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# Raster Recipes

The Raster classes are in the [geoscript.layer](#) package.

## Raster Properties

Read a Raster from a File

```
File file = new File("src/main/resources/earth.tif")
Format format = Format.getFormat(file)
Raster raster = format.read("earth")
```



Get the Raster's Bounds.

```
Bounds bounds = raster.bounds
println "Bounds: ${bounds}"
```

```
Bounds: (-179.99999999999997, -89.9999999998205, 179.9999999996405, 90.0, EPSG:4326)
```

Get the Raster's Projection.

```
Projection projection = raster.proj
println "Projection: ${projection}"
```

```
Projection: EPSG:4326
```

Get the Raster's Size.

```
List size = raster.size  
println "Size: ${size[0]}x${size[1]}"
```

Size: 800x400

Get the Raster's number of columns and rows.

```
int cols = raster.cols  
int rows = raster.rows  
println "Columns: ${cols} Rows: ${rows}"
```

Columns: 800 Rows: 400

Get the Raster's Bands.

```
List<Band> bands = raster.bands  
println "Bands:"  
bands.each { Band band ->  
    println "  ${band}"  
}
```

Band:  
RED\_BAND  
GREEN\_BAND  
BLUE\_BAND

Get the Raster's block size.

```
List blockSize = raster.blockSize  
println "Block size: ${blockSize[0]}x${blockSize[1]}"
```

Block size: 800x8

Get the Raster's pixel size.

```
List pixelSize = raster.pixelSize  
println "Pixel size: ${pixelSize[0]}x${pixelSize[1]}"
```

Pixel size: 0.4499999999995505x0.449999999999551

Get more information about a Raster's Bounds.

```
File file = new File("src/main/resources/earth.tif")
Format format = Format.getFormat(file)
Raster raster = format.read("earth")
List<Band> bands = raster.bands
bands.each { Band band ->
    println "${band}"
    println "  Min = ${band.min}"
    println "  Max = ${band.max}"
    println "  No Data = ${band.noData}"
    println "  Is No Data = ${band.isNoData(12.45)}"
    println "  Unit = ${band.unit}"
    println "  Scale = ${band.scale}"
    println "  Offset = ${band.offset}"
    println "  Type = ${band.type}"
}
```

```
RED_BAND
  Min = 0.0
  Max = 0.0
  No Data = [0.0]
  Is No Data = false
  Unit = null
  Scale = 1.0
  Offset = 0.0
  Type = byte

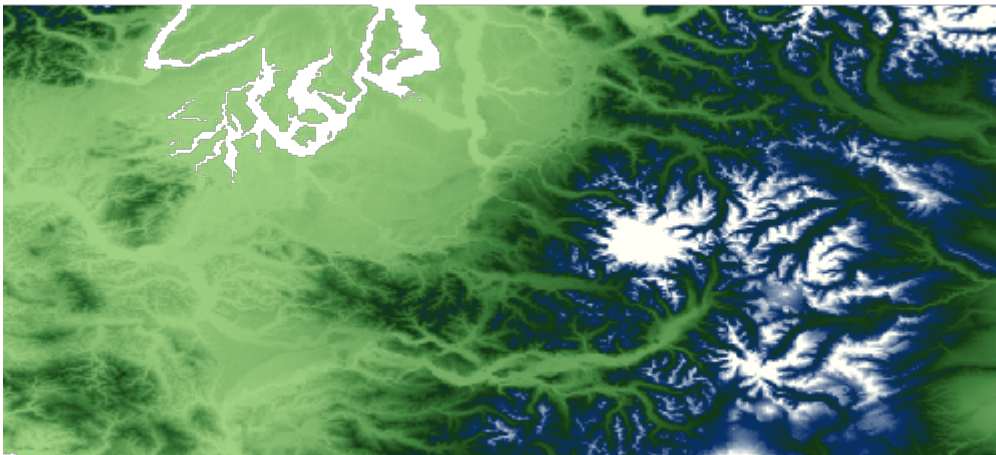
GREEN_BAND
  Min = 0.0
  Max = 0.0
  No Data = [0.0]
  Is No Data = false
  Unit = null
  Scale = 1.0
  Offset = 0.0
  Type = byte

BLUE_BAND
  Min = 0.0
  Max = 0.0
  No Data = [0.0]
  Is No Data = false
  Unit = null
  Scale = 1.0
  Offset = 0.0
  Type = byte
```

## Raster Values

Get values from a Raster

```
File file = new File("src/main/resources/pc.tif")
Format format = Format.getFormat(file)
Raster raster = format.read("pc")
```



Get values from a Raster with a Point.

```
double elevation = raster.getValue(new Point(-121.799927,46.867703))  
println elevation
```

3069.0

Get values from a Raster with a Pixel Location.

```
List pixel = [100,200]  
elevation = raster.getValue(pixel)  
println elevation
```

288.0

## Raster Processing

### Crop

Crop a Raster with a Bounds

```
File file = new File("src/main/resources/earth.tif")  
Format format = Format.getFormat(file)  
Raster raster = format.read("earth")  
Raster croppedRaster = raster.crop(new Bounds(-160.927734,6.751896,-34.716797  
,57.279043, "EPSG:4326"))
```



## Project

Reproject a Raster to another Projection

```
File file = new File("src/main/resources/earth.tif")
Format format = Format.getFormat(file)
Raster raster = format.read("earth")
Projection projection = new Projection("EPSG:3857")
Raster projectedRaster = raster.crop(projection.geoBounds()).reproject(projection)
```

