Colby College On-Campus Trail System

Emily Wilbert ('07)

ES212: Introduction to GIS and Remote Sensing, Colby College, Waterville, ME

Abstract:
This map is designed as a resource for students and the public to use and develop a better understanding of the trails system on the Colby Campus. I used a Garmin GPSmap 60CS to chart all the trails on Runnals Hill and in the Arboretum. Then, using ArcGIS, I compiled the tracked trails and laid them over an aerial photo of the campus. Because many of the trails are hard to find, I took digital photos of each trail entry to help the user locate them. Then, by taking note of the grade and width of the trail, I decided which trails were suitable for certain activities. This gives users an idea of where to go for walking, running, mountain biking, cross-country skiing, and snowshoeing.

Introduction:
Currently, there are few detailed maps available of the trail system on the Colby campus. With such an amazing resource for adventure and exploration, there should be a way for Colby students and personnel as well as local residents from the community to become more familiar with the trail system. The goal of this study was to discover how many miles of trail exist on campus and what uses they are suitable for.

Methods:
Using a Garmin 60CS Global Positioning System (GPS), I walked or rode my mountain bike on all of the trails in the Arboretum and on Runnals Hill. The GPS unit plotted a point every three meters as I passed. The data from the unit was then uploaded to a computer, where I could connect the points and create ties for each of the trails plotted. I then overlaid these trails on an aerial photo of the campus and a thematic layer of buildings and landmarks on campus. This process was completed in ArcGIS, a Geographic Information System (GIS) software program. Distances of the trails were calculated on the GPS unit. The suitability for specific activities is based on average trail width, ground cover and average slope of the terrain.

Figure 1: Colby College Campus

Results:
Figure 1 shows an overview of the entire college campus with all of the trails I mapped. It shows buildings, roads, and parking lots to give reference points for trail users.
Figure 2 shows a more detailed view of the trails located on Runnals Hill. There are 2.226 miles of trails and uses include: Mountain biking, running, walking, snowshoeing, and cross-country skiing. The trail cover is a combination of mowed grass, packed dirt, mulch, and roots.
Figure 3 shows a more detailed view of the trails located in the Arboretum. There are 2.645 miles of trail and uses include: Mountain biking, running, walking, snowshoeing, and cross-country skiing. The trail cover is a combination of mowed grass, packed dirt, mulch, and roots.
I calculated 4.87 miles of trails on the Colby Campus. There are many more miles of trails, but because of the limitations I encountered, they were not included in this study.

Discussion:
Several difficulties were encountered during this project. First, the Garmin 60CS GPS units have up to 15 meter error. When I put many of the trails on the aerial photo, it became clear that the plotted trails deviated slightly from the actual trails. A more accurate unit with sub-meter accuracy could address this limitation. Second, the unit often had trouble finding satellite reception due to dense vegetation overhead. Therefore, there are several other trails that do not appear in these figures because the GPS unit could not track them.

Acknowledgements:
I would like to thank Professor Philip Nyhus for his patience and help with this project.

Figure 2: Runnals Trails and Pictures

Figure 3: Arboretum Trails and Pictures