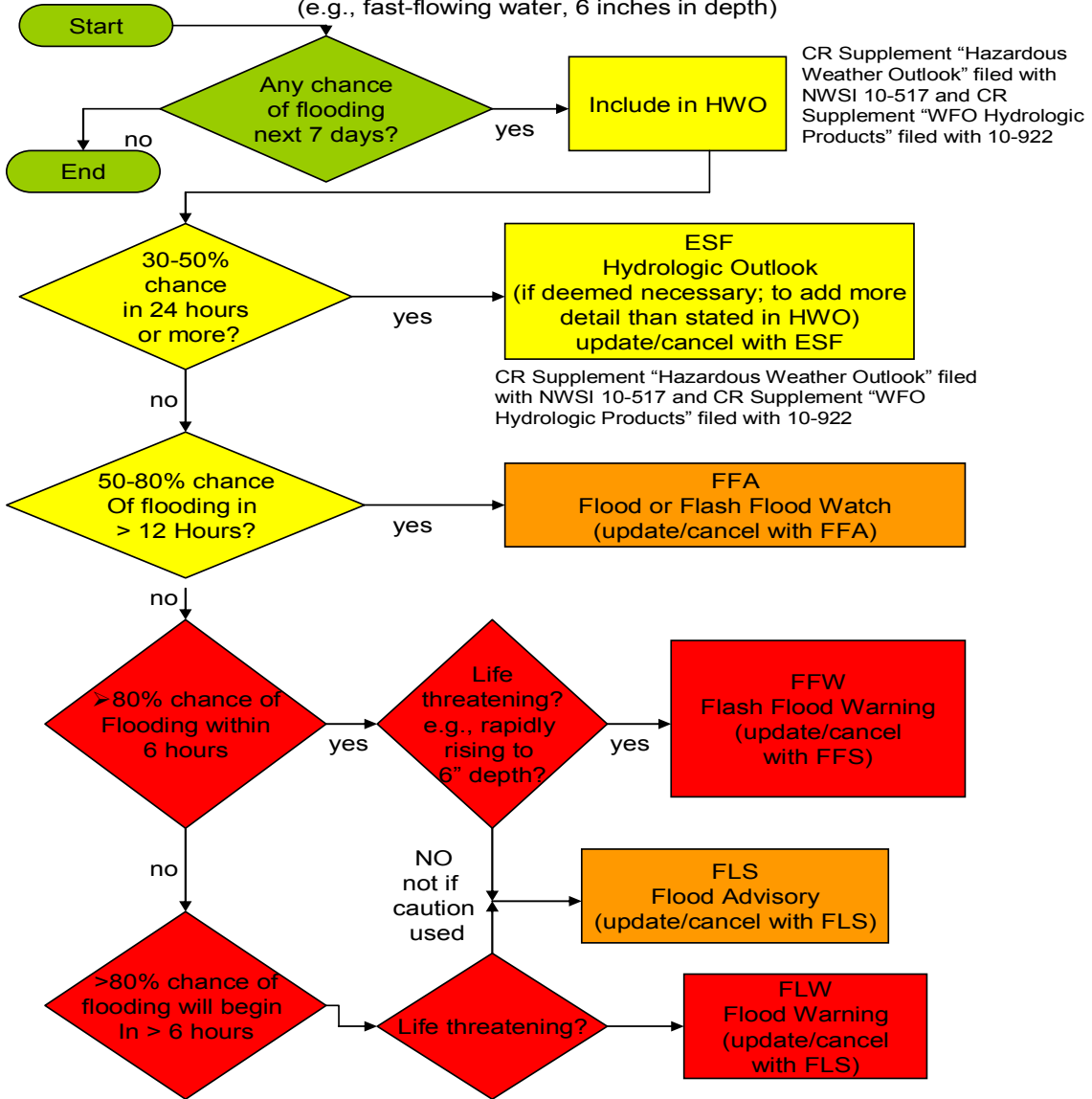
8. Flood Advisory (FLS) vs. Hydrologic Statement (RVS). Flood Advisories are issued in the near-term situation where confidence is high that flooding will occur but will not threaten life if caution is used. For river forecast points (including headwater or local river forecast points), a Flood Advisory (FLS) is issued when the stream is above bankfull but below flood stage. For significant rises to below bankfull that warrant public notification, a Hydrologic Statement (RVS) is issued.

Appendix A

Decision Flowchart for Areal Flooding

Time frames stated are those for typical situations.
Ref. NWSI 10-1605, section 7.11 for warning criteria
(e.g., fast-flowing water, 6 inches in depth)

Ref. NWSI
10-922

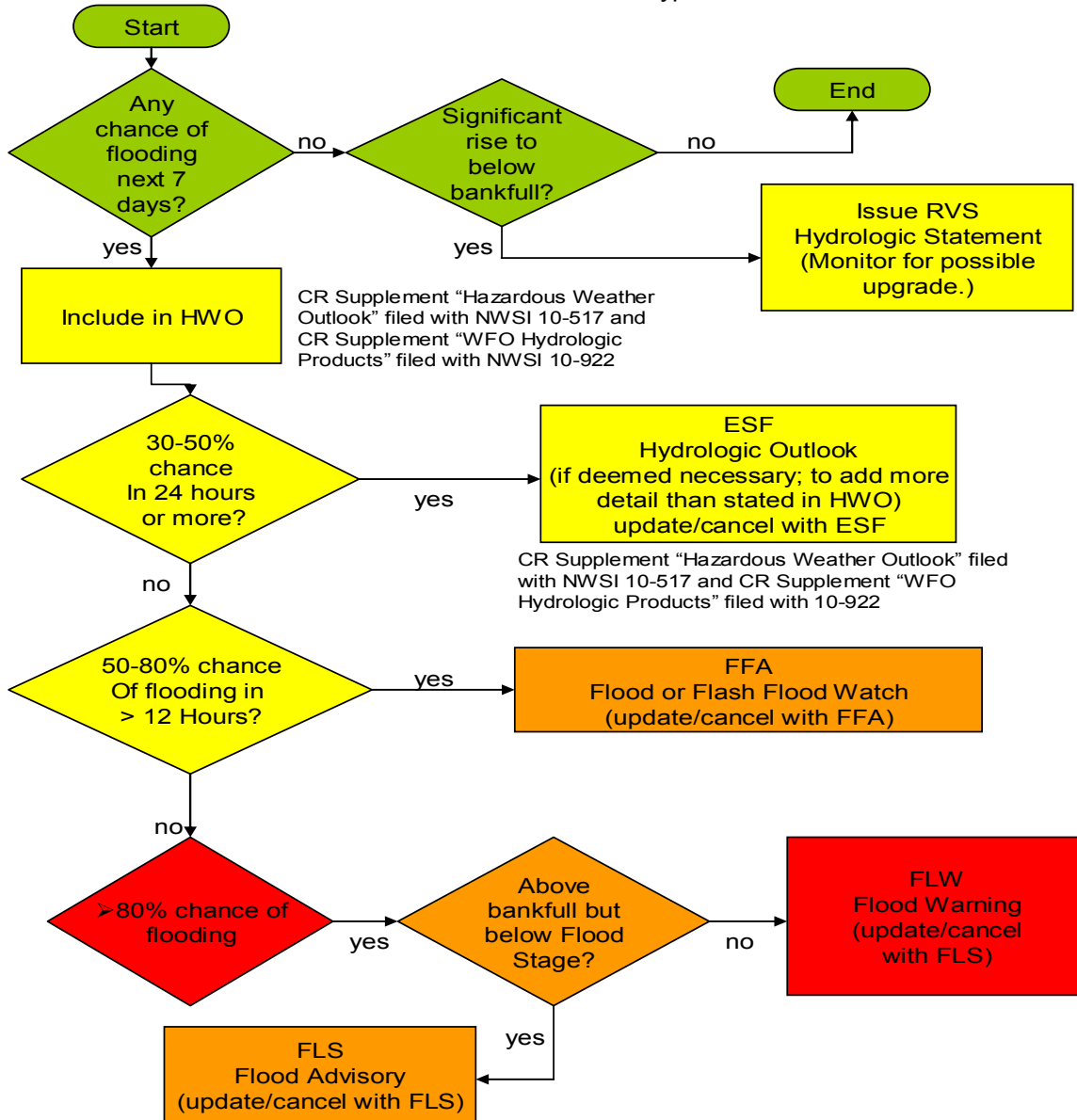


Appendix B

Decision Flowchart for River Flooding

Ref. NWSI 10-922

Time frames stated are those for typical situations.



Appendix C

Guidelines and examples for annual *Spring Flood and Water Resources Outlook*

The Spring Flood and Water Resources Outlook is divided into the following sections (the order of the items may be changed at local discretion, within policy found in NWSI 10-922 and its CR supplement):

- 1 World Meteorological Organization (WMO) Header, UGC, and Mass News Disseminator (MND) header block
- 2 Primary Headline
- 3 Description of Hydrologic Service Area
- 4 Secondary Headline (optional)
- 5 Valid time of outlook
- 6 Outlook Table of Forecasts (if available) with description to help interpret table
- 7 Outlook Summary and Definition of Flood Categories
- 8 Current Hydrologic and Climatological Conditions
- 9 Climatological Outlook and Forecast Conditions
- 10 Closing statement indicating when additional information will be provided
- 11 Reference to WFO homepage

- 1. WMO Header, UGC, product expiration time and MND header block

** note: The MND product type must remain "HYDROLOGIC OUTLOOK"*

FGA ₁ A ₂ ii 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.	
HYDROLOGIC OUTLOOK	(MND Product Type Line)
NATIONAL WEATHER SERVICE <WFO location>	(Issuing Office)
Time am/pm time_zone mon dd yyyy	(Issuance time/date)

- 2. Primary Headline

...SPRING FLOOD AND WATER RESOURCES OUTLOOK...

- 3. Description of Hydrologic Service Area
- 4. Secondary Headline(s) (optional)

Define the type of flooding and category (if available), or water supply issue being addressed.

4.1 **Examples:**

...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...

5. Valid time of Outlook

6. Outlook Table of Forecasts (if available) with description to help interpret table

6.1 **Example 1:**

LOCATION	FLOOD STAGE (FT)	NORMAL PRECIP	NO PRECIP
MISSISSIPPI RIVER			
DUBUQUE IA	17	19.4	17.8
CAMANCHE IA	17	20.1	18.0
LE CLAIRE IA	11	13.3	12.2
QUAD CITIES	15	17.4	16.3
MUSCATINE IA	16	19.6	17.1
BURLINGTON IA	15	17.5	16.0
GREGORY LANDING MO	15	20.2	16.2

THIS FLOOD OUTLOOK SHOWS TWO COLUMNS OF CREST VALUES FOR EACH LOCATION. THE COLUMN LABELED NORMAL PRECIPITATION IS BASED ON AVERAGE FUTURE TEMPERATURES AND PRECIPITATION. THE COLUMN LABELED NO PRECIPITATION IS BASED ON AVERAGE FUTURE TEMPERATURES AND NO FUTURE PRECIPITATION. HOWEVER...IF FUTURE CONDITIONS ARE NOT NORMAL OR ICE JAMS DEVELOP...THEN ACTUAL RIVER FORECASTS WILL DIFFER FROM THE FORECASTS SHOWN.

Example 2:

IN THE TABLE BELOW...THE 90 THROUGH 10 PERCENT COLUMNS INDICATE THE CHANCE THAT A LOCATION ON A RIVER COULD RISE ABOVE THE LISTED STAGE LEVELS IN THE NEXT 90 DAYS. FOR EXAMPLE: THE MISSISSIPPI RIVER AT ST CLOUD SCSU HAS A FLOOD STAGE OF 9.0 FEET. THERE IS A 90 PERCENT CHANCE THE RIVER WILL RISE TO OR ABOVE 4.5 FEET AND LESS THAN A 10% CHANCE OF REACHING OR EXCEEDING FLOOD STAGE IN THE NEXT 90 DAYS. A COMPARISON OF THE CURRENT OUTLOOK

PROBABILITIES TO HISTORICAL PROBABILITIES CAN BE FOUND AT OUR WEB SITE AT WWW.CRH.NOAA.GOV/MPX/AHPS.

CHANCE OF EXCEEDING STAGES AT SPECIFIC LOCATIONS
VALID DECEMBER 24, 2003 - MARCH 23, 2004.

LOCATION	90%	80%	70%	60%	50%	40%	30%	20%	10%
MISSISSIPPI RIVER									
ST CLOUD SCSU (DATUM = 958.49) FLOOD STAGE = 9.0	4.5	4.5	4.5	4.6	4.6	4.6	4.6	4.6	4.6
MINNEAPOLIS (DATUM = 784.0) FLOOD STAGE = 16.0	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.4	4.4

- 7. Outlook Summary and definition of Flood Categories, if used (include only those definitions for categories used. Ref. NWSI 10-950 at <http://www.nws.noaa.gov/directives/010/pd01009050a.pdf> .)

7.1 **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 (if available), 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 Bureau of Reclamations. Links may be added to the product if desired. Some sources are:

<http://www.nohrsc.nws.gov/>
<http://www.hprcc.unl.edu/products/current.html>
<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>

8.1 **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](http://WWW.CPC.NCEP.NOAA.GOV/PRODUCTS/EXPERT_ASSESSMENT/DROUGHT_ASSESSMENT.HTML) .

Example 2:

THE MISSISSIPPI 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>

9.1 **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/](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.

As in Example 1 in section 8.1 above:

A [monthly, weekly, biweekly] SYNOPSIS OF HYDROLOGIC AND CLIMATOLOGICAL CONDITIONS WILL CONTINUE FOR THE FORESEEABLE FUTURE. THE NEXT SPRING FLOOD AND WATER RESOURCES OUTLOOK WILL BE ISSUED ON [date].

11. Reference to WFO homepage

Include the sentence, "Visit our home page at www.crh.noaa.gov/local office/ for more weather and flood information."

Sample Product 1

FGUS73 KIWX 111825 CCA

ESFIWX

INC001-003-009-017-033-039-049-053-069-075-085-087-091-099-103-113-
131-141-149-151-169-179-181-183-MIC021-023-027-059-149-OHC003-039-
051-069-125-137-161-171-181500-

HYDROLOGIC OUTLOOK

NATIONAL WEATHER SERVICE NORTHERN INDIANA

1225 AM EST FRI MAR 11 2005

... SPRING FLOOD AND WATER RESOURCES OUTLOOK...

THIS SPRING FLOOD AND WATER RESOURCES OUTLOOK IS FOR THE RIVERS IN THE SAINT JOSEPH RIVER BASIN IN NORTHERN INDIANA AND SOUTHERN LOWER MICHIGAN...THE UPPER WABASH RIVER BASIN UPSTREAM OF LAFAYETTE INDIANA IN NORTHERN INDIANA... THE KANKAKEE RIVER BASIN UPSTREAM OF DUNNS BRIDGE IN NORTHERN INDIANA AND THE MAUMEE RIVER BASIN IN NORTHEAST INDIANA AND NORTHWEST OHIO UPSTREAM OF GRAND RAPIDS OHIO AND SOUTHERN LOWER MICHIGAN ALONG WITH THEIR ASSOCIATED TRIBUTARIES.

THIS OUTLOOK IS ISSUED IN ADDITION TO THE 5 DAY RIVER FORECASTS THAT ARE ISSUED WHEN RIVER FORECAST LOCATIONS ARE IN FLOOD OR FORECAST TO RISE ABOVE FLOOD STAGE.

THERE IS ONE TABLE FOR THE SAINT JOSEPH AND KANKAKEE RIVER BASINS IN NORTHERN INDIANA SOUTHERN LOWER MICHIGAN. PROBABILISTIC NUMBERS ARE NOT AVAILABLE FOR THE MAUMEE AND UPPER WABASH RIVER BASINS. THE TABLES DISPLAY THE CHANCE OF EXCEEDING STAGES AT SPECIFIC LOCATIONS.

CHANCE OF EXCEEDING STAGES AT SPECIFIC LOCATIONS

... VALID MARCH 15 2005 - JUNE 13 2005 ...

LOCATION	FS(FT)	90%	80%	70%	60%	50%	40%	30%	20%	10%
KANKAKEE RIVER...										
DAVIS IN	10.0	10.4	11.0	11.3	11.7	11.9	12.1	12.6	12.8	13.2
YELLOW RIVER...										
PLYMOUTH IN	13.0	8.3	9.0	9.8	10.4	11.0	11.2	12.0	12.6	13.0
KNOX IN	10.0	7.2	7.7	8.2	8.3	8.5	8.8	9.1	9.5	9.9
ST. JOSEPH RIVER...										
THREE RVRS MI	7.0	5.9	6.2	6.4	6.7	6.8	7.1	7.4	7.6	8.1
MOTTVILLE MI	8.0	5.4	5.8	5.9	6.3	6.5	6.7	7.1	7.3	7.7
ELKHART IN	24.0	21.4	21.7	22.0	22.2	22.4	22.8	23.1	23.6	24.0
SOUTH BEND IN	5.5	3.2	3.5	3.9	4.2	4.5	4.8	5.2	5.9	6.4
NILES MI	11.0	7.9	8.3	8.7	9.0	9.4	9.7	10.0	10.8	11.2
ELKHART RIVER...										
GOSHEN IN	7.0	3.7	4.0	4.6	4.9	5.1	5.3	5.6	6.4	7.1

THIS LONG-RANGE PROBABILISTIC OUTLOOK CONTAINS 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... 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 A PART OF THE NATIONAL WEATHER SERVICES ADVANCED HYDROLOGIC PREDICTION SERVICE.

RIVER FLOWS IN THE MAUMEE AND UPPER WABASH RIVER BASINS ARE RUNNING FROM 70 PERCENT TO AS MUCH AS 200 PERCENT OF NORMAL.

...SNOW COVER AND LIQUID WATER CONTENT...

NEW SNOW HAS FALLEN ACROSS THE ENTIRE HYDROLOGIC SERVICE AREA OVER THE PAST 24 HOURS. SNOWFALL AMOUNTS RANGED FROM ONE INCH ACROSS PARTS OF NORTHWEST OHIO TO AS HIGH AS 6 INCHES OVER FAR NORTHWEST INDIANA AND EXTREME SOUTHWEST LOWER MICHIGAN. TWO TO AS MUCH AS 4 INCHES COVER MOST OF NORTHWEST AND NORTH CENTRAL INDIANA AND SOUTHWEST AND SOUTH CENTRAL MICHIGAN. SNOW WATER EQUIVALENT AMOUNTS OF LESS THAN A TENTH OF AN INCH TO AS MUCH 0.3 INCHES WITH THE HIGHEST AMOUNTS IN A 50 MILE WIDE BAND EXTENDING FROM MICHIGAN CITY INDIANA TO FORT WAYNE INDIANA. THE GROUND WAS SNOW FREE BEFORE THURSDAY.

...SOIL CONDITIONS AND FROST DEPTHS...

SOIL MOISTURE CONTINUES TO BE EXTREMELY HIGH ACROSS THE AREA WITH PALMER DROUGHT SEVERITY INDEX CALCULATED MARCH 5 2005 RANGING FROM PLUS 3.5 TO PLUS 5.3 WITH ALL AREAS EXCEPT SOUTHWEST LOWER MICHIGAN ABOVE PLUS 4. PLUS 3 INDICATES VERY MOIST SOIL CONDITIONS WITH PLUS 4 OR GREATER INDICATING EXTREMELY MOIST SOIL CONDITIONS. SOIL CONTINUES TO BE FROZEN TO AS MUCH AS 20 INCHES IN SOME LOCATIONS.

...RIVER CONDITIONS...

RIVER FLOWS ARE IN THE NORMAL TO ABOVE NORMAL RANGE ACROSS THE AREA. AS STATED ABOVE...RIVER FLOWS IN THE MAUMEE AND UPPER WABASH RIVER BASINS RANGE FROM 70 PERCENT TO 200 PERCENT OF NORMAL RANGE. MINOR FLOODING CONTINUES ALONG THE TIFFIN RIVER IN NORTHWEST OHIO. FLOODING HAS RECENTLY SUBSIDED ALONG THE KANKAKEE RIVER.

...WEATHER OUTLOOKS...

THE 6 TO 10 DAY FORECAST VALID FROM WEDNESDAY MARCH 16 TO SUNDAY MARCH 20 CALLS FOR BETWEEN A 60 AND 70 PERCENT CHANCE OF BELOW NORMAL TEMPERATURES AND A GREATER THAN 33 PERCENT CHANCE OF BELOW NORMAL PRECIPITATION. NORMAL TEMPERATURES FOR THIS TIME PERIOD HAVE HIGHS IN THE UPPER 40S AND LOWS IN THE UPPER 20S. NORMAL PRECIPITATION IS AROUND 0.5 INCHES.

THE 30 DAY OUTLOOK FOR THE REST OF MARCH 2005 INDICATE A GREATER THAN 33 PERCENT CHANCE OF BELOW NORMAL TEMPERATURES AND EQUAL CHANCES OF ABOVE/BELOW NORMAL PRECIPITATION.

...FLOOD OUTLOOK SUMMARY...

FLOOD POTENTIAL CONTINUE TO BE ABOVE NORMAL ACROSS THE ENTIRE AREA DUE TO THE VERY WET SOIL MOISTURE...FROZEN SOILS AND NORMAL TO ABOVE NORMAL RIVER FLOWS. MORE SNOW HAS FALLEN AS WELL OVER THE PAST 24 HOURS PUTTING DOWN 2 TO 4 INCHES OVER MUCH OF THE AREA. THERE IS A 10 PERCENT CHANCE OF MAJOR FLOODING ALONG THE KANKAKEE RIVER...WITH A 100 PERCENT CHANCE OF MINOR FLOODING. THERE IS A 10 PERCENT CHANCE OF MINOR FLOODING ALONG THE ST. JOSEPH RIVER (MICHIGAN)...THE YELLOW AND ELKHART RIVERS OVER THE NEXT 90 DAYS. MINOR FLOODING IS OCCURRING ALONG THE TIFFIN RIVER AT THE PRESENT TIME.

EVEN THOUGH THE PRESENT WEATHER PATTERN INDICATES BELOW NORMAL PRECIPITATION...THE PRESENT SOIL CONDITIONS AND RIVER FLOW CONDITIONS HEAVILY FAVOR FLOODING.

...FLOOD TERMINOLOGY...

THE TERM MINOR FLOODING IS USED TO INDICATE MINIMAL OR NO PROPERTY

DAMAGE. HOWEVER SOME PUBLIC INCONVENIENCE IS POSSIBLE.

THE TERM MODERATE FLOODING IS USED TO INDICATE THE INUNDATION OF SECONDARY ROADS. TRANSFER TO A HIGHER ELEVATION MAY BE NECESSARY TO SAVE PROPERTY. SOME EVACUATIONS MAY BE REQUIRED.

THE TERM MAJOR FLOODING IS USED TO INDICATE EXTENSIVE INUNDATION AND PROPERTY DAMAGE USUALLY CHARACTERIZED BY THE EVACUATION OF PEOPLE AND LIVESTOCK AND CLOSURE OF BOTH PRIMARY AND SECONDARY ROADS.

ADDITIONAL SUPPORTIVE DATA AND EXPLANATIONS ARE AVAILABLE ON THE INTERNET AT:WWW.CRH.NOAA.GOV/IWX/(INTERNET ADDRESSES ARE ALL LOWER CASE) .

THE NEXT SCHEDULED SPRING FLOOD AND WATER RESOURCES OUTLOOK WILL BE ISSUED ON FRIDAY...MARCH 18 2005. THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) WILL BE ISSUING ITS 2005 SPRING OUTLOOK ON THURSDAY...MARCH 17. VISIT: WWW.NOAA.GOV TO OBTAIN MORE INFORMATION ABOUT THIS NATIONAL OUTLOOK.

ADDITIONAL SUPPORTIVE DATA AND EXPLANATIONS ARE AVAILABLE ON THE INTERNET AT:WWW.CRH.NOAA.GOV/IWX... INTERNET ADDRESSES ARE ALL IN LOWER CASE. AHPS CAN BE FOUND UNDER... CURRENT CONDITIONS/LAKES AND RIVERS AHPS.

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Sample Product 2

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HYDROLOGIC OUTLOOK

NATIONAL WEATHER SERVICE OMAHA/VALLEY NE

106 PM CST FRI MAR 11 2005

...SPRING FLOOD AND WATER RESOURCES OUTLOOK...

THIS OUTLOOK COVERS THE OMAHA HYDROLOGIC SERVICE AREA (HSA) WHICH ENCOMPASSES 30 COUNTIES ACROSS EASTERN NEBRASKA AND 8 COUNTIES ACROSS SOUTHWEST IOWA. THE MAIN RIVERS ACROSS EASTERN NEBRASKA INCLUDE THE ELKHORN...PLATTE AND MISSOURI AND ALL THEIR RESPECTIVE TRIBUTARIES WHILE SOUTHWEST IOWA CONSISTS OF THE MAPLE...NODAWAY...LITTLE SIOUX AND ALL TRIBUTARIES ASSOCIATED WITH THE NISHNABOTNA.

...DROUGHT CONDITIONS REMAIN A SLIGHT PROBLEM ACROSS SOUTHEAST NEBRASKA AND SOUTHWEST IOWA...

ABNORMALLY DRY CONDITIONS CONTINUE ACROSS SOUTHEAST NEBRASKA AND SOUTHWEST IOWA AS HAS BEEN THE CASE THROUGH THE WINTER MONTHS.

THERE IS NO POTENTIAL FOR FLOODING DUE TO SNOWMELT THIS SEASON ACROSS THE OMAHA HSA.

TEMPERATURES FROM NOVEMBER TO FEBRUARY AVERAGED ABOVE NORMAL WITH THE EXCEPTION OF JANUARY WHERE THEY WERE RUNNING BELOW NORMAL ACROSS

THE OMAHA HSA. PRECIPITATION ACROSS THE HSA WAS ABOVE NORMAL IN NOVEMBER AND FEBRUARY WHILE ONLY ABOVE NORMAL IN JANUARY ACROSS PORTIONS OF EAST-CENTRAL NEBRASKA. DECEMBER WAS A MONTH OF BELOW NORMAL PRECIPITATION ACROSS THE ENTIRE HSA WHILE JANUARY WAS BELOW NORMAL ALSO FOR THE NORTHERN HALF OF THE HSA INCLUDING THE OMAHA AREA AS WELL AS NORFOLK.

IN THE TABLE BELOW, THE 90 THROUGH 10 PERCENT COLUMNS INDICATE THE CHANCE THE RIVER COULD RISE ABOVE THE LISTED STAGE LEVELS IN THE NEXT 90 DAYS. EXAMPLE: THE WEEPING WATER CREEK AT UNION...NEBRASKA HAS A FLOOD STAGE OF 25.0 FEET. IN THE NEXT 90 DAYS THERE IS A 20 PERCENT CHANCE THE RIVER WILL RISE ABOVE 20.3 FEET.

CHANCE OF EXCEEDING STAGES IN FEET AT SPECIFIC LOCATIONS
VALID MARCH 15, 2005 - JUNE 13, 2005

LOCATION	FS (FT)	90%	80%	70%	60%	50%	40%	30%	20%	10%
MAPLE RIVER MAPLETON IA	21.0	6.2	7.2	8.7	9.2	9.6	10.1	10.5	12.1	15.2
LITTLE SIOUX R TURIN IA 4S	20.0	9.6	11.3	12.5	14.5	16.9	18.1	18.8	19.8	22.3
SOLDIER RIVER PISGAH IA 1E	28.0	5.5	7.6	8.2	9.2	10.4	11.2	11.9	14.5	17.5
BOYER RIVER LOGAN IA	19.0	8.1	8.9	9.6	10.5	11.6	12.8	15.2	17.4	20.2
WEEPING WATER C UNION NE	25.0	2.8	5.1	6.5	7.7	8.7	11.8	15.4	20.3	25.5
E. NISHNABOTNA R RED OAK IA	18.0	7.5	10.1	11.4	12.4	14.0	15.6	17.9	20.5	22.2
W. NISHNABOTNA R HANCOCK IA	14.0	5.7	6.6	7.6	8.4	9.0	11.4	13.9	18.6	21.5
RANDOLPH IA	19.0	10.3	11.9	13.7	14.6	16.0	18.0	20.0	22.0	23.4
NISHNABOTNA R HAMBURG IA	23.0	13.8	18.1	21.5	21.9	23.6	25.6	28.1	29.8	31.3
LITTLE NEMAHA R AUBURN NE 1E	22.0	5.2	6.9	8.6	9.9	10.6	12.1	16.0	18.5	22.4
N FK BIG NEMAHA R HUMBOLDT NE	28.0	4.0	5.9	6.9	7.5	8.3	9.5	12.1	13.1	15.2
BIG NEMAHA R FALLS CITY NE	23.0	6.6	9.9	11.2	12.6	13.9	15.9	19.0	20.0	23.0
NODAWAY RIVER CLARINDA IA 1E	19.0	8.7	9.4	10.7	11.3	12.0	13.9	14.9	17.3	20.4

THE ABSENCE OF SNOW COVER COUPLED WITH PRESENT CONDITIONS INDICATE REDUCED CHANCES FOR FLOODING ON RIVERS THIS SPRING. EXCEPTIONS TO THIS ARE THE LITTLE SIOUX RIVER BASIN ACROSS THE NORTHERN TIER OF SOUTHWEST IOWA AND THE NISHNABOTNA RIVER BASIN ACROSS SOUTHWEST IOWA. DUE TO VERY WET SOIL CONDITIONS IN THESE AREAS...THERE IS A POSSIBILITY FOR MINOR FLOODING IF NORMAL PRECIPITATION OCCURS THIS SPRING. CURRENT RIVER CONDITIONS GENERALLY INDICATE NORMAL TO BELOW

NORMAL FLOWS ACROSS EASTERN NEBRASKA AND SOUTHWEST IOWA. A SUMMARY OF RIVER CONDITIONS FOR SELECTED RIVER STATIONS AS OF MARCH 9 IS AS FOLLOWS:

	LONG TERM MEDIAN (CFS)	CURRENT (CFS)
PLATTE RIVER - LOUISVILLE...NE	8080	4930
MISSOURI RIVER - OMAHA...NE	19100	12600
MISSOURI RIVER - RULO...NE	29200	19000

BELOW NORMAL TEMPERATURES ARE EXPECTED OVER THE NEXT COUPLE OF WEEKS ACROSS EASTERN NEBRASKA AND SOUTHWEST IOWA WHILE PRECIPITATION IS EXPECTED TO BE ABOVE NORMAL ACROSS EASTERN NEBRASKA WHILE SOUTHWEST IOWA IS EXPECTED TO BE NEAR NORMAL.

FOR ADDITIONAL INFORMATION GO TO
[HTTP://WWW.CPC.NCEP.NOAA.GOV/PRODUCTS/EXPERT_ASSASSEMENT/DROUGHT_ASSASSEMENT.HTML](http://www.cpc.ncep.noaa.gov/products/expert_assessment/drought_assessment.html)

AND

[HTTP://WWW.CPC.NCEP.NOAA.GOV/PRODUCTS/PREDICTIONS/](http://www.cpc.ncep.noaa.gov/products/predictions/)

THIS IS THE LAST SPRING FLOOD AND WATER RESOURCES OUTLOOK FOR THIS SNOWMELT SEASON. THE NEXT LONG-RANGE PROBABILISTIC OUTLOOK WILL BE ISSUED THE WEEK OF APRIL 25.

VISIT OUR HOME PAGE AT [WWW.CRH.NOAA.GOV/OAX/](http://www.crh.noaa.gov/oax/) FOR MORE WEATHER AND FLOOD INFORMATION.

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