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Geog 10 s5

Physical Geography in Happy Valley

State College, also known as Happy Valley, is located in central Pennsylvania caught towards the edge of the Appalachian Mountains. State College's physical geography is unique because of its location which differs from anywhere else in the world. While still similar to its surroundings it is still one of a kind. It has its own different types of soils, trees, rocks, land use, and weather, all of which change constantly. It is easier to see these changes over time, whether its four weeks or forty years, change is observed.

For data collection, weather observations were recorded from State College for five days in a row and then again 4 weeks later. Physical geography data was collected more specifically from the Pennsylvania State Game Lands 176 also known as Patton Woods on two separate occasions four weeks apart. The first set of data was taken from February 27th, 2010 through March 3rd, 2010 and the second set of observations was taken from April 3rd, 2010 through April 7th, 2010, five days in each set.

The land in the past wasn't always full of businesses and housing, in fact around 1940 everything around campus, which was much smaller in the past, was agricultural land surrounded by forests. In 1960 a few of the closer farms to the north edge of campus became residential areas which are still present across Park Avenue. By the 1970s there were multiple residential subdivisions as well as the Mt Nittany Expressway, route 220. The land went from mainly agricultural use to heavy residential and shopping areas. Farms are still present in

surrounding areas but the campus has grown steadily in the past 60 years, cutting into the forests as well. (Penn Pilot, 2010)

Starting from the ground up, ninety percent of the soil in the area is sandy morrison and similar soils. This soil is found all over in the woods and is weathered from its parent materials of sandstone and limestone, mixed with decayed vegetation. Limestone is also the most common rock type found in the lower flat regions of state college. Morrison is capable of draining water quite well as well as being able to hold a decent amount at the same time, reducing the chance of flooding or ponding but allowing vegetation to grow and prosper. There are slight traces of fine silt and clay in the area but not on the surface (Soil Map, 2010). Soil characteristics tend to stay the same in this area over time since most of the erosion of the Appalachian Mountains has already occurred.

Happy Valley's physical land geography features such as its Valley shape were created by erosion of the softer stones such as limestone and sandstone with the harder stones, such as shale, left behind. This leaves limestone bedrock here on the flat areas. The Harder rocks are today seen as mountains instead of being flat due to past plate tectonic shifts. Converging tectonic plates forced the earth's surface to compress and fold. These erosion paths have left many creeks and a few lakes and ponds. The climate and the soil allow for vegetation to grow quite easily in the area, blanketing the area in forests shrubs and other plants. This is the same in surrounding areas regarding overall characteristics but as mentioned before State College and its surroundings are unique amongst each other. Weather and vegetation are covered in more detail in the observations taken at various places over the course of a few weeks.

During the first week of observations, both physical land geography and weather were looked at. At the State Game Lands a 10x10 foot plot was observed as an average of the area since its surroundings were similar. Within this plot there were 7 trees that were 0-5 years old, 6 trees that were 5-10 years old, and only 4-5 trees 10-25 years old. Only one tree in the tract was 25-50 and again only one being older than 50 years. These trees types consisted of Pine, Oak, Maple and Cherry. Other vegetation included a moderate amount of dormant shrubs filling in the space between trees making it hard to walk through but easily seen through. The soil was moist, loose, full of leaves and snow covered. The tree top canopy was open with leaves sparse, only a few dead ones left that did not blow off throughout the winter months. Observations followed typical winter environment trends.

The weather during the first set of observations took place during the end of the cold season. Happy Valley has steady precipitation all year round, so old snow was also present despite the frigid temperatures which left the air quite humid as it melted each day. With an average of 30 to 32 degrees each day and nearly the same unchanged cloud cover all week it wasn't a surprise to see little change in day to day observations. Cloud cover consisted of typically overcast stratus clouds covering most of the sky if not all. Winds were a steady 10 mph from the Northwest. Taking these observations at the same time, 5pm, lead to the sun's position relatively in the same spot as the day before, about 10 degrees from the horizon and facing 240 degrees Southwest.

Four weeks later similar observations were taken, both observed weather and a second site visit. This time around it was spring and vegetation was sprouting and previous growth was budding. The trees have some green to them as their leaves are starting to fill in, the bushes showed new green stems and the flowers had buds. Grasses were now present in the more open

areas as well as some forbs. Some old dead branches were now on the ground. There weren't any obvious signs of animal activity but there were some bugs of various types within the soil. The soil itself had now decomposed further than before making it rich in nutrients for the new growth to feed on.

As for weather during the second set of observations, the average temperature rose above 70 degrees, even above 80 the last few days. With very minimal cloud cover and increased temperature the air became less humid. Wind speed and direction also changed, winds were slightly faster and contained more gusts; wind was now blowing from the south west. The sun position was now higher at 20 degrees, twice as high as before and was now more westerly at 255 degrees west.

The physical changes are known to change with the seasons, as warm moist air is available day and night, plants can grow without being subjected to the observed harsh conditions of late February. Different animals also become more active during different seasons; this was not actually observed however. As for the weather, known to have about three cold months, and two months separating the five months of warmth, temperature observations followed this. Cloud cover during the first week was in part due to the jet streams and cold fronts pushing cold air down across the Great Lakes' warm humid air pushing clouds over central Pennsylvania. With the Jet Steams returning to normal position during the spring there wasn't as much cold air being forced into the area. Precipitation was mentioned before as being wet all year; this wasn't observed but it just happened to not precipitate during those two separate weeks. The sun's position makes sense due to the earth's tilt on its axis, during the first set of data the earth was tilted further away, creating a lower sun angle and a more southern sunset.

Towards the spring the earth is starting to tilt more towards the sun creating a steeper sun angle and a more direct west sunset.

By comparing the research of the area's climate and physical geography with actual recorded observations at different known times there are apparent connections between the two. The observed cold cloudy days during the winter due to the earth's position follow all the contributing factors. The same can be said for the second set of observations and research. The observations seen without explanation make sense and line up with the science behind it all. It's one thing to see something, but it's great to know why it is that way.

Sources:

Penn Pilot. Historic Aerial Photographs of Pennsylvania. *Penn State CEI*. Accessed 5/1/10.<http://www.pennpilot.psu.edu/>

Soil Map. Natural Resources Conservation Services. *United States Department of Agriculture*. Accessed 5/1/10. < http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>