



Illusory Timelessness: A Geologic and Anthropomorphic History of the Belgrade Lakes Watershed

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Geologic History:

Plate tectonic activity and constructive and destructive glacial activity remodeled the Belgrade landscape over timescales of millions of years.

Bedrock Formation: 420 million years ago the collision of the microcontinent Avalon with the North American continent formed Northern Appalachian Mountains. The ensuing geologic activity created the metasedimentary and igneous rocks (i.e., granite) that underlie the Belgrades.



Figure 1: Metamorphic bedrock in the Blue Rock Quarry on R5 at the Sidney Exit. (Personal Photograph)



Figure 2: Exposed Granite Bedrock in the Kennebec Highlands. (Personal Photograph)

Post-Glacial Modifications: The last Ice Age in the Belgrades occurred between 95,000-14,000 BCE. Glaciers two thirds of a mile thick depressed the underlying landmasses to allow marine submergence and creation of the DeGeer Sea upon glacial recession. However, rapid isostatic rebound (50mm/yr) dried up the sea 2,550 years later. Glacial till creates a blanket layer of rock debris and other sediments throughout the Belgrades. The Belgrades are made up on one of the best esker systems in Maine, created by meltwater tunnels within the glacier depositing concentrated rows of sediments as it retreated. In addition, a chain of kettlelakes in the southern portion of the watershed was created by "dead ice" that was separated from the glacier.



Figure 3: Map of the DeGeer sea and ice-flow patterns from the receding Laurentide ice-sheet (<http://www.maine.gov/documents-services/land-use-planning/land-use-planning/land-use-planning.pdf>)



Figure 6: The Colby-Marston Bog is an exemplary kettlelake. (<http://www.colby.edu/colby-marston-bog>)



Figure 4: Extent of DeGeer Sea in the late-glacial era. (<http://www.maine.gov/documents-services/land-use-planning/land-use-planning.pdf>)



Figure 6: A glacial erratic located near East Pond in Smithfield, Maine. (Personal Photograph)

Vegetational Colonization and Reforestation:

The climatic conditions of the Holocene Interglacial allowed a mixed hardwood forest to develop before the arrival of humans sparked widespread deforestation and reforestation of the area

Colonization: The recession of the DeGeer Sea from the Belgrades left a barren landscape colonized by a few pioneering species of dwarf shrubs and sedges. Over the next 7,000 years the Belgrade forest developed a species composition consisting of conifers such as Hemlock and White Pine and broadleaf trees such as Maple, Red Oak and Birch. The cold, rainy climate of central Maine played the largest role in determining which species would succeed in the region. The natural disturbance cycle of blowdowns, animal activity and forest blights also influenced the forest's makeup.



Figure 8: Photo of Icelandic glacial desert depicts what the Belgrade Region would have looked like 11,450 BCE. (<http://www.colby.edu/belgrade-lakes-watershed/>)



Figure 9: Mid-successional evergreen forest. (<http://www.maine.gov/documents-services/land-use-planning/land-use-planning.pdf>)



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Reforestation: Evidence of the first Paleo-Indians in the Belgrades dates back to the between 9,000-13,000 years ago. Early Native Americans developed the land for agriculture as well as used forest fires as a landscape management tool. European settlement included more extensive forest clearing for logging and agricultural purposes. Deforestation lowered lake levels (causing dam construction) and reduced wildlife habitat. However, these industries migrated elsewhere allowed for reforestation in the Belgrades. Reforestation altered the original species composition, increasing fir and spruce abundance and reducing hemlock, birch and beech abundance.



Figure 11: The 1865 spring log drive down the Kennebec. (<http://www.colby.edu/belgrade-lakes-watershed/>)



Figure 12: Permanent Dam on Great Pond. (Personal Photograph)



Figure 13: Aerial Depictor of Reforestation on Snow Pond. (<http://www.colby.edu/belgrade-lakes-watershed/>)

Post-Industrial Age Anthropogenic Impact:

The maturation of local industries as well as the increasing flux of summer tourists continued to alter the landscape in the 20th century.

Anthropogenic Impacts: The establishment of Maine Central Power along the Messalonskee Stream in 1899 catalyzed the push for modernization in the Belgrades. In contrast, as upscale hotels and summer camps proliferated, the preservation of the "untouched" rustic Maine countryside became a valuable commodity. However, anthropogenic effects continued to accumulate. Permanent dams increased shoreline erosion. Invasive species such as Northern Pike and Milfoil have disrupted the lake's food chain. Increased run-off from land-use changes and nutrient loading from usage of fertilizers etc. have accelerated lake eutrophication.



Figure 14: Site of Central Maine Power's first hydroelectric generator on Messalonskee Stream. (Personal Photograph)



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Figure 16: Diagram of natural vs. cultural lake eutrophication. (<http://www.colby.edu/belgrade-lakes-watershed/>)

Future Perspectives: Conservation groups such as the Belgrade Regional Conservation Alliance, the Maine Congress of Lake Associations and local lake associations of the Belgrade Watershed have introduced programs such as the "LakeSmart" program led by the BRCA to promote lake-friendly landscaping. These programs need widespread participation to be successful. While the Belgrade Lakes may not be timeless, knowledge of local landscape history can inspire the stewardship needed to slow the accelerated rate of change caused by humans.

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