Tutorial Set 4: Remote sensing

Exercise Site20_4-2 NDVI calculation

Learning objective: Calculating NDVI using band RED and band NIR **Techniques:** Use the Raster Calculator to clip and compose a new image **Data Source**: Dataset5

Part 1: Clipping images to site boundary

1. Convert *Field20_Boundary.shp* (vector) to a raster. Go to **ArcToolbox > Conversion Tools** > **To Raster > Polygon to Raster**. Save as *Boundary.TIF*.

~	Polygon to Raster —		×	
Input F	eatures			
Field	20_Boundary	•	2	
Value f	ield			
INDEX			$\mathbf{\mathbf{v}}$	
Output	Raster Dataset			
D:\Te	mpForWork\SProject\Class\Additional\NDVI_Landset7Images\Set2_2002Sep\Processed\Boundary.TIF		2	
Cell as	signment type (optional)			
CELL_	CENTER		~	
Priority	field (optional)			
NONE			~	
Cellsize	e (optional)			
1.7			2	
	OK Cancel Environments Sho	w He	lp >>	

2. Result of Boundary.TIF



3. Clip *RED.TIF* and *RED.TIF* to the boundary of *Boundary.TIF*. Go to **Spatial Analyst Tools** > **Map Algebra > Raster Calculator**.

```
Algebra expression = RED.TIF * Boundary.TIF
Output raster = RED_c.TIF
```

Click **Environment Setting** to change **Raster Analysis>cell size = MINIMUM of INPUTS** for the output raster.

6	Raster Calculator	_ 🗖 ×
Map Algebra expression Layers and variables - Boundary.TIF NIR.TIF RED.TIF ColorMap "RED.TIF" * "Boundary.TIF" Coutput taster D:\TempForWork\SProject\C	7 8 9 / == != & 4 5 6 * > >= 1 2 3 - < <= ^ 0 . + () ~ lass\Additional\NDVI_Landset7Images\Set2_2	Conditional — ^ Con Pick SetNull Math — Abs Exp Exp10 ✓
 Environ Workspace Output Coordinates Processing Extent XY Resolution and Tolera M Values 	OK Cancel Environm	nents Show Help >>
 Ž Values Š Geodatabase Š Geodatabase Advanced Fields Random Numbers Čartography Čoverage 	Cells	Size = Minimum of Inputs
* Raster Analysis Cell Size Minimum of Inputs Mask Raster Storage	 <	

- 4. Repeat previous step (3) to clip *NIR.TIF*.
- 5. Results of the clipped images: *RED_c.TIF* and *NIR_c.TIF*.



Part 2: Calculating NDVI

$$NDVI = \frac{(NIR - Red)}{(NIR + Red)}$$

1. Go to ArcToolbox > Spatial Analyst Tools > Map Algebra > Raster Calculator

Algebra expression =

```
(Float("NIR_c.TIF")-Float("RED_c.TIF")/(Float("NIR_c.TIF")+Float("RED_c.TIF"))
```

```
Output raster = NDVI.TIF
```

~	Raster Calculator	_ 🗆 🗙							
Map Algebra expression Layers and variables NDVI3.TIF Boundary.TIF RED_c.TIF NIR_c.TIF NIR_TIF RED.TIF ColorMap	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Abs Exp Exp10 Exp2 Float Int Ln Log10							
♦ ColorMap ♥ 0 . + () ~ Lugio Inn2 (Float("NIR_c.TIF")-Float("RED_c.TIF"))/(Float("NIR_c.TIF")+Float("RED_c.TIF")) Output raster NDVI.TIF OK Cancel Environments Show Help >>									

2. Result of NDVI image.



