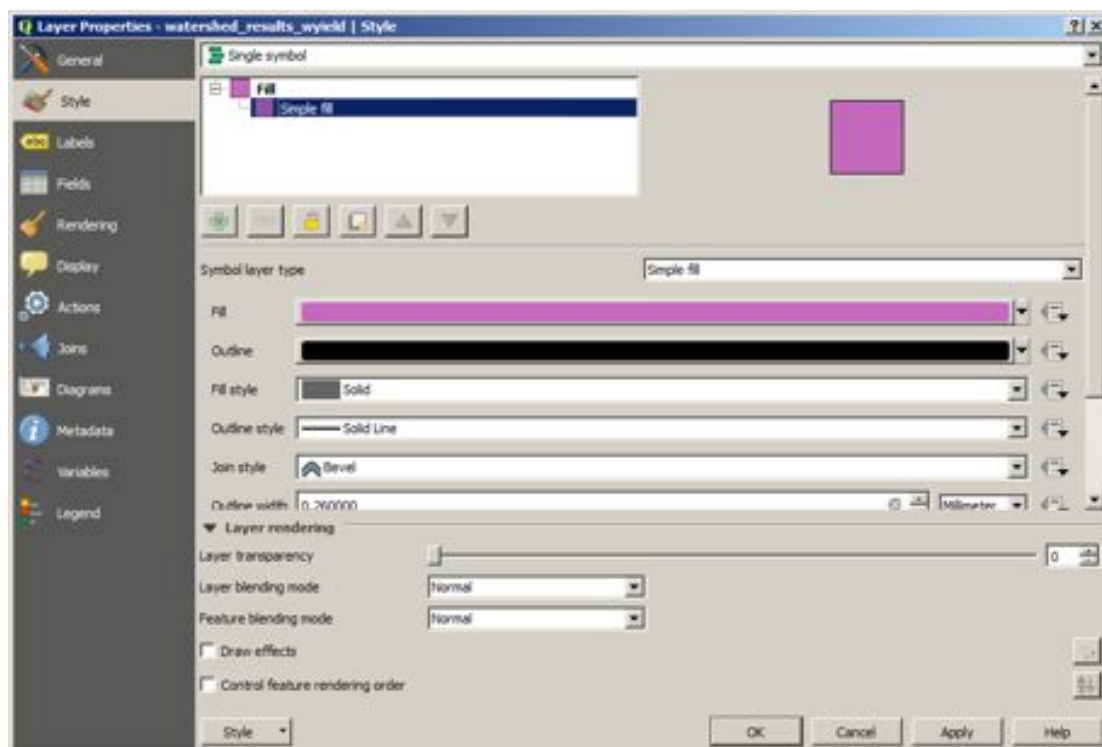


6.6 Interpreting the results with QGIS

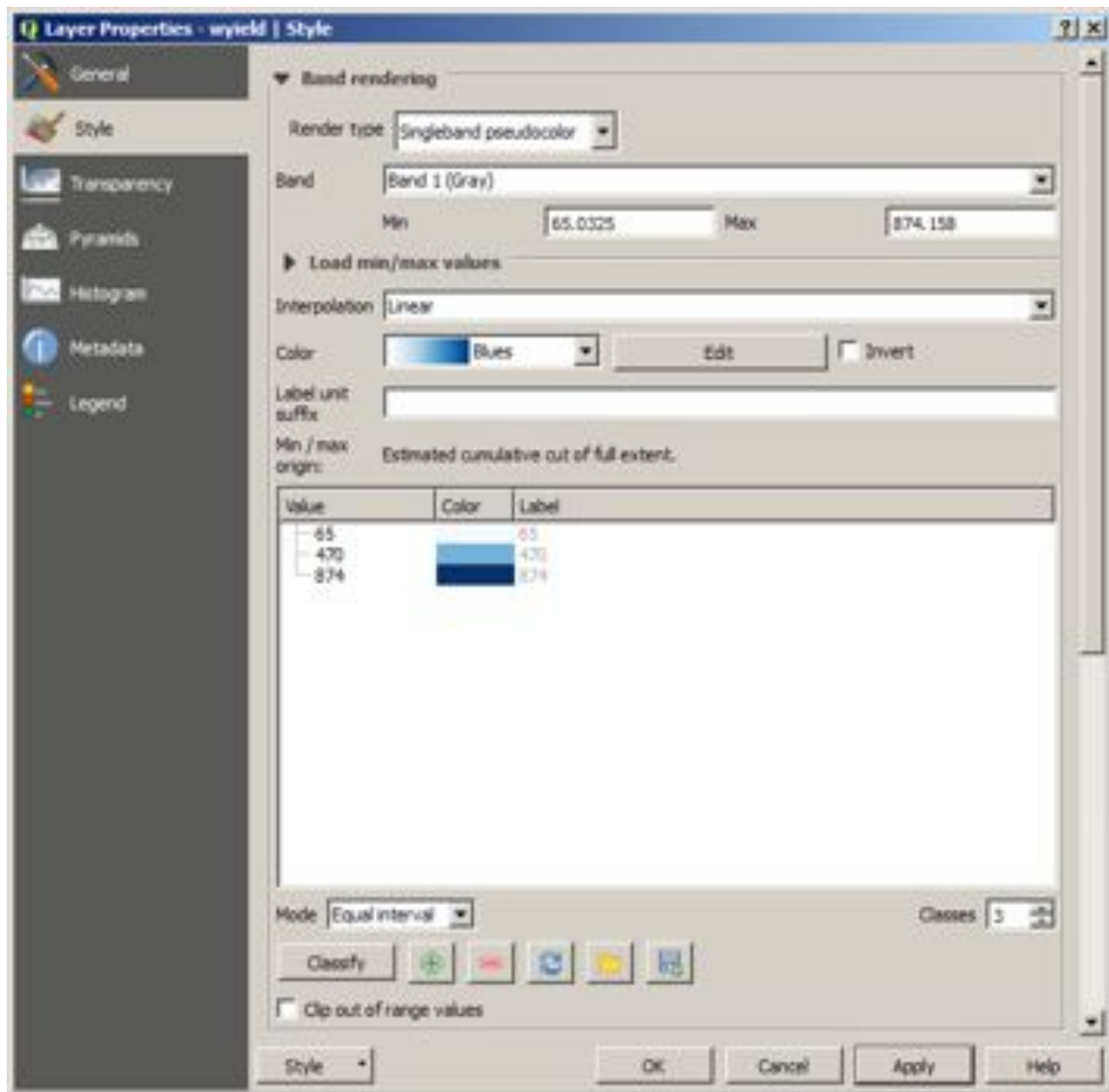
These final part of the tutorial will help you to interpreting the outputs of the InVEST Water Yield model. See module 6.4 for information on how to obtain these outputs.

A) Insert the Ouputs layers in QGIS

1. Select **Layer > Add Layer > Add Vector Layer** and browse to the output from the InVEST Water Yield model and select **watershed_results_wyield.shp**. The watersheds will appear in a random color. In the Layers Panel right click on the layer and select properties. Under the **Style** tab there is the symbology hierarchy with **Fill > Simple fill**. Select **Simple fill** in the symbology hierarchy and under **Symbol layer type** you will see the symbology definition. Next to the current fill color click on the down arrow and select **Transparent fill** from about the color wheel. Next change the **Outline width** to **0.5 mm**.



2. Select **Layer > Add Layer > Add Raster Layer** and browse to the output from the InVEST Water Yield model and select **wyield.tif**. The water yield will appear in grayscale colors. In the Layers Panel right click on the layer and select properties. Under the **Style** tab you will see **Render type**. Change **Render type** from **Singleband gray** to **Singleband pseudocolor** and change **Color** to **Blues**, **Mode** to **Equal interval**, and **Classes** to **3**.



3. Right click **wyield.tif** in the **Layers Panel** and select **Zoom to Layer** this will make it easy to set the extent in the Print Composer.

B) Prepare a map layout

1. Open QGIS and select **New Print Composer** from the file menu.
2. Enter **Water Yield** as the title in the Composer title window and click **OK**.



3. Set the desired page properties **Composer > Page Setup** in this tutorial we will use **A4** paper.

4. Select **View > Show Grid** and **View > Snap to Grid**

C) Compose your map layout

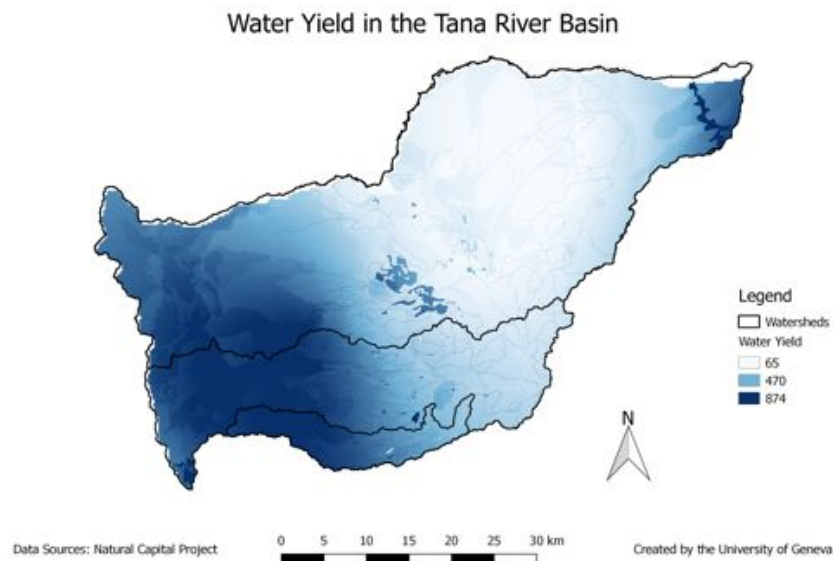
1. Select **Layout > Add Map** use the cross hairs to draw a map area. Click on the **Item properties** tab on the right sided. Under **Position and size** set **X** to **10 mm**, **Y** to **10 mm**, **Width** to **277 mm**, **Height** to **190 mm**. Under **Extents** click on **Set to map canvas extent**. Under **Main properties** change **Scale** to a round number that still accommodates the map.
2. Rename the layers in the **Layers Panel** by right click on each layer and selecting **Rename**.

D) Add a legend and labels to your map layout

1. Select **Layout > Add Legend** and use the cross hairs to draw in a legend in the lower right corner. Click on the **Item properties** tab on the right sided. Under **Position and size** change the **Width** to **35 mm**, **Height** to **45 mm**, **Reference point** to the lower right corner, **X** to **287 mm**, and **Y** to **150 mm**.
2. Select **Layout > Add Label** use the cross hairs to draw at the top. Click on the **Item properties** tab on the right sided. Under **Main properties** enter **Water yield in the Tana River Basin**. Under **Appearance** change the **Horizontal alignment** to **Center** and change **Vertical alignment** to **Middle**. Under **Font** change the **Size** to **24**. Under **Position and size** set **X** to **10 mm**, **Y** to **10 mm**, **Width** to **277 mm**, **Height** to **20 mm**.
3. Select **Layout > Add Label** use the cross hairs to draw in the lower left corner. Click on the **Item properties** tab on the right sided. Under **Main properties** enter **Data Source: Natural Capital Project**. Under **Appearance** leave the **Horizontal alignment** at **Left** and change **Vertical alignment** to **Bottom**. Under **Font** change the **Size** to **12**. Under **Position and size** set **X** to **10 mm**, **Y** to **200 mm**, **Width** to **75 mm**, **Height** to **10 mm**, and **Reference point** to the lower left corner.
4. Select **Layout > Add Label** use the cross hairs to draw in the lower left corner. Click on the **Item properties** tab on the right sided. Under **Main properties** enter **Created by [Your Name]**. Under **Appearance** leave the **Horizontal alignment** at **Right** and change **Vertical alignment** to **Bottom**. Under **Font** change the **Size** to **12**. Under **Position and size** set **X** to **287 mm**, **Y** to **200 mm**, **Width** to **75 mm**, **Height** to **10 mm**, and **Reference point** to the lower right corner.

E) Add a scalebar and North arrow to your map layout

1. Select **Layout > Add Scalebar** use the cross hairs to draw in the bottom right. Click on the **Item properties** tab on the right sided. Under **Segments** change **Segments** to **left 0 and right 6**, select **Fixed width** and set the value to **5000 units**. Under **Position and size** set **X** to **148.5 mm**, **Y** to **200 mm**, **Width** to **100 mm**, **Height** to **20 mm**, and **Reference point** to the middle center corner.
2. Select **Layout > Add Image** use the cross hairs to draw in the lower left corner. Click on the **Item properties** tab on the right sided. Under **Search directories** select the desired north arrow image from the provided ones. Under **Position and size** set **X** to **210 mm**, **Y** to **150 mm**, **Width** to **15 mm**, **Height** to **25 mm**, and leave the **Reference point** to as the top left.



F) Make a new map with another output

1. Now that you know how to make a basic map for water yield try making maps of the other raster outputs from InVEST:

- `output\per_pixel\fractp` (fraction): Estimated actual evapotranspiration fraction of precipitation per pixel (Actual Evapotranspiration / Precipitation). It is the mean fraction of precipitation that actually evapotranspires at the pixel level.
- `output\per_pixel\aet` (mm): Estimated actual evapotranspiration per pixel.

You can also produce maps from the vector outputs per subwatersheds from `output\subwatershed_results_wyield.shp`. You can for instance map the following attributes:

- `precip_mn` (mm): Mean precipitation per pixel on the subwatershed.
- `PET_mn` (mm): Mean potential evapotranspiration per pixel on the subwatershed.
- `AET_mn` (mm): Mean actual evapotranspiration per pixel on the subwatershed.
- `wyield_mn` (mm): Mean water yield per pixel on the subwatershed.
- `num_pixels`: Number of pixels per subwatershed.
- `wyield_vol` (m3): Volume of water yield in the subwatershed.
- `wyield_ha` (m3): Volume of water yield in the subwatershed per hectare.

For more info: <http://data.naturalcapitalproject.org/nightly-build/invest-users-guide/html/reservoirhydropowerproduction.html#interpreting-results>

References

http://docs.qgis.org/2.14/en/docs/user_manual/print_composer/print_composer.html
http://www.qgistutorials.com/en/docs/making_a_map.html
http://www.qgistutorials.com/en/docs/automating_map_creation.html