Soil and Water Assessment Tools (SWAT) Model
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Next lecture is on the soil water assessment tool. We have been seeing there are different models which are being used for the water resources assessment people and that is; many of them are make developed for in keeping the reservoir construction of a reservoir and how much storage facility with to be given and of that kind of category but they there the problem is about the parameters which are being monitored of a particular region whereas when it comes down to the agriculture activities and agriculture or any other land-based activities we do not have enough monitoring stations or the input parameters are not available uniformly everywhere. So for this purpose and as well as the terrain and the land cover classes are not considered.

So one of the tools is about the soil water assessment tool which has been developed by the USDA some time back that incorporates meteorological parameters terrain parameters and based on that they have started calculating but how they have calculated is it is they are all there it is calculated based on the hydrological response unit they are the response units includes the meteorological condition that is a rainfall temperature and other activities as one over for a grid as well as terrain parameters that is about hydrology, soil parameters and plant growth and the land management is also included in that that means what it the individual hydrological response unit does it if there is going to be a one millimeter of rainfall then over a particular uniform area of the grid, so how much will infiltrate how much will be used by the plants. How much will be because of the temperature and the humidity conditions; how much will be lost in the transfer position all those things are calculated before it says that this much is the runoff which we can expect from this particular unit or the hydrological units and what it does it; it is a spatio-temporal model. So wear it you could use ArcGIS generated as well as it does generated the generators geospatial information can be brought into the Arc SWAT and it can be assessed for the water availability.

Now what you see here is the River Basins normally River Basins what we try to do is we try to further subdivide this the major river basins into sub basins and here this is sub basins are equal into the it is a pour point sub basins like this and you have the river flow over here. So this is the pour points; pour points are nothing but the entire water which is being which flows through this particular collected and flows through this particular river is measured at that area that is what it is nothing but it is a rain gauge units which we wanted to have it up. So now this type of sub basins are created are demarcated by the system based on this terrain parameters like what we do it when you are doing it on a personal basis. Now what we have got in the advantage of this particular software for water availability or purposes; there are multiple sub-basins.

Okay, all these sub-basins are added and you have a water availability pour point at this area, you have a pour point at this area then the individual sub-basin water availability or surface runoff from the individual areas are calculated before it comes down to the work outlet which moves off the area. So this can be, this particular estimated values can be verified by selective or wherever these with the existing River gauges and so that the validation is possible and

with reference the actual measurements as well as the estimated measurement. So this has got some advantages when compared to the rest of the models which people are using it out. So, now this particular basin has got the 58 sub basins and it is they have got 1915 HR use units these HR use units are nothing but as I said this is how the surface runoff is calculated in this model. Now that is what the model is I just have a few glimpses of the answers which is got for this particular purposes one is; this is the predicted one, this is this is the estimated one, this is the actual ones.

So this is the observed one, this is the estimated one. So when you see that they are somewhere closer to each other and so that the validation is nearly it is acceptable when compared to the considering the variations; variation in rainfall across the area as well as the variation within a particular plants used class areas or as well as land covered used areas. So this is more acceptable that is what is given here in this type of R-factor as well as the other statistical validation materials okay? Now this again this can be compared with the individual activity; this is the pour point which is there around 50.

50 is the pour point which what we are seeing it here 50; at this pour point what was the thing? Why we have chosen to show it to you is. So this is the estimated ones, from this SWAT model and this is the measurement facility is also available. So that it can be compared. So now it overall this estimated value from this model is acceptable which can be if it is acceptable then we can take it for any other planning purposes in giving more water to or adding more land areas which will be used in this area now what we have seen in this particular lecture is SWAT model, soil, water tool. This is this geospatial tool and it does it; it takes the geospatial information through ArcGIS and other GIS software and it combines with the measurements of the atmosphere meteorological measurements such as rainfall temperature and other activities and combines with the land cover features and it creates its own sub-basins based on the hydrological response unit the hydrological response unit represent a unit area of the year and which will be very unique in its nature. Thank you.