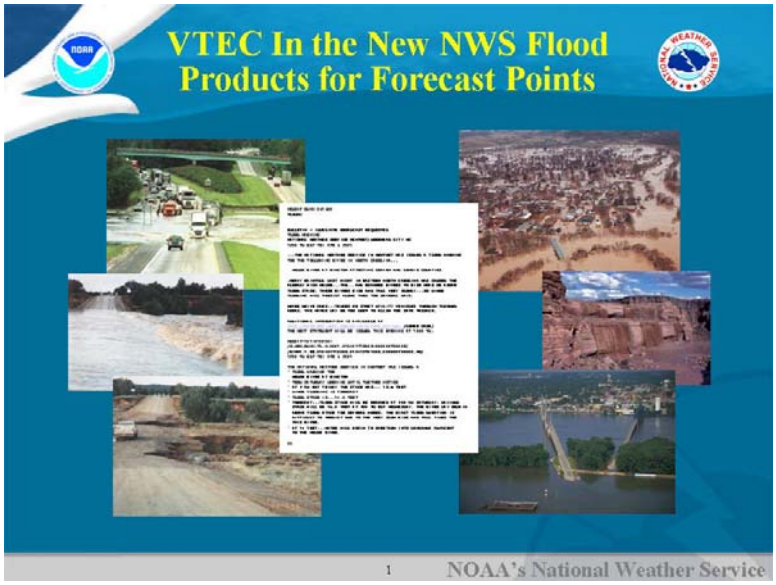
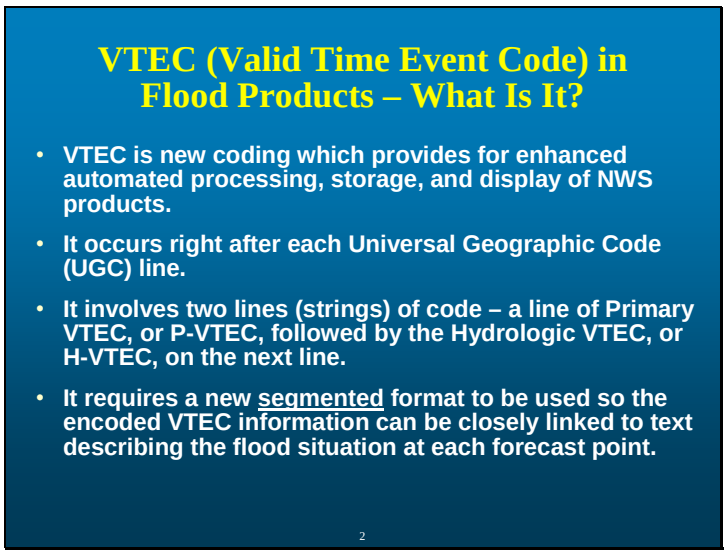


This presentation will describe how Valid Time Event Code (or VTEC) and new formats will be implemented in NWS flood products for forecast points. These products include the following:.

1. Flood Warning for Forecast Points (FLW)
2. Flood Statement – Follow-up to Flood Warning for Forecast Points (FLS)
3. Flood Watch for Forecast Points (FFA) (Doesn't include the flood watches issued for areas)
4. Flood Advisory for Forecast Points (FLS) (Doesn't include the flood advisories issued for areas)



The National Weather Service (NWS) has been implementing the Valid Time Event Code, or VTEC, in stages since early 2005. The time arrived in Spring, 2006 to start implementing VTEC in flood products for forecast points. For some users of NWS hydrologic products, this may be the first time they have really had to gain an understanding of VTEC. Some basic facts about VTEC which are of interest to hydrologic product users include:

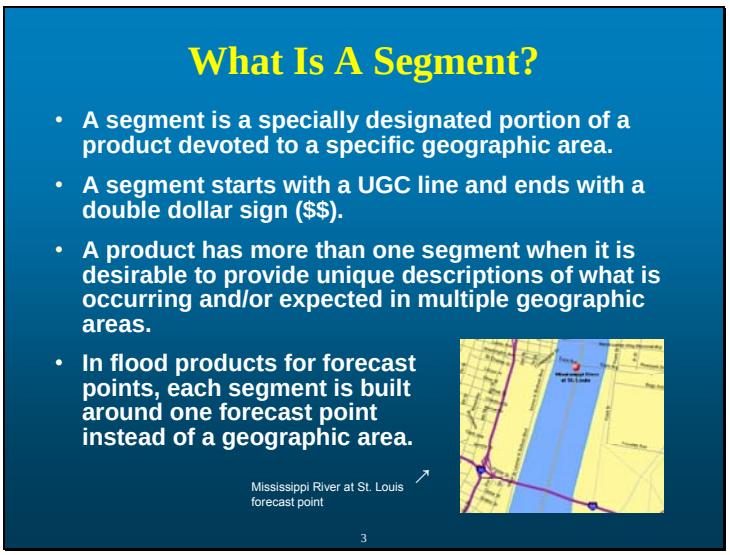
- VTEC is new coding which provides for enhanced automated processing, storage, and display of National Weather Service (NWS) products.

- VTEC information occurs right after each Universal Geographic Code (UGC) line in NWS products.

- In hydrologic products, VTEC involves two lines (or strings) of code – a line of Primary VTEC, or P-VTEC, followed by the Hydrologic VTEC, or H-VTEC, on the next line.

- In flood products for forecast points, VTEC requires a new segmented format to be used so the encoded VTEC information can be closely linked to text describing the flood situation at each forecast point.

The complete rules of VTEC can be found in NWS Instruction 10-1703, *Valid Time Event Code (VTEC)*. This directive is quite long and is best used as reference material when you need information on a specific topic.



The fourth bullet on the previous page referred to a "segmented format." The concept of a "segment" or "segmented format" may be new to some users, so some further explanation of these terms may be of benefit:

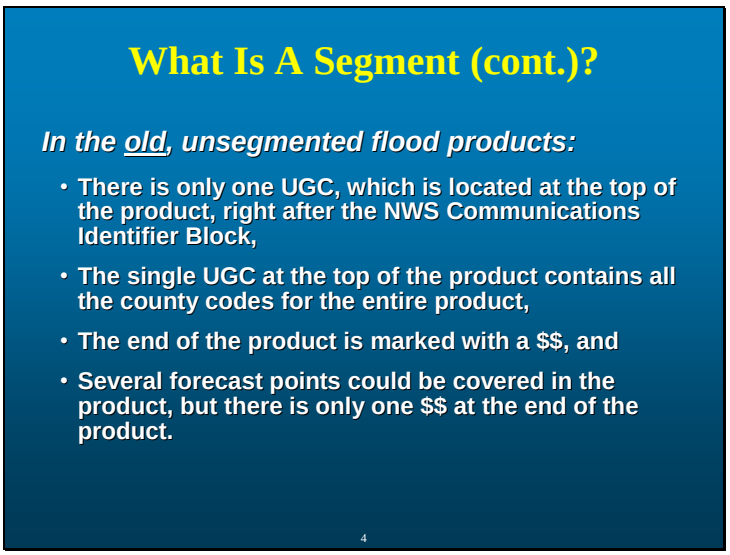
- A segment is a specially designated portion of a product containing information devoted to a specific geographic area.

- Each segment in a NWS product starts with a UGC line and ends with a double dollar sign ($$).

- A product will have more than one segment when it is desirable to provide unique descriptions of what is occurring or expected to occur in more than one geographic area.

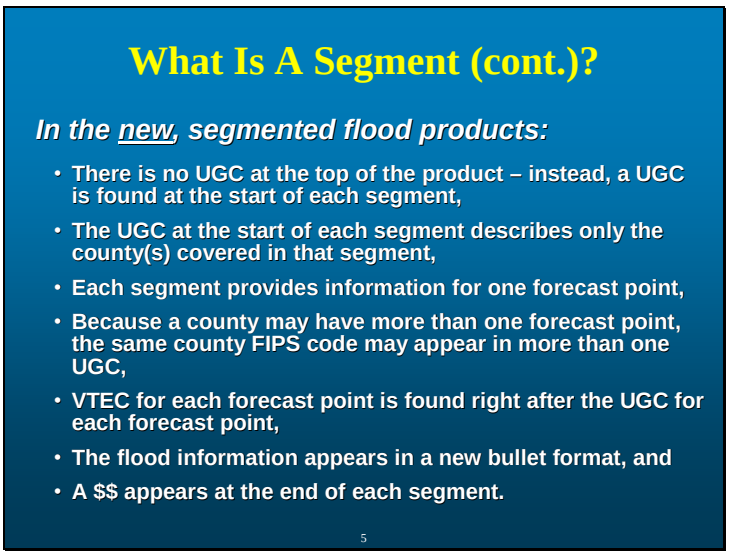
- In flood products for forecast points, each segment is built around one forecast point instead of a "geographic area." This is called "segmentation by forecast point." This is different from most NWS products such as severe thunderstorm warnings or winter weather advisories, which are issued for areas and each segment is for one or more counties or zones.

The concept of a forecast point is central to an understanding of how flood products for forecast points are different from other NWS products. The map in the lower right corner illustrates the location of a single forecast point – the Mississippi River at St. Louis. The forecast point is a river gage, which in this case is located in the middle of the river on the Eads Bridge just east of downtown St. Louis. The observed and forecast stages at this forecast point represent conditions in a river reach upstream and downstream from this location. Government officials and other users at various locations along this reach monitor observations and forecasts for the St. Louis forecast point and know when to take action. For example operators of the Chouteau Island Pump Station, which is about 9 miles upstream from the forecast point, know that their station begins to flood when the St. Louis gage reaches a stage of 44.1 feet.



The new, segmented flood products for forecast points will look quite different from the old, unsegmented products issued by the NWS prior to roughly Spring, 2006. In the old, unsegmented flood products that the NWS has issued until now:

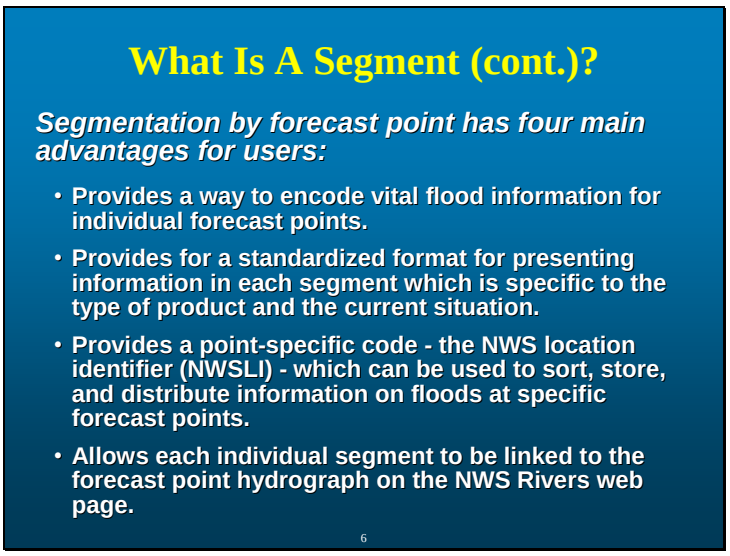
- There is only one UGC for the entire product, which is located at the top, right after the NWS Communications Identifier Block,
- The single UGC at the top of the product contains all the county codes for the entire product,
- The very end of the product is marked with a $$, and
- Several forecast points could be covered in the product, but there is only one $$ at the end of the product.



In the new, segmented flood products:

- There is no UGC near the top of the product – instead, a UGC is found at the start of each segment,
- The UGC at the start of each segment describes only the county(s) covered in that particular segment,
- Each segment provides warning, watch or advisory information as well as observation and forecast information for one forecast point,
- Because a county may have more than one forecast point, the same county FIPS code may appear in more than one UGC,
- VTEC for each forecast point is provided right after the UGC for each forecast point,
- The warning, watch or advisory information as well as observation and forecast information for the forecast point is provided in a new bullet format, and
- A $$ appears at the end of each segment and at the end of the product.

A brief side note - NWS products can be recognized as segmented or unsegmented by the location of the UGC line – if the UGC line occurs at the top of the product before the MND header block, the product is considered unsegmented. If the UGC line occurs after the MND header block, the product is segmented even if it has only one segment.



As stated earlier, a segment is a subdivision of a watch, warning, or advisory product which is specially configured to address a specific geographic area. We have shown how segments in flood products for forecast points cover individual forecast points rather than geographic areas. We have also shown how a product can consist of one or more segments. Segmentation by forecast point has four main advantages for users:

- It provides a way to encode vital flood information for individual forecast points.
- It provides for a standardized way for presenting information in each segment which is specific to the type of product and the current situation.
- It provides a point-specific code - the NWS location identifier (NWSLI) - which can be used to sort, store, and distribute information on floods at specific forecast points.
- It allows each individual segment to be linked to the forecast point hydrograph on the NWS Rivers web page.

What Is A Segment (cont.)?

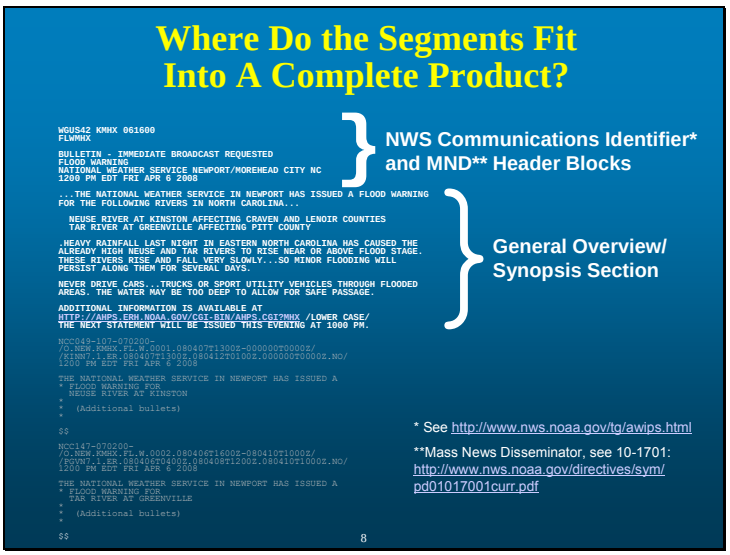
Here is what a segment in a flood product could look like:

```
NCC049-107-070200-
/O.NEW.KMHX.FL.W.0001.080407T1300Z-000000T0000Z/
/KINN7.1.ER.080407T1300Z.080412T0100Z.000000T0000Z.NO/
1200 PM EDT FRI APR 6 2008

THE NATIONAL WEATHER SERVICE IN NEWPORT HAS ISSUED A
* FLOOD WARNING FOR
  NEUSE RIVER AT KINSTON
* FROM SATURDAY MORNING UNTIL FURTHER NOTICE
* AT 9 AM EDT FRIDAY THE STAGE WAS... 13.5 FEET
* MINOR FLOODING IS FORECAST
* FLOOD STAGE IS...14.0 FEET
* FORECAST...FLOOD STAGE WILL BE REACHED AT 900 AM SATURDAY. MAXIMUM
  STAGE WILL BE 15.0 FEET AT 900 PM EDT WEDNESDAY. THE RIVER MAY REMAIN
  ABOVE FLOOD STAGE FOR SEVERAL WEEKS. THE EXACT FLOOD DURATION IS
  DIFFICULT TO PREDICT DUE TO THE VERY SLOW RISE AND FALL TIMES FOR
  THIS RIVER.
* AT 14 FEET...WATER WILL BEGIN TO OVERFLOW INTO LOWLANDS ADJACENT
  TO THE NEUSE RIVER.

$$
```

Neuse River at Kinston ↓

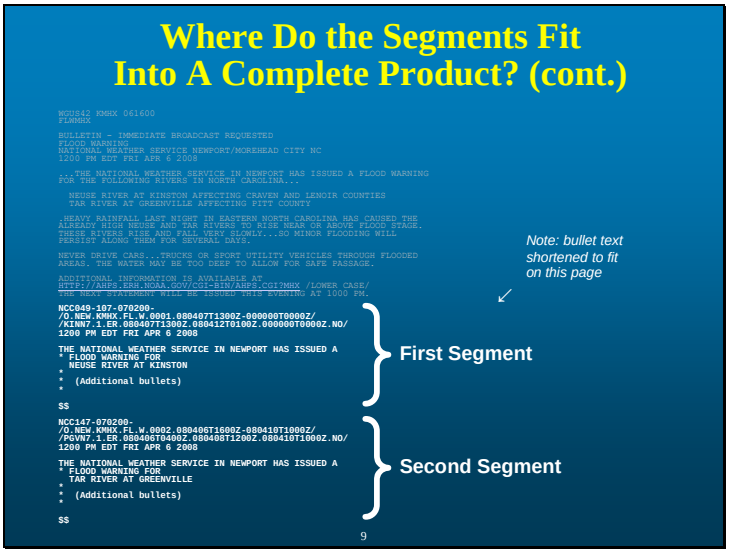
7

Here is what a single segment in a flood product could look like. This segment would appear in a flood warning for forecast points. Note the UGC, P-VTEC, H-VTEC, and time stamp lines at the top followed by the bullets below. A double dollar sign ($$) indicates the end of the segment. Several such segments could exist in a single flood product.

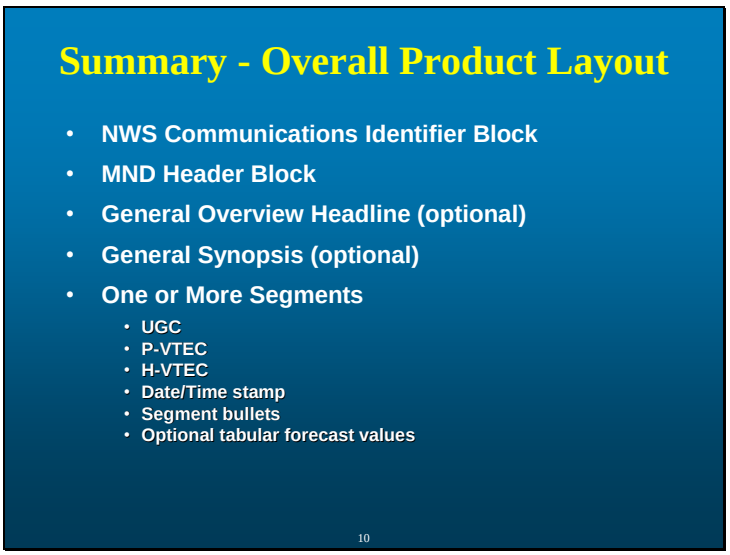


Now, let's look at where segments would fit into a complete flood product for a forecast point. There may actually be a considerable amount of text before the first segment is encountered in a product. First comes the NWS Communications Identifier and the Mass New Disseminator Header Blocks. See the NWS Communications Header Policy Document at http://www.nws.noaa.gov/tg/awips.html for more information on the NWS Communications Identifier block. See NWS Instruction 10-1701 for more information on the MND Header Block.

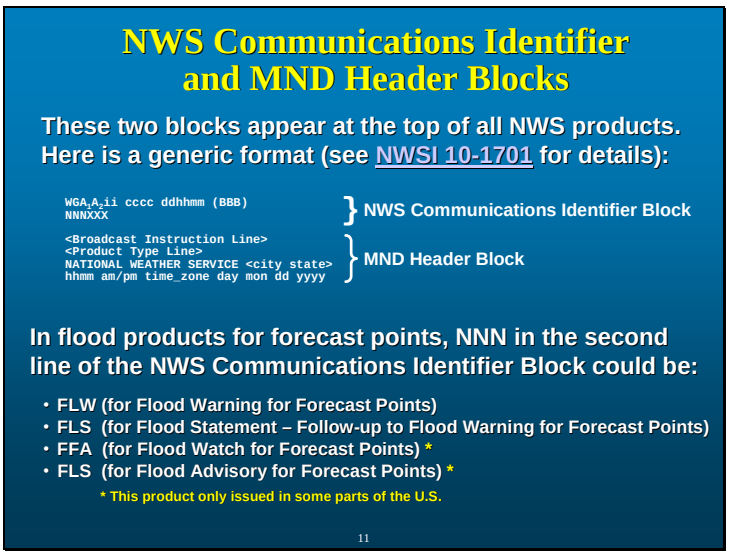
After the MND Header Block, the NWS office issuing the product has the option to include a General Overview/ Synopsis Section. This section actually has two parts, each part being optional – a General Overview Headline and a General Synopsis. One or both of these may be included. Each item occurring before the segments are shown using a bold white font in this slide and will be discussed in more detail in later slides. The actual product segments are shown in lighter lettering on this slide.



After the optional general overview/synopsis section, or the MND Header Block if no general overview headline and/or general synopsis were included, the remainder of the product will consist of one or more segments. This slide highlights the two segments in our sample product using a bold white font. Note that each segment has its own UGC, P-VTEC, H-VTEC, and time stamp lines. Each segment starts with a UGC line and ends with a double dollar sign ($$). Note also that several bullets were left out of each segment so that the entire product could be shown on a single slide. An example of what a complete segment could look like was shown two slides earlier.



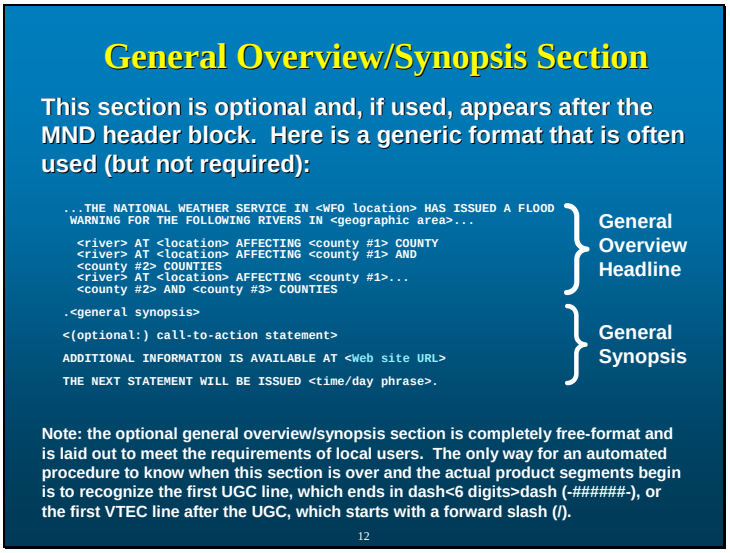
To summarize, each NWS flood product for forecast points consists of an NWS Communications Identifier Block, MND Header Block, optional General Overview Headline, optional General Synopsis, and one or more segments. Each segment is made up of five parts – a UGC line, P-VTEC line, H-VTEC line, Date/time stamp, and bullets, plus a sixth item that hasn't been discussed until now – optional tabular forecast values. Tabular forecast values are just the numerical forecast information that was issued for the forecast point, shown in table format. These tabular forecast values, if provided, are separated from the rest of the segment information by a double ampersand (&&).



All NWS products start off with two header blocks – the NWS Communications Identifier (CI) Block and the Mass News Disseminator (MND) Block. In flood products for forecast points, the three letters used for NNN in the second line of the NWS Communications Identifier Block could be any of the following:.

- **FLW** (for Flood Warning for Forecast Points)
- **FLS** (for Flood Statement – Follow-up to Flood Warning for Forecast Points)
- **FFA** (for Flood Watch for Forecast Points)
- **FLS** (for Flood Advisory for Forecast Points)

The last two products listed here are only issued in some parts of the U.S., so you may not ever see them issued for your area of interest.



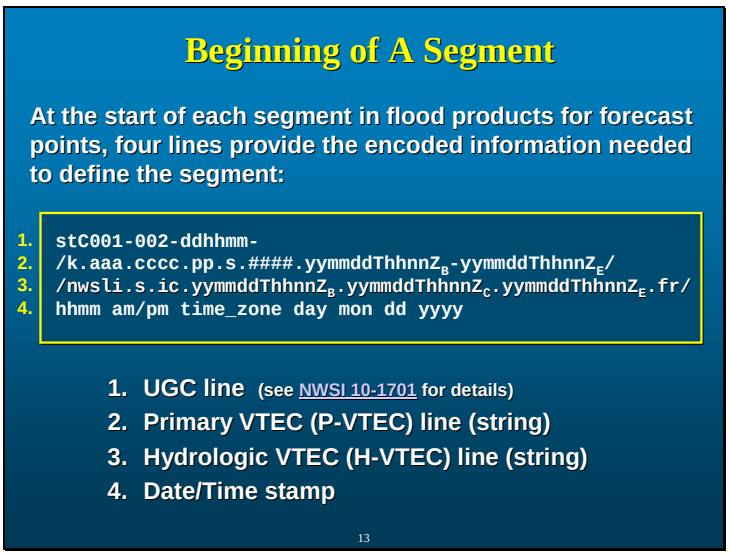
Now let's start looking at the new format features of the NWS's flood products for forecast points. First, a few notes should be made about the optional general overview/synopsis section, which occurs after the MND header block but before the product segments.

1. First, this general overview/synopsis section may consist of one or more general overview headlines, a general synopsis, or both.

2. Second, the general overview headlines in this section use the same format as the headlines used in other NWS products such as winter storm warnings – that is, each one starts and ends with three dots. However, no standardized wording exists for the text between the dots. A typical headline could read "...The National Weather Service in Rapid City has issued a flood warning for the following rivers in western South Dakota...," but other wording could be used. After such a headline, a list of the rivers, forecast points, and counties covered in the warning could be provided. This list of rivers, forecast points, and counties might be indented, but would not have to start and end in three dots.

3. Third, the general synopsis, if provided, occurs after the headline and consists of one or more paragraphs describing the current hydrometeorological situation. Other paragraphs such as a call-to-action statement and a sentence pointing a web site for additional information could also be included as part of the general synopsis. The only format requirement that can be assumed for the general synopsis is that the first paragraph will start with a single dot.

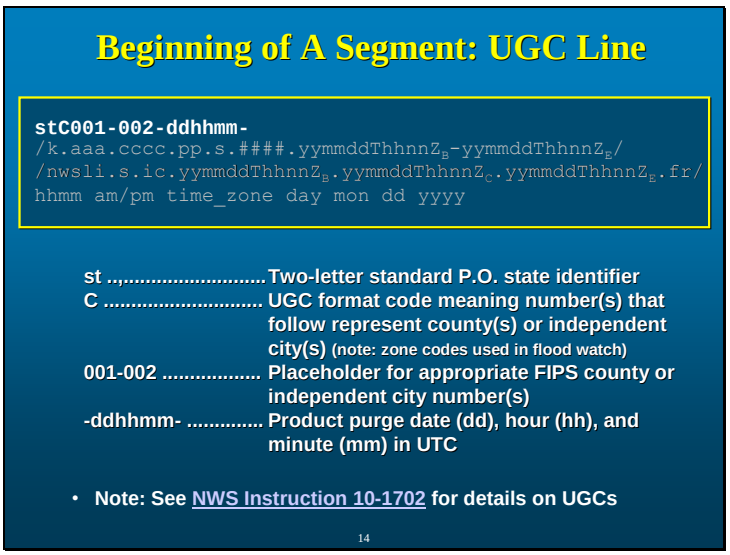
4. Lastly, the general overview/synopsis section in a flood product will not necessarily look like the one shown here. The format for this section is determined by each WFO in coordination with its local users. The only way for an automated procedure processing NWS products to know when this section is over and the actual product segments begin is to recognize the first UGC line, which ends in dash<six digits>dash (-######-), or the first VTEC line after the first UGC line, which starts with a forward slash (/).



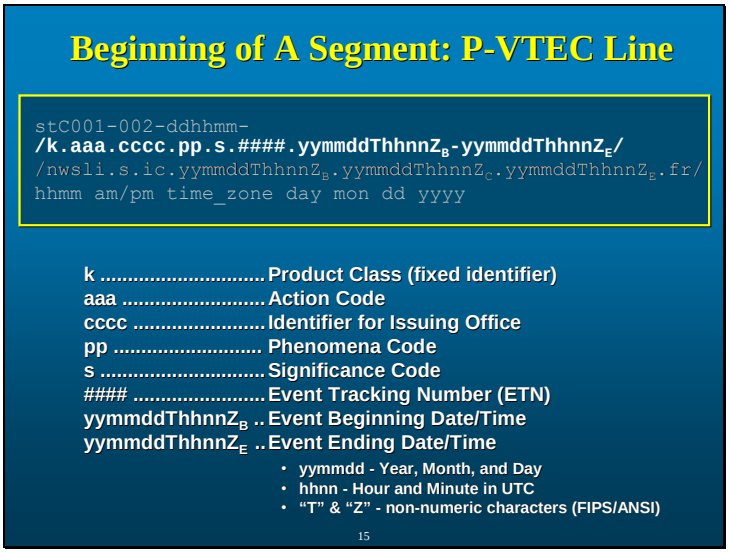
After the optional general overview headline/synopsis section, or the MND header block if there is no general overview headline/synopsis section, comes the core of flood products for forecast points – the segments. At the start of each segment, there are four lines providing the encoded information needed to define the segment. As shown in the enlarged view here, these four lines are:

1. The UGC line, for which details can be found in NWS Instruction 10-1701,
2. The Primary VTEC (P-VTEC) line,
3. The Hydrologic VTEC (H-VTEC) line, and
4. The Date/Time stamp.

Collectively, these four lines provide encoded information needed to identify the states and counties affected by the actual or potential flood event, the actual forecast point involved, and the event status as defined in the primary and hydrologic VTEC lines.



As stated earlier, the beginning of a segment is defined by a UGC line. This training will not go into much detail on the content of this line, as most users are already familiar with UGCs. NWS Instruction 10-1702 contains all the official procedures and guidelines on UGCs. One fact worthy of note here is that county codes will be used in flood warnings for forecast points, flood statements – follow-up to flood warnings for forecast points, and flood advisories for forecast points. The only exception to this is in Alaska, which must use zone codes because there are no counties in that state. Also, for the foreseeable future, zone codes will be used in all flood watches for forecast points to match what is used in areal flood watch products.



Let's focus on the P-VTEC line (or string) for a moment. The first element in this line is **Product Class "k,"** a fixed identifier which can have the value of "O," indicating this is operational VTEC in an operational product; "T," indicating a test product with test VTEC (such as those issued during special awareness weeks announced by the NWS); "X," indicating an operational product with test VTEC; or "E," indicating an experimental product with experimental VTEC.

Next comes the **Action Code "aaa,"** which identifies the current status of the watch, warning, or advisory for the possible, expected, or occurring flood event. Several possible Action Codes exist to identify product status – for example, "NEW" indicates the first product issuance for an event, "CON" indicates the watch, warning, or advisory continues to be in effect, and "CAN" indicates the watch, warning, or advisory is cancelled. NWS Instruction 10-1703 contains descriptions of all available Action Codes.

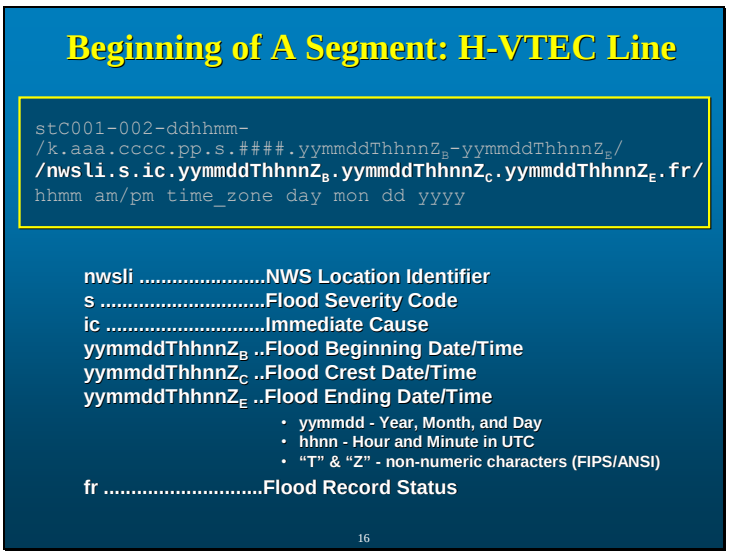
Next comes the **cccc identifier**. This is just a four-letter code (upper case) which identifies the issuing NWS office.

Next comes the **Phenomena Code "pp,"** which for hydrologic events identifies the type of flood event in terms of urgency and areal coverage. For the products covered in this training, the only available Phenomena Code is "FL" for flood. Other NWS hydrologic products not covered in this training may use FA for areal flooding and FF for flash flooding.

Next comes the **Significance Code "s,"** which identifies the level of importance and certainty of the hydrologic event in terms of classic NWS watch/warning/advisory/statement terminology. Four possible letters can be used for this code in flood products for forecast points – "W," indicating a warning; "A," indicating a watch; "Y," indicating an advisory; and "S," indicating non-flood information will be provided.

Next comes the **Event Tracking Number (ETN) "####,"** which is a four-digit number assigned to keep track of the event in terms of how it is addressed by various VTEC actions and/or products issued over its lifetime. It is important to note here that the way an event as addressed by VTEC is not the same as what would normally be thought of as an event in weather or hydrologic terms. In the context of VTEC, an event is a specific combination of phenomenon (e.g., type of weather or flood activity) and how it is characterized in terms of its level of significance and certainty (e.g., a Watch, Warning, or Advisory). A good way of illustrating this difference is to look at a fictitious flood situation. Assume that a few days before a flood event at a forecast point, the level of certainty that it would occur was somewhat low. A flood watch for the forecast point would be issued, assuming we're in an area where that product is used. A segment in that product would have an ETN assigned to it, say 0005, if it were the fifth flood watch for a forecast point during the year. Now, say a day or two passes and the flood becomes imminent – so a flood warning is issued for the same forecast point. However, with VTEC, there is no guarantee that the ETN in the new flood warning would be 0005 as it was in the earlier watch. In fact, if it were the first flood warning issued by the NWS office during that year, the ETN would be 0001. This shows how you can't count on the ETN remaining constant as a series of watches, warnings, and/or advisories are issued for a forecast point throughout what we would usually think of as "an event."

Last in the P-VTEC line, we find the **Event Beginning Date/Time and Event Ending Date/Time groups**. (time in UTC). These dates and times identify when the event is expected to begin and end. For many flood events, the duration is so long and/or the river's drop in elevation per mile is so small that it is impossible to identify when the flood event will end. In such cases, zeros are used for the event ending date and time until the end of the flood can be forecast.



Now let's look at the H-VTEC line, which appears in all NWS hydrologic products. The first element in this line is the **NWS location identifier "nwsli."** An NWSLI is a unique character/number combination assigned by the NWS to identify a specific location. An NWSLI is included in the H-VTEC to allow user applications to link the latest NWS flood information provided in the segment to a specific geographic location.

Next comes the **Flood Severity Code "s."** In flood warnings for forecast points, the Flood Severity code can be 1 for minor flooding, 2 for moderate flooding, 3 for major flooding, and N for no flooding.

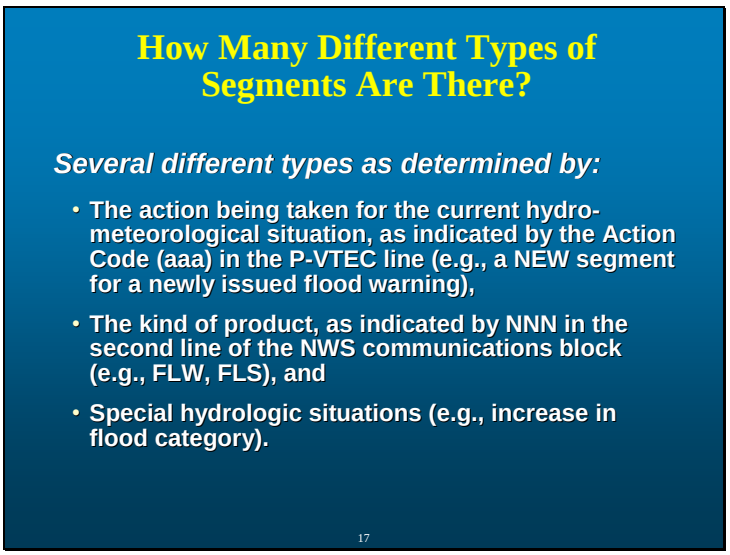
Next comes the two-letter **immediate cause code "ic,"** which identifies the hydrometeorological cause for the flood event. In flood products, the most common entries for this field will be ER for excessive rainfall, SM for snowmelt, and RS for rain and snowmelt. However, other two-letter codes exist for a variety of causes, which are listed in NWS Instruction 10-1703.

Next come the **Flood Begin Date/Time, Flood Crest Date/Time, and Flood End Date/Time groups**. There are a few things to note here about these date/time groups:

1. The Flood Begin Date/Time in the H-VTEC line will usually be the same as the Event Beginning Date/Time in the P-VTEC line. However, if the observed flooding began before the first flood warning was issued, the Flood Begin Date/Time in the H-VTEC line will be the time when flood stage was observed or estimated to have been exceeded while the Event Beginning Date/Time in the P-VTEC line will be the date/time when the flood warning was first issued.

2. The Flood End Date/Time in the H-VTEC line will usually not be the same as the Event Ending Date/Time in the P-VTEC line. The Flood End Date/Time is just the best available estimate of when the river will drop below flood stage. The Event Ending Date/Time is set to be later than the Flood End Date/Time -- often by six hours or more -- to allow time for an observation to be received confirming that the stream has dropped below flood stage. Also, when a flood warning for a forecast point has to be cancelled before the Event Ending Date/Time provided in the previously issued product, .the Flood Ending Date/Time in the H-VTEC line will be encoded with the time the flooding actually ended, while the Event Ending Date/Time in the P-VTEC line will retain the time provided in the previously issued product.

The **Flood Record Status "fr"** comes at the end of the H-VTEC line. In flood products for forecast points, there are three possible values for "fr" – NO, if a record flood is not expected; NR, if a near record or record flood is expected; or UU, if the forecast point has no period of record to use for comparisons.



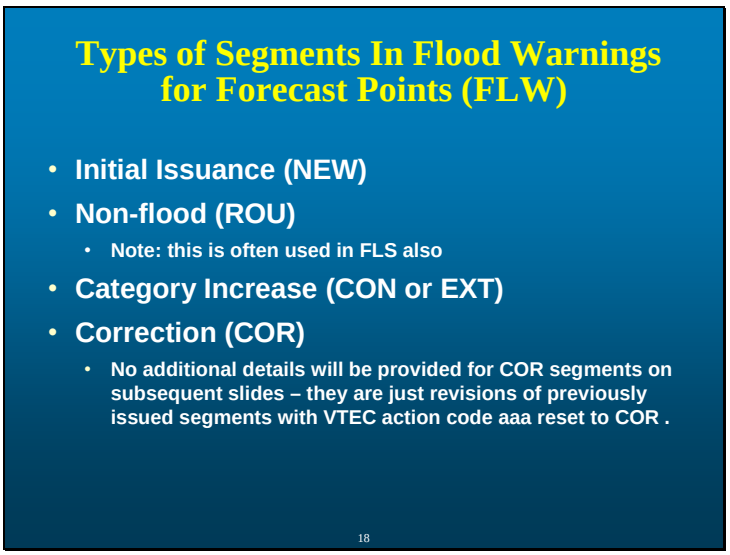
With VTEC, several types of segments are defined for flood products for forecast points according to three general criteria:

1. The type of action being taken for the point defined by the segment. For example, if an event is just starting and a new flood warning needs to be issued, an Initial Issuance segment type is created with the VTEC action code NEW.

2. The kind of product being issued, as indicated by the three letters used for NNN in the second line of the NWS communications block. For example, only certain types of segments can be issued under the FLW (flood warning) identifier, while other types of segments can be issued under the FLS (flood statement) identifier.

3. Special hydrologic situations, such as when there is an increase in forecast flood category.

The relationships between segment type and these criteria will be explained more in later slides.



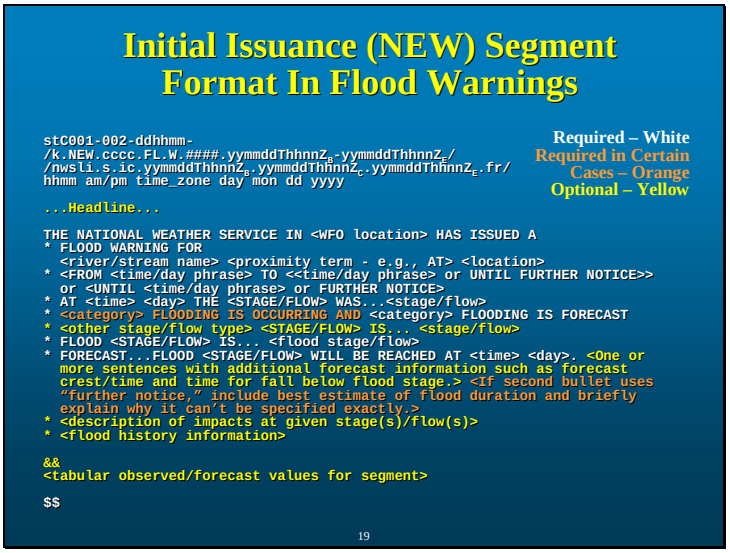
There are four kinds of segments used in products issued under the flood warning (or FLW) identifier:

1. The first and most commonly issued segment type is the Initial Issuance Segment. This type uses the VTEC action code **NEW** and is for when a flood warning is issued for a forecast point for the first time in an event.

2. The second segment type is the Routine or Non-flood Segment. This type uses the VTEC action code **ROU** and is used to provide observations, forecasts, and other information for a forecast point that is not currently expected to go into flood. Routine segments may also be issued in flood statements following up flood warnings for forecast points. Many NWS Weather Forecast Offices include this type of segment in their flood warnings and statements to give users a complete picture of all forecast points in a river or river reach.

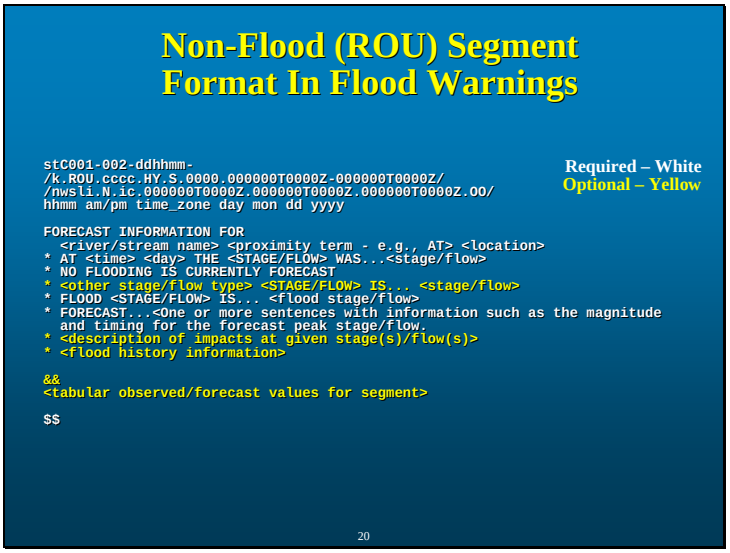
3. The third type is the Category Increase Segment. This type uses the VTEC action code **CON** or **EXT** and is for the special case when flooding has or is expected to increase in category, such as from minor to moderate flooding. The EXT action code is used when the increase in flood category also involves a change in duration in the Event Beginning Date/Time or Event Ending Date/Time. The CON action code is used in this segment type when no change in the Event Ending Date/Time is expected, even though the flood category is increasing. In either case, these segments include a special headline and other wording to highlight the category increase.

4. The fourth type is the Correction or **COR** Segment. Actually, the correction action code can be used when correcting many types of segments. It is for correcting any non-VTEC or non-UGC error or omission in a segment of a previously issued product.



Now, let's go into some detail on the format for each segment type in Flood Warnings for Forecast Points. First, one thing to note in this format example and each one to come -- the text that is required to always exist in the segment type is shown in white, text required in certain cases is shown in orange, and optional text is shown in yellow. Also note in this example and those to come that the mandatory UGC line, primary VTEC string, hydrologic VTEC string, and date/time stamp are all at the top of the segment. Let's review a few highlights of the bullet portion of this segment:

1. The headline after the date/time stamp is optional, but if provided, it always begins and ends with three dots.
2. Note how the second bullet identifies the period of time covered by the flood warning. Including this kind of information is a major change from the way the NWS has done flood warnings in the past. In the past, NWS offices used to just issue a flood warning, follow it up with flood statements as needed, and assume that users would know that the flooding was over when that forecast point was no longer covered in flood statements. Now, products will identify the date and time when the flooding is expected to end. However, it is impossible in some situations to specify when the flooding is going to end – so "UNTIL FURTHER NOTICE" is included in place of a date and time. We will touch on this again in a moment.
3. In the fourth bullet, the phrase "<category> FLOODING IS OCCURING AND" is only used if flooding is already occurring when the product is issued.
4. The fifth bullet for the other stage/flow type is optional – it is used for special stages defined for local areas such as "caution stage" or "monitor stage."
5. The seventh bullet starts with required text describing when flood stage or flow will be reached, but after that, any free-form text may be included that is needed to describe the forecast situation.
6. If "UNTIL FURTHER NOTICE" is used instead of an event ending time in the second bullet, the seventh bullet will include an explanation as to why the ending time cannot be provided. Examples of such text are:
    - "The ending time cannot be specified because it is beyond the current forecast horizon," or
    - "The ending time cannot be specified because this river has very slow rise and fall times."
7. The eighth and ninth bullets - the flood impact and flood history bullets - are optional. When they are included, they provide historical points of reference to compare the current flood to past events.
8. Some NWS offices provide tabular observed/forecast information at the end of each segment for their local users. This tabular information is always separated off from the bulleted area by a double ampersand (&&). Some NWS offices save up all the tabular observed/forecast information for all forecast points covered in the product and just insert one table right before the $$ of the last segment, using a && at the start of the table and ending it with the $$ which marks the end of the segment. Either of these ways of including tabular forecast information is done according to the preferences of local users.



Now, let's look at some features of the non-flood or "ROU" segment format. As stated earlier, this type of segment is sometimes included in flood warning and flood statement products to provide information for a forecast point that is currently not in flood or expected to go into flood. Including this type of segment helps give a complete picture of the status of all forecast points along a river reach, both those that are above flood stage and those that are below flood stage.

The VTEC strings in ROU segments have two distinguishing characteristics:

1. First, in the P-VTEC string, the action code is ROU (for Routine), the phenomena code is HY (for Hydrologic), the significance code is S (for statement), the ETN is zeroed out, and the Event Beginning and Event Ending Date/Time stamps are also zeroed out.

2. Second, the only information available in the H-VTEC string is the NWSLI, the flood severity code "N" to indicate no flooding is occurring, and a single letter designating the immediate cause. The Flood Date/Time groups are zeroed out and two capital "O's" are stored in the Flood Record Status to indicate it is not applicable.

The bullet portion of ROU segments is different from other segment types in some ways and similar in other ways. Some highlights of the bullet portion include the following:

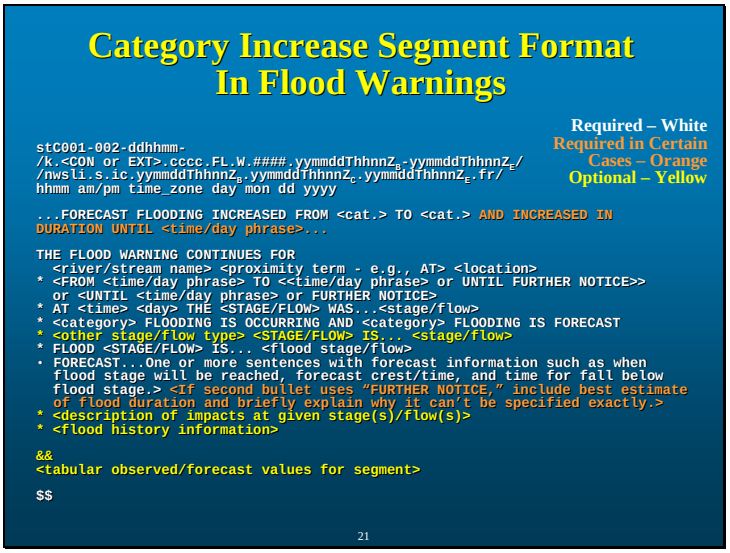
1. The lead-in text simply reads "FORECAST INFORMATION FOR."

2. The second bullet always reads "NO FLOODING IS FORECAST."

3. The forecast bullet is free-form – it includes whatever text is needed to address the situation.

4. The impact and flood history bullets are optional.

5. Just like the NEW segment, tabular observed/forecast information may be included at the end of each segment, or included in a single table in the last segment. In either case, it is separated off from the segment bullets by a double ampersand.



The category increase segment is reserved for situations when a flood warning is already in effect for a forecast point and the maximum of the observed or forecast flooding increases to a higher flood category than the maximum of the observed or forecast flooding from the previously issued FLW or FLS product. In other words, it is used when either the forecast flood category is being increased, or the observed flooding jumped to a higher category than was previously forecast.

The only special VTEC feature to note is that the action code can be either CON or EXT. If no change in duration of the flood warning is involved, the action code is CON. If the category increase also involves an increase in flood duration, which is probably most often the case, then the action code is EXT.

It should be pointed out that NWS policy requires category increase segments to always be issued under the FLW identifier. This policy ensures that category increase situations receive the maximum visibility. If a previously issued flood statement product (FLS) covered several forecast points, but now some of those points are increasing in flood category, the forecast points in that past FLS product are temporarily split into two products:

1. A separate FLW product is used for the point(s) that increased in flood category.

2. The remaining forecast point(s) continue to be covered in a FLS product.

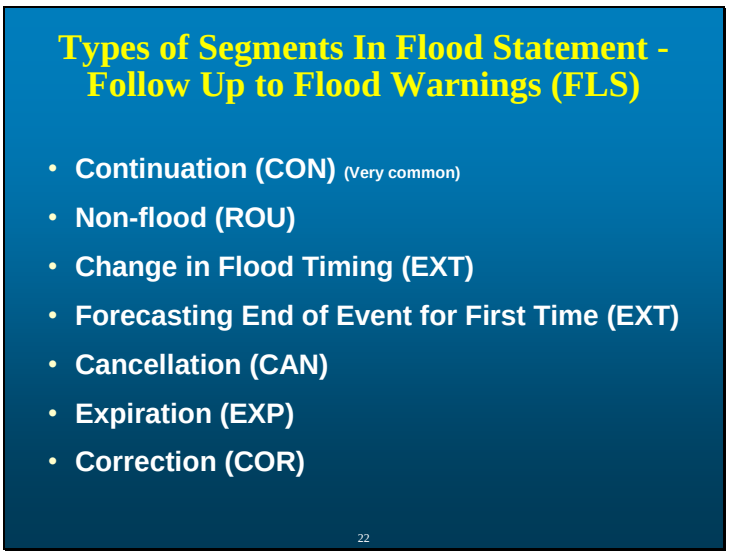
After the category increase for the forecast points is announced in a separate FLW, all forecast points are once again covered together in subsequent FLS products.

Here are a few highlights of the bullet section in category increase segments:

1. The headline is required in this segment type. If only a stage increase is involved, then only the text shown above in white has to be provided, but if the duration of the flood warning is also being extended, then the second phrase is also included.

2. The lead-in to the bullets simply reads "THE FLOOD WARNING CONTINUES FOR" followed on the next line by the river and forecast point name. This is the same format used in continuation segments, which will be discussed shortly.

3. The rest of the bullets follow the same rules as initial issuance (NEW) segments.



Now, we will look at some characteristics of the Flood Statement – Follow-up to Flood Warning to Forecast Points (FLS). Seven types of segments are used in this kind of FLS product:

1. The first type is the Continuation or **CON** Segment. This very commonly issued segment type uses the VTEC action code CON and is used when a flood warning is being continued for a forecast point.

2. The second type is the Routine or Non-flood Segment. As is the case for FLW products, the **ROU** segment type is used to provide observations, forecasts, and other information on a forecast point that is not currently expected to go into flood.

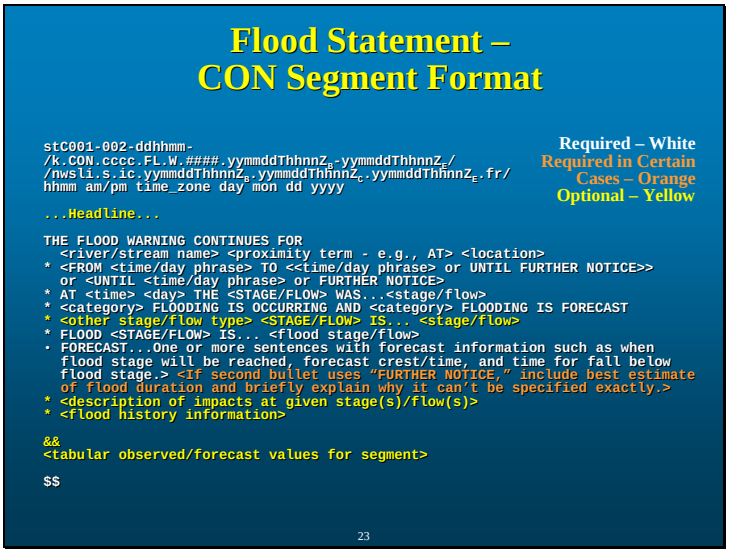
3. The third type is the Change in Flood Timing or **EXT** Segment. This commonly used segment type uses the VTEC action code EXT and is often thought of as an extension, but it used when the valid time period of an existing flood warning has been changed in any way – for example, made longer or shorter.

4. The fourth type is the Forecasting End of Event for the First Time Segment. This is a **specialized EXT** segment for cases when the previously issued flood warning or statement had an unspecified event ending time (that is, used "UNTIL FURTHER NOTICE"), but now the time is being specified in this product. These segments include a special headline and other wording to highlight when the flooding is expected to end.

5. The fifth type is the Cancellation or **CAN** Segment. Its use is pretty obvious – it is for canceling a flood warning for a forecast point.

6. The sixth type is the Expiration or **EXP** Segment. This segment type is used to announce expiration of a flood warning for a forecast point.

7. The seventh type is the Correction or **COR** Segment. In this case, it would be for correcting any non-VTEC or non-UGC error or omission in the previously flood statement product.



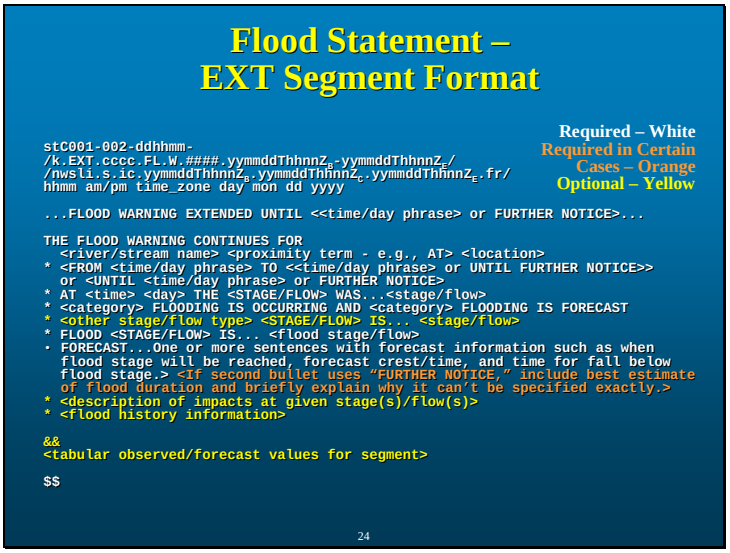
Let's go into some detail on the format for each segment type in the Flood Statement – Follow-up to Flood Warning for Forecast Points. The first and most common type is the continuation or CON segment. The CON segment is used to continue a flood warning when no change has been made to the event beginning or/and event ending time provided in the previously issued flood warning or flood statement.

Here are some guidelines to keep in mind when interpreting the bullet section of continuation segments:

1. The headline is optional.

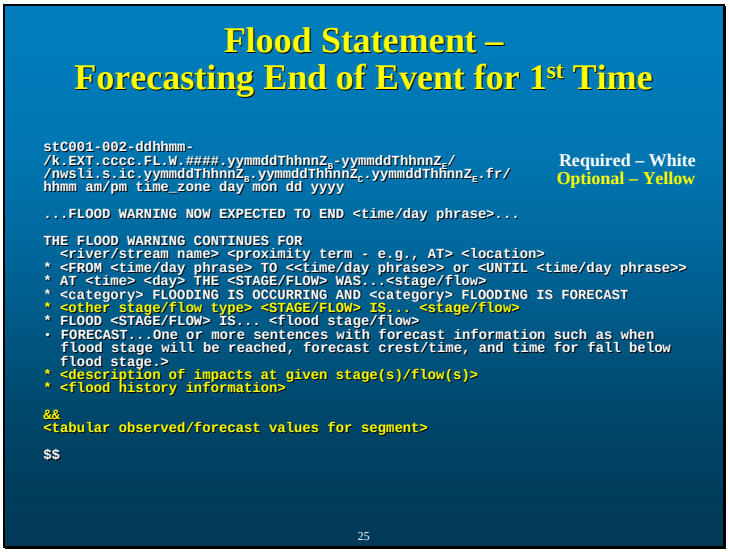
2. The lead-in phrase uses the same format as the one already described for category increase segments.

3. The format for the remaining portion is the same as those given previously for NEW segments, except forecast bullet is entirely free-form.



Another common type of segment issued under the flood statement identifier is the change in duration or EXT segment. EXT segments are common because the forecast times, especially the Flood Ending Date/Time, can frequently change in a flood warning for forecast points. Any change to the Event Beginning or Event Ending Date/Time will result in issuance of an EXT segment for that forecast point. Sometimes there is no obvious hydrometeorological cause for changes in forecast date/times, while other times the reason is clear, like when additional precipitation occurs which causes the flooding to last longer. A special "extension" headline is used at the top of these segments to highlight the lengthening of the flood warning.

The format for the bulleted portion after the lead-in phrase are the same as those given previously for CON and NEW segments.



Segments forecasting the end of an event for the first time are a special kind of change in duration segment issued under the FLS identifier. They are issued when a non-zero Event Ending Date/Time is provided after the previous product had an indeterminate Event Ending Date/Time – that is, had ten zeros in the Event Ending Date/Time and "UNTIL FURTHER NOTICE" was used in the first bullet, but now the Event Ending Date/Time is being specified.

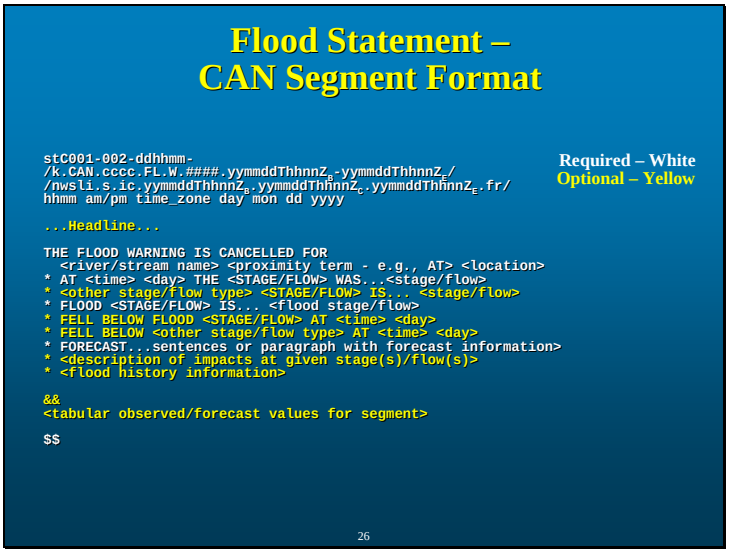
Here are some features of note for this type of segment:

1. The EXT action code is used because event ending time in P-VTEC is being changed – that is, it will now contain an actual date and time instead of being 000000T0000Z like it was in the previous product.

2. The headline is required – it announces that the event ending time is now being forecast.

3. The lead-in phrase and bullets follow the same format as CON statements, except, of course, that "UNTIL FURTHER NOTICE" is not an option in the first bullet for this type of segment.

4. The next product issued after the one containing this segment type may revert to using an indeterminate Event Ending Date/Time if new information once again indicates flooding will continue beyond the date/time specified in this product.



When a flood warning is no longer needed, a cancellation segment may be issued. CAN segments may be issued at any time before the product expiration time of the most recently issued flood product. Here are some highlights of CAN segments:

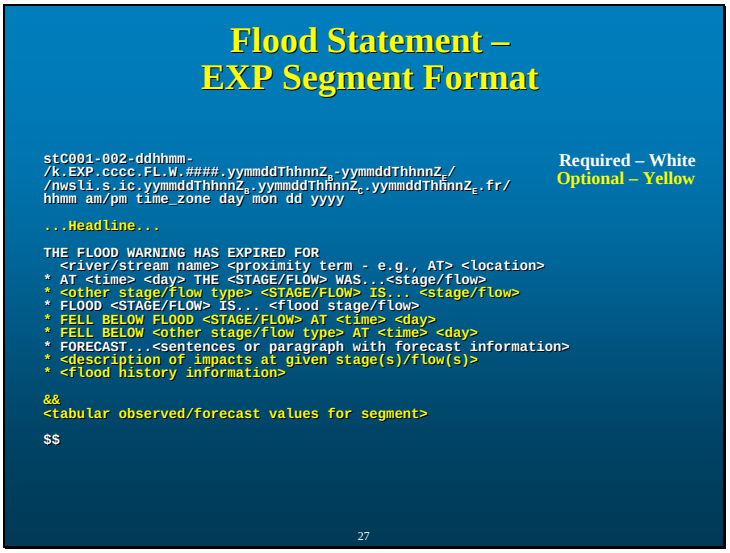
1. The headline is optional – it is only included when it would be beneficial to users.

2. As is the case for all previous segment types, the bullet for other locally-defined stage/flow types is optional.

3. Bullets may be included describing when the river fell below flood stage/flow and any other locally-defined stage/flow type.

4. The forecast bullet contains any information that is necessary to “close out” the flood event.

5. The seventh and eighth bullets - the flood impact and flood history bullets - are optional.

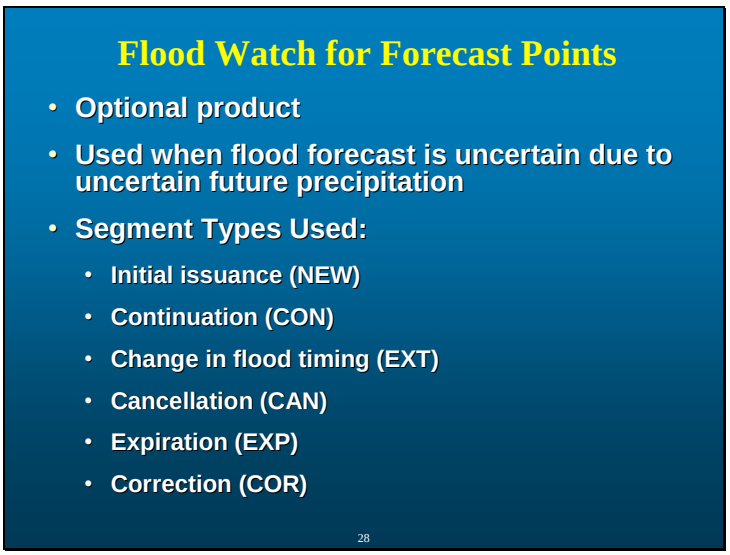


Expiration or EXP segments are used to announce the end of a flood warning after the most recent product for the forecast point has expired and the flooding is over. EXP segments are issued no more than 10 minutes before the expiration time of the previously issued flood product and within 24 hours after the expiration time of the previously issued flood product.

The format guidelines for EXP segments are the same as for Cancellation segments, except the lead-in phrase for the bullets announces a product expiration instead of a cancellation.

It is important to note that a CAN or EXP segment is not necessarily issued just because a river has fallen below flood stage or flow. When the situation is such that a river could bounce back above flood stage or flow, the flood warning can be kept going using a CON segment in a flood statement even though the river is currently below flood criteria.

It should also be pointed out that issuance of a CAN or EXP segment at the end of a flood is not required. However, it is a common practice.

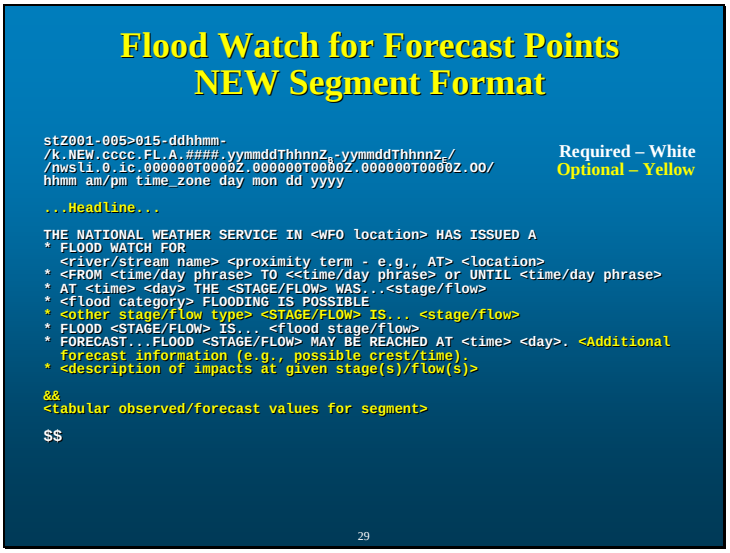


Let's quickly review some other flood products for forecast points that may be issued by some NWS Weather Forecast Offices. The first is the flood watch for forecast points. It is important to remember the flood watch for forecast points is only issued in a few parts of the country, but it's use may increase in the future.

The idea behind the flood watch for forecast points is to have a product which can provide flood forecast information when precipitation is forecast which could potentially cause flooding at specific forecast points, but there isn't enough certainty yet to issue a full flood warning for forecast points. Because it is a watch product, zone codes are used in the UGCs, the same as the much more frequently issued areal flood/flash flood watch product.

Five types of segments, plus of course the correction segment, can be used in flood watches for forecast points. They are:

1. NEW segments (for initial issuance),
2. CON segments (for continuations),
3. EXT segments (for any change in flood timing),
4. CAN segments (for cancellations), and
5. EXP segments (for expirations).



A brief look at the format of a NEW segment will give an idea of the characteristics of flood watches for forecast points. We won't try to cover format for other segment types for this product like we did for the flood warning, but many of the highlights given below apply to other segment types in the flood watch for forecast points.

1. First, the phenomena code/significance code combination used in this product is always FL.A.

2. Second, the headline is always optional in this and all other types of segments in the flood watch for forecast points.

3. Third, there is always a lead-in phrase for the bullet portion of the segment, just like flood warnings. In the above example, it is "THE NATIONAL WEATHER SERVICE IN <WFO location> HAS ISSUED A."

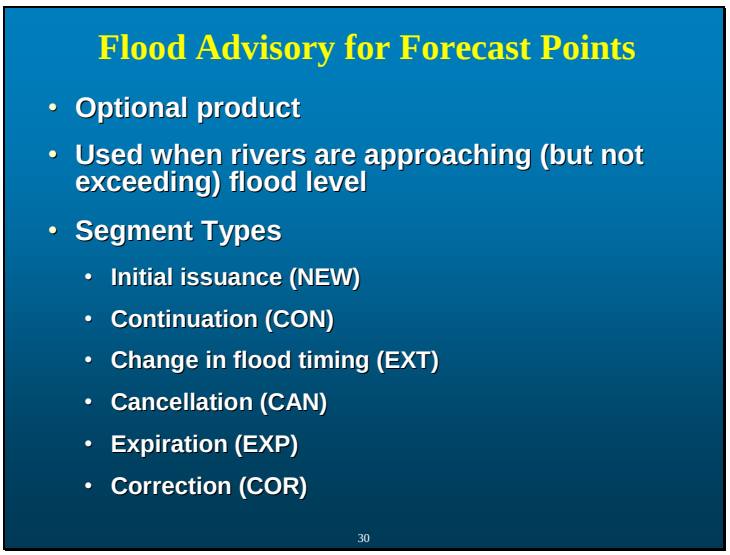
4. Fourth, an event ending time is always specified in this product.

5. Fifth, the fourth bullet is a bit different – it reads "flood category type" FLOODING IS POSSIBLE.

6. Sixth, just like other point-based flood products, a bullet for special stage/flow types used in the local area may be included.

7. Seventh and lastly, the forecast bullet starts off with "FORECAST...FLOOD STAGE MAY BE REACHED AT <time>." The bullet is worded in this way to reflect the fact that flooding isn't a sure thing when the product is being issued, since it is a flood watch.

For a description and examples of the other types of segments used in flood watches for forecast points, see Section 4 of NWS Instruction 10-922 and Section 4 of NWS Manual 10-923.

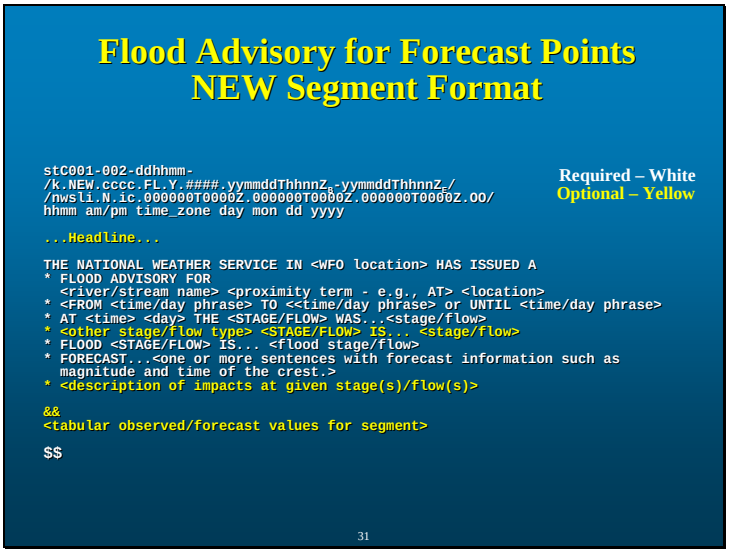


Another type of flood product for forecast points is the flood advisory for forecast points. As is the case for the flood watch for forecast points, this is an optional product only issued by a few NWS Weather Forecast Offices.

The idea behind this product is to have a flood advisory that can be issued for forecast points when rivers approach flood stage, but there currently is no expectation that flood stage will be exceeded. This gets the word out that the river is going to rise to a significant level, but not high enough to warrant a flood warning.

The same five types of segments used in flood watches for forecast points, plus the correction segment, can be used in flood advisories for forecast points. They are:

1. NEW segments (for initial issuance),
2. CON segments (for continuations),
3. EXT segments (for any change in event timing),
4. CAN segments (for cancellations), and
5. EXP segments (for expirations).



To get an idea of the characteristics of flood advisories for forecast points, let's briefly look at the format of a NEW segment. You may notice that the format for flood advisories for forecast points is similar to the flood warning. Many of these highlights for the NEW segment will apply to the other segment types used in this product.

1. First, the phenomena code/significance code combination used in this product is always FL.Y

2. Second - the only codes entered in the H-VTEC string are the nwsli, N to indicate "none" for the flood severity, and the appropriate two-letter code for the immediate cause. The rest of the fields are always zeroed out.

3. Third, the headline is always optional in all types of segments.

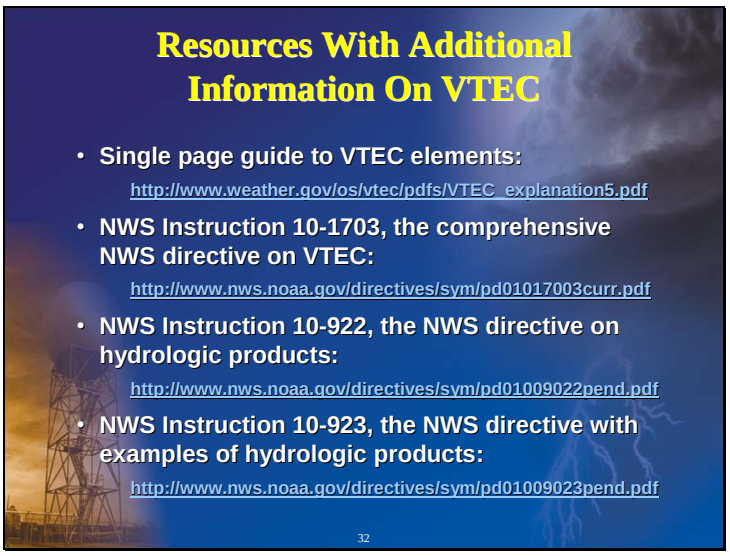
4. Fourth, there is always a lead-in phrase for the bullet portion of the segment, just like flood warnings. In the above example, the lead-in phrase is "THE NATIONAL WEATHER SERVICE IN <WFO location> HAS ISSUED A."

5. Fifth, an event ending time is always specified in this product.

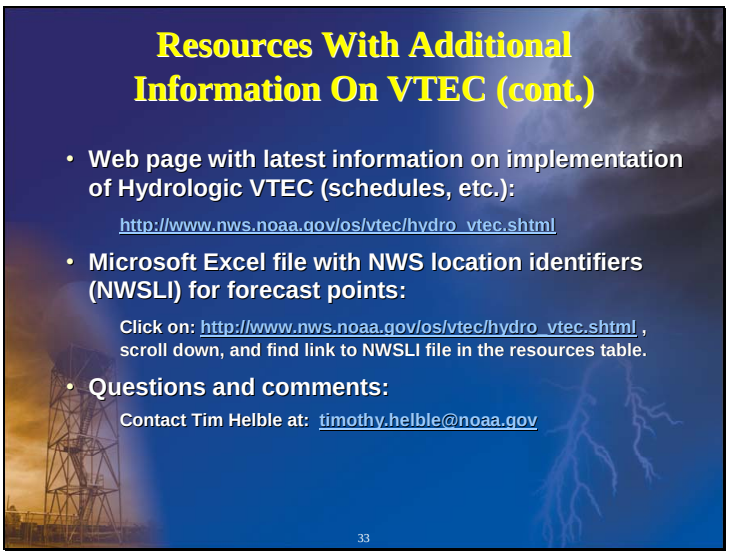
6. Sixth, a bullet for special stage/flow types used in the local area may be included.

7. Seventh and lastly, text in the forecast bullet is free-format.

For a description of the other segment types used in flood advisories for forecast points, see section 12 of NWS Instruction 10-922 and section 9 of NWS Manual 10-923.



No additional notes here.



No additional notes here.