

# THE RFC SUPPORT TEAM

The RFC Support Team (the team) is focused on the support of the RFC's in the issuance of quality river forecasts. As such, the support team shall:

1. Support the use of OFS/IFP in making daily forecasts:
2. Support enhancement of the use of OFS/IFP/ESP:
3. Support the maintenance of the OFS database:
4. Support use of OFS/IFP for special purpose runs:
5. Support work in procedure development:
6. Support use of Data Ingest, Handling, Display, QC and Dissemination programs:
7. Support use of the RAX software
8. For questions related to programs for which the team is not responsible, the team should be able to refer the RFC to the appropriate person or arrange for hand off to the appropriate group.

## GENERAL GUIDELINES

1. The team does not have expertise in all aspects of RFC forecast operations. The team is expected to know where to go to for help or referral for all aspects of the forecasting process.
2. The team should have a basic understanding of the forecasting process as it relates to any given RFC.

## RFC RESPONSIBILITIES

1. The RFC will conduct routine status runs and check the output of the status runs to help avert any potential problems.
2. The RFC's will ensure that all necessary personnel have subscribed to the RFC List Server to ensure the timely flow of information between the support team and the RFC's.
3. When requesting assistance in troubleshooting a problem, the RFC will provide the team with the information outlined in the: SUPPORT PROCESS, Informational Needs section as well as any additional information requested by the team.

## SUPPORTED PROGRAMS

The following is a list of the programs developed by the Office of Hydrologic Development (OHD), delivered through the official AWIPS builds process and supported by the team.

### IFP Programs

IFP\_Map \_ calls the following when needed:

- NWSRFS\_no\_startup
- bin\_to\_ss\_input
- ifp\_nwsrfs
- parse\_mods\_by\_segment
- post\_default\_run\_dates
- seg\_sort
- set\_dates
- startifp\_done
- working\_dialog

IFP\_Map Utilities \_ could be called by user

- delete\_atoms
- delete\_is\_running
- print\_prop

### NWSRFS/OFS Programs

- batchpst
- debuild
- espinit
- esputil
- fcinit
- fcst
- filecrat
- filesize
- goesdb
- pebuild
- ppdutil
- ppinit
- prdutil
- reorder
- sasmdb
- shefpars
- shefpost
- shefutil

### NWSRFS/Utility Program

- looknset

## NWSRFS/Calibration Programs

idma  
mat  
map  
mape  
pxpp  
mcp3  
opt3  
icp

## Data Ingest, Handling, Dissemination and QC programs

product\_manager  
ldm  
DecodeDPA  
ofs\_de  
siipp  
shefdecode  
xnav  
xdat  
xsets  
MPE

## Standalone FFG

ffguid calls the following as needed:

affgconv  
etest  
ffguid  
grib\_dev  
gribpk  
grid5ro  
julday  
llgrid  
lmgrid  
lmpconv  
mapconv  
mbhconv  
mbpconv  
nccconv  
nchconv  
ncpconv  
prodgen  
wggconv  
wggrid  
wgpconv  
zparm

#### Programs to create geographic files

- create\_bas\_bound
- create\_county
- create\_rivers\_asc
- create\_rivers\_bin
- create\_states
- find\_hrap
- find\_latlon
- grid\_to\_basin
- grid\_to\_county
- reformat\_river\_to\_asc
- reformat\_river\_to\_bin

#### RFC Archive Database Server (RAX) decoders

- shef\_decode\_raw
- shef\_decode\_processed

#### RFC Archive Database Server (RAX) Verification Program and Templates

- ivp
- builpairs\_template.txt
- natlstats\_pair\_template.above.txt
- natlstats\_pair\_template.below.txt
- natlstats\_template..txt
- rfc.ob6-r27.jar
- dbgen.jar
- ihfsdb.jar

The following is a list of the RAX programs developed by the Office of Hydrologic Development (OHD), RFC Development Manager, RFC Archive Database Update and Maintenance Team delivered through the official AWIPS builds process and supported by the team.

#### RFC Archive Database Server (RAX) software

- arcmenu
- datview
- display\_rc
- dcextract
- dcparse
- fetchmods
- get\_params
- get\_states
- group\_del

group\_parse  
ingestdef  
loadmods  
locatdef  
nrdsdlyparse  
ofsshef  
params\_del  
process\_flow  
process\_precip  
process\_stage  
process\_sw  
process\_temp  
transfer\_precip  
transfer\_txn  
slope\_to\_stage  
usgsdlyparse  
vfyfcst2shef  
vfyobs2shef

## RFC REQUESTS FOR SOFTWARE SUPPORT

An RFC will contact the team by phone or email whenever they have a question or problem. The team may request that an RFC follow up a phone conversation with a detailed email to ensure an accurate understanding of the problem or question.

The email address for the RFC Support Team is:

[rfc.support@noaa.gov](mailto:rfc.support@noaa.gov)

The phone numbers for the RFC Support Team are:

RFC Support Cell Phone.....301-467-2543  
Randy Rieman.....301-713-0624 ext 165  
John F. Kuhn.....301-713-0624 ext 155  
NHOR Work Room.....301-713-0640 ext 223

The Team will respond to the RFC and confirm that the initial question or problem description has been received in three business days. In addition, the RFC will either be given a date to expect a status report from the Team or if not given a date, then the RFC should assume a status report will be sent within five business days. More than one status report may be sent.

If the Team does not meet these deadlines, the RFC's should feel free to send a reminder to the Team or the Team and Jeff Zimmerman.

## SUPPORT PROCESS

Informational Needs:

When troubleshooting a reported problem at an RFC, the team will need to know the name of the program producing the error, on which system the error occurred as well as access to particular files, depending on the program. The RFC is expected to place the needed files in the /home/hrl directory on their AWIPS DS1 system (DX1 when DS1 is retired):

1. command line initiated program - When investigating a reported problem with a command line initiated program problem, the support team will need the following information and files from the RFC:
  - a. Description of the problem.
  - b. input file (OFS Runs - with the HCL they were running)
  - c. output file
  - d. associated log file for the run
  - e. set of recent fs5files (OFS Runs)
  
2. interactive program - When investigating a reported problem with an interactive program, the support team will need the following information and files from the RFC:
  - a. Description of the problem
  - b. Sequence of steps that cause the problem
  - c. Any error or warning messages received (have them copy the errors from the program window into a file)
  - d. Forecast group and segment they were using (IFP Runs)
  - e. Dates they had set for the run: start date, end of observations and end of run (IFP Runs)
  - h. set of recent fs5files (IFP Runs)

#### Check Bug Lists and Obtain Files:

The team will first check to see if the problem is already posted on one of the bug lists located on the RFC webpage: [http://www.nws.noaa.gov/om/water/RFC\\_support/](http://www.nws.noaa.gov/om/water/RFC_support/)

They will log onto the RFC's AWIPS DS1 system (DX1 when DS1 is retired) and ftp the necessary files back to NHOR.

#### Problem Replication:

The team will then move the RFC's files into the proper directories on NHOR and attempt to replicate the problem by running the program in question. If a problem is encountered, the team will then follow the procedure outlined below in the TROUBLESHOOTING TIPS FOR OHD PROGRAMS section.

#### Problem Fixes, New Bugs and Old Bugs:

If, after troubleshooting the problem, the team determines that a fix is available, they will test their findings and report the solution back to the RFC. If they can not find a solution or work around to the problem, they will consult with OHD-HSEB personal. With HSEB assistance, the team will determine if this is a new bug or if some other work around is possible. If it is a new bug, a bug report is created and given a unique bug number. It is then prioritized and placed on the appropriate bug list. All bug lists are available for inspection on the RFC Support Team Homepage:

[http://www.nws.noaa.gov/om/water/RFC\\_support/](http://www.nws.noaa.gov/om/water/RFC_support/)

If it is determined that the reported bug has already been reported by another RFC, the newly reporting RFC is added to the bug report and the bug is reprioritized.

## BUG REPORT HANDOFF

After it has been determined that a new bug exists, information is handed over to the appropriate group in the following ways:

### **HSEB:**

Once it is determined that a reported problem will be listed as a new bug, the support team will take the following actions:

1. A bug directory is created in the appropriate location on the NHDR system. A readme.txt file is created containing a description of the bug as reported to the team by the RFC and any additional information that is relevant to the problem. The necessary files to recreate the problem are transferred to the directory.
2. A bug report is created, given a unique bug number, prioritized and placed on the HSEB Bug List:

[http://www.nws.noaa.gov/om/water/RFC\\_support/hseb\\_buglist.shtml](http://www.nws.noaa.gov/om/water/RFC_support/hseb_buglist.shtml)

The RFC Support Team expects the HSEB to commit two person months of effort per calendar month, on average, to assisting HSD.

### **HSMB:**

Once it is determined that a reported problem will be listed as a new bug, the support team will take the following actions:

1. Create a readme.txt file that contains a description of the bug as reported to the team by the RFC and any additional information that is relevant to the problem. Transfer this file, along with the necessary input files to the location specified by the person designated by HSMB to handle the bug.
2. A bug report is created, given a unique bug number, prioritized and placed on the HSMB Bug List:

[http://www.nws.noaa.gov/om/water/RFC\\_support/hsmb\\_buglist.shtml](http://www.nws.noaa.gov/om/water/RFC_support/hsmb_buglist.shtml)

### **RAX Support Team:**

Once it is determined that a reported problem will be listed as a new bug, the team will take the following actions:

1. Create a readme.txt file that contains a description of the bug as reported to the team by the RFC and any additional information that is relevant to the problem. Transfer this file, along with the necessary input files to the location specified by the person designated by the RAX Support Team Leader.

2. A bug report is created, given a unique bug number, prioritized and placed on the Archiver Bug List:

[http://www.nws.noaa.gov/om/water/RFC\\_support/Archive\\_database.shtml](http://www.nws.noaa.gov/om/water/RFC_support/Archive_database.shtml)

## TROUBLESHOOTING TIPS FOR OHD PROGRAMS

1. If a command line initiated program doesn't run to completion - it died in the middle of the run or the output was incomplete - make sure to check the log file.
  - a. If there are READ or WRITE errors in the log files, it will identify the file where the problem occurred - check the permissions on that file.
    1. If the file does not include read and write permission to that file, change the permission to include read and write permissions to the file, and rerun the job.
    2. If the file does include read and write permissions to the file, then retry the job - a temporary network or system problem may have prevented the job from running to completion.

(OFS Tip) If you still have problems, set your local .Apps\_defaults token:

```
ofs_log_output : on
```

Then rerun the job – this will result in a lot of detail information being written to the log file about the opening and closing of files. Make sure to reset this token back to off, or you will end up with very large output files.

- b. If the log looks OK, check the output file to see if the job quit at a certain step. This information might be able to provide a clue as to how far the job progressed with the input file.

(OFS Tip) This is sometimes seen in fcinit during segment definitions. If there is bad input in the segdef, the output will only get to a certain spot. The output can provide a clue as to what part of the segdef input was bad.

2. If a command line initiated program completes but you don't receive the output which was expected:

- a. Read the ERRORS and WARNINGS in your output file for clue as to what may have gone wrong.

(OFS Tip) If you receive a FATAL ERROR message from ppinit or fcinit, it will tell you the last command run. Check the output for that run to see why or where it failed. The FATAL ERROR message also indicates that you may have to restore files from tape backup. Doing the runs on a test set of files before trying them on the operational files will avoid many situations where you will need to restore files from tape.

- b. Check the input to make sure you're running what you want to. (OFS Tip) For example, make sure your dates are set correctly, you're running the forecast group you want, you've run your preprocessors, you have the techniques you want set, etc.
    - c. Check the log file for potential problems described above in 1a.
  3. If an interactive program, such as IFP, doesn't run to completion - it died in the middle of a segment run:
    - a. Check the background window where the program messages are displayed. See if there were any WARNING or ERROR messages that might explain why the run stopped.
    - b. If there are no messages - try to duplicate the error. Try to remember the sequence of steps you went thru to get there. Sometimes there are temporary network or file system problems that will cause a glitch that you can't duplicate when you try again moments later.

(IFP Tip) If there are no messages \_ try to duplicate the error. Try to remember the sequence of steps you went thru to get there. Were you making a mod at the time? If so, what mod?

(IFP Tip) If you can duplicate the error \_ check to see if it happens at other segments or only the one where the trouble occurs.

(IFP Tip) Check to see that the segment successfully runs in a batch run of OFS - preferably with the PLOTHYD technique turned on (set to 1) for the segment(s) where the trouble occurs.

## Appendix: Detailed steps for the support process

- 1 An RFC contacts the HSD support Team with a problem
  - 1.1 Via email
    - 1.1.1 HSD determines if there is enough information to debug the problem
      - 1.1.1.1 If not, HSD contacts the RFC to request additional information
      - 1.1.1.2 If yes, they begin an Initial Problem Assessment
  - 1.2 Via the phone
    - 1.2.1 HSD collects enough information to debug the problem.
    - 1.2.2 They begin an Initial Problem Assessment
  - 1.3 The Support team expects to reply within three business days of receiving a request for assistance.
    - 1.3.1 If the response time is longer than three days, the support team suggests the RFC send an email requesting assistance and the RFC include Jeff Zimmerman in the second email.
- 2 Initial Problem Assessment
  - 2.1 Determine if the problem is a supported problem
    - 2.1.1 Supported if the program is an OHD delivered AWIPS baseline program
  - 2.2 If not supported, refer the RFC to appropriate alternate support person
    - 2.2.1 Send appropriate alternate email informing them of problem transfer
    - 2.2.2 Send RFC an email informing them of appropriate alternate
  - 2.3 If supported, continue assessment
    - 2.3.1 Check Bug Lists located on the RFC Support Team webpage:  
[http://www.nws.noaa.gov/om/water/RFC\\_support/](http://www.nws.noaa.gov/om/water/RFC_support/)
      - 2.3.1.1 Check OHD/HSEB fix request list  
[http://www.nws.noaa.gov/om/water/RFC\\_support/hseb\\_buglist.shtml](http://www.nws.noaa.gov/om/water/RFC_support/hseb_buglist.shtml)
      - 2.3.1.2 Check OHD/HSMB fix request list  
[http://www.nws.noaa.gov/om/water/RFC\\_support/hsmb\\_buglist.shtml](http://www.nws.noaa.gov/om/water/RFC_support/hsmb_buglist.shtml)
      - 2.3.1.3 Check RFC Archiver Support Team fix request list  
[http://www.nws.noaa.gov/om/water/RFC\\_support/Archive\\_database.shtml](http://www.nws.noaa.gov/om/water/RFC_support/Archive_database.shtml)
      - 2.3.1.4 If the problem has already been reported, but not fixed
        - 2.3.1.4.1 Re-prioritize the problem report
        - 2.3.1.4.2 Add the new RFC to the bug report
        - 2.3.1.4.3 Add the new RFCs data to the bug directory
      - 2.3.1.5 If the problem has already been reported, and it is fixed
        - 2.3.1.5.1 Test the fix with the new RFCs data
          - 2.3.1.5.1.1 If the problem is fixed, send an email to the RFC
          - 2.3.1.5.1.2 If the problem is not fixed, continue.
    - 2.3.2 Obtain files
      - 2.3.2.1 Log onto the RFC's AWIPS ds1 system and ftp the necessary files back to NHOR
- 3 Problem Replication
  - 3.1 Move the RFC's files into the proper directories on NHOR

- 3.2 Attempt to replicate the problem by running the program in question.
- 3.3 If the problem cannot be duplicated, send email to the RFC requesting additional information
- 3.4 If the problem can be duplicated, the support team will then troubleshoot the problem
  - 3.4.1 If the HSD team resolves the problem, they will email the solution to the RFC in question.
  - 3.4.2 If HSD cannot resolve the problem, HSD will request support with the troubleshooting from the development office responsible for the program.
    - 3.4.2.1 HSEB,
    - 3.4.2.2 HSMB,
    - 3.4.2.3 RFC Development teams
      - 3.4.2.3.1 RAX team
  - 3.4.3 If HSD cannot resolve the problem with assistance of the development organization and the problem is considered a bug, it is reported to the appropriate development organization.
  - 3.4.4 If HSD cannot resolve the problem with assistance of the development organization and the problem is considered a requirement, it is reported to the appropriate organization.
    - 3.4.4.1 This action is reported to the RFC

#### 4 Creating a bug report

- 4.1 The HSD team determines to whom they should report a bug.
  - 4.1.1 The OHD/HSEB
  - 4.1.2 The OHD/HSMB
  - 4.1.3 The RFC Development team
    - 4.1.3.1 RAX team
- 4.2 A bug report is entered into the appropriate list
  - 4.2.1 The report includes the RFC name
  - 4.2.2 The report includes a unique bug number
    - 4.2.2.1 The number includes the release in which the bug was reported
    - 4.2.2.2 The number include a sequential number, incremented by one with each bug.
- 4.3 The bug is prioritized.
  - 4.3.1 If it is an Emergency Bug Fix, it is reported to the development group immediately.
    - 4.3.1.1 Work to correct an Emergency Bug begins as soon as it has been reported.
- 4.4 If the bug is reported to the OHD/HSEB, Data is moved into the bug directory on the NHDR
  - 4.4.1 data to create the bug
  - 4.4.2 and a description of how to create the bug
- 4.5 If the bug is reported to the OHD/HSMB, information is moved into the location specified by the HSMB
  - 4.5.1 data to create the bug
  - 4.5.2 and a description of how to create the bug

- 4.6 If the bug is reported to the RFC Archiver development team, moved into the location specified by the RFC Archiver team
    - 4.6.1 data to create the bug
    - 4.6.2 and a description of how to create the bug
  - 4.7 When the Support Team has created the bug report, they send a status report to the RFC which includes
    - 4.7.1 Development organization to whom the bug has been reported
    - 4.7.2 Person responsible for tracking the bug progress
    - 4.7.3 The expected response time to the report
  - 4.8 The support team tracks this bug until there is a confirmation of the hand-off from the development organization.
- 5 When an HSEB developer is available, he or she examines the top of the priority list and selects a bug to investigate from the top three items on the list.
  - 6 They announce their selection to the HSD bug coordinator and the rest of the team and HSD is notified.
  - 7 HSD moves bug from the unassigned area to the assigned area and adds the initials of the developer to the bug.
  - 8 While developing a fix for the bug, the developer investigates the problem, consulting with HSD as necessary to determine she fully understands the problem, why the current result is incorrect and the expected results. Typically, the developers interact with HSD rather than directly with the users who reported the problem.
    - 8.1 The developer may determine the problem is a coding problem, a documentation problem, a user error, or the code works as designed and the bug is really an enhancement, the bug needs to be re-assigned to a different developer, or the bug has been overtaken by events.
  - 9 If the developer determines the problem is a coding problem, the developer follows the standard HSEB development process for fixing bugs.
    - 9.1 The general steps are described here but for the exact steps are described at <http://hsp.nws.noaa.gov/oh/nomirror/hseb/index2.html>
      - 9.1.1 The developer creates a Maintenance Request (MR) which provides a brief description of the problem and is used by the HSEB software CM process.
      - 9.1.2 The MR czar assigns the MR to the developer.
      - 9.1.3 When the developer thinks he has designed a solution to the bug, he submits the design of the fix to another developer for review, discussion and approval.
      - 9.1.4 The developer also creates a test procedure which can be used to duplicate the problem with the current software and demonstrate the problem has been resolved with the fixed software.
      - 9.1.5 The developer checks out the appropriate software modules from the baseline of the release under development.
      - 9.1.6 The developer implements the fix and tests the fix using the test procedure.

- 9.1.7 The developer executes the appropriate regression tests for the changed modules and verifies the expected results are produced.
  - 9.1.8 The developer promotes the modified modules into the baseline of the release under development and announces the bug has been fixed.
- 9.2 When the developer has completed the bug fix and followed all appropriate CM steps they inform HSD and HSD updates the status of the bug moving it from the assigned category on the Priority list to the appropriate Release area, indicating the release in which the fix will be included (this is usually the next release).
- 10 If the developer determines the problem is a documentation problem, the developer updates the documentation and puts new documentation onto the web.
- 11 If the developer determines the problem is a user error, the correct input is provided to the HSD and they pass it on to the users.
- 12 If the developer determines the problem is the code works as designed and the bug is really an enhancement, this result is passed to the HSD team at the weekly coordination meetings.
- 13 If the developer determines the problem the bug needs to be re-assigned to a different developer, the bug is placed back on the queue in the priority order set by the HSD.
- 14 If the developer determines the problem has been overtaken by events, the bug is closed and this result is passed on to the HSD at the weekly coordination meetings.
- 15 If the HSD team requests an interim software release, the developer creates an interim release following HSEB interim release process. This process is documented at <http://hsp.nws.noaa.gov/oh/nomirror/hseb/index2.html>
  - 15.1 Copy new code to the ihfs user.
  - 15.2 Update the readme files in the home directory.
  - 15.3 Compile with other previous interim releases
  - 15.4 Test
  - 15.5 Deliver to HSD by placing on NHOR
- 16 The HSD bug coordinator monitors the progress of the above efforts, periodically checking that the developers are actively working on the bugs assigned to them and facilitating actions when problems are encountered in the process.
- 17 Weekly coordination meetings are held between HSD and the HSEB group leader and the HSD bug coordinator. Topics at these meetings include the status of bugs, recently reported problems, issues which may affect the bug fix process.
  - 17.1 The HSEB will act as a court of last resort for the HSD team.