VI.5.4-XSETS   SHEF ENCODED TIME SERIES PROGRAM (XSETS)

Purpose

Program XSETS is a graphical program used to generate river forecast
products from time series data in the Processed Data Base.

Main Features

Program XSETS allows users to:

    o display simulated stage and flow time series values from the
       Processed Data Base in the form of a SETS file

    o edit the simulated stage and flow time series using a generic
       Unix text editor prior to transmission of a SETS file

    o transmit the SETS file using the user specified transmission
       program

    o graphically view past SETS hydrographs that were ingested into
       an Informix database as well as the working time series
       hydrograph

Program Description

Input for XSETS comes from:

    1. run options are set using apps_defaults tokens (see Chapter
       I.2-UNIX-XSETS)

    2. the Forecast Groups and Segments used within XSETS are
       specified by a configuration file (see Section
       VI.5.4-XSETS-CONFIG)

    3. the Processed Data Base is read to get the flow and river
       stage forecasts

    4. the Informix database is read to get the current river stage,
       historical observed river stages and previously generated
       river forecast products

Output from XSETS is a Standard Hydrologic Exchange Format (SHEF)
encoded time series (SETS) file. The file is sent to various offices
where it is ingested into an Informix database.

XSETS also includes a feature called Forecast Progression (FCSTPROG)
that allows the user to view the observed stage hydrograph as well as
previously issued river stage and flow forecasts. FCSTPROG accesses
the Informix database to get the observed river stages and previously
produced forecasts and the current SETS file is accessed for the
current forecast.

Chapter I.2-UNIX-XSETS contains program execution and apps_defaults token information.

Section VI.5.4-XSETS-CONFIG describes the configuration file used by XSETS.

Section VI.5.4-XSETS-EXAMPLES contains XSETS examples.

Figure 1 shows the main XSETS window that is generated at start-up.

There are four sections to this window:

   o The **Select Forecast Group** menu allows the user to choose a
      Forecast Group.

   o The **Select Segments** menu allows the user to choose one or more
      Segments for which to produce a SETS file.

   o The buttons on the far right of the main window provide the
      functionality. The function of each button will be described
      below.

   o The Message window is displayed at the bottom of the main
      window and is displayed by the **Messages** toggle button. When
      toggled on, the Messages window is displayed, as shown in
      Figure 2.

Select Forecast Group

The Forecast Group is selected by clicking on one of the Forecast
Groups displayed in the **Select Forecast Group** menu. Only one
Forecast Group can be chosen at a time, and once selected any
previously created SHEF encoded time series file is lost. This means
that FCSTPROG (described below) will not know of the previously
constructed ASCII text file when it is started. The Forecast Groups
listed in the menu are specified in the configuration file.

Select Segments

After a Forecast Group is selected, XSETS fills in the **Select
Segments** menu as shown in Figure 3. The user may select Segments by
doing any of the following:

   o Clicking on the individual Segments to either highlight or
      un-highlight a Segment.
   o Clicking on the **Clear Selections**/**Select All** button to either
      clear all selected Segments or select all Segments.
   o Clicking on the **Flood Check plus...** button to select all
      routine Segments and Segments that are in flood, according to
      the configuration file setup.
   o Clicking on the **Flood Check Only** button to select all Segment
      that are in flood, according to the configuration file setup.

The Segments that are listed in the menu are those specified for the
selected Forecast Group within the configuration file.

Buttons

The following buttons are provided, top to bottom, in the XSETS window:

- o **Use OFS Files**/**Use IFP Files** toggle: This pair of toggle buttons allow users to select either the default OFS database files or the files the user created through IFP as the source of the time series data.
- o **Clear Selections**/**Select All** button: This button has two functions. First, if no Segments are currently selected (highlighted), the button functions as a **Select All** button, and by clicking it, all Segments are selected in the **Select Segments** window. Second, if any Segments are currently selected, the button functions as a **Clear Selections** button, and by clicking it, all Segments are de-selected in the **Select Segments** window. This button is activated as soon as a Forecast Group is chosen.
- o **Flood Check plus...** button: By clicking on this button, Segments are selected that are either routine or are in flood, as defined by the configuration file, and all other Segments are de-selected. This button is activated as soon as a Forecast Group is chosen.
- o **Flood Check Only** button: By clicking on this button, all Segments that are in flood are selected and all other Segments are de-selected. This button is activated as soon as a Forecast Group is chosen.
- o **Fcst Progression** button: By clicking on this button, FCSTPROG is executed. This sub-program will be described below. This button is activated when exactly one Segment is selected.
- o **Make Forecast** button: By clicking on this button, the SETS file is created for the Segments currently selected. After the file is created, it is opened in the .Apps_defaults specified text editor. This button is activated when one or more Segments are selected.
- o **Redisplay Forecast** button: By clicking on this button, the most recently created SETS file is opened inside the text editor. This button is activated only after **Make Forecast** is clicked for the current Forecast Group. Note that when a new Forecast Group is chosen using the **Select Forecast Group** button, knowledge of the name of the most recently created file is lost, so the **Redisplay Forecast** button is made unavailable.
- o **Display Old Forecast** button: By clicking on this button, a Unix file browser is opened in the current XSETS output directory, so that the user can select a previously created SETS file. After a file is chosen, it is opened inside the text editor.
- o **Print Forecast** button: By clicking on this button, the SETS file is printed using the command provided in the .Apps_defaults file. This button is activated only after **Make Forecast** is clicked for the current Forecast Group.
- o **Transmit Forecast** button: By clicking on this button, the SETS file is transmitted through the use of the command provided in the .Apps_defaults file.

o **Override Crest Check** toggle: When this toggle is on, all crests, regardless of the crest stage, are displayed in the SETS file. When this toggle is off, the crest check specifications provided in the configuration file are used to determine if a crest should be displayed.

o **Reread Config Info** button: By clicking on this button, the program specifications provided in the configuration file and .Apps_defaults file are refreshed and XSETS is restarted with no Forecast Groups selected.

o **Help** button: By clicking on this button, the help command is executed as provided in the .Apps_defaults file. Currently, there is no default help command provided, so this button will not function properly.

o **Quit** button: By clicking on this button, XSETS is closed.

Message Window

The message window displays all messages generated by XSETS. If a line is preceded by '*WARNING*', then the message pertains to some problem encountered by XSETS that is not significant enough to prevent the execution of the current operation. If a line is preceded by '*ERROR*', then the message pertains to some problem encountered by XSETS that is considered severe enough that the execution of the current operation is halted. If any problem is encountered within XSETS, this window should be the first place examined for the source of the error. As described above, this window is displayed when the **Messages** toggle is on. It can also be displayed by readjusting the size of the main window to include the Message window's space.

FCSTPROG Window

The FCSTPROG window, shown in Figure 4, is created when the **Fcst Progression** button is selected. There are three main components to the FCSTPROG window:

o The **Hydrographs Display** window shows the individual hydrographs and the observed hydrograph that FCSTPROG was able to acquire from the Informix database.

o The **Hydrographs Legend** window provides the cross reference of the date of the hydrograph and a corresponding number.

o A few buttons for control and options are provided along the top of the main window and between the two previously described windows.

Hydrographs Display Window

The **Hydrographs Display** window displays the observed stage hydrograph and each of the hydrographs it can find within the Informix database for the selected Segment. The observed hydrograph is read from the height table in the database. The forecast hydrographs are produced by XSETS using the Informix fcstheight or fcstdischarge table for stages or flows, respectively. If the Segment has more than one product specified in the configuration file, the first product is chosen by default.

The observed stage hydrograph is displayed as green circles, while the other hydrographs are displayed based on the number and color scheme provided in the **Hydrograph Legend** window. When the user clicks within the **Hydrographs Display** window, a stage and date corresponding to the point of the click are provided just below the window.

Hydrographs Legend Window

The lower display in the main window is called the **Hydrographs Legend** window. In it, the hydrographs read from the database and from the SHEF encoded time series file are listed. A hydrograph is specified by the date of its creation, as given in the data base, or by 'TEMP ASCII FILE' if it is from the SHEF file. Each line in the Legend is printed in a specific color and is assigned a line number. The line number and line color provides the key to identifying the hydrograph in the Display window.

FCSTPROG Buttons

The following buttons are provided for FCSTPROG:

- o **Create Rules of Thumb** button: By clicking this button, FCSTPROG attempts to open the rules of thumb associated with XNAV so that the user can view and edit them. The editor used is nedit.
- o **Refresh** button: By clicking this button, the data for the display is refreshed, so the user can edit the SETS file manually and see the new hydrograph by saving the file and clicking **Refresh** in the FCSTPROG main window.
- o **Close** button: By clicking this button, the FCSTPROG window is closed.
- o **QPF**/**NONQPF**/**ALL** toggle: This toggle allows the user to select which type of forecast hydrographs are to be shown: QPF generated hydrographs, non-QPF generated hydrographs, or all hydrographs. The default selection is all.

Configuration File

The contents of the configuration file used by program XSETS is described in Section VI.5.4-XSETS-CONFIG.

Apps_defaults Tokens

XSETS uses apps_defaults tokens to set execution options and path names. A description of the tokens is in Chapter I.2-UNIX-XSETS.

Program Execution Information

See Chapter I.2-UNIX-XSETS for program execution information.
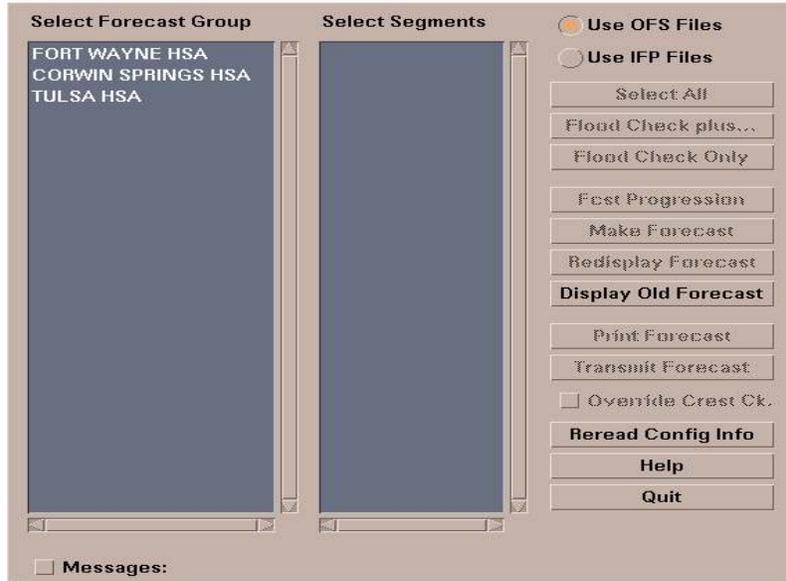
Figure 1. Main XSETS window

Figure 2. Main XSETS window with 'Messages' window

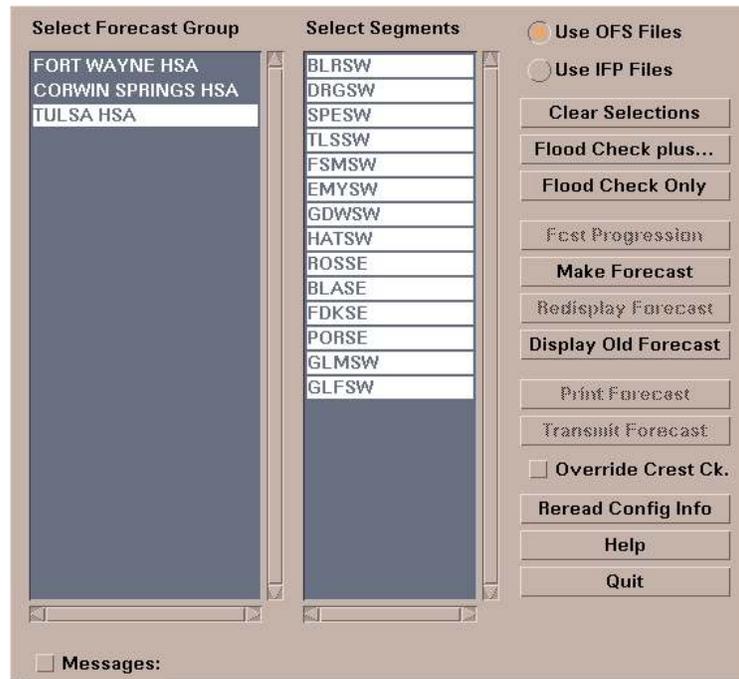Figure 3. Display of Segments for a selected Forecast Group

Figure 4.   FCSTPROG
window