

IX.5.6 FORECAST SYSTEM FORECAST COMPONENT DATA BASE ACCESS

Introduction

The Forecast Component Data Base (FCDB) [[Hyperlink](#)] includes parametric, carryover and Rating Curve files.

The parametric files contain information about the Operations that are used by Segments and the organization of the Segments.

The carryover file contains the state variables for each Segment for various dates.

The Rating Curve file contains Rating Curves definitions and other forecast point related information.

Access Routines

The routines used to access the FCDB include:

<u>Routine</u>	<u>Function</u>
FCDATE 2/	Fill common block FCSEGC [Hyperlink] with the carryover dates for the specified Segment
FCOBBL 2/	Sort arrays of internal Julian dates and times into ascending order
FCORDR 2/	Set Segment computational order for the specified Segments organization (i.e., either single Segment, Forecast Group or Carryover Group)
FGETCO 1/	Get carryover for the specified Segment and date
FGETRC 1/	Fill Rating Curve definition common block FRATNG [Hyperlink] with definition of the specified Rating Curve
FGETSG 1/	Fill Segment definition common block FCSEGN [Hyperlink] and read parametric information for specified Segment
FIDFLT 1/	Initialize user default values in common blocks
FOPCDE 2/	Convert Operation identifier to Operation number
FOPCDX 2/	Convert Operation number to Operation identifier
FSERCH 2/	Find one or all Operations of a given type in a Segment parameter array
INSTRT 1/	Initialize control values in common blocks

identifier

CALL FCORDR - computational order of the requested Segment grouping set in common block FCRUNC - the number of Segments ordered is stored in the variable NSEGEX in FCRUNC

A loop through the NSEGEX Segments is then set up with the following calls made for each Segment:

CALL FGETSG - parameters for the Segment are read into the parameter array

CALL FSERCH - location of the first Operation of the requested type in the parameter array is obtained based on the Operation type number - subsequent occurrences of this Operation type can be found with additional calls to FSERCH as indicated by output from the previous call - if the name of the specific Operation to be located is known only a single call to FSERCH is needed

Example 2:

The following subroutine calls are used if the carryover for a particular Operation type for the Segments in any type of Segment grouping (either a single Segment, a Forecast Group or a Carryover Group) for a particular date is to be read and located in the carryover array:

CALL FOPCDE - Operation number is obtained from the Operation identifier

CALL JULDA - convert the desired date of carryover from format of month, day and year to internal Julian date and hour

CALL FCORDR - computational order of the requested Segment grouping is stored in common FCRUNC - the number of Segments ordered is stored the variable NSEGEX in FCRUNC

Loop through the NSEGEX Segments with the following calls made for each Segment:

CALL FGETSG - parameters for the Segment are read into the parameter array

CALL FGETCO - carryover array is filled for the requested date (in Julian format) for the current Segment - the identifier needed as an argument in the call is found in common block FCSEGN

CALL FSERCH - location in the parameter array for the Operation type is obtained based on the Operation type number

(and Operation name if known) - the location of carryover in the carryover array for the Operation type is in the first part of the parameter array - see Section VIII.2 for description of contents of the parameter array

Example 3:

The following subroutine calls are used if the carryover for a particular Operation type for the most recent date of carryover for the Segments in any type of Segment grouping (either a single Segment, a Forecast Group or a Carryover Group) is to be read and located in the carryover array:

- CALL FOPCDE - Operation number is obtained from the Operation identifier
- CALL FCORDR - computational order of the requested Segment grouping is stored in common block FCRUNC - the number of Segments ordered is stored the variable NSEGEX in FCRUNC
- CALL FGETSG - common block FCSEGN is filled using the record location for the first of the ordered Segments (the parameter array does not need to be filled)
- CALL FCDATE - list of carryover dates available for the first Segment is read and stored in common block FCSEGC - the identifier needed as an argument is the one held in FCSEGN - the dates and hours must be transferred from the arrays in FCSEGC to local arrays before the dates are ordered to find the most recent date
- CALL FCOBBL - Julian dates and hours of carryover are put in ascending order - only the available dates of carryover (NSLOTS in common block FCCGD) should be sorted - the most recent date is position NSLOTS in the sorted list of carryover dates and hours

Loop through the NSEGEX Segments with the following calls made for each Segment:

- CALL FGETSG - parameters for the Segment are read into the parameter array
- CALL FGETCO - carryover for the most recent date for the Segment is read - the Segment identifier needed as an argument in the call is the one stored in FCSEGN
- CALL FSERCH - location in the parameter array for the Operation is obtained based on the Operation number (and the Operation name if known) - the location of carryover in the carryover array for the Operation type is in the first part of the parameter array -

see Section VIII.2 for description of contents of the parameter array

Example 4:

The following subroutine call is needed if a Rating Curve is to be read. If successfully read, the Rating Curve definition is in the common block FRATNG.

CALL FGETRC - Rating Curve is read for the specified Rating Curve

Example

The following example shows how to:

- o find carryover for Segments that have a specified Operation
- o find most recent carryover for Segments that have specified Operation
- o get a Rating Curve definition

```
C
PROGRAM MAIN
C
CHARACTER*8 OPID,ORID,SEGID,OPNAM,RCID
CHARACTER*8 MSGTYP
C
PARAMETER (LWORK=1000)
DIMENSION WORK(LWORK)
PARAMETER (LCO=10)
DIMENSION ICODA(LCO),ICOHR(LCO)
C
INCLUDE 'uiox'
INCLUDE 'upagex'
INCLUDE 'common/fcrunc'
INCLUDE 'common/fcsegn'
INCLUDE 'common/fccgd'
INCLUDE 'common/fcsegc'
INCLUDE 'common/fc'
INCLUDE 'common/fp'
INCLUDE 'common/ft'
INCLUDE 'common/fts'
INCLUDE 'common/fratng'
C
C
C OPEN INPUT/OUTPUT FILES
CALL UPRIMO
C
C GET USER IDENTIFIER
CALL HGTUSR (PUSRID,ISTAT)
C
C PRINT USER IDENTIFIER
WRITE (LP,*) 'USER = ',PUSRID
C
CALL INSTRT
C
C GET DEFAULT HCL VALUES
CALL HLCBS ('FCEXEC ',ISTAT)
IF (ISTAT.GT.0) THEN
10 WRITE (LP,10) 'HYDROLOGIC COMMAND LANGUAGE'
FORMAT ('0**ERROR** READING ',A,' DATA BASE CONTROL RECORDS.')
```

```

C
C - - - - -
C
C FIND CARRYOVER FOR SEGMENTS THAT HAVE SPECIFIED OPERATION
C
C     WRITE (LP,*)
C
C GET OPERATION NUMBER FOR OPERATION NAME
C     OPID='SAC-SMA'
C     CALL FOPCDE (OPID,NUMOP)
C     WRITE (LP,*) 'FOPCDE CALLED : OPID=',OPID,' NUMOP=',NUMOP
C SET CARRYOVER DATE
C     CALL FCTZC (ITZ,IDSAV,CODE)
C     IMO=03
C     IDA=30
C     IYR=93
C     IHR=12
C     CALL JULDA (JDAY,INTHR,IMO,IDA,IYR,IHR,ITZ,IDSAV,CODE)
C GET SEGMENTS IN CARRYOVER GROUP
C     IDTYPE=1
C     ORID='TEXORADO'
C     CALL FCORDR (IDTYPE,ORID,ISTAT,WORK,LWORK)
C     WRITE (LP,*) 'FCORDR CALLED : ORID=',ORID,' ISTAT=',ISTAT,
*     ' NSEGEX=',NSEGEX
C     IF (ISTAT.EQ.0) THEN
C         IF (NSEGEX.GT.0) THEN
C             PROCESS EACH SEGMENT
C             DO 30 I=1,NSEGEX
C                 GET SEGMENT DEFINITION
C                 IREC=IRSGEX(I)
C                 IOPT=1
C                 NOPARM=0
C                 CALL FGETSG (SEGID,IREC,MP,P,MT,T,MTS,TS,IOPT,NOPARM,
*                 ISTAT)
C                 WRITE (LP,*) 'FGETSG CALLED : ISTAT=',ISTAT,
*                 ' SEGID=',SEGID
C             GET CARRYOVER
C             IHR=0
C             MSGTYP='ERROR'
C             CALL FGETCO (SEGID,JDAY,IHR,C,MC,MSGTYP,ISTAT)
C             WRITE (LP,*) 'FGETCO CALLED : JDAY=',JDAY,
*             ' ISTAT=',ISTAT
C             CHECK IF OPERATION NUMBER FOUND
C             OPNAM=' '
C             LOCP=1
20             CALL FSERCH (NUMOP,OPNAM,LOCP,P,MP)
C             WRITE (LP,*) 'FSERCH CALLED : NUMOP=',NUMOP,
*             ' LOCP=',LOCP,' OPNAM=',OPNAM
C             IF (LOCP.GT.0) GO TO 20
C             CHECK IF OPERATION NUMBER AND NAME ROUND
C             OPNAM='BLASE'
C             LOCP=0
C             CALL FSERCH (NUMOP,OPNAM,LOCP,P,MP)
C             WRITE (LP,*) 'FSERCH CALLED : NUMOP=',NUMOP,
*             ' OPNAM=',OPNAM,' LOCP=',LOCP
C             IF (LOCP.GT.0) THEN
C                 GET LOCATION OF CARRYOVER IN C ARRAY
C                 LOCC=P(LOCP)+6
C                 WRITE (LP,*) 'LOCC=',LOCC
C                 ENDIF
30             CONTINUE
C             ENDIF
C         ENDIF
C
C - - - - -
C
C FIND MOST RECENT CARRYOVER FOR SEGMENTS THAT HAVE SPECIFIED OPERATION
C

```

```

WRITE (LP,*)
C
C GET OPERATION NUMBER FOR OPERATION NAME
  OPID='SAC-SMA'
  CALL FOPCDE (OPID,NUMOP)
  WRITE (LP,*) 'FOPCDE CALLED : OPID=',OPID,' NUMOP=',NUMOP
C GET SEGMENTS IN CARRYOVER GROUP
  IDTYPE=1
  ORID='TEXORADO'
  CALL FCORDR (IDTYPE,ORID,ISTAT,WORK,LWORK)
  WRITE (LP,*) 'FCORDR CALLED : ORID=',ORID,' ISTAT=',ISTAT,
*   ' NSEGEX=',NSEGEX
  IF (ISTAT.EQ.0) THEN
    IF (NSEGEX.GT.0) THEN
C      GET SEGMENT DEFINITION FOR FIRST SEGMENT - DO NOT FILL
C      PARAMETER ARRAY
        IREC=IRSGEX(1)
        IOPT=1
        NOPARM=1
        CALL FGETSG (SEGID,IREC,MP,P,MT,T,MTS,TS,IOPT,NOPARM,
*          ISTAT)
        WRITE (LP,*) 'FGETSG CALLED : ISTAT=',ISTAT,
*          ' SEGID=',SEGID
C      GET CARRYOVER DATES
        IOBS=0
        CALL FCDATE (SEGID,IOBS)
        WRITE (LP,*) 'FCDATE CALLED : SEGID=',SEGID,
*          ' IOBS=',IOBS
        DO 40 I=1,NSLOTS
          ICODA(I)=ICDAYC(I)
          ICOHR(I)=ICHRC(I)
40      CONTINUE
C      SORT DATES WITH MOST RECENT LAST
        CALL FCOBBL (ICODA,ICOHR,NSLOTS)
        WRITE (LP,*) 'FCOBBL CALLED : NSLOTS=',NSLOTS
C      PROCESS EACH SEGMENT
        DO 60 I=1,NSEGEX
C      GET SEGMENT DEFINITION
          IREC=IRSGEX(I)
          IOPT=1
          NOPARM=0
          CALL FGETSG (SEGID,IREC,MP,P,MT,T,MTS,TS,IOPT,NOPARM,
*            ISTAT)
          WRITE (LP,*) 'FGETSG CALLED : ISTAT=',ISTAT,
*            ' SEGID=',SEGID
C      GET CARRYOVER
          JDAY=ICODA(NSLOTS)
          IHR=0
          MSGTYP='ERROR'
          CALL FGETCO (SEGID,JDAY,IHR,C,MC,MSGTYP,ISTAT)
          WRITE (LP,*) 'FGETCO CALLED : JDAY=',JDAY,
*            ' ISTAT=',ISTAT
C      CHECK IF OPERATION NUMBER FOUND
          OPNAM=' '
          LOCP=1
50      CALL FSERCH (NUMOP,OPNAM,LOCP,P,MP)
          WRITE (LP,*) 'FSERCH CALLED : NUMOP=',NUMOP,
*            ' LOCP=',LOCP,' OPNAM=',OPNAM
          IF (LOCP.GT.0) GO TO 50
C      CHECK IF OPERATION NUMBER AND NAME ROUND
          OPNAM='BLASE'
          LOCP=0
          CALL FSERCH (NUMOP,OPNAM,LOCP,P,MP)
          WRITE (LP,*) 'FSERCH CALLED : NUMOP=',NUMOP,
*            ' OPNAM=',OPNAM,' LOCP=',LOCP
          IF (LOCP.GT.0) THEN
C      GET LOCATION OF CARRYOVER IN C ARRAY
          LOCC=P(LOCP)+6

```

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        WRITE (LP,*) 'LOCC=',LOCC
        ENDIF
60      CONTINUE
        ENDIF
      ENDIF
C
C - - - - -
C
C GET RATING CURVE DEFINITION
C
      WRITE (LP,*)
C
      RCID='ROSSE'
      CALL FGETRC (RCID,ISTAT)
      WRITE (LP,*) 'FGETRC CALLED : RCID=',RCID,' ISTAT=',ISTAT
      IF (ISTAT.EQ.0) THEN
        WRITE (LP,'(A,5A4,A,5A4)') ' RIVERN=',RIVERN,' RIVSTA=',RIVSTA
      ENDIF
C
C - - - - -
C
C CLOSE FILES
      CALL UCLOSL
C
70    WRITE (LP,*)
      WRITE (LP,*) '- PROCESSING COMPLETED -'
C
      STOP
C
      END

```