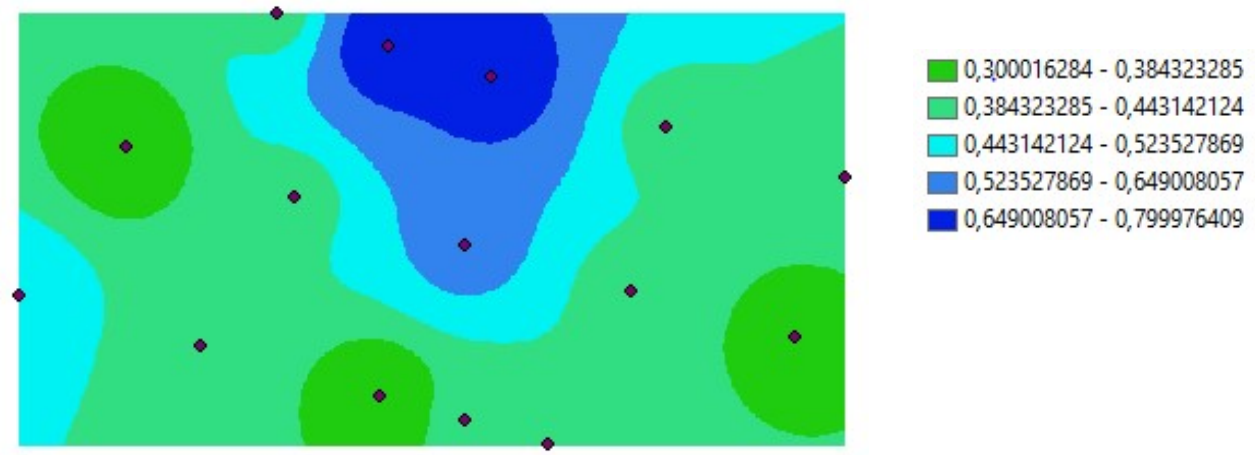
Results Analysis

The soil moisture change over each of the time intervals given was analysed using the Raster Calculator from the spatial analyst toolbox.

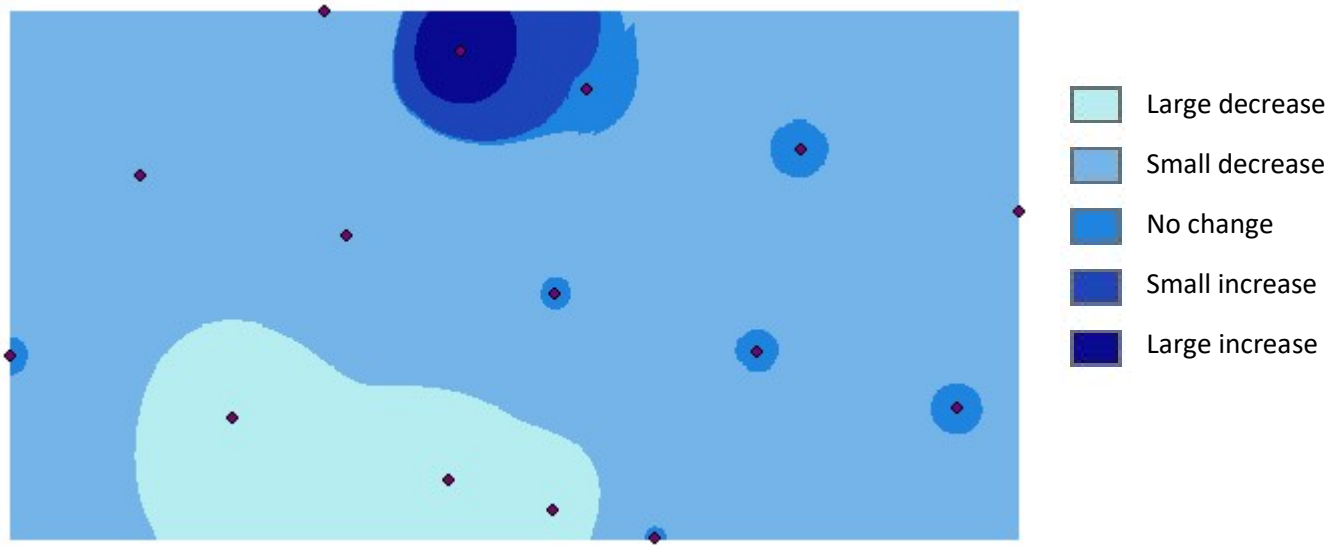
To represent the moisture content for each of the given months, I chose to use Inverse Distance Weighting. I chose this model because it works on the entire data set provided and not just a subset of the data. Moisture content is not a discrete property and affects an area instead of just a single point. IDW uses averaging of surrounding cells to interpolate the data for plotting. IDW works by looking at values in the closest or nearby surrounding area for calculations instead of calculating using values that are far away and therefore not spatially as strongly related to the point of interest. The fact that it is a weighted average eliminates outliers which is useful in analysing moisture content since moisture content in extreme weather conditions is irrelevant in giving a valid measure of soil moisture content for a specific content.



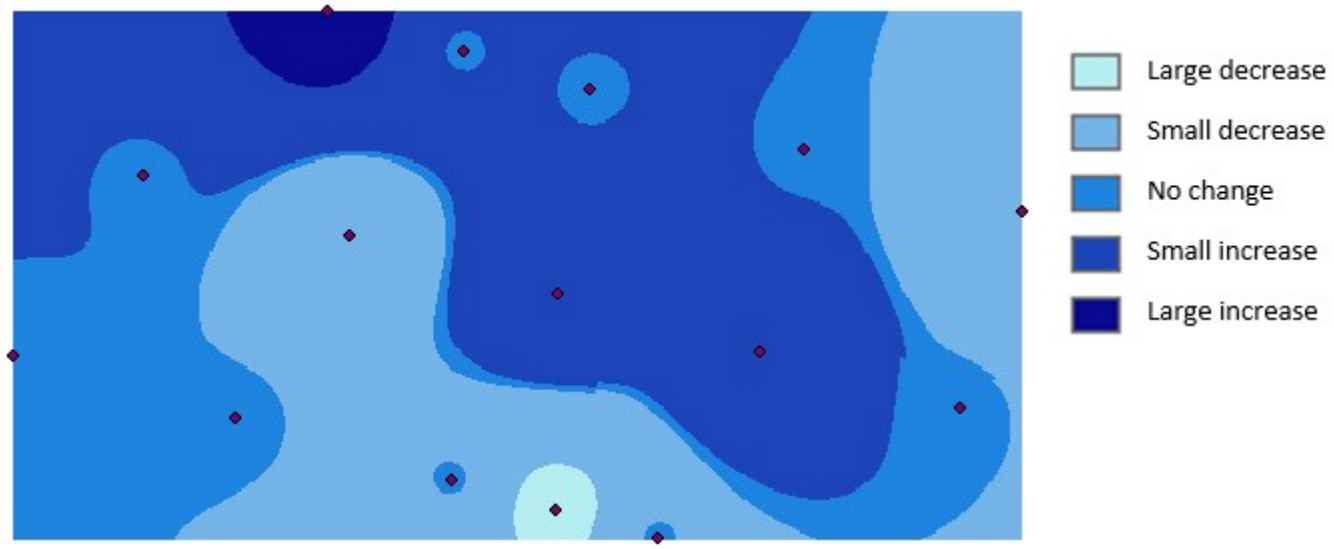
Inverse Distance Weighting for points in area K2b for December 2012

Raster Calculator on IDW Results

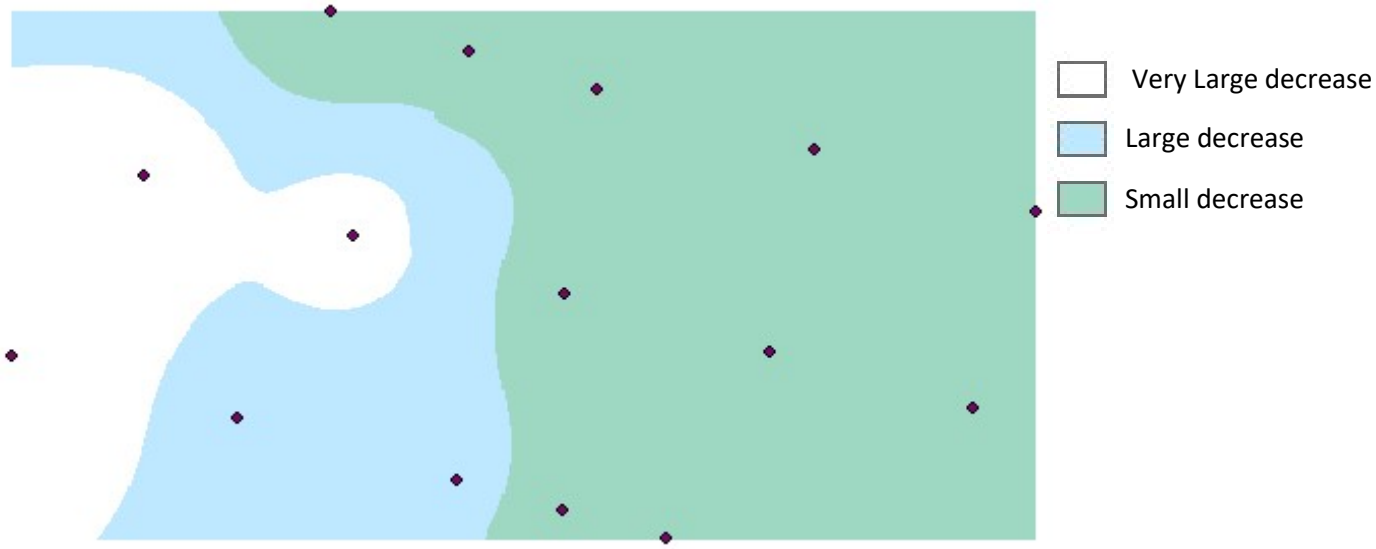
To observe changes, the raster calculator was used to find the difference in moisture content for the same month in different years. Below are the surface models that we generating using IDW to show the changes.



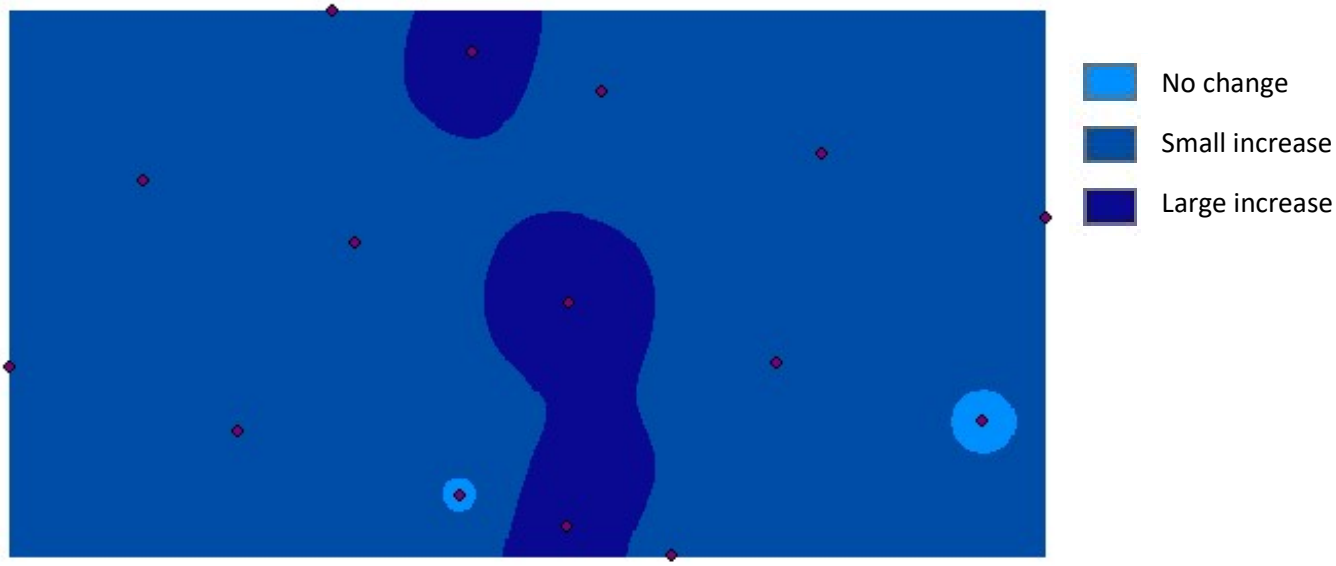
Change from June 2011 to June 2012



Change from September 2011 to September 2012



Change from December 2011 to December 2012



Change from March 2012 to March 2013

The changes as indicated by the colours on each image were analysed by checking whether the values were positive or negative for the specified range of values. Positive differences indicate an increase in soil moisture and negative differences a decrease. Values with differences close to zero indicate very little to no change. The range for each of the colour symbols was changed using the symbol window for each of the raster calculated layers.

We see a decrease in a large portion of the area between June 2011 and June 2012 as well as a small area of large increase. We expect relatively high moisture values since this is the rainy season. This is probably why we see a wide range of moisture levels. From the results we can see how the moisture content in soils have no hard boundaries and change over an area and not for a specific point. The results shown in the final output layers correspond with the data supplied on the excel spreadsheet, proving this method to be useful and effective in displaying the change in moisture content for each of the points over the time period of a year for each of the months.