


Answers - GLaSS Training material, Lesson #7

What are the ranges of reflectance values in the image?

What are the ranges of reflectance values for lakes?



And for snow?

The ranges of the whole image and for each surface type in the image can be assessed opening the *Spectrum view*  and spanning the image with the cursor. Values are comprised between 0 and 0.2 in all bands, in the whole image. Water is very low reflective, thus lakes with clear waters shows very low reflectance values. On the other hand, particles and dissolved substances in water can alter their reflectance.

What's the overall accuracy of the model you have just created?

The overall accuracy is the ratio of correctly classified features against the total sum of features. Click on evaluate model performance and select *Accuracy Measures* tab to get the value of this parameter. For further information of the other values reported in this tab, See Lesson 2.

How many pixels have been classified as 'Lakes'?

- Left click on 'Classification' band name in *Product* tab.
- Open *Statistics* tool , enable the *use of ROI mask(s)* option in statistics computation and select the mask 'Lakes'. Then click on  to compute statistics: the number of classified pixels is shown. In fact statistics are computed only for pixels containing a valid value, while pixels with NaN (Not a Number) value are excluded.


How would lakes A, B and D appear in False Colour composition?

In *False Colour* RGB composition, Landsat Green, Red and NIR (Near-Infrared) bands are shown respectively as Blue, Green and Red layers.

Blue lakes are almost dark in green, red and infrared bands due to the low reflectance of clear waters, thus lake B would appear almost black.

Turquoise lakes being more reflective in the green band would appear blue, while grey lakes are much more reflective in the whole Visible-NIR spectrum, due to sediments, and they would appear turquoise.

Compare spectra to in situ measurements: are they similar?




- Export spectra to text file clicking on  and import the text file in a spreadsheet to compare spectra from EO product and in situ measures, which are quite similar in both shape and magnitude.

What's the percentage of pixels classified as blue/grey/turquoise lakes in 2014?

- Open *Statistics* operator, enable the use of ROI mask(s) option in statistics computation and select the masks of different classes. Among statistics for each class, also the number of classified pixels is reported. Repeat the same with mask 'Lakes_2014'. Then compute the percentage for each classes on the basis of the total number of pixels included in 'Lakes_2014' mask.

What's the percentage of pixels classified as blue/grey/turquoise lakes in 2015 considering the same area included in 2014 subset?

To obtain masks for the same subset of 2014:

- Open a 2014 RGB visualization;
- Create a new vector data container clicking on : rename it as 'subset'. A new vector object is created and appears on the 'vector' folder in *Products* tab.
- With the *Rectangle drawing* tool , draw a rectangle on the whole image.
- Open *Mask Manager*: 'subset' mask has been created. Select it and transfer it to 2015 classification product.
- For each class, select the respective mask together with the 'subset' mask and create a new class mask from their intersection clicking on .

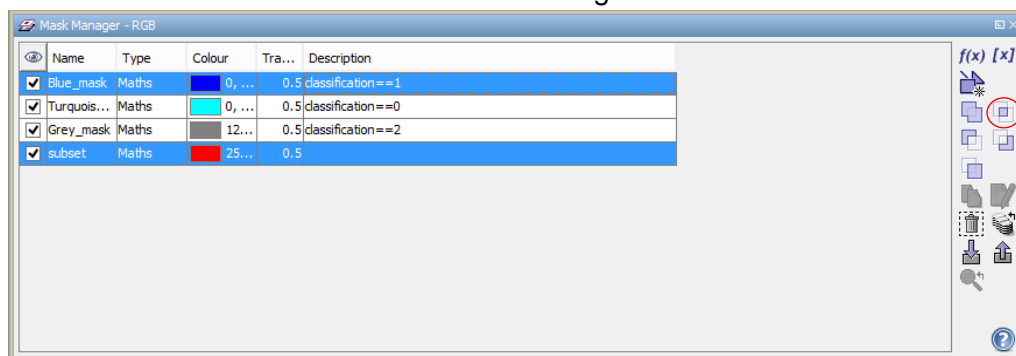


Figure 1. Masks intersection in Mask Manager.

- Use these three new masks for statistics computation to retrieve the number of pixels in each class.
- Repeat these last two steps with 'Lakes' mask to retrieve the total number of classified pixels.

Is there any change between these two consecutive years?

- Compare percentage obtained for both classes in both image to evaluate possible changes

How many pixels are classified as ponds in 2014? And in 2015? Are there any differences?

- Open the classified products and *Mask Manager*: define masks for both the classes on both images and find out the number of classified pixels in each class using again *Statistics* operator.
- Compare results to investigate any possible variation.
- In order to obtain a visualization of variations, transfer the two classes masks created in the last step from 2015 to 2014 or vice versa.
- Open Mask Manager and keeping Transparency set to 0.5, change masks colour as indicated in Fig. 2. Changes should thus be shown in orange.





<input checked="" type="checkbox"/>	Glacier_tongues_2014	Maths	 255, 0, 0	0.5
<input checked="" type="checkbox"/>	Glacier_tongues_2015	Maths	 255, 0, 0	0.5
<input checked="" type="checkbox"/>	Ponds_2014	Maths	 255, 255, 0	0.5
<input checked="" type="checkbox"/>	Ponds_2015	Maths	 255, 255, 0	0.5

Figure 2. Mask colours set for change detection.