

Appendix C – Quick Start Guide

Quick Start Guide to PC-HYDRO

1. **Open the webpage.** The first step to using PC-HYDRO is to open the webpage at <http://pchydro.rfcd.pima.gov>.

The screenshot displays the PC-HYDRO V7 web application interface. A central disclaimer overlay is visible, featuring the Pima County Flood Control logo and text regarding the terms of use. The background interface includes a top navigation bar with 'File', 'Output', 'Links', 'PC-HYDRO V7 Manual', and 'Help'. Below this, there are sections for 'Project Information' (with fields for Project Name, User Name, Job Number, Date, and Concentration Point) and 'Watershed Information' (with a Watershed Area dropdown). A map on the left shows the location of the project. On the right, there are sections for 'Watercourse Information' (with fields for Watercourse (Lc), Gravity (Lca), Elev. increment, and Basin Factor) and 'Soil Types' (with a dropdown for Veg. Cover Type). At the bottom, there is a table for 'Peak Discharge' with columns for 'i at Tc (in/hr)', 'q at Tc (in/hr)', and 'Q (cfs)'. A note at the bottom left states: 'Note: Yellow background indicates that the data is outside the limitations of the program.' The footer contains copyright information and contact details for Pima County RFCD.

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No part of the Website may be exported or re-exported in contravention of U.S. export laws or regulations.

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As a voluntary user of PC-HYDRO 7.3 you agree to indemnify and hold the Pima County Regional Flood Control District, and its agencies, officials, representatives, and employees, including its contractors and suppliers, harmless from any claim or demand, including reasonable attorneys' fees, made by any third party due to or arising out of your use of PC-HYDRO 7.3 or breach of this Agreement or your violation of any law or the rights of a third party.

Version

PC-HYDRO 7.3 uses a different save-file format. Any files saved with PC-HYDRO 7.3 will not be able to be opened with an earlier version.

Agree

I Agree

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2. **Read and Agree to the Terms and Conditions of Use.** Press the **I Agree** button on the Terms and Conditions of Use screen. By doing so, the user agrees to rigidly uphold certain stipulations of use, including the Waiver of Liability, Limitations of Liability, Indemnity, and the voluntary Consent to all Terms and Conditions of Use. Pressing the **I Agree** button will cause the PC-HYDRO webpage to appear.

File Output Links PC-HYDRO V7 Manual Help Policy

Project Information

Project Name: Job Number:

User Name: Date:

Concentration Point: Client Name:

Project Notes (450 Characters max):

Watershed Information

Watershed Area: Acres

Watershed Type:

Length of Longest Watercourse (Lc):

Length to Center of Gravity (Lca):

Length Increment: Elev. Increment: Basin Factor:

Total of Length Increments greater than Lc:

Rainfall Data

Map Satellite

Enter a query:

Latitude: Longitude:

Fetch Rainfall Data Show/Hide

Rainfall Data Matches Lat/Long Info

Note: **Yellow background** indicates that data input is needed, a data format error, or that data entered is outside the limitations of the program. See [PC-HYDRO user guide](#) for more information.

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Vegetation/Soil Information

Vegetative Cover Density (%):

Impervious Cover (%):

Soil Types

Soil Type: % CN Veg. Cover Type:

Calculate Runoff Data / Peak Discharge

Yr	Cw	Tc (min)	I at Tc (in/hr)	q at Tc (in/hr)	Q (cfs)
1					
2					
5					
10					
25					
50					
100					
200					
500					
1000					

3. **Getting to know the menu options:**

- Under the Output menu **Generate Hydrographs** will generate and save a standard Pima County hydrograph from an active calculation.
- The **Links** dropdown menu will direct the user to data sites or other related sites. The **PC Hydro VX Manual** drop down menu will provide the user with pdf versions of the user manual for information on how to use the calculator.
- Pressing the **File** toolset button and selecting **Save to .pk6 format** will allow the user to browse and save the input data. *Closing the webpage will close the program without saving the input data.*
- Pressing the **Calculate Runoff Data/Peak Discharge** button will cause the program to calculate and display Runoff Data using the new or updated information.
- Selecting the **Help** menu button directs you to information about the current version of the webpage through the **About** button or how to contact the District regarding comments, feature requests or to report a bug through the **Support** button. Pressing the Policy button on the right side of the webpage directs you to the Pima County Regional Flood Control District's page containing "Rules and Procedures".

4. **Start a New calculation or Open an existing calculation.**

- For new projects, proceed to step 5.
- To open an existing file, press the **File** toolset button, select **Open .pk5 or .pk6 file**, and then browse for and open an existing PC-HYDRO file. Version 7.3 of PC-HYDRO will open existing data sets having a *.pk5 or the newer *.pk6 file extensions. Opening an existing calculation will populate the web page fields.

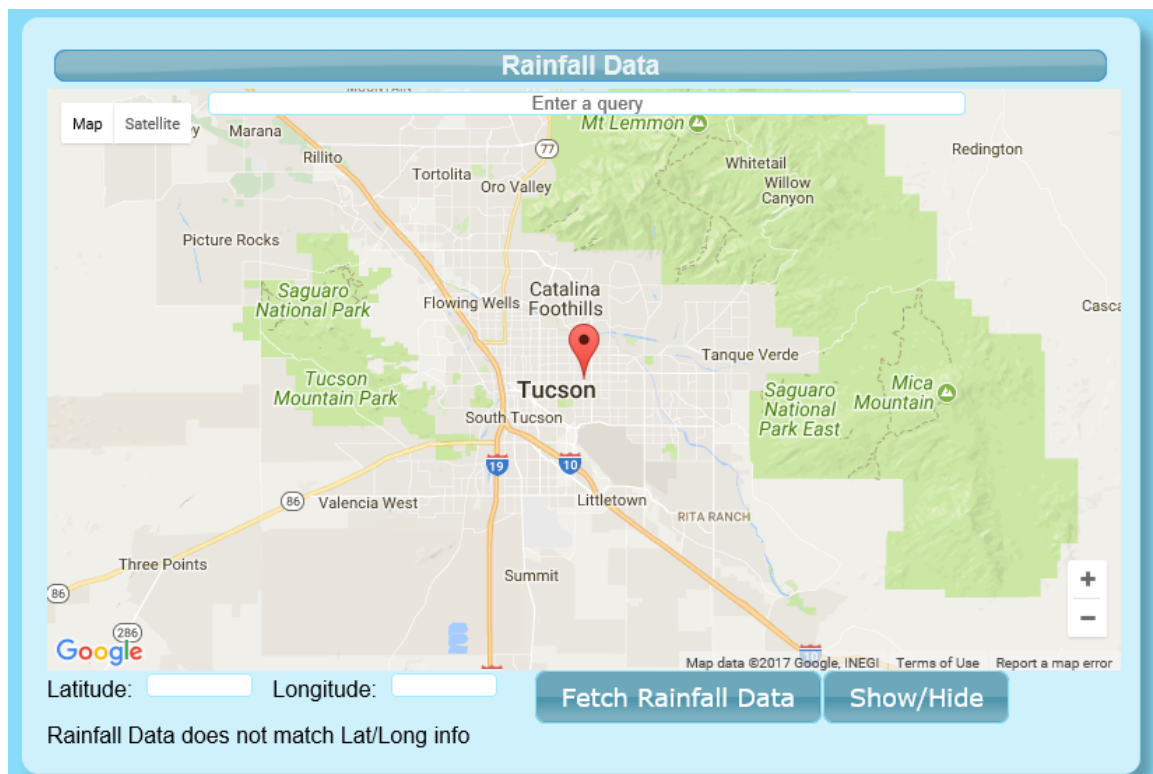
5. **Enter Project Data.** Within the "Project Information" area enter information describing the project and drainage concentration point, consisting of: **Project Name**, **Username**, **Concentration Point** (including whether the analysis is for existing or future hydrologic conditions; for example: "CP#30 Existing"), **Job Number**, **Date** of calculation or revision, and **Client Name**, in the appropriate fields. A **Notes** field is available to annotate the calculation with up to 450 characters of information relevant to the calculation, i.e., Existing Conditions, Developed Conditions, LID calculations, etc.

6. **Enter Watershed Information.** Enter **Watershed Information**, general **Watershed Area** with a drop down to indicate the appropriate units as either Acres or Square Miles, **Watershed Type** from the drop down, **Length of Longest Watercourse** and the **Length to the Center of Gravity**, and representative **Length Increments**, **Elevation Increments** and **Basin Factors**. When selecting values for these parameters, assume existing land uses and watershed characteristics within those basins identified as Balanced or Critical, and where stormwater detention will be required as a condition of new development. Otherwise, assume future land uses and watershed characteristics for those watersheds where stormwater detention will not be required. In this second case, consideration should be given to the maximum probable urbanization likely to occur within the watershed's boundaries. Do this by looking at the Land Use Intensities given in the current Pima County Comprehensive Plan.

The screenshot shows a software interface titled "Watershed Information". It contains several input fields and dropdown menus. The "Watershed Area" field is a yellow text box followed by a dropdown menu currently set to "Acres". The "Watershed Type" field is a dropdown menu currently set to "Undeveloped-Mountain". Below these are two more yellow text boxes: "Length of Longest Watercourse (Lc):" with the value "0" and "Length to Center of Gravity (Lca):". At the bottom, there are three white text boxes labeled "Length Increment", "Elev. Increment", and "Basin Factor". The "Length Increment" box contains the value "0". To the right of these boxes is a blue button with a white plus sign.

Important: unless granted prior approval by the PCRFC, PC-HYDRO shall not be used to calculate flood peaks for watersheds larger than 10 square miles or having 100-year Times of Concentration longer than 180 minutes.

7. **Enter Rainfall Data.** Enter rainfall and flood **Return Period**, **Rainfall Input** (entering either Latitude and Longitude coordinates for the watershed centroid, or rainfall intensity/duration values independently obtained from the NOAA Atlas 14, Upper 90% Confidence Limits). Values representing Latitude and Longitude, in decimal degrees, can be entered with up to 4 significant figures. After entering Latitude and Longitude manually or panning/zooming within the map window to the watershed centroid, press **Fetch Rainfall Data** to populate the precipitation-depth entry fields. (If you pan to a new centroid location you must reload the data from NOAA by again pressing the **Fetch Rainfall Data** button. The webpage links to the current NOAA Atlas 14 web page to retrieve the most current information. The rainfall data can be hidden and shown again by pressing the **Show/Hide** button.



8. **Enter Soil and Vegetation Data.** Enter **Vegetation Cover Density**, **Vegetative Cover Type**, percentage of **Impervious Cover**, and the **Percent** and **Curve Number** corresponding to NRCS-SCS Hydrologic Soil Types B, C, and D. When selecting representative values for vegetation, bare soil, and impervious cover types, assume existing watershed conditions, if stormwater detention will be required as a condition of future development within the entire watershed, otherwise, assume future conditions based on allowable Land Use Intensities given in the Pima County Comprehensive Plan. Representative NRCS-SCS Curve Numbers from the Graph on Figure 1 are automatically inserted/updated into the CN field. The CN may be manually modified if justified.

Vegetation/Soil Information

Vegetative Cover Density (%)

Impervious Cover (%)

Soil Types

Soil Type	%	CN	Veg. Cover Type
Type B	0	<input type="text"/>	Desert Brush

9. **Calculate the Resulting Flood Peak and Save the Input Data** Perform the calculation by pressing the **CALCULATE Runoff Data/ Peak Discharge** button located near the bottom right corner of the page. Check the input for correctness, and output for consistency and reasonableness. If all of the fields in yellow have not been entered, an error message will be returned. Either **PRINT** the output to a pdf file or **SAVE** the input by first pressing the **FILE** button found in the toolset at the top of the PC-HYDRO Summary Page and then Browsing to the desired storage location. Closing the webpage, will the close the page without saving the input data.

Calculate Runoff Data / Peak Discharge

Yr	Cw	Tc (min)	i at Tc (in/hr)	q at Tc (in/hr)	Q (cfs)
1					
2					
5					
10					
25					
50					
100					
200					
500					
1000					

10. **Optional --- Print or Export a Synthetic Hydrograph.** If needed, a Pima County Synthetic Hydrograph can be generated, with user-defined time increments, and either sent directly to a pdf file, or Browsed and Saved as Comma Separated (*.csv) Text File at a user-defined location. These hydrograph output files will have a *.hyd extension, which can be later used in Microsoft Word, Microsoft Excel, HEC-HMS, or other similar programs, as desired. A third output option for the Hydrograph is an *.xlsx file that can be copied and pasted into the PC Route spreadsheet. You will need to select your desired return intervals for the *.pdf files. For the Excel format and *.csv, all return periods are automatically generated. The output Hydrograph Increment and Volume Units must also be selected. Press **Generate Hydrograph** when finished.

Generate Hydrograph

Output Format: .PDF
.CSV
Volume Units: .XLSX (Excel/PC-ROUTE)

Hydrograph Increment (min): 1

Select Return Periods to Output:

- ☐ 1-yr
- ☐ 2-yr
- ☐ 5-yr
- ☐ 10-yr
- ☐ 25-yr
- ☐ 50-yr
- ☐ 100-yr
- ☐ 200-yr
- ☐ 500-yr
- ☐ 1000-yr

Generate Hydrograph

Generate Hydrograph

Output Format: .PDF

Volume Units: Acre-Feet
Cubic Feet

Hydrograph Increment (min): 1

Generate Hydrograph