# LAB 5: Watershed and Stream Network Delineation

### **Tran Quang Bao**

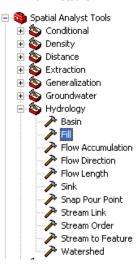
#### Part 1. Digital Elevation Model (DEM) and Stream Network Delineation

Step 1: Open ArcMap

Step 2: Activate <u>Hydrology</u> Tool in Spatial Analysis Tools

Step 3: Use Fill Tool to remove or fill pits

🎤 Fill	-02
Input surface raster	^
binhdinh_1_3	<b>2</b>
Output surface raster	
D:\DHLN\BAIGIANG\QLNN\Baitap\Lab2\Fill_binhdinh	<b>2</b>
Z limit (optional)	
	<u> </u>
OK Cancel Environments Show H	elp >>



#### Step 4: Use **Flow Direction** to determine flow direction

Flow Direction	
Input surface raster	<u> </u>
Fill_Binhdinh	<b>2</b>
Output flow direction raster	
D:\DHLN\BAIGIANG\QLNN\Baitap\Lab3\Flow_D	<b>1</b>
Force all edge cells to flow outward (optional)	_
Output drop raster (optional)	
	<b>2</b>
OK Cancel Environments Show	Help >>

### Step 5: Use **Flow Accumulation** to determine water accumulates

Flow Accumulation	-08
Input flow direction raster	<u>_</u>
Flow_D	- 🗃
Output accumulation raster	
D:\DHLN\BAIGIANG\QLNN\Baitap\Lab3\Flow_Acc	i 🖻
Input weight raster (optional)	
2	- 🖻
Output data type (optional)	
FLOAT	▼
OK Cancel Environments Sho	ow Help >>

Step 6: Use **<u>Reclassify</u>** to identify stream network (raster)

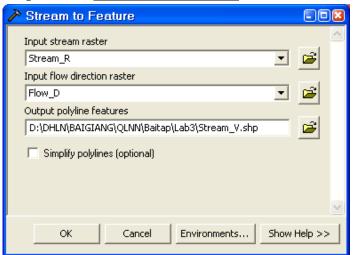
Reclassify		2 🛛
Input raster: Reclass field:	Flow_Acc	•
Set values to reclass	·	
Old values	New values	Classify
0 - 1000 1000 - 200000	NoData 1	Unique
NoData	NoData	
		Add Entry
		Delete Entries
Load	Save	Precision
🔲 Change missing va	lues to NoData	
Output raster:	D:\DHLN\BAIGIANG\QLNN\Baitap\La	b3\Stream_R 🖻
	ОК	Cancel

\* Notes: Choosing a threshold depending watershed number

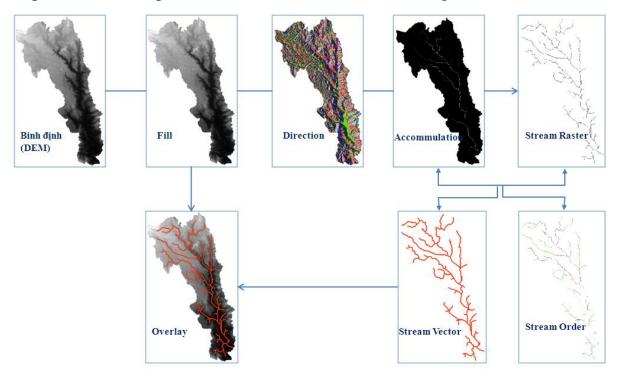
Step 7: Use Stream Order to determine Stream Order

🔑 Stream Order	-02
Input stream raster	<u> </u>
Stream_R	<b>2</b>
Input flow direction raster	
Flow_D	<b>2</b>
Output raster	_
D:\DHLN\BAIGIANG\QLNN\Baitap\Lab3\Stream_Or	<b>2</b>
Method of stream ordering (optional)	
STRAHLER	<b>–</b>
OK Cancel Environments Show	Help >>

Step 8: Use Stream to Feature to conver stream network from Raster to Vector



Step 10: Use Powerpoint to create a flowchart as following:

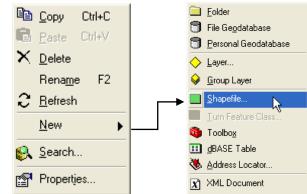


Flowchart for Stream Network Delineation of Watersheds

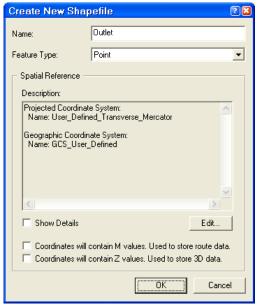
#### Part 2. Delineation of Watersheds

#### Step 1: Identify Outlet of the watershed

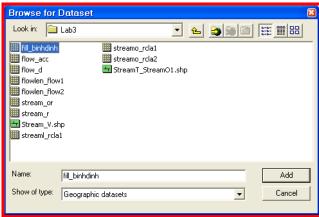
- Use ArcCatalog to create a new shapefile (point)
- Right Click in ArcCatalog , choose New =>Shapefile..



- Put a name for new shapefile (Outlet)



\* Note: Click Edit => Import Coordinate Systems



- Add Outlet Layer in ArcMap

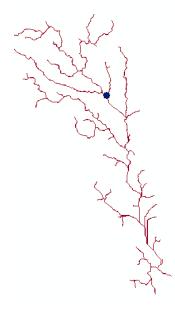
- Activate Editor Toolbar (View =>Toolbar... => Editor)
- Click Editor => Start Editing



#### - Choose Create New Feature for Outlet file



- Choose a location for Outlet in Stream Network

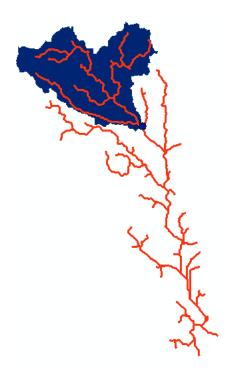


#### **Step 2: Watershed Delineation**

- Use **Watershed** in **Hydrology** Tool (ArcToolbox => Spatial Analysis)

		×
Input flow direction raster		^
Flow_D	<b>2</b>	
Input raster or feature pour point data		
Outlet	<b>2</b>	
Pour point field (optional)		
Id	-	
Output raster D:\DHLN\BAIGIANG\QLNN\Baitap\Lab3\Watershed	2	
D:/DHEN/pAt/gtAn/gtQEN/n/pai/ab/Lab3/watershed		
		V
OK Cancel Environments Show	Help >>	

- Create a layout of watershed



## TURN IN (two pages in color printing):

- A Flowchart of Stream Network Delineation
- A Layout of Watershed Delineation

<u>Note</u>: This lab needs to be completed individually and should reflect your own, independent work. You will have one week to complete this lab assignment.