Ecohydraulics
HYD254

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AUTOTUTORIAL 5: PHYSICAL HABITAT ANALYSIS

Background: The most basic physical habitat analysis one can do is to create a raster map of the global habitat suitability index. However, for people to value that product it is necessary to perform "bioverification". In this tutorial you will evaluate how well the combination of hydraulic habitat suitability curves and 2D model output performs at predicting the actual locations of Chinook salmon redds.

Objective: Practice the steps involved in physical habitat mapping and bioverification.

Materials: HSCexample.zip file, ArcGIS, MS Word.

Homework assignment:

1) Read Chapter 8 of the textbook.

2) Follow the steps from Chapter 5 to create depth and velocity TINs and 3-foot rasters using the provided 2D model output file.

3) Use the file "0_HSC_data" to quantify the habitat suitability curves (HSCs) provided

    a) Plot the depth and velocity HSCs.
    b) Use the procedure in section 8.2.2 (p. 113) of the textbook to quantify the HSCs.

4) Apply the HSC functions to the depth and velocity data provided in the file "0_modeloutput_XYDV.csv" to yield DHSI and VHSI data. This can either be done in Excel as explained on p. 115 of the textbook or in ArcGIS using the Raster Calculator and Con() statements.

5) Use the Raster Calculator to compute GHSI as the geometric mean of DHSI and VHSI.

6) Bin GHSI according to each of the habitat quality schemes shown on p. 117.

7) Using the data from the file "0_redd_locations.csv", go through the bioverification procedure in section 8.6 with the tutorial data to determine which HSI bins, if any, are preferred and avoided.

8) Write up a brief summary of your work, including plots of the HSCs, a GHSI map with the redd locations on it, and a plot showing the main result of the bioverification. Provide your interpretation as to whether the GHSI "bioverified" or not?

Helpful info:

Please read the README text file to get the latest updates and troubleshooting tips before starting the tutorial.