The ACRU Hydrological Response Unit Delineation Standalone Script Guide

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DOCUMENT REVISIONS

Date	Version Number	Updated By	Document Changes
01/17/2017	0.01	Charmaine Bonifacio	Initial Draft
01/18/2017	0.02	Charmaine Bonifacio	Final Draft

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1 INTRODUCTION

1.1 Scope and Purpose

This document describes the delineation of hydrological response units (HRU) for the Agricultural Catchments Research Unit (ACRU) agro-hydrological modelling system. This document is meant for both users of the ACRU model who wish to setup and run the ACRU model without using the ArcGIS for Desktop environment. However, the process of compiling spatial data for the ACRU model can combined with ArcGIS for Desktop environment under a Windows® operating system.

The ACRU-HRU Delineation Tool was developed to automate the delineation of hydrological response units (HRU) for the ACRU (v 336) model. The creation of HRU is a key step in utilizing ACRU in a distributed mode. Spatial data are pre-processed where raster data are often resampled according to the user's specification for a particular watershed. Essentially, the tool allows the user to automatically delineate the HRU using ArcPY modules available in ArcGIS for Desktop.

1.2 Script Overview

```
def main():
    # Obtain Input From User
    ws_file = r"C:\test\hru\7\or_ws_7" # INPUT Raster
    ab_file = r"C:\test\hru\7\or_ab_7"   # INPUT Raster
    elev_file = r"C:\test\hru\7\or_elev"  # INPUT Raster
    lc_file = r"C:\test\hru\7\or_lc_2k_rec" # INPUT Raster
    rad_file = r"C:\test\hru\7\or_rad_4" # INPUT Raster
    workSpace = r"C:\test\hru\7"       # OUTPUT Directory
    #maskLayer = r"C:\test\test\5\or_ws_bnd2_buf1km.shp"
    HRUName = "or_2000_74" # Input HRU
```

Change the pathname between the " " quotations.

Procedure:

1. Locate the first raster file and copy the address.
2. Locate the second raster file and copy the address.
3. Locate the third raster file and copy the address.
4. Locate the fourth raster file and copy the address.
5. Locate the fifth raster file and copy the address.
6. Locate the directory to save the output file and copy the address.
7. Enter the name of the file.

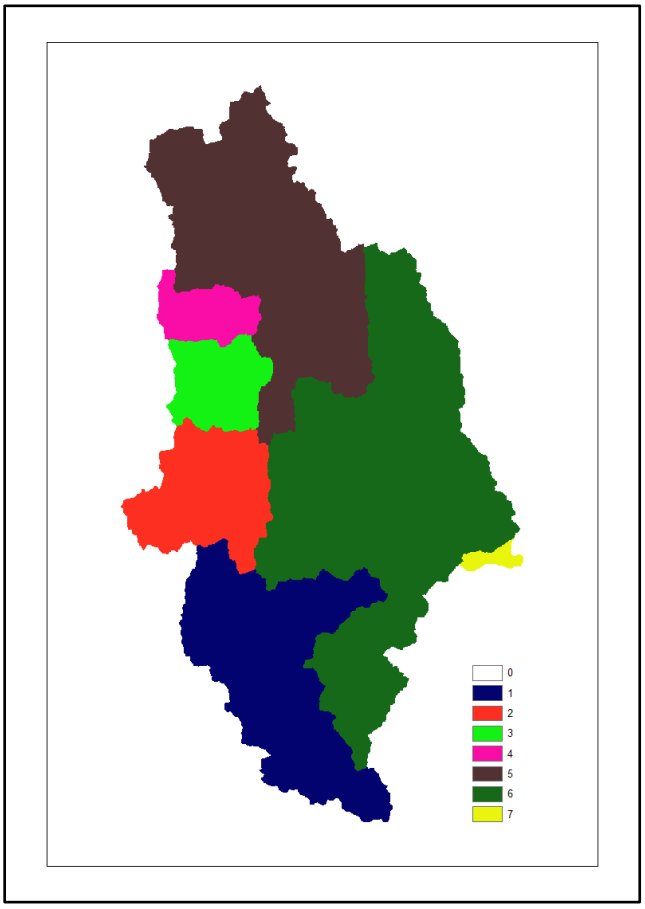
2 Spatial Layers

The ACRU-HRU Delineation Tool was used to delineate hydrological response unit for the Oldman Reserver Watershed, located in southern Alberta. The each of the spatial layers were resampled specifically due to the unique identifier. Here, we used five raster layers with a specific unique identifier in the following format: 123456789.

- 1 denotes first layer with 1 digit
- 234 denotes second layer with 3 digits
- 56 denotes third layer with 2 digits
- 78 denotes fourth layer with 2 digits
- 9 denotes fifth layer with 1 digit

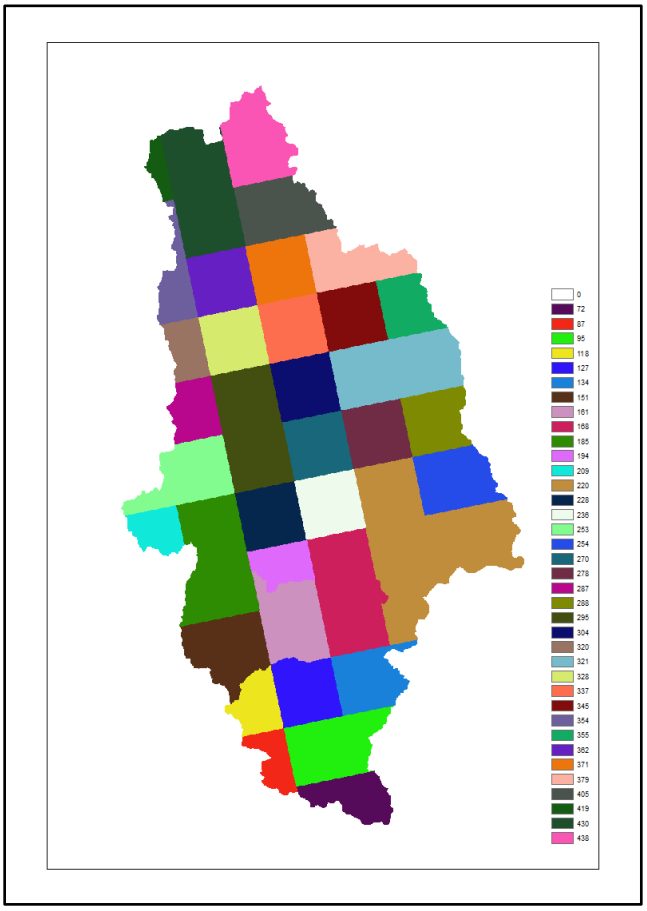
In order to create this unique identifier using Python, the following expression was used:
(layer1 * 100000000) + (layer2 * 100000) + (layer3 * 1000) + (layer4 * 10) + layer5

2.1 Layer One Sample



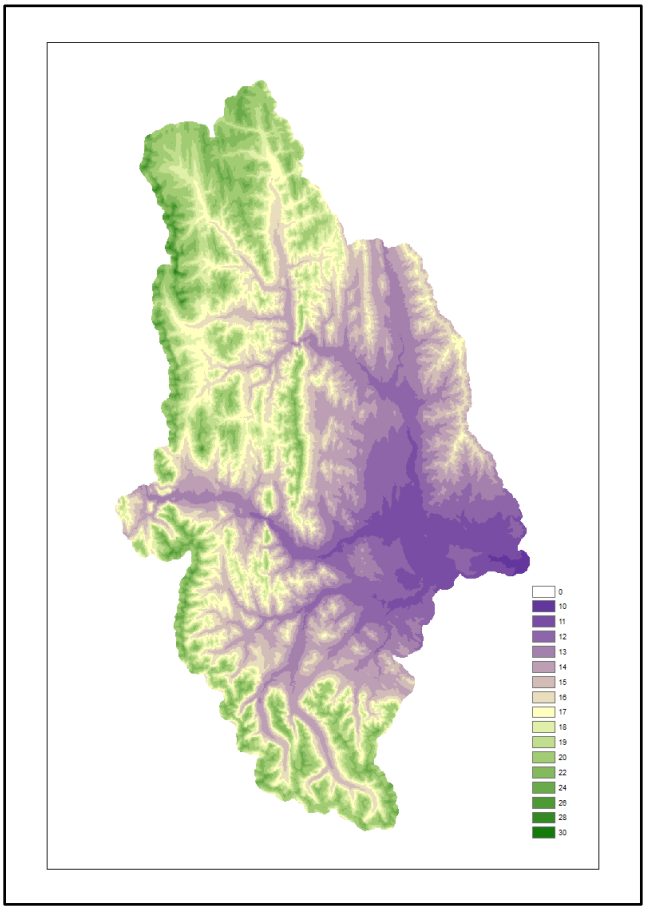
For the Oldman Reservoir Watershed, the sub-watershed data was selected as the first layer. The raster layer is multiplied by 100000000 in order to setup the specific unique identifier in the following format: 123456789. Here, 1 denotes the first layer using 1 digit placeholder.

2.2 Layer Two Sample



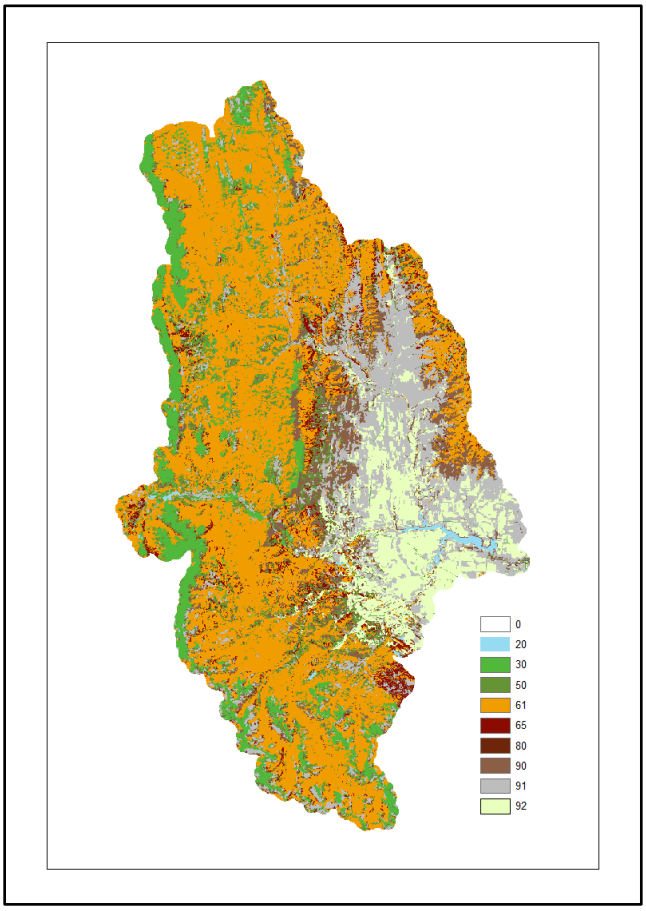
The gridded 10K data was selected as the second layer. The raster layer is multiplied by 100000 in order to setup the second set of identifier. Using this format where unique identifier is 123456789, the identifier 234 denotes second layer using 3 digit placeholder.

2.3 Layer Three Sample



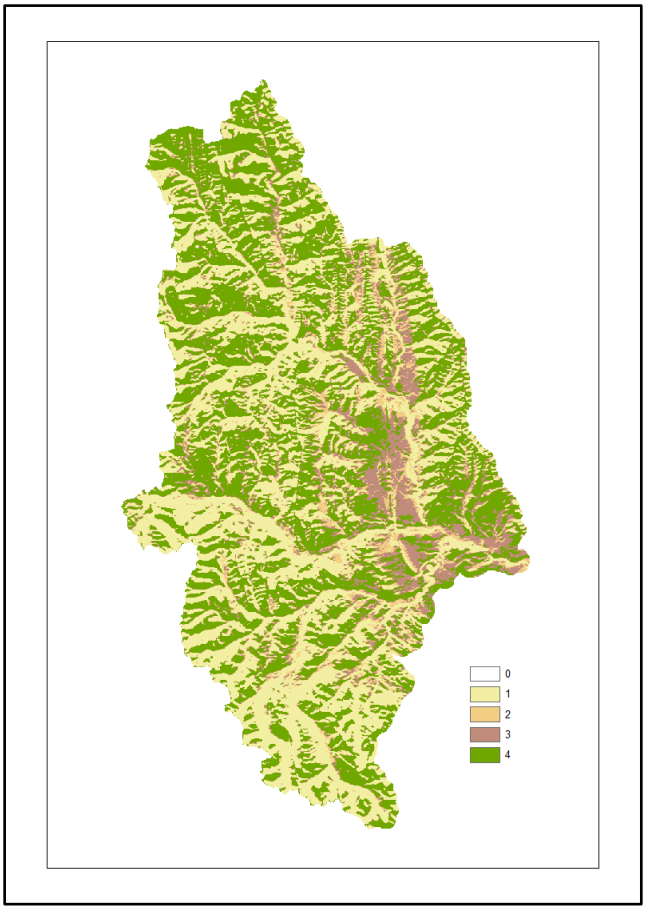
Theelevation data was selected as the third layer. The raster layer is multiplied by 1000 in order to setup the third set of identifier. Using this format where unique identifier is 123456789, the identifier 56 denotes third layer with 2 digit placeholder.

2.4 Layer Four Sample



The land cover data was selected as the fourth layer. The raster layer is multiplied by 10 in order to setup the fourth set of identifier. Using this format where unique identifier is 123456789, the identifier 78 denotes fourth layer with 2 digit placeholder.

2.5 Layer Five Sample



The aspect data was selected as the fifth layer. In this layer, using this format where unique identifier is 123456789, the identifier 9 denotes fifth layer with 1 digit placeholder.

If you encounter issues not addressed by this user guide, please contact Charmaine Bonifacio for additional support