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## 1 Geodatabase Configuration

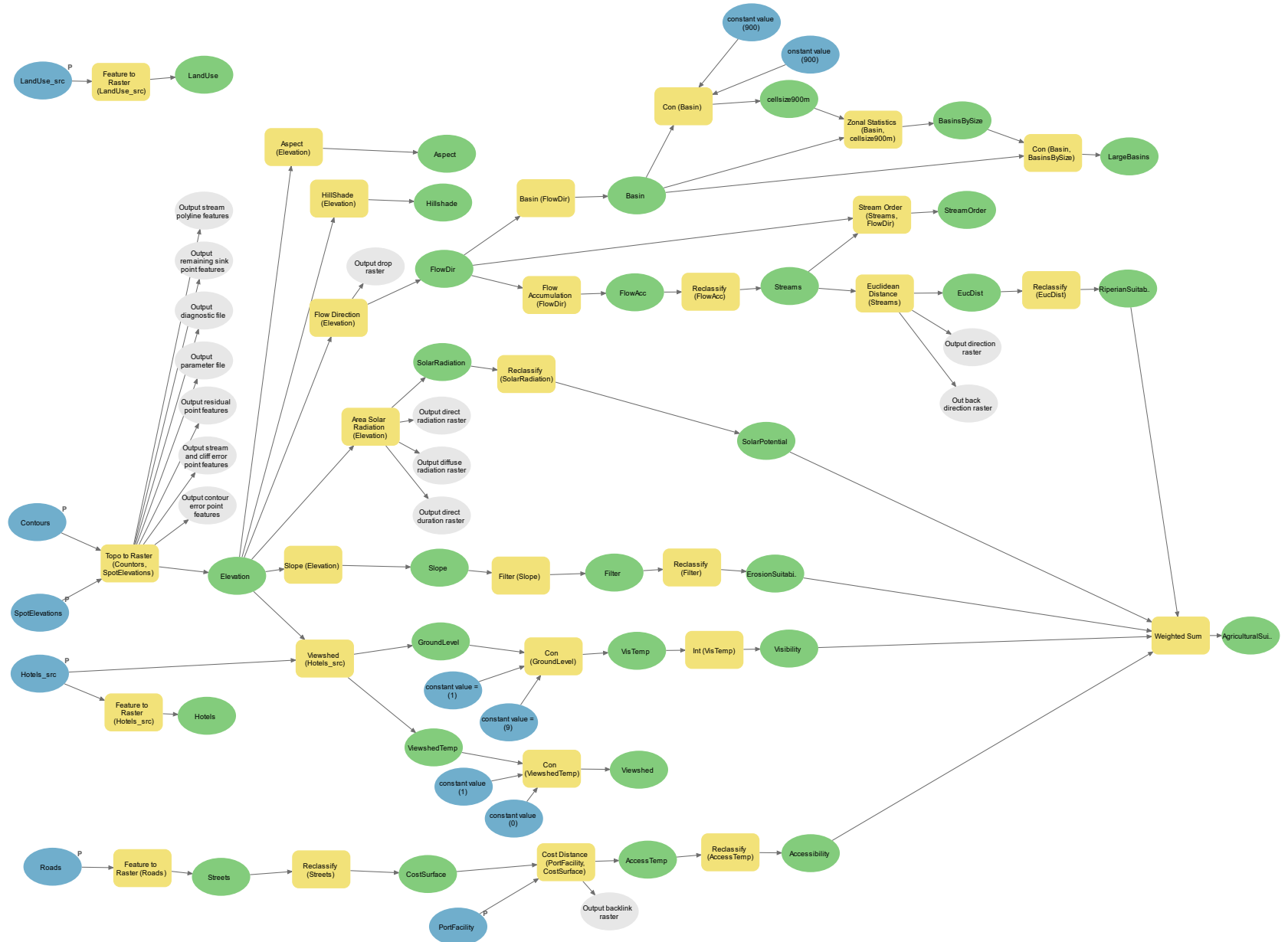
The geodatabase for this project is configured as follows:

- The geodatabase for this project is named *RasterAnalysis\_CP.gdb*.
- This geodatabase contains a toolbox named *DefaultToolbox* which contains a model builder model names *RasterAnalysis*.
- All the source data has been imported into a feature dataset a named *source\_data* inside the geodatabase.
- Some of the feature classes inside the *source\_data* feature dataset were renamed by appending the suffix *\_src* to ensure that feature class names were unique in the geodatabase. The feature classes affected by this renaming are *Hotels\_src* and *LandUse\_src*.
- The projected coordinate system *WGS 1972 UTM Zone 6S* is used throughout this project.

### 1.1 Notes

I noticed that although all the layers are consistent with one another they do not perfectly align with the default topographic base map. For example, you can see the discrepancy in the island's coastline in the Land feature class which was used as the mask for the raster processing. I think this could indicate that the coordinate reference system specified in the source data may not correctly match the data.

## 2 Model Builder – RasterAnalysis model



### 3 Model Environments

**Environments**

Search

▼ **Workspace**

Current Workspace: RasterAnalysis\_CP.gdb

Scratch Workspace: RasterAnalysis\_CP.gdb

▼ **Output Coordinates**

Output Coordinate System: WGS\_1972\_UTM\_Zone\_6S

Geographic Transformations:

▼ **Processing Extent**

Extent: As Specified Below

189858.875 207706.5469

8052399 8065800.5

▼ **Parallel Processing**

Recycle Interval Of Processing Workers:

Parallel Processing Factor:

Number of Retries on Failures:

▼ **Raster Analysis**

Cell Size: 30

Cell Size Projection Method: Convert units

Mask: Land

Cell Alignment: Default

Snap Raster:

▼ **Geodatabase**

Output CONFIG Keyword:

Auto Commit: 1000

Maintain Attachments: ☒

▼ **Geodatabase Advanced**

Maintain Spatial Index: ☐

Preserve Global IDs: ☐

Transfer Geodatabase Field Properties: ☐

▼ **Fields**

Transfer field domain descriptions: ☐

Maintain fully qualified field names: ☒

▼ **XY Values**

Output XY Domain: Same As Input

XY Resolution: Unknown

XY Tolerance: Unknown

▼ **M Values**

Output M Domain: Same As Input

Output has M Values: Same As Input

M Tolerance:

M Resolution:

▼ **Z Values**

Output Z Domain: Same As Input

Default Output Z Value:

Output has Z Values: Same As Input

Z Resolution: Unknown

Z Tolerance: Unknown

▼ **Random Numbers**

Random Number Generator: Seed 0

Generator: ACM collected algo

**Cartography**

Cartographic Coordinate System:

Reference Scale:

Cartographic Partitions:

**Raster Storage**

Pyramid: ☒ Build  
 Pyramid levels:   
 Skip first: ☐  
 Resampling technique:   
 Compression type:

Raster Statistics: ☒ Calculate  
 X skip factor:   
 Y skip factor:   
 Statistics ignore value (s):

Compression: Type   
 Tile Size: Width   
 Height

Resample:   
 NoData:

**Terrain Dataset**

Minimize memory use during analysis on terrains: ☐

**TIN**

Default TIN Storage Version:

**Geostatistical Analysis**

Coincident Points:

**Maritime**

S-100 Feature Catalogue File:

**Processor Type**

Processor Type:

GPU ID:

**Remote Processing Server**

User Name:

Password:

Processing Server:

**Multidimensional Analysis**

Match Multidimensional Variable: ☒  
 Union Dimension: ☐

**Business Analyst**

Data Source:

Network Source:

Use Detailed Aggregation: ☐

OK Cancel

## 4 Level 1

### 4.1 Feature to Raster (LandUse\_src) -> LandUse

#### 4.1.1 Parameters

Feature to Raster (LandUse\_src): Feature to Raster

Parameters Environments Properties

Input features:

Field:

Output raster:

Output cell size:

OK

### 4.1.2 Environments

Feature to Raster (LandUse\_src): Feature to Raster

Parameters **Environments** Properties

▼ Output Coordinates

Output Coordinate System  
WGS\_1972\_UTM\_Zone\_6S

Geographic Transformations

▼ Processing Extent

Extent As Specified Below

← 189218.8555 → 207757.5666

↓ 8050995.8968 ↑ 8066092.6253

▼ Raster Analysis

Cell Size  
30

Cell Size Projection Method  
Convert units

Snap Raster

▼ Geodatabase

Output CONFIG Keyword

Auto Commit 1000

▼ Raster Storage

Pyramid ☒ Build

Pyramid levels

Skip first ☐

Resampling technique NEAREST

Compression type DEFAULT

Compression Type LZ77

Tile Size Width 128

Height 128

OK

### 4.1.3 Notes

The instructions read: “Convert the Land Use shapefile into a raster, using the Feature to Raster tool. In this case, do not use the ‘*Land.shp*’ as a feature mask, as the Land Use data includes water. Make sure to select the correct field that represents the different land use categories. Call it ‘*LandUse*.’” However, there are two fields that represent land use category: *LUCODE* and *NAME*. I choose to use the *NAME* field because it is more readable and represents broader categories. Interestingly, the Feature to Raster tool does not appear to copy the mask from the model’s environment and there is no mask field in this tool’s specific environment settings. So, I did not encounter an issue with using *Land.shp* as a feature mask. However, I did have to change the extent of this layer to use the extent of the original *LandUse.shp* shapefile (i.e. the extent of the feature class *source\_data/LandUse\_src*) otherwise this layer gets clipped to the default extent specified in the model’s environment which is derived from the *Land.shp* shapefile (i.e. the extent of the feature class *source\_data/Land*).



## 4.2 Topo to Raster (Contours, SpotElevations) -> Elevation

### 4.2.1 Parameters

Topo to Raster (Contours, SpotElevations): Topo to F ×

Parameters Environment Properties ?

Input feature data ▾

Feature layer Contours ▾

Field CONTOUR ▾

Type Contour ▾

Feature layer SpotElevations ▾

Field Z ▾

Type Point elevation ▾

+ Add another

⚠ Output surface raster

Elevation ▾

Output cell size ▾

30 ▾

Output extent ▾

As Specified Below ▾

← 189858.875 → 207706.5469

↓ 8052399 ↑ 8065800.5

Margin in cells 20

Smallest z value to be used in interpolation

Largest z value to be used in interpolation

Drainage enforcement ▾

Enforce ▾

Primary type of input data ▾

Contour ▾

Maximum number of iterations 20

Roughness penalty

Profile curvature roughness penalty

Discretisation error factor 1

Vertical standard error 0

Tolerance 1 2.5

Tolerance 2 100

Optional outputs

OK

## 4.2.2 Environments

Topo to Raster (Countours, SpotElevations): Topo to F ×

Parameters **Environments** Properties ?

▼ **Output Coordinates**

Output Coordinate System  
WGS\_1972\_UTM\_Zone\_6S

Geographic Transformations

▼ **Processing Extent**

Extent As Specified Below

← 189858.875 → 207706.5469

↓ 8052399 ↑ 8065800.5

▼ **Raster Analysis**

Cell Size  
30

Cell Size Projection Method  
Convert units

Mask  
Land

Snap Raster

▼ **Geodatabase**

Output CONFIG Keyword

Auto Commit 1000

▼ **Fields**

☐ Transfer field domain descriptions

▼ **XY Values**

Output XY Domain Same As Input

XY Resolution Unknown

XY Tolerance Unknown

▼ **M Values**

Output M Domain Same As Input

Output has M Values  
Same As Input

M Resolution

M Tolerance

▼ **Z Values**

Output Z Domain Same As Input

Default Output Z Value

Output has Z Values  
Same As Input

Z Resolution Unknown

Z Tolerance Unknown

▼ **Raster Storage**

Tile Size Width 128 Height 128

OK

## 4.2.3 Notes

I encountered problems rendering all the raster layers that had a float data type. The progress spinner in the bottom right of the screen would keep spinning with the message “Drawing” when you mouse over it. Strangely, if I saved the project these layers would render immediately when I reopened the project again.

## 4.3 Feature to Raster (Hotels\_src) -> Hotels

### 4.3.1 Parameters

The screenshot shows the 'Parameters' tab of the 'Feature to Raster (Hotels\_src): Feature to Raster' dialog. The 'Input features' dropdown is set to 'Hotels\_src'. The 'Field' dropdown is set to 'NAME'. The 'Output raster' dropdown is set to 'Hotels'. The 'Output cell size' dropdown is set to '30'. There is an 'OK' button at the bottom right.

### 4.3.2 Environments

The screenshot shows the 'Environments' tab of the 'Feature to Raster (Hotels\_src): Feature to Raster' dialog. The 'Output Coordinates' section shows 'Output Coordinate System' set to 'WGS\_1972\_UTM\_Zone\_6S'. The 'Processing Extent' section shows 'Extent' set to 'As Specified Below' with coordinates: 189858.875, 207706.5469, 8052399, and 8065800.5. The 'Raster Analysis' section shows 'Cell Size' set to '30', 'Cell Size Projection Method' set to 'Convert units', and 'Snap Raster' set to an empty dropdown. The 'Geodatabase' section shows 'Output CONFIG Keyword' set to an empty text box and 'Auto Commit' set to '1000'. The 'Raster Storage' section shows 'Pyramid' checked, 'Pyramid levels' set to an empty text box, 'Skip first' unchecked, and 'Resampling technique' set to 'NEAREST'. The 'Compression' section shows 'Compression type' set to 'DEFAULT', 'Type' set to 'LZ77', 'Tile Size' set to '128' for both 'Width' and 'Height'. There is an 'OK' button at the bottom right.

## 4.4 Feature to Raster (Roads) -> Streets

### 4.4.1 Parameters

The screenshot shows the 'Parameters' tab of the 'Feature to Raster (Roads): Feature to Raster' dialog. The 'Input features' dropdown is set to 'Roads'. The 'Field' dropdown is set to 'Shape\_Length'. The 'Output raster' dropdown is set to 'Streets'. The 'Output cell size' dropdown is set to '30'. There is an 'OK' button at the bottom right.

## 4.4.2 Environments

Feature to Raster (Roads): Feature to Raster

Parameters Environments Properties

Output Coordinates

Output Coordinate System: WGS\_1972\_UTM\_Zone\_6S

Geographic Transformations:

Processing Extent

Extent: As Specified Below

Left: 189858.875 Right: 207706.5469

Bottom: 8052399 Top: 8065800.5

Raster Analysis

Cell Size: 30

Cell Size Projection Method: Convert units

Snap Raster:

Geodatabase

Output CONFIG Keyword:

Auto Commit: 1000

Raster Storage

Pyramid: ☒ Build

Pyramid levels:

Skip first: ☐

Resampling technique: NEAREST

Compression type: DEFAULT

Compression Type: LZ77

Tile Size: Width: 128 Height: 128

OK

## 4.4.3 Notes

The instructions read: “Convert the Streets shapefile into a raster, but rather than using street ID, use the shape length as the conversion field. Call it ‘Streets.’” However, there is no Streets.shp shapefile in the Lab5 source data. So, I used the Roads.shp shapefile instead. There is also a SecondaryRoads.shp which appears to contain a subset of the contents of the Roads.shp file. I did not use the SecondaryRoads.shp file.

## 5 Level 2

### 5.1 Aspect (Elevation) -> Aspect

#### 5.1.1 Parameters

Aspect (Elevation): Aspect

Parameters Environments Properties

Input raster: Elevation

Output raster: Aspect

Method: Planar

OK

### 5.1.2 Environments

Aspect (Elevation): Aspect

Parameters Environments Properties

Output Coordinates

Output Coordinate System  
WGS\_1972\_UTM\_Zone\_6S

Geographic Transformations

Processing Extent

Extent As Specified Below

189858.875 207706.5469

8052399 8065800.5

Raster Analysis

Cell Size  
30

Cell Size Projection Method  
Convert units

Mask  
Land

Snap Raster

Geodatabase

Output CONFIG Keyword

Auto Commit 1000

Raster Storage

Tile Size Width 128 Height 128

OK

## 5.2 Hillshade (Elevation) -> Hillshade

### 5.2.1 Parameters

HillShade (Elevation): HillShade

Parameters Environments Properties

Input raster  
Elevation

Output raster  
HillShade

Azimuth 315

Altitude 45

☐ Model shadows

Z factor 1

OK

## 5.2.2 Environments

HillShade (Elevation): HillShade

Parameters **Environments** Properties ?

▼ **Output Coordinates**

Output Coordinate System  
WGS\_1972\_UTM\_Zone\_6S

Geographic Transformations

▼ **Processing Extent**

Extent As Specified Below

← 189858.875 → 207706.5469

↓ 8052399 ↑ 8065800.5

▼ **Raster Analysis**

Cell Size  
30

Cell Size Projection Method  
Convert units

Mask  
Land

Snap Raster

▼ **Geodatabase**

Output CONFIG Keyword

Auto Commit 1000

▼ **Raster Storage**

Compression Type LZ77

Title Size Width 128

Height 128

OK

## 5.3 Area Solar Radiation (Elevation) -> SolarRadiation

### 5.3.1 Parameters

Area Solar Radiation (Elevation): Area Solar Radiatio

Parameters **Environments** Properties ?

Input raster  
Elevation

⚠ Output global radiation raster  
SolarRadiation

Latitude -17.534150050998488

Sky size / Resolution 200

Time configuration Multiple days

Year 2021

Start day 5

End day 160

Day interval 14

Hour interval 0.5

☐ Create outputs for each interval

› Topographic parameters

› Radiation parameters

› Optional outputs

OK

### 5.3.2 Environments

Area Solar Radiation (Elevation): Area Solar Radiatio ×

Parameters Environments Properties ?

▼ Output Coordinates

Output Coordinate System  
WGS\_1972\_UTM\_Zone\_65

Geographic Transformations

▼ Processing Extent

Extent As Specified Below

← 189858.875 → 207706.5469

↓ 8052399 ↑ 8065800.5

▼ Raster Analysis

Cell Size  
30

Cell Size Projection Method  
Convert units

Mask  
Land

Snap Raster

▼ Geodatabase

Output CONFIG Keyword

Auto Commit 1000

▼ Raster Storage

Tile Size Width 128 Height 128

OK

## 5.4 Slope (Elevation) -> Slope

### 5.4.1 Parameters

Slope (Elevation): Slope ×

Parameters Environments Properties ?

Input raster  
Elevation

Output raster  
Slope

Output measurement  
Degree

Method  
Planar

Z factor 1

OK

## 5.4.2 Environments

**Slope (Elevation): Slope**

Parameters **Environments** Properties

▼ **Output Coordinates**

Output Coordinate System  
WGS\_1972\_UTM\_Zone\_6S

Geographic Transformations

▼ **Processing Extent**

Extent As Specified Below

← 189858.875 → 207706.5469

↓ 8052399 ↑ 8065800.5

▼ **Raster Analysis**

Cell Size  
30

Cell Size Projection Method  
Convert units

Mask  
Land

Snap Raster

▼ **Geodatabase**

Output CONFIG Keyword

Auto Commit 1000

▼ **Raster Storage**

Tile Size Width 128 Height 128

OK

## 5.5 Viewshed (Hotels\_src, Elevation) -> ViewshedTemp, GroundLevel)

### 5.5.1 Parameters

**Viewshed (Hotels\_src): Viewshed**

Parameters **Environments** Properties

Input raster  
Elevation

Input point or polyline observer features  
Hotels\_src

Output raster  
ViewshedTemp

Output above ground level raster  
GroundLevel

Z factor  
1

☐ Use earth curvature corrections

OK



## 5.5.2 Environments

Viewshed (Hotels\_src): Viewshed

Parameters Environments Properties

▼ Output Coordinates

Output Coordinate System: WGS\_1972\_UTM\_Zone\_6S

Geographic Transformations: [Empty]

▼ Processing Extent

Extent: As Specified Below

Left: 189858.875 Right: 207706.5469

Bottom: 8052399 Top: 8065800.5

▼ Raster Analysis

Cell Size: 30

Cell Size Projection Method: Convert units

Mask: Land

Snap Raster: [Empty]

▼ Geodatabase

Output CONFIG Keyword: [Empty]

Auto Commit: 1000

▼ Raster Storage

Compression Type: LZ77

Title Size Width: 128

Height: 128

OK

## 5.5.3 Notes

The instructions for the viewshed tool claim that “The resulting viewshed raster has two value types indicating if an area can be seen (TRUE) or not (FALSE).” However, the tool generates a raster with values 1 through 9 which represent the number of observers who can view a particular cell. Therefore, the results of viewshed are saved to the ViewshedTemp raster and then the Con tool is used to transform this into a raster with values 0 and 1 where 0 represents false and 1 represents true. The results of the Con tool are stored as the Viewshed raster.

## 5.6 Flow Direction (Elevation) -> FlowDir

### 5.6.1 Parameters

Flow Direction (Elevation): Flow Direction

Parameters Environments Properties

Input surface raster: Elevation

Output flow direction raster: FlowDir

☐ Force all edge cells to flow outward

Output drop raster: [Empty]

Flow direction type: D8

OK

## 5.6.2 Environments

Flow Direction (Elevation): Flow Direction

Parameters **Environments** Properties ?

▼ **Output Coordinates**

Output Coordinate System  
WGS\_1972\_UTM\_Zone\_6S

Geographic Transformations

▼ **Processing Extent**

Extent As Specified Below

← 189858.875 → 207706.5469

↓ 8052399 ↑ 8065800.5

▼ **Parallel Processing**

Parallel Processing Factor

▼ **Raster Analysis**

Cell Size  
30

Cell Size Projection Method  
Convert units

Mask  
Land

Snap Raster

▼ **Geodatabase**

Output CONFIG Keyword

Auto Commit 1000

▼ **Raster Storage**

Compression Type LZ77

Tile Size Width 128 Height 128

OK

## 5.7 Reclassify (Streets) -> CostSurface

### 5.7.1 Parameters

Reclassify (Streets): Reclassify

Parameters **Environments** Properties ?

Input raster  
Streets

Reclass field  
VALUE

Reclassification

Start	End	New
0	1000000	1
NODATA	NODATA	4

Reverse New Values

Unique Classify

Output raster  
CostSurface

☐ Change missing values to NoData

OK

## 5.7.2 Environments

**Reclassify (Streets): Reclassify**

Parameters **Environments** Properties

▼ **Output Coordinates**

Output Coordinate System  
WGS\_1972\_UTM\_Zone\_6S

Geographic Transformations

▼ **Processing Extent**

Extent As Specified Below

← 189858.875 → 207706.5469

↓ 8052399 ↑ 8065800.5

▼ **Parallel Processing**

Parallel Processing Factor

▼ **Raster Analysis**

Cell Size  
30

Cell Size Projection Method  
Convert units

Mask  
Land

Snap Raster

▼ **Geodatabase**

Output CONFIG Keyword

Auto Commit 1000

▼ **Raster Storage**

Compression Type LZ77

Title Size Width 128 Height 128

OK

## 5.7.3 Notes

The instruction read “Use the Reclassify tool to reclassify all roads from the road raster with a length greater than 0 to 1, and all other cells to 4.” However, there is not Roads raster, I assume this refers to the Streets raster.

## 5.8 Commentary

Plant growth depends on sunlight, water, soil nutrients, and temperature among other factors. The slope, and its derived products: aspect, and calculated area solar radiation, indicate the amount of sunlight available to support plant growth at any given location. In addition, the slope, and its derived products: flow direction, flow accumulation, and streams, indicate the availability of water to support plant growth at any location. On the other hand, too much slope may lead to erosion and make an area unsuitable for agriculture. In addition, temperature is a function of elevation with higher temperatures that tend to produce increased plant growth occurring at lower elevation. Together these factors have a strong impact on the potential agricultural productivity and resulting profitability of an area and therefore play an important role in determining the agricultural suitability of an area. However, precipitation is an important factor that seems to be missing from the model.

## 6 Level 3

### 6.1 Basin (FlowDir) -> Basin

#### 6.1.1 Parameters

The screenshot shows the 'Basin (FlowDir): Basin' dialog box with the 'Parameters' tab selected. It contains two input fields: 'Input D8 flow direction raster' set to 'FlowDir' and 'Output raster' set to 'Basin'. There is an 'OK' button at the bottom right.

#### 6.1.2 Environments

The screenshot shows the 'Basin (FlowDir): Basin' dialog box with the 'Environments' tab selected. It contains several sections: 'Output Coordinates' with 'Output Coordinate System' set to 'WGS\_1972\_UTM\_Zone\_6S'; 'Processing Extent' with 'Extent' set to 'As Specified Below' and numerical values for left, right, top, and bottom; 'Raster Analysis' with 'Cell Size' set to '30', 'Cell Size Projection Method' set to 'Convert units', 'Mask' set to 'Land', and 'Snap Raster' set to an empty field; 'Geodatabase' with 'Output CONFIG Keyword' set to an empty field and 'Auto Commit' set to '1000'; and 'Raster Storage' with 'Compression' set to 'LZ77' and 'Tile Size' set to '128'. There is an 'OK' button at the bottom right.

### 6.2 Flow Accumulation (FlowDir) -> FlowAcc

#### 6.2.1 Parameters

The screenshot shows the 'Flow Accumulation (FlowDir): Flow Accumulation' dialog box with the 'Parameters' tab selected. It contains five input fields: 'Input flow direction raster' set to 'FlowDir', 'Output accumulation raster' set to 'FlowAcc', 'Input weight raster' set to an empty field, 'Output data type' set to 'Float', and 'Input flow direction type' set to 'D8'. There is an 'OK' button at the bottom right.

## 6.2.2 Environments

Flow Accumulation (FlowDir): Flow Accumulation

Parameters Environments Properties

▼ Output Coordinates

Output Coordinate System  
WGS\_1972\_UTM\_Zone\_6S

Geographic Transformations

▼ Processing Extent

Extent As Specified Below

← 189858.875 → 207706.5469

↓ 8052399 ↑ 8065800.5

▼ Parallel Processing

Parallel Processing Factor

▼ Raster Analysis

Cell Size  
30

Cell Size Projection Method  
Convert units

Mask  
Land

Snap Raster

▼ Geodatabase

Output CONFIG Keyword

Auto Commit 1000

▼ Raster Storage

Compression Type LZ77

Tile Size Width 128 Height 128

OK

## 6.3 Reclassify (SolarRadiation) -> SolarPotential

### 6.3.1 Parameters

Reclassify (SolarRadiation): Reclassify

Parameters Environments Properties

Input raster  
SolarRadiation

Reclass field  
VALUE

Reclassification

Start	End	New
270184.5	329663.215278	1
329663.215278	389141.930556	2
389141.930556	448620.645833	3
448620.645833	508099.361111	4
508099.361111	567578.076389	5
567578.076389	627056.791667	6
627056.791667	686535.506944	7
686535.506944	746014.222222	8
746014.222222	805492.9375	9
NODATA	NODATA	NODATA

Unique Classify

Output raster  
SolarPotential

☐ Change missing values to NoData

OK

## 6.3.2 Environments

**Reclassify (SolarRadiation): Reclassify**

Parameters **Environments** Properties

**Output Coordinates**

Output Coordinate System: WGS\_1972\_UTM\_Zone\_6S

Geographic Transformations: [Empty]

**Processing Extent**

Extent: As Specified Below

Left: 189858.875 Right: 207706.5469

Bottom: 8052399 Top: 8065800.5

**Parallel Processing**

Parallel Processing Factor: [Empty]

**Raster Analysis**

Cell Size: 30

Cell Size Projection Method: Convert units

Mask: Land

Snap Raster: [Empty]

**Geodatabase**

Output CONFIG Keyword: [Empty]

Auto Commit: 1000

**Raster Storage**

Compression Type: LZ77

Tile Size: Width 128 Height 128

OK

## 6.4 Filter (Slope) -> Filter

### 6.4.1 Parameters

**Filter (Slope): Filter**

Parameters **Environments** Properties

Input raster: Slope

Output raster: Filter

Filter type: Low pass

☒ Ignore NoData in calculations

OK

## 6.4.2 Environments

Filter (Slope): Filter

Parameters Environments Properties

Output Coordinates

Output Coordinate System  
PROJCS["WGS\_1972\_UTM\_Zone\_6S",GEOGCS["GCS\_WGS\_1972",PRIMEM["Greenwich",0],UNIT["Meter",1]]]

Geographic Transformations

Processing Extent

Extent As Specified Below

189858.875 207706.5469

8052399 8065800.5

Raster Analysis

Cell Size 30

Cell Size Projection Method Convert units

Mask Land

Snap Raster

Geodatabase

Output CONFIG Keyword

Auto Commit 1000

Raster Storage

Tile Size Width 128 Height 128

OK

## 6.5 Con (GroundLevel) -> VisTemp

### 6.5.1 Parameters

Con (GroundLevel): Con

Parameters Environments Properties

Input conditional raster  
GroundLevel

Expression

Load Save Remove

SQL

Where VALUE is greater 10

+ Add Clause

Input true raster or constant value  
constant value = (1)

Input false raster or constant value  
constant value = (9)

Output raster  
VisTemp

OK

## 6.5.2 Environments

Con (GroundLevel): Con

Parameters **Environments** Properties ?

▼ Output Coordinates

Output Coordinate System  
PROJCS['WGS\_1972\_UTM\_Zone\_65',GEOGCS['GCS\_WGS\_1972',PRD...

Geographic Transformations  
[Empty]

▼ Processing Extent

Extent As Specified Below

← 189858.875 → 207706.5469

↓ 8052399 ↑ 8065800.5

▼ Raster Analysis

Cell Size 30

Cell Size Projection Method  
Convert units

Mask  
Land

Snap Raster  
[Empty]

▼ Geodatabase

Output CONFIG Keyword  
[Empty]

Auto Commit 1000

▼ Raster Storage

Compression Type LZ77

Tile Size Width 128

Height 128

OK

## 6.6 Con (ViewshedTemp) -> Viewshed

### 6.6.1 Parameters

Con (ViewshedTemp): Con

Parameters **Environments** Properties ?

Input conditional raster  
ViewshedTemp2

Expression  
[Empty]

Load Save Remove

SQL ☐

Where Value is not 0

+ Add Clause

Input true raster or constant value  
constant value (1)

Input false raster or constant value  
constant value (0)

Output raster  
Viewshed

OK



## 6.6.2 Environments

Con (ViewshedTemp): Con

Parameters **Environments** Properties

▼ **Output Coordinates**

Output Coordinate System  
WGS\_1972\_UTM\_Zone\_6S

Geographic Transformations

▼ **Processing Extent**

Extent As Specified Below

← 189858.875 → 207706.5469

↓ 8052399 ↑ 8065800.5

▼ **Raster Analysis**

Cell Size  
30

Cell Size Projection Method  
Convert units

Mask  
Land

Snap Raster

▼ **Geodatabase**

Output CONFIG Keyword

Auto Commit 1000

▼ **Raster Storage**

Compression Type LZ77

Title Size Width 128

Height 128

OK

## 6.7 Cost Distance (PortFacility, CostSurface) -> AccessTemp

### 6.7.1 Parameters

Cost Distance (PortFacility, CostSurface): Cost Distan

Parameters **Environments** Properties

Input raster or feature source data  
PortFacility

Input cost raster  
CostSurface

Output distance raster  
AccessTemp

Maximum distance

Output backlink raster

Source Characteristics

OK

## 6.7.2 Environments

Cost Distance (PortFacility, CostSurface): Cost Distan ×

Parameters Environments Properties ?

▼ Output Coordinates

Output Coordinate System  
WGS\_1972\_UTM\_Zone\_6S

Geographic Transformations

▼ Processing Extent

Extent As Specified Below

← 189858.875 → 207706.5469

↓ 8052399 ↑ 8065800.5

▼ Parallel Processing

Parallel Processing Factor

▼ Raster Analysis

Cell Size  
30

Cell Size Projection Method  
Convert units

Mask  
Land

Snap Raster

▼ Geodatabase

Output CONFIG Keyword

Auto Commit 1000

▼ Raster Storage

Compression Type LZ77

Tile Size Width 128 Height 128

OK

## 6.8 Commentary

As mentioned above the hydrological products derived from the elevation and slope have a strong impact on potential plant growth. In addition, the derived products: flow direction, flow accumulation, stream order, and basins, predict how agricultural runoff, such as pesticides, fertilizers, and eroded soil, will move through the environment and help predict what downstream areas, communities, and ecosystems could be affected by potential agricultural development. The sink geoprocessing tool could be used to predict areas where contaminants may accumulate. In addition, it would be useful to model water retention based on soil type and vegetation.

The basin tool indicates that there are many small basins along the coastline of the island. This makes sense because the small streams that drain these areas reach the ocean before they can join larger streams and form part of a bigger basin. An alternate approach to extract only the large basins might be to use the raster-to-polygon tool to convert the raster basin layer to a vector layer. Then you could select the basin polygons by area. Another way to create a similar dataset would be to use the watershed geoprocessing tool.

## 7 Level 4

### 7.1 Con (Basin) -> cellsize900m

#### 7.1.1 Parameters

The screenshot shows the 'Con (Basin): Con' dialog box with the 'Parameters' tab selected. The 'Input conditional raster' is set to 'Basin'. The 'Expression' section has a 'Where' clause: 'OBJECTID is greater than 0'. The 'Input true raster or constant value' is set to 'constant value (900)'. The 'Input false raster or constant value' is also set to 'constant value (900)'. The 'Output raster' is set to 'cellsize900m'. The 'SQL' toggle is turned off. The 'OK' button is at the bottom right.

#### 7.1.2 Environments

The screenshot shows the 'Con (Basin): Con' dialog box with the 'Environments' tab selected. The 'Output Coordinates' section shows 'Output Coordinate System' as 'PROJCS["WGS\_1972\_UTM\_Zone\_6S",GEOGCS["GCS\_WGS\_1972",Datum["NAD83",Spheroid["WGS84",6378137,0.0000000000000001,0.0000000000000001,0.0000000000000001,0.0000000000000001,0.0000000000000001,0.0000000000000001,0.0000000000000001],PrimeMeridian["Greenwich",0],Unit["Meter",1]]],Projection["Transverse\_Mercator",0,0,0,0,0,0]]' and 'Geographic Transformations' as an empty dropdown. The 'Processing Extent' section shows 'Extent' as 'As Specified Below' with coordinates: 189858.875, 207706.5469, 8052399, and 8065800.5. The 'Raster Analysis' section shows 'Cell Size' as 30, 'Cell Size Projection Method' as 'Convert units', 'Mask' as 'Land', and 'Snap Raster' as an empty dropdown. The 'Geodatabase' section shows 'Output CONFIG Keyword' as an empty text box and 'Auto Commit' as 1000. The 'Raster Storage' section shows 'Compression' as 'Type: LZ77' and 'Tile Size' as 'Width: 128'. The 'Height' is also set to 128. The 'OK' button is at the bottom right.

## 7.2 Reclassify (FlowAcc) -> Streams

### 7.2.1 Parameters

**Reclassify (FlowAcc): Reclassify**

Parameters   Environments   Properties

Input raster  
FlowAcc

Reclass field  
Value

Reclassification

Start	End	Reverse New Values
0	200	NODATA
200	1000000	1
NODATA	NODATA	NODATA

Unique   Classify

Output raster  
Streams

☐ Change missing values to NoData

OK

### 7.2.2 Environments

Reclassify (FlowAcc): Reclassify

Parameters

Environments

Properties

?

▼

Output Coordinates

Output Coordinate System

PROJCS[WGS\_1972\_UTM\_Zone\_6S',GEOGCS[GCS\_WGS\_1983],PRIM

Geographic Transformations

▼

▼

Processing Extent

Extent

As Specified Below

189858.875

207706.5469

8052399

8065800.5

▼

Parallel Processing

Parallel Processing Factor

▼

Raster Analysis

Cell Size

30

Cell Size Projection Method

Convert units

Mask

Land

Snap Raster

▼

Geodatabase

Output CONFIG Keyword

Auto Commit

1000

▼

Raster Storage

Compression

Type

LZ77

Tile Size

Width

128

Height

128

OK

### 7.3 Reclassify (Filter) -> ErosionSuitability

### 7.3.1 Parameters

Reclassify (Filter): Reclassify

Parameters Environments Properties

Input raster  
Filter:2

Reclass field  
VALUE

Reclassification

Start	End	New
0	7.074371	9
7.074371	14.14621	8
14.14621	21.218049	7
21.218049	28.289888	6
28.289888	35.361726	5
35.361726	42.433565	4
42.433565	49.505404	3
49.505404	56.577243	2
56.577243	1000000	1
NODATA	NODATA	NODATA

Unique Classify

Output raster  
ErosionSuitability

☐ Change missing values to NoData

OK

## 7.3.2 Environments

Reclassify (Filter): Reclassify

Parameters Environments Properties

Output Coordinates

Output Coordinate System  
PROJCS['WGS\_1972\_UTM\_Zone\_6S',GEOGCS['GCS\_WGS\_1984',PRIMES[...]]]

Geographic Transformations

Processing Extent

Extent As Specified Below

189858.875 207706.5469

8052399 8065800.5

Parallel Processing

Parallel Processing Factor

Raster Analysis

Cell Size 30

Cell Size Projection Method Convert units

Mask Land

Snap Raster

Geodatabase

Output CONFIG Keyword

Auto Commit 1000

Raster Storage

Compression Type LZ77

Title Size Width 128 Height 128

OK

## 7.3.3 Notes

With the default equal interval classification methods when I specified 9 classes, I found that I would get 10 classes in the output raster because 0 was included. For some reason there are some pixels which have a value lower than the bottom of the range generated by this tool. To avoid this issue, I modified the upper and lower limits for the ranges generated by the equal interval classification method to 0 and 1,000,000 respectively.

## 7.4 Int (VisTemp) -> Visibility

### 7.4.1 Parameters

The screenshot shows the 'Parameters' tab of the 'Int (VisTemp): Int' dialog. It has a title bar with a close button. Below the title bar are three tabs: 'Parameters' (selected), 'Environments', and 'Properties'. A help icon (?) is on the right. The 'Input raster or constant value' section has a dropdown menu set to 'VisTemp' and a folder icon. The 'Output raster' section has a text field set to 'Visibility' and a folder icon. At the bottom right is an 'OK' button and a help icon.

### 7.4.2 Environments

The screenshot shows the 'Environments' tab of the 'Int (VisTemp): Int' dialog. It has a title bar with a close button. Below the title bar are three tabs: 'Parameters', 'Environments' (selected), and 'Properties'. A help icon (?) is on the right. The 'Output Coordinates' section is expanded, showing 'Output Coordinate System' with a dropdown set to 'PROJCS["WGS\_1972\_UTM\_Zone\_6S",GEOGCS["GCS\_WGS\_1972",...]]' and a globe icon, and 'Geographic Transformations' with a dropdown. The 'Processing Extent' section is expanded, showing 'Extent' with a dropdown set to 'As Specified Below', and four input fields for coordinates: 189858.875, 207706.5469, 8052399, and 8065800.5. The 'Raster Analysis' section is expanded, showing 'Cell Size' with a dropdown set to '30', 'Cell Size Projection Method' with a dropdown set to 'Convert units', 'Mask' with a dropdown set to 'Land', and 'Snap Raster' with a dropdown. The 'Geodatabase' section is expanded, showing 'Output CONFIG Keyword' with a text field, 'Auto Commit' with a checkbox checked, and 'Raster Storage' section expanded, showing 'Compression' with a dropdown set to 'LZ77' and 'Tile Size' with a dropdown set to '128'. At the bottom right is an 'OK' button and a help icon.

### 7.4.3 Notes

Is this step necessary? It looks like the *VisTemp* layer was already in integer format.

## 7.5 Reclassify (AccessTemp) -> Accessibility

### 7.5.1 Parameters

Reclassify (AccessTemp): Reclassify

Parameters Environments Properties ?

Input raster  
AccessTemp

Reclass field  
VALUE

Reclassification

Start	End	New
0	2792.008681	9
2792.008681	5584.017361	8
5584.017361	8376.026042	7
8376.026042	11168.034722	6
11168.034722	13960.043403	5
13960.043403	16752.052083	4
16752.052083	19544.060764	3
19544.060764	22336.069444	2
22336.069444	25128.078125	1
NODATA	NODATA	NODATA

Unique Classify

Output raster  
Accessibility

☐ Change missing values to NoData

OK

### 7.5.2 Environments

Reclassify (AccessTemp): Reclassify

Parameters Environments Properties ?

Output Coordinates

Output Coordinate System  
PROJCS['WGS\_1972\_UTM\_Zone\_65',GEOGCS['GCS\_WGS\_1984',PRIMEM['Greenwich',0],UNIT['Meter',1]]

Geographic Transformations

Processing Extent

Extent As Specified Below

189858.875 207706.5469

8052399 8065800.5

Parallel Processing

Parallel Processing Factor

Raster Analysis

Cell Size 30

Cell Size Projection Method Convert units

Mask Land

Snap Raster

Geodatabase

Output CONFIG Keyword

Auto Commit 1000

Raster Storage

Compression Type LZ77

Tile Size Width 128 Height 128

OK

## 8 Level 5

### 8.1 Zonal Statistics (Basin, cellsize900m) -> BasinBySize

#### 8.1.1 Parameters

Zonal Statistics (Basin, cellsize900m): Zonal Statistics ×

Parameters Environments Properties ?

Input raster or feature zone data  
Basin

Zone field  
VALUE

Input value raster  
cellsize900m

Output raster  
BasinsBySize

Statistics type  
Sum

☒ Ignore NoData in calculations  
☐ Process as multidimensional

OK

#### 8.1.2 Environments

Zonal Statistics (Basin, cellsize900m): Zonal Statistics ×

Parameters Environments Properties ?

▼ Output Coordinates  
Output Coordinate System  
PROJCS['WGS\_1972\_UTM\_Zone\_6S',GEOGCS['GCS\_WGS\_1984',DATUM['D\_WGS\_1984',SPHEROID['WGS\_1984',6378137,298.257223563],AUTHORITY['EPSG:4326']],PRIMEM['Greenwich',0],UNIT['Meter',1],AUTHORITY['EPSG:31466']],PROJECTION['Transverse\_Mercator'],PARAMETERS['Scale\_Factor=0.9996',False,0,0,0,0],UNIT['Meter',1],AUTHORITY['EPSG:31466']]

Geographic Transformations  
None

▼ Processing Extent  
Extent As Specified Below  
Left: 189858.875 Right: 207706.5469  
Bottom: 8052399 Top: 8065800.5

▼ Parallel Processing  
Parallel Processing Factor  
1

▼ Raster Analysis  
Cell Size  
30  
Cell Size Projection Method  
Convert units  
Mask  
Land  
Snap Raster  
None

▼ Geodatabase  
Output CONFIG Keyword  
None  
Auto Commit  
1000

▼ Raster Storage  
Compression Type LZ77  
Tile Size Width 128 Height 128

OK



## 8.2 Stream Order (Streams, FlowDir) -> StreamOrder

### 8.2.1 Parameters

The screenshot shows the 'Parameters' tab of the 'Stream Order (Streams, FlowDir): Stream Order' dialog box. It contains the following fields:

- Input stream raster:** A dropdown menu with 'Streams' selected.
- Input flow direction raster:** A dropdown menu with 'FlowDir' selected.
- Output raster:** A text field containing 'StreamOrder'.
- Method of stream ordering:** A dropdown menu with 'Strahler' selected.

At the bottom right is an 'OK' button.

### 8.2.2 Environments

The screenshot shows the 'Environments' tab of the 'Stream Order (Streams, FlowDir): Stream Order' dialog box. It contains several expandable sections:

- Output Coordinates:**
  - Output Coordinate System:** A text field containing 'PROJCS["WGS\_1972\_UTM\_Zone\_6S",GEOGCS["GCS\_WGS\_1972",DATUM["WGS\_1972",SPHEROID["WGS\_1972",6378137,0],UNIT["Meter",1],AUTHORITY["EPSG",4326]]]]'.
  - Geographic Transformations:** A dropdown menu.
- Processing Extent:**
  - Extent:** A dropdown menu with 'As Specified Below' selected.
  - Left:** A text field containing '189858.875'.
  - Right:** A text field containing '207706.5469'.
  - Bottom:** A text field containing '8052399'.
  - Top:** A text field containing '8065800.5'.
- Raster Analysis:**
  - Cell Size:** A text field containing '30'.
  - Cell Size Projection Method:** A dropdown menu with 'Convert units' selected.
  - Mask:** A dropdown menu with 'Land' selected.
  - Snap Raster:** A dropdown menu.
- Geodatabase:**
  - Output CONFIG Keyword:** A text field.
  - Auto Commit:** A text field containing '1000'.
- Raster Storage:**
  - Compression:** A dropdown menu with 'Type LZ77' selected.
  - Tile Size:** A text field containing '128'.

At the bottom, there is a 'Height' text field containing '128' and an 'OK' button.

## 8.3 Euclidean Distance (Streams) -> EucDist

### 8.3.1 Parameters

The screenshot shows the 'Parameters' tab of the 'Euclidean Distance (Streams): Euclidean Distance' dialog box. The 'Input raster or feature source data' is set to 'Streams'. The 'Output distance raster' is 'EucDist'. The 'Input raster or feature barrier data' is empty. The 'Maximum distance' is empty. The 'Output cell size' is '30'. The 'Distance Method' is 'Planar'. The 'Output direction raster' and 'Out back direction raster' are empty. An 'OK' button is at the bottom right.

### 8.3.2 Environments

The screenshot shows the 'Environments' tab of the 'Euclidean Distance (Streams): Euclidean Distance' dialog box. The 'Output Coordinates' section shows 'Output Coordinate System' as 'PROJCS[WGS\_1972\_UTM\_Zone\_65'. The 'Processing Extent' section shows 'Extent' as 'As Specified Below' with coordinates: 189858.875, 207706.5469, 8052399, and 8065800.5. The 'Parallel Processing' section shows 'Parallel Processing Factor' as empty. The 'Raster Analysis' section shows 'Cell Size' as '30', 'Cell Size Projection Method' as 'Convert units', 'Mask' as 'Land', and 'Snap Raster' as empty. The 'Geodatabase' section shows 'Output CONFIG Keyword' as empty and 'Auto Commit' as '1000'. The 'Raster Storage' section shows 'Compression' as 'Type LZ77', 'Tile Size' as 'Width 128' and 'Height 128'. An 'OK' button is at the bottom right.

## 9 Level 6

### 9.1 Con (Basin, BasinBySize) -> LargeBasin

#### 9.1.1 Parameters

Con (Basin, BasinsBySize): Con

Parameters Environments Properties

Input conditional raster  
BasinsBySize

Expression  
Load Save Remove

SQL ☐

Where VALUE is greater 200000

+ Add Clause

Input true raster or constant value  
Basin

Input false raster or constant value

Output raster  
LargeBasins

OK

#### 9.1.2 Environments

Con (Basin, BasinsBySize): Con

Parameters Environments Properties

Output Coordinates

Output Coordinate System  
PROJCS['WGS\_1972\_UTM\_Zone\_6S',GEOGCS['GCS\_WGS\_1972',PRIMES['Greenwich Meridian',UNIT['Meter',1],AUTHORITY['EPSG',31466]],PROJ4['PROJ4'],TOWGS84[0,0,0,0,0,0,0,0,0,0],AUTHORITY['EPSG',31466]]]

Geographic Transformations

Processing Extent

Extent As Specified Below

189858.875 207706.5469

8052399 8065800.5

Raster Analysis

Cell Size 30

Cell Size Projection Method Convert units

Mask Land

Snap Raster

Geodatabase

Output CONFIG Keyword

Auto Commit 1000

Raster Storage

Compression Type LZ77

Tile Size Width 128

Height 128


OK

## 9.2 Reclassify (EucDist) -> RiperianSuitability

### 9.2.1 Parameters

## Reclassify (Euclid): Reclassify

Parameters    Environments    Properties    ?




Input raster  
 


Reclass field

Reclassification

Reverse New Values

Start	End	New
0	178.667914	1
178.667914	357.335829	2
357.335829	536.003743	3
536.003743	714.671658	4
714.671658	893.339572	5
893.339572	1072.007487	6
1072.007487	1250.675401	7
1250.675401	1429.343316	8
1429.343316	1608.01123	9
NODATA	NODATA	NODATA

Unique    Classify      

Output raster  
 

☐ Change missing values to NoData

OK

### 9.2.2 Environments

Reclassify (Euclid): Reclassify

Parameters

Environments

Properties

?

▼ Output Coordinates

Output Coordinate System

PROJCS[WGS\_1972\_UTM\_Zone\_6S,GEOGCS[GCS\_WGS\_1983,PR

Geographic Transformations

▼ Processing Extent

Extent

As Specified Below

189858.875 207706.5469

8052399 8065800.5

▼ Parallel Processing

Parallel Processing Factor

▼ Raster Analysis

Cell Size

30

Cell Size Projection Method

Convert units

Mask

Land

Snap Raster

▼ Geodatabase

Output CONFIG Keyword

Auto Commit

1000

▼ Raster Storage

Compression

Type LZW

Title Size

Width 128

Height 128

OK

### 9.3 Notes

The instructions say 'Reclassify the resulting raster, using the quantile method, with 9 breaks. Name the output "RiparianSuitability." Areas nearest streams should have low values of 1, areas farthest away a

value of 9.' However, the reclassify tool only allows equal interval classification so this method was used instead.

## 10 Level 7

### 10.1 Weighted Sum (Solar Potential, ErosionSuitability, RiparianSuitability, Accessibility, Visibility) -> AgriculturalSuitability

#### 10.1.1 Parameters

The screenshot shows the 'Parameters' tab of the 'Weighted Sum' tool. It lists five input rasters with their respective fields and weights:

Raster	Field	Weight
Accessibility:2	Value	0.3
ErosionSuitability:2	Value	0.15
RiparianSuitability:2	VALUE	0.1
SolarPotential:2	Value	0.25
Visibility:2	Value	0.2

The 'Output raster' is set to 'AgriculturalSuitability'. An 'Add another' button is visible below the input rasters.

#### 10.1.2 Environments

The screenshot shows the 'Environments' tab of the 'Weighted Sum' tool. It contains several sections for configuring the tool's environment:

- Output Coordinates:** Output Coordinate System is set to 'PROJCS["WGS\_1972\_UTM\_Zone\_6S",GEOGCS["GCS\_WGS\_1972",...]]'. Geographic Transformations is empty.
- Processing Extent:** Extent is set to 'As Specified Below'. The bounding box is defined by coordinates: 189858.875 (left), 207706.5469 (right), 8052399 (bottom), and 8065800.5 (top).
- Parallel Processing:** Parallel Processing Factor is set to 1.
- Raster Analysis:** Cell Size is 30. Cell Size Projection Method is 'Convert units'. Mask is 'Land'. Snap Raster is empty.
- Geodatabase:** Output CONFIG Keyword is empty. Auto Commit is set to 1000.



## 11 Output from Sample Run

Executing (Topo to Raster (Contours, SpotElevations)): TopoToRaster

"C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\source\_data\Contours CONTOUR

Contour;C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\source\_data\SpotElevations Z PointElevation"

C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Elevation 30 "189858.875 8052399 207706.5469 8065800.5" 20

# # Enforce Contour 20 # 1 0 2.5 100 # # # # #

Start Time: Wednesday, May 12, 2021 12:42:42 PM

Succeeded at Wednesday, May 12, 2021 12:42:54 PM (Elapsed Time: 12.38 seconds)

Executing (Aspect (Elevation)): Aspect C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Elevation

C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Aspect Planar Meter GEODESIC\_AZIMUTHS

Start Time: Wednesday, May 12, 2021 12:42:54 PM

Succeeded at Wednesday, May 12, 2021 12:42:56 PM (Elapsed Time: 1.33 seconds)

Executing (HillShade (Elevation)): HillShade C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Elevation

C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\HillShade 315 45 NO\_SHADOWS 1

Start Time: Wednesday, May 12, 2021 12:42:56 PM

Succeeded at Wednesday, May 12, 2021 12:42:58 PM (Elapsed Time: 2.13 seconds)

Executing (Area Solar Radiation (Elevation)): AreaSolarRadiation

C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Elevation

C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\SolarRadiation -17.534112320862363 200 "MultiDays 2021 5

160" 14 0.5 NOINTERVAL 1 "From the input surface raster" 32 8 8 "Uniform overcast sky" 0.3 0.5 # # #

Start Time: Wednesday, May 12, 2021 12:42:59 PM

Succeeded at Wednesday, May 12, 2021 12:43:34 PM (Elapsed Time: 34.78 seconds)

Executing (Flow Direction (Elevation)): FlowDirection C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Elevation

C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\FlowDir NORMAL # D8

Start Time: Wednesday, May 12, 2021 12:43:34 PM

2021-05-12T12:43:34.852: Initialization Phase ...

2021-05-12T12:43:34.982: Completion Phase ...

Succeeded at Wednesday, May 12, 2021 12:43:35 PM (Elapsed Time: 1.28 seconds)

Executing (Flow Accumulation (FlowDir)): FlowAccumulation

C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\FlowDir

C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\FlowAcc # Float D8

Start Time: Wednesday, May 12, 2021 12:43:36 PM

2021-05-12T12:43:37.139: Initialization Phase ...

2021-05-12T12:43:37.381: Completion Phase ...

Succeeded at Wednesday, May 12, 2021 12:43:37 PM (Elapsed Time: 1.68 seconds)

Executing (Reclassify (FlowAcc)): Reclassify C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\FlowAcc Value "0

200 NODATA;200 1000000 1" C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Streams DATA

Start Time: Wednesday, May 12, 2021 12:43:38 PM

Succeeded at Wednesday, May 12, 2021 12:43:39 PM (Elapsed Time: 1.32 seconds)

Executing (Stream Order (Streams, FlowDir)): StreamOrder

C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Streams

C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\FlowDir

C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\StreamOrder Strahler

Start Time: Wednesday, May 12, 2021 12:43:40 PM

Succeeded at Wednesday, May 12, 2021 12:43:42 PM (Elapsed Time: 2.43 seconds)

Executing (Basin (FlowDir)): Basin C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\FlowDir  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Basin  
Start Time: Wednesday, May 12, 2021 12:43:43 PM  
Succeeded at Wednesday, May 12, 2021 12:43:45 PM (Elapsed Time: 2.16 seconds)

Executing (Con (Basin)): Con C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Basin 900  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\cellsize900m 900 "OBJECTID > 0"  
Start Time: Wednesday, May 12, 2021 12:43:46 PM  
Succeeded at Wednesday, May 12, 2021 12:43:47 PM (Elapsed Time: 1.55 seconds)

Executing (Zonal Statistics (Basin, cellsize900m)): ZonalStatistics  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Basin VALUE  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\cellsize900m  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\BasinsBySize Sum DATA CURRENT\_SLICE 90 Auto-detect  
Start Time: Wednesday, May 12, 2021 12:43:48 PM  
Succeeded at Wednesday, May 12, 2021 12:43:49 PM (Elapsed Time: 1.32 seconds)

Executing (Con (Basin, BasinsBySize)): Con C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\BasinsBySize  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Basin  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\LargeBasins # "VALUE > 200000"  
Start Time: Wednesday, May 12, 2021 12:43:50 PM  
Succeeded at Wednesday, May 12, 2021 12:43:51 PM (Elapsed Time: 1.47 seconds)

Executing (Feature to Raster (LandUse\_src)): FeatureToRaster  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\source\_data\LandUse\_src NAME  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\LandUse 30  
Start Time: Wednesday, May 12, 2021 12:43:52 PM  
Succeeded at Wednesday, May 12, 2021 12:43:54 PM (Elapsed Time: 1.64 seconds)

Executing (Feature to Raster (Hotels\_src)): FeatureToRaster  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\source\_data\Hotels\_src NAME  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Hotels 30  
Start Time: Wednesday, May 12, 2021 12:43:54 PM  
Succeeded at Wednesday, May 12, 2021 12:43:56 PM (Elapsed Time: 1.43 seconds)

Executing (Viewshed (Hotels\_src)): Viewshed C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Elevation  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\source\_data\Hotels\_src  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\ViewshedTemp 1 FLAT\_EARTH 0.13  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\GroundLevel  
Start Time: Wednesday, May 12, 2021 12:43:56 PM  
Succeeded at Wednesday, May 12, 2021 12:44:05 PM (Elapsed Time: 9.04 seconds)

Executing (Con (ViewshedTemp)): Con C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\ViewshedTemp 1  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Viewshed 0 "Value < > 0"  
Start Time: Wednesday, May 12, 2021 12:44:06 PM  
Succeeded at Wednesday, May 12, 2021 12:44:07 PM (Elapsed Time: 1.46 seconds)

Executing (Euclidean Distance (Streams)): EucDistance C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Streams  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\EucDist # 30 # Planar # #  
Start Time: Wednesday, May 12, 2021 12:44:08 PM  
2021-05-12T12:44:09.370: Initialization Phase ...  
2021-05-12T12:44:09.589: Completion Phase ...

Succeeded at Wednesday, May 12, 2021 12:44:10 PM (Elapsed Time: 1.54 seconds)

Executing (Feature to Raster (Roads)): FeatureToRaster  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\source\_data\Roads Shape\_Length  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Streets 30  
Start Time: Wednesday, May 12, 2021 12:44:10 PM  
Succeeded at Wednesday, May 12, 2021 12:44:11 PM (Elapsed Time: 1.42 seconds)

Executing (Reclassify (Streets)): Reclassify C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Streets VALUE "0  
1000000 1;NODATA 4" C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\CostSurface DATA

Start Time: Wednesday, May 12, 2021 12:44:12 PM

Succeeded at Wednesday, May 12, 2021 12:44:13 PM (Elapsed Time: 1.63 seconds)

Executing (Cost Distance (PortFacility, CostSurface)): CostDistance  
 C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\source\_data\PortFacility  
 C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\CostSurface  
 C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\AccessTemp # # # # #

Start Time: Wednesday, May 12, 2021 12:44:14 PM

2021-05-12T12:44:15.239: Initialization Phase ...

2021-05-12T12:44:15.435: Completion Phase ...

Succeeded at Wednesday, May 12, 2021 12:44:15 PM (Elapsed Time: 1.55 seconds)

Executing (Reclassify (AccessTemp)): Reclassify C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\AccessTemp  
 VALUE "0 2792.008681 9;2792.008681 5584.017361 8;5584.017361 8376.026042 7;8376.026042 11168.034722  
 6;11168.034722 13960.043403 5;13960.043403 16752.052083 4;16752.052083 19544.060764 3;19544.060764  
 22336.069444 2;22336.069444 25128.078125 1" C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Accessibility  
 DATA

Start Time: Wednesday, May 12, 2021 12:44:16 PM

Succeeded at Wednesday, May 12, 2021 12:44:17 PM (Elapsed Time: 1.33 seconds)

Executing (Slope (Elevation)): Slope C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Elevation  
 C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Slope Degree 1 Planar Meter

Start Time: Wednesday, May 12, 2021 12:44:17 PM

Succeeded at Wednesday, May 12, 2021 12:44:19 PM (Elapsed Time: 1.51 seconds)

Executing (Filter (Slope)): Filter C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Slope  
 C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Filter "Low pass" DATA

Start Time: Wednesday, May 12, 2021 12:44:19 PM

Succeeded at Wednesday, May 12, 2021 12:44:21 PM (Elapsed Time: 1.27 seconds)

Executing (Reclassify (Filter)): Reclassify C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Filter VALUE "0  
 7.074371 9;7.074371 14.146210 8;14.146210 21.218049 7;21.218049 28.289888 6;28.289888 35.361726 5;35.361726  
 42.433565 4;42.433565 49.505404 3;49.505404 56.577243 2;56.577243 1000000 1"  
 C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\ErosionSuitability DATA

Start Time: Wednesday, May 12, 2021 12:44:21 PM

Succeeded at Wednesday, May 12, 2021 12:44:23 PM (Elapsed Time: 1.59 seconds)

Executing (Reclassify (EucDist)): Reclassify C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\EucDist VALUE "0  
 178.667914 1;178.667914 357.335829 2;357.335829 536.003743 3;536.003743 714.671658 4;714.671658 893.339572  
 5;893.339572 1072.007487 6;1072.007487 1250.675401 7;1250.675401 1429.343316 8;1429.343316 1608.011230 9"  
 C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\RiperianSuitability DATA

Start Time: Wednesday, May 12, 2021 12:44:23 PM

Succeeded at Wednesday, May 12, 2021 12:44:25 PM (Elapsed Time: 1.38 seconds)

Executing (Reclassify (SolarRadiation)): Reclassify  
 C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\SolarRadiation VALUE "270184.500000 329663.215278  
 1;329663.215278 389141.930556 2;389141.930556 448620.645833 3;448620.645833 508099.361111 4;508099.361111  
 567578.076389 5;567578.076389 627056.791667 6;627056.791667 686535.506944 7;686535.506944 746014.222222  
 8;746014.222222 805492.937500 9" C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\SolarPotential DATA

Start Time: Wednesday, May 12, 2021 12:44:25 PM

Succeeded at Wednesday, May 12, 2021 12:44:27 PM (Elapsed Time: 1.31 seconds)

Executing (Con (GroundLevel)): Con C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\GroundLevel 1  
 C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\VisTemp 9 "VALUE > 10"

Start Time: Wednesday, May 12, 2021 12:44:27 PM

Succeeded at Wednesday, May 12, 2021 12:44:29 PM (Elapsed Time: 1.40 seconds)

Executing (Int (VisTemp)): Int C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\VisTemp  
 C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Visibility

Start Time: Wednesday, May 12, 2021 12:44:29 PM

Succeeded at Wednesday, May 12, 2021 12:44:31 PM (Elapsed Time: 1.58 seconds)



Executing (Weighted Sum): WeightedSum "C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Accessibility Value  
0.3;C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\ErosionSuitability Value  
0.15;C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\RiparianSuitability VALUE  
0.1;C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\SolarPotential Value  
0.25;C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\Visibility Value 0.2"  
C:\ArcGISProjects\GIST53\Lab5\RasterAnalysis\_CP.gdb\AgriculturalSuitability

Start Time: Wednesday, May 12, 2021 12:44:32 PM

Succeeded at Wednesday, May 12, 2021 12:44:33 PM (Elapsed Time: 1.86 seconds)