

# Estimating Roughness Coefficients

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## USE OF THIS SEARCH ENGINE

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The website essentially has two functions: (1) it allows the user to compare data from a searchable database, and (2) it allows the user to interactively enter variables into a variety of hydraulic equations that solve for the unknown variable in the equation.

### Presentation and Comparison of Selected Streams

The database can be accessed via the web page in several different ways. The user can query the database by entering the range of  $n$  values, or by searching regionally by use of point and click maps. The results of the query can then be presented and compared to a stream for which the user is attempting to determine the roughness coefficient.

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### Entering the range of $n$ value

The user can specify the range of  $n$  value of interest. A list of the available data matching the range, or in the case that no available data are available in the specified range, the data closest to the entered range, will be listed in order of the best match. The list provides the five best matches from the data base, and includes the site name, location, and "Match %". The "Match %" is 100 percent if the  $n$  value of the site is in the range specified by the user, and decreases as the  $n$  value of the site gets further away from the specified range. The user can click on the "continue" button to continue the list, which will eventually cycle through all of the data in the database.

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### Searching by use of maps

The user can point and click on different States in the United States to search the database. If the user clicks on a State, for which there is data in the database, a list is produced which begins with data from that State. The list then provides data from other States in order of closest proximity. The "Match %" is 100 percent if the data are in the specified State, and

decreases by approximately 5% every State away. There is also a button available on the main map page for data from outside of the continental U.S.

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### **Addition of data to the data base**

The website will be maintained by the USGS, Illinois District. A download button is also available on the website for users who wish to burn their own CD-ROM for use in the field. The user can download updated versions as they deem necessary. If you or your organization have additional data which could be added to the data base, or if errors are found in the data, please contact [David Soong](#) or [Teresa Halfar](#) at the USGS.

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## **COMPUTATIONAL TOOLS**

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The web page also has an interactive utility that allows the user to enter variables into a variety of hydraulic equations. Most of these equations were developed for specific stream characteristics, so a more in-depth knowledge of the references that each of the equations comes from could be helpful to the user.

### **Calculations using hydraulic and/or geometric data**

For any of the variety of equations listed, the user can enter known hydraulic and geometric data in the appropriate fields and click the "Calculate" button to determine the unknown value. Then, if the user wishes to compare the calculated value to sites with the same or similar values, they can click on the "Similar  $n$  values" button. This action will automatically insert the calculated  $n$  value into both the maximum and minimum fields for the range of  $n$ . Clicking on the "Next" button will take the user to the database.

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## Entering channel characteristics

The user can estimate the Manning's  $n$  value for a given stream by using Cowan's Method. The interface is very user friendly and the user simply has to click on the characteristics of a stream to fill in the fields needed for the  $n$  value calculation. Clicking the button next to the description of any given range for a stream characteristic parameter will automatically insert the median for that range into the appropriate field. If the user wishes to increase or decrease that value, he or she must go into the appropriate field and manually change it.

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