

FREE SOFTWARE AVAILABLE FOR TRANSPORTATION & FISH PASSAGE DESIGN

HYDROLOGICAL MODELING SOFTWARE

1. Flow Analysis with Stream Gage Data

- Flood Frequency Analysis Software
 - USGS PeakFQ: <https://water.usgs.gov/software/PeakFQ/>
 - USACE HEC-SSP: <https://www.hec.usace.army.mil/software/hec-ssp/>
- Percent Exceedance Flow Analysis Software
 - Microsoft Excel – Flow Duration Curve Analysis
(see Appendix IX-C from CDFW'S *California Salmonid Stream Habitat Restoration Manual, Fourth Edition* for an example of fish passage flow calculations)
- Online sites providing peak flow discharges and average daily stream flows at stream gages
 - USGS Surface-Water Data for California: <https://waterdata.usgs.gov/ca/nwis/sw>
 - CA Department of Water Resource's California Data Exchange Center (CDEC):
<http://cdec.water.ca.gov/cdecstation2/>

2. Flow Analysis without Stream Gage Data

- Regional Regression Analysis Software
 - USGS StreamStats: <https://streamstats.usgs.gov/ss/>
 - USGS – “Methods for Determining Magnitude and Frequency of Floods in California, Based on Data through Water Year 2006”: <https://pubs.usgs.gov/sir/2012/5113/>

3. Precipitation-Runoff Hydrological Models

- Precipitation-Runoff Modeling Software
 - USACE HEC-HMS: <https://www.hec.usace.army.mil/software/hec-hms/>
 - NRCS WinTR-55 Small Water Hydrology:
<https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?cid=stelprdb1042901>
- Meteorological Data – NOAA Atlas 14, Volume 6 for Point Precipitation Frequency Estimates for California: https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ca

4. WMS – The Watershed Modeling System

- FHWA provides a free “pro” version of the license to all Caltrans employees. Contact Scott Hogan from FHWA at Scott.Hogan@dot.gov to request a license.
- For everyone else there is a free “community” version that does not include advanced analysis and graphic features. Contact Aquaveo for this free version at <http://www.aquaveo.com/request-license?s=SMS&v=12.2>

HYDRAULIC MODELING SOFTWARE

1. 1-Dimensional Hydraulic Modeling Software

- FHWA HY-8 Culvert Hydraulic Analysis Program:
<https://www.fhwa.dot.gov/engineering/hydraulics/software/hy8/>
- USFS FishXing – Fish Passage Analysis through Culverts:
<https://www.fs.fed.us/biology/nsaec/fishxing/>
- FHWA Hydraulic Toolbox Program:
<https://www.fhwa.dot.gov/engineering/hydraulics/software/toolbox404.cfm>
- USACE HEC-RAS: <https://www.hec.usace.army.mil/software/hec-ras/>

2. 2-Dimensional Hydraulic Modeling Software

- SMS – The Surface-Water Modeling System with the Sedimentation and River Hydraulics 2-Dimensional Model (SRH-2D)
 - FHWA provides a free “pro” version of the license to all Caltrans employees. Contact Scott Hogan from FHWA at Scott.Hogan@dot.gov to request a license.
 - For everyone else there is a free “community” version that does not include advanced analysis and graphic features. Contact Aquaveo for this free version at <http://www.aquaveo.com/request-license?s=SMS&v=12.2>
- USACE HEC-RAS 2D: <https://www.hec.usace.army.mil/software/hec-ras/>

CONTACT INFORMATION

- Rick Macala, Hydraulic Engineer with the CA Dept. of Fish and Wildlife
 - Email – rick.macala@wildlife.ca.gov
 - Office Phone – 916-322-9606