**SCRIPTS**

For EAH, there are a total of 7 scripts/modules. You will only need to execute eah.py and graph\_select.py. You should be able to execute all scripts on the server.

1. **eah.py**

*Location on Server:*

[U:\Scripts\EAH\eah.py](file:///U:\Scripts\EAH\eah.py)

Need to execute from Willow

*Purpose:*

* main script that invokes efm.py, lp.py, prob.py, area.py, and graph.py
* **mandatory** script input parameters include:
  + hydrology file
  + geometry file
  + path of output directory
  + timing (start month, start day, end month, end day)
  + duration
* **optional** script input parameters include:
  + species – species name label to output in EAH graph file
  + verbose – Boolean field, if specified, additional debug files are output in addition to regular script output files
  + probability – Boolean field if specified, flow probability uses raw probability distribution as opposed to Log Pearson III
* script output result files
  + CSV file with suffix ilp contains fully interpolated area , flow, probability data used to produce ADF Curve in EAH Graph file
  + CSV file with suffix blp contains brief summary recurrence table of area, flow, probability at common recurrence intervals (1 yr, 2 yr, 5 yr, 10 yr, 50 yr, 200 yr)
  + EAH Graph file

1. **graph\_select.py**

[**U:\Scripts\EAH\graph\_select.py**](file:///U:\Scripts\EAH\graph_select.py)

*Purpose:*

* GUI tool that allows user to compare multiple EAH scenario result files located in specified target directory

*Execution:*

* 1. Change directory to location of EAH scripts:

cd “C:\Users\SLALONDE\Documents\Python Scripts\EAH>”

* 1. Enter command to start script:

python graph\_select.py

You should see a new window should appear with title “EAH Graph Selector”.

* 1. In EAH Graph Selector window, click on Select button.
  2. Browse folders and select directory location which has the EAH files to compare
  3. Click on checkboxes to select all applicable hydrology, geometry, duration, and timing parameters to be compared
  4. Click on Apply button.
* script output result is new EAH graph file containing the combined selected parameters. Graph files will be saved in the same directory as the directory chosen when clicking Select button

1. efm.py

* script determines annual peak flows based on the constraints of the timing window and duration

1. lp.py

* script calculates the log pearson distribution based on EFM script output (default method)

1. prob.py

* script calculates the probability distribution based on EFM script output (override method)

1. area.py

* script calculates area duration frequency (ADF), expected annual habitat (EAH) values, and recurrence interval tables based on flow distribution and flow to area tables

1. graph.py

* script generates ADF curve based on area script output

**YOLO BYPASS FOR AMERICAN RIVERS**

**Input Files**

*Directory with Input Hydrology and Geometry Files*

[*Z:\Projects\Yolo Bypass\Alternatives\EAH Inputs*](file:///Z:\Projects\Yolo%20Bypass\Alternatives\EAH%20Inputs)

*Hydrology CSV Files:* YoloBypassBaseline, YoloBypassNotch, YoloBypassNotchFeb15, YoloBypassNotchMarch1, YoloBypassNotchMarch15, YoloBypassNotchMarch31, YoloBypassNotchApril15, YoloBypassNotchMay1, YoloBypassNotchMay15

*Geometry/FTA CSV Files:*  sac\_fta, sac\_fta\_depth\_1feet

*Raw Verona Gage Data File*

[Z:\Projects\Yolo Bypass\Alternatives\EAH Inputs\Gage\Verona\_USGS\_Daily\_Discharge.xlsx](file:///Z:\Projects\Yolo%20Bypass\Alternatives\EAH%20Inputs\Gage\Verona_USGS_Daily_Discharge.xlsx)

*Modelling Spreadsheet*

[Z:\Projects\Yolo Bypass\Alternatives\20140904 YoloBypassInflowCalcs.xlsx](file:///Z:\Projects\Yolo%20Bypass\Alternatives\20140904%20YoloBypassInflowCalcs.xlsx)

Methodology Outline

[..\Yolo Bypass\Yolo Bypass Hydrology Spreadsheet Notes.docx](file:///C:\Users\SLALONDE\Documents\Yolo%20Bypass\Yolo%20Bypass%20Hydrology%20Spreadsheet%20Notes.docx)

**Script Execution**

To run all scenarios:

1. From Windows Start Menu on Seth’s machine, type “cmd” in textbox labeled “Search programs and files”
2. In DOS window, type yolowrap.bat and hit Enter

Results will be saved in the following directory [..\Yolo Bypass\Scenario Runs\20140908](file:///\\192.168.37.11\CHINOOK\Scripts\Yolo%20Bypass\Scenario%20Runs\20140908)

**Results**

*Summary of All Scenario Results*

[Z:\Projects\Yolo Bypass\Alternatives\EAH Results\20140827 YoloBypassResultSummary.xlsx](file:///Z:\Projects\Yolo%20Bypass\Alternatives\EAH%20Results\20140827%20YoloBypassResultSummary.xlsx)

*Powerpoint Slides for 9/3/14 Meeting*

[Z:\Projects\Yolo Bypass\Alternatives\EAH Results\140902Yolo\_MT.pptx](file:///Z:\Projects\Yolo%20Bypass\Alternatives\EAH%20Results\140902Yolo_MT.pptx)

*Directory with Individual Result Files*

[..\Yolo Bypass\Scenario Runs\20140826](file:///\\192.168.37.11\CHINOOK\Scripts\Yolo%20Bypass\Scenario%20Runs\20140826)

**CVFPP San Joaquin Dos Rios/Three Amigos**

**Input Files**

*Directory with Input Hydrology and Geometry Files*

[*Z:\Projects\CVFPP Phase 2\LSJR Analysis\EAH\Dos Rios Three Amigos\Inputs*](file:///Z:\Projects\CVFPP%20Phase%202\LSJR%20Analysis\EAH\Dos%20Rios%20Three%20Amigos\Inputs)

*Hydrology CSV Files:* SJRhydrology1940, SJRandTLRhydrology1940, TLRhydrology1940

*Geometry/FTA CSV Files:*  DosRiosSJRbaseline, DosRiosSJRalternative, ThreeAmigosSJRbaseline, ThreeAmigosSJRalternative, ThreeAmigosSJRandTLRbaseline, ThreeAmigosSJRandTLRalternative

*Raw Gage Data Files*

[Z:\Projects\CVFPP Phase 2\LSJR Analysis\EAH\Dos Rios Three Amigos\Inputs\Gage\sanjoaquin\_newman\_raw\_usgs.txt](file:///Z:\Projects\CVFPP%20Phase%202\LSJR%20Analysis\EAH\Dos%20Rios%20Three%20Amigos\Inputs\Gage\sanjoaquin_newman_raw_usgs.txt)

[Z:\Projects\CVFPP Phase 2\LSJR Analysis\EAH\Dos Rios Three Amigos\Inputs\Gage\tulomne\_merced\_raw\_usgs.txt](file:///Z:\Projects\CVFPP%20Phase%202\LSJR%20Analysis\EAH\Dos%20Rios%20Three%20Amigos\Inputs\Gage\tulomne_merced_raw_usgs.txt)

**Script Execution**

1. Create new FTA csv files based on hydraulic model FTA tables provided by Devinder at DWR. Confirm with Mark whether any scenario requires only using Tulomne River hydrology.
2. Create output directory for the model run
   1. mkdir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908"
3. Change directory to location of EAH script
   1. cd “C:\Users\SLALONDE\Documents\Python Scripts\EAH>”
4. Execute EAH scripts for Dos Rios breach sites using SJR hydrology

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\DosRiosSJRbaseline.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 1 -sda 1 -emo 6 -eda 15 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\DosRiosSJRalternative.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 1 -sda 1 -emo 6 -eda 15 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\DosRiosSJRbaseline.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 11 -sda 1 -emo 6 -eda 15 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\DosRiosSJRalternative.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 11 -sda 1 -emo 6 -eda 15 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\DosRiosSJRbaseline.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 1 -sda 21 -emo 7 -eda 7 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\DosRiosSJRalternative.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 1 -sda 21 -emo 7 -eda 7 -durations 7 10

1. Execute EAH scripts for Three Amigos breach sites using SJR hydrology

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\ThreeAmigosSJRbaseline.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 1 -sda 1 -emo 6 -eda 15 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\ThreeAmigosSJRalternative.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 1 -sda 1 -emo 6 -eda 15 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\ThreeAmigosSJRbaseline.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 11 -sda 1 -emo 6 -eda 15 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\ThreeAmigosSJRalternative.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 11 -sda 1 -emo 6 -eda 15 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\ThreeAmigosSJRbaseline.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 1 -sda 21 -emo 7 -eda 7 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\ThreeAmigosSJRalternative.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 1 -sda 21 -emo 7 -eda 7 -durations 7 10

1. Execute EAH scripts for Three Amigos breach sites using combined SJR and TLR hydrology

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRandTLRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\ThreeAmigosSJRandTLRbaseline.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 1 -sda 1 -emo 6 -eda 15 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRandTLRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\ThreeAmigosSJRandTLRalternative.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 1 -sda 1 -emo 6 -eda 15 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRandTLRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\ThreeAmigosSJRandTLRbaseline.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 11 -sda 1 -emo 6 -eda 15 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRandTLRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\ThreeAmigosSJRandTLRalternative.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 11 -sda 1 -emo 6 -eda 15 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRandTLRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\ThreeAmigosSJRbaseline.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 1 -sda 21 -emo 7 -eda 7 -durations 7 10

C:\Users\SLALONDE\Documents\Python Scripts\EAH>python eah.py -hfile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\SJRandTLRhydrology1940.csv" -afile "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\ThreeAmigosSJRandTLRalternative.csv" -odir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908" -smo 1 -sda 21 -emo 7 -eda 7 -durations 7 10

**Result Files**

*Summary of All Scenario Results*

[Z:\Projects\CVFPP Phase 2\LSJR Analysis\EAH\Dos Rios Three Amigos\Results\20140825\_DosRios\_ThreeAmigos\_EAH\_Summary.xlsx](file:///Z:\Projects\CVFPP%20Phase%202\LSJR%20Analysis\EAH\Dos%20Rios%20Three%20Amigos\Results\20140825_DosRios_ThreeAmigos_EAH_Summary.xlsx)

Directory with Individual Result Files

[..\CVFPP\SJR\Dos Rios\_3 Amigos\20140825](file:///\\192.168.37.11\CHINOOK\Scripts\CVFPP\SJR\Dos%20Rios_3%20Amigos\20140825)

**CVFPP San Joaquin Firebaugh**

**Input Files**

*Directory with Input Hydrology and Geometry Files*

[*Z:\Projects\CVFPP Phase 2\LSJR Analysis\EAH\Firebaugh\Inputs*](file:///Z:\Projects\CVFPP%20Phase%202\LSJR%20Analysis\EAH\Firebaugh\Inputs)

*Hydrology CSV Files:* MendotaModel, MendotaHistorical

*Geometry/FTA CSV Files:*  Eco1Baseline, Eco1Alternative, Eco2Baseline, Eco2Alternative, Eco3Baseline, Eco3Alternative, Eco4Baseline, Eco4Alternative, Eco5Baseline, Eco5Alternative, Eco6Baseline, Eco6Alternative

**Script Execution**

1. Confirm with Mark what scenarios require rerunning.
2. Create output directory for the model run
   1. mkdir "C:\Users\SLALONDE\Documents\CVFPP\SJR\Dos Rios\_3 Amigos\20140908"
3. Change directory to location of EAH script
   1. cd “C:\Users\SLALONDE\Documents\Python Scripts\EAH>”
4. Execute EAH scripts for Dos Rios breach sites using SJR hydrology