

HEFR-FRAT Toolset Readme File
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The Hydrology-based Environmental Flow Regime (HEFR) Excel .xla add-in, the Flow Regime Application Tool (FRAT) spreadsheet, and associated supporting spreadsheets, documentation, and example datasets are bundled together in this package.

Current Tool Versions (all dated January 13, 2012)

HEFR v3.0.xla

IHA-MBFIT v3.0.xlsm

HydroSep Template v1.0.xlsm

FRAT v4.0.xlsb

Table of Contents (following file structure)

❖ HEFR

➤ Documentation

▪ SAC Hydrologic Methods Report, 3rd ed

• hydrologicmethods06172011.pdf

- ◆ This is the current SAC Hydrologic Methods document, dated March 15, 2011. Note that this document is somewhat older than the HEFR toolset, so some minor inconsistencies may exist. All of the functionality in HEFR is described accurately in the document.

▪ HEFR Workshop Presentations

- This folder contains five PowerPoint presentations from the June 10, 2010 HEFR workshop.

➤ Main

▪ BRRi

• Brazos River at Richmond example dataset, including

◆ BRRichmond19232010_IHA.xlsm

- IHA simulation using the IHA-MBFIT v3.0 spreadsheet

◆ BRRichmond19232010.xlsx

- IHA “daily efcs”-style outputs spreadsheet

◆ Brazos_HEFR_Inputs_BRRi.xml

- XML HEFR batch input file

◆ BRRi19232010_Example_HEFR_outputs v3.0.xlsb

- HEFR outputs. These match the Brazos BBEST outputs for the Richmond gage.

▪ Masters

• HEFR v3.0.xla

- ◆ This is the HEFR code (an Excel add-in).

• IHA-MBFIT v3.0.xlsm

- ◆ This is the IHA-MBFIT spreadsheet.
 - HEFR Batch.xlsm
 - ◆ Spreadsheet for running HEFR in batch mode. The supplied file contains the Richmond simulation only.
 - IHA-MBFIT Batch.xlsm
 - ◆ Spreadsheet for running IHA and MBFIT in batch mode. The supplied file contains the Richmond simulation only.
 - HydroSep Template v1.0.xlsm
 - ◆ Spreadsheet template for visualizing hydrographic separation outputs.
 - All_Gages_Flow_Data.xlsx
 - ◆ Spreadsheet that is used by the “IHA-MBFIT Batch.xlsm” spreadsheet. Only used when running IHA-MBFIT in batch mode. It must contain flow data for all gages included in the batch run. The supplied file contains the Richmond data only.
- ❖ FRAT
- Documentation
 - 20120113 FRAT Memo to SAC.docx
 - A short memo describing the features, assumptions, and limitations of FRAT.
 - FRAT Spreadsheet
 - FRAT v4.0.xlsm
 - This is a FRAT simulation set up for the Navasota River near Easterly environmental flows as applied to the potential Millican-Panther Creek Reservoir.

Required HEFR File Structure

This directory structure is required to run the “IHA-MBFIT Batch” and “HEFR Batch” codes. The directories “Main” and “Masters” must exist and have those names. The subdirectories can have any names that match the appropriate columns in the Batch spreadsheets.



General Instructions for Installing HEFR

- Excel 2007: Open Excel, click on the office button (top left corner), “Excel Options,” “Add-ins,” in the “manage” drop-down box select “Excel Add-ins” and click “go,” “Browse” and find the “HEFR v3.0.xla” file. Click OK. You should now have a HEFR menu in the “Add-ins” ribbon.
- Excel 2010: Open Excel, click on the File Menu, then “Options,” “Add-ins,” in the “manage” drop-down box select “Excel Add-ins” and click “go,” “Browse” and find the “HEFR v3.0.xla” file. Click OK. You should now have a HEFR menu in the “Add-ins” ribbon. If you get an error entitled “Object library invalid...” then try deleting all .xld

files in this folder: “C:\Documents and Settings\USER\Application Data\Microsoft\Forms\” as described in <http://www.lesanvaezi.com/delete-exd-files-to-fix-object-library-invalid-error/>.

Overall HEFR-FRAT Approach for a New Gage

Please see the SAC Hydrologic Methods document as well as instructions sheet in each spreadsheet for additional details.

1. Download flow data from USGS
2. Perform hydrographic separation
 - a. Manual Mode
 - i. Copy and paste hydrologic data into “IHA-MBFIT v3.0.xlsm” and generate hydrographic separation results.
 - ii. Create an excel file matching the IHA “daily efcs” format (see example file “BRRichmond19232010.xlsx”). Be very careful to match the format as closely as possible.
 - b. Batch Mode
 - i. Copy and paste hydrologic data into “All_Gages_Flow_Data.xlsx”.
 - ii. Open “IHA-MBFIT Batch.xlsm”.
 - iii. Populate yellow cells.
 - iv. Click “Run IHA-MBFIT Batch” button (a properly formatted “daily efcs”-style spreadsheet will be generated automatically).
3. Visualize hydrographic separation results (optional)
 - a. Copy hydrographic separation results into “HydroSep Template v1.0.xlsm” to visualize results.
 - b. Redo hydrographic separation if necessary.
4. HEFR
 - a. Manual Mode
 - i. Install HEFR (see instructions above).
 - ii. Open hydrographically separated “daily efcs”-style spreadsheet.
 - iii. Run HEFR from Excel ribbon.
 - b. Batch Mode
 - i. Install HEFR (see instructions above).
 - ii. Create input XML file. It is easiest to start with the provided Richmond example and edit it using Microsoft’s “XML NotePad”.
 - iii. Open “HEFR Batch.xlsm”.
 - iv. Populate yellow cells
 - v. Click “Run HEFR Batch” button
 - vi. If desired, click buttons to “Obtain Matrices” and “Copy to PPT”.

Notes:

1. Macros must be turned on.

2. You will probably have to do some final custom formatting of the HEFR output matrices based on your preferences.
3. The xml input file has some formatting and structure flexibility (e.g., the order of inputs can be changed), but not a lot, so please follow the supplied format when possible. The “daily efcs” input file has very little formatting flexibility. Please follow the format of the supplied file (or any standard IHA daily efcs output file) as closely as possible.
4. Pre-v3.0 HEFR xml files had a different format than v3.0 HEFR xml files. HEFR v3.0 is backwards compatible with the old xml files, should you wish to rerun old HEFR runs (e.g., G-SA, Nueces, Brazos, and C-L BBEST runs). For future runs, please use the new format.