Abstract:
The Belgrade Regional Conservation Alliance (B CRA) has acquired a great deal of land in the Belgrade Lakes region of Maine and is currently in negotiations on many pieces of land throughout the area. Data available online from the Maine Office of GIS, and data from the B CRA were used to carry out this analysis. One area of interest is Mount Phillip, the summit of which the B CRA recently acquired. There is a good view to the south of the mountain, but the potential view to the east and north is in question. This study analyzed the view from the top of the mountain, focusing on two landmarks: Mosher Hill to the east, and North Pond to the north. The analysis shows that both Mosher Hill and North Pond can be seen well from Mount Phillip. These results could help the B CRA both by adding weight to their negotiations to protect Mosher Hill, as well as influencing their decision whether or not to trim the forest on Mount Phillip to open up the view of North Pond that is currently blocked.

Introduction:
The Belgrade Regional Conservation Alliance (B CRA) owns land and conservation easements throughout the Belgrade Lakes region of Maine. The B CRA has recently acquired the protection of Mount Phillip. The view from the top of the mountain is of interest to the organization. In particular, two landmarks, Mosher Hill to the east and North Pond to the north of the mountain, stand out as areas that might be visible from the top of Mount Phillip. In the case of Mosher Hill, its visibility from Mount Phillip could add weight to the B CRA’s negotiations in attempting to protect the hill. North Pond is of interest because the majority of the views from the top of the mountain are to the south. The B CRA has thought about protecting the top of the mountain to allow for a more scenic view to the north; but was unsure of whether or not the effort and the loss of trees would be worth it. I have gathered data from the B CRA and from the Maine Office of GIS and analyzed the view to the south and to the north in order to determine the extent of both Mosher Hill and North Pond that can be seen from the top of Mount Phillip.

Methods:
Data for this project were obtained from the Maine Office of GIS, the USGS, and the Belgrade Regional Conservation Alliance. Digital Elevation Models were downloaded for the Belgrade, Belgrade Lakes, Mercer, Norridgewock, Readfield, and Rome grids from the Maine Office of GIS. These were mosaiced together using ArcMap’s raster data management tools. A hillshade analysis was then run using ArcMap’s spatial analyst tools, and that hillshade is used in both maps. Roads were added for each cell from data previously collected from the Maine Office of GIS and were also appended to each other. Landcover data was obtained from the USGS NLCD data set. The landcover raster data layer was clipped to fit the extent of the DEMs. The data on the B CRA’s trails and land boundaries were provided by Nate Kane at the Maine DOT, who had worked on it previously. Point shapefiles were created in ArcCatalog to locate the three landmarks being used in this analysis, Mount Phillip, Mosher Hill, and North Pond. The shapefile for Mount Phillip had two points, since in order to see the north the top had to be created. Only one point is shown on the map for simplicity. Once this was done a viewshed analysis was run for Mount Phillip. The raster layer used for this analysis was the DSM layer obtained from the Maine Office of GIS. The observer points were the four points at the top of Mount Phillip. All of the layers are projected to UTM Zone 19, NAD 83. The work was done in ArcGIS 9.0. The results of the analysis are shown in the bottom right, while the landcover map is shown in the top right for reference.

Results:
In total, 18,669,850 acres are visible from the top of Mount Phillip according to this analysis. Of those, approximately 500,000 acres are covered by water, which brings the total actual dry land visible from the mountain down to approximately 18,169,650 acres. B CRA land totals approximately 234,000 acres. Only a few thousand of those acres are visible from Mount Phillip; however. Much of the Kennebec Highlands, the large area of B CRA land to the left of the map, is not visible from Mount Phillip. This accounts for approximately 185,870 of the B CRA’s acreage, according to this data. North Pond is almost entirely visible from the top of the mountain, as are the majority of its northern and eastern basins. Mosher Hill’s northern and western slopes are also clearly visible from Mount Phillip.

Discussion:
Getting the data that I needed was a bit of a challenge as I had to obtain it from Mike Little, the Executive Director of the B CRA in Belgrade Lakes, and Nate Kane, the GIS Coordinator of the Maine DOT’s Bureau of Planning in Augusta, which took some time as both men are extremely busy. After obtaining the data and projecting it all to the same coordinate system (UTM zone 19, NAD 83) the work went rather smoothly. The main goal was to determine how much of the surrounding area was visible from the top of Mount Phillip, with special attention paid to Mosher Hill and North Pond. The visibility of Mosher Hill from Mount Phillip had not been analyzed before, and it could prove a helpful extra reason why Mosher Hill should be protected. As figure 2 shows, Mosher Hill can be clearly seen from Mount Phillip. This means that it would be a prime area for conservation as it would help preserve the beautiful view to the south and east from the top of the mountain. North Pond is an interesting case because the B CRA has been debating whether or not to trim some of the vegetation on top of Mount Phillip in order to open up a view to the north towards North Pond. Just how much of a view would be available was questionable, however, as no one had analyzed it before. Figure 2 shows that much of the area to the north is visible from the top of Mount Phillip. The northern and eastern shorelines of the North Pond all be seen well from the top of the mountain. This suggests that the B CRA may be justified in opening up the view to the north from the top of Mount Phillip.

The data on the B CRA’s landholdings that were used for this map and that are shown are outdated, much has been added since the time this data set was put together. Once the data is updated, this viewshed analysis could have further uses in providing incentives to expand further around an otherwise small and seemingly less important plot of land, as it will gain value as part of the view land that is visible from the top of Mount Phillip. The preservation of that view could become a new supportive force the B CRA can use in its efforts to acquire and protect more land in the Belgrade Lakes region.