Geology of Central Park

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Introduction

Central Park stretches from 59th St. to 110th St. and sits between 5th and 8th avenue. The entire area is approximately 840 acres. Although the park underwent urban landscaping, many rock outcrops have been well preserved.

Central Park North / Central

Wednesday March 23, 2016. Journeyed from 110th St. to 67th St. Weather: sunny and warm. Observed deeper burial of Manhattan Schist (larger garnets), amphibolites, boudines, quartz and pegmatite veins

Central Park South

Friday April 1, 2016. Traveled from 67th St. to 59th st and from 5th to 8th avenue. Weather: sunny and warm. Observed glacial striations, erratics, Cameroon's Line, pegmatite, aplite, and milky quartz veins and dikes

Major Unit: Manhattan Prong

Formed during the Taconian Orogeny, which is when the closing of Iapetus Ocean occurred though the collision of North America and the volcanic island arc. It is composed of metamorphic rocks such as gneiss, schist, and quartzite which formed the hills and marble which formed the valleys.

Abstract: Despite being geologically quiet nowadays, New York City has had a rich and active geologic past. The rocks we see today in Central Park formed approximately 450 million years ago (Cambrian – Ordovician) in a mountain building event referred to as the Taconic Orogeny. During this event, a volcanic island arc named Avalon collided with proto-North America along its eastern border. This collision metamorphosed previously existing autochthonous sedimentary shale rock which came from the erosion of the ancient Grenvillian Mountains while also metamorphosing allochthonous volcanic and sedimentary rock in the Avalon forearc basin. These rock units are now known as the Manhattan and Hartland formations which consist of mostly schist and amphibolite metamorphic rock. Subsequent orogenic events squeezed out fluids within the rock forming many igneous dykes and veins. More recently, the Central Park landscape was reshaped by glaciers indicated by the many glacial striations and erratics.

Key Words: Manhattan schist, foliation, glacial erosion, striations, micaschist, quartz, amphibolite, granofels, roche moutonee, pegmatite, erratic, Taconic Orogeny, Manhattan Prong, autochthonous, Hartland formation, Cameroon's line, dyke, vein, boudin

Objective: Interpret Central Park's geologic history and ancient environment by observing geologic features and rock compositions.

Rocks and Features


Fig 1 – Boudinaged quartz vein in amphibolite


Fig 2 – Folding of quartz veins in Migmatite


Fig 3 – Garnet Porphyroblasts (red) in stretched Manhattan Schist


Fig 4 – Cameroon's Line: Hartland and Manhattan formation boarder

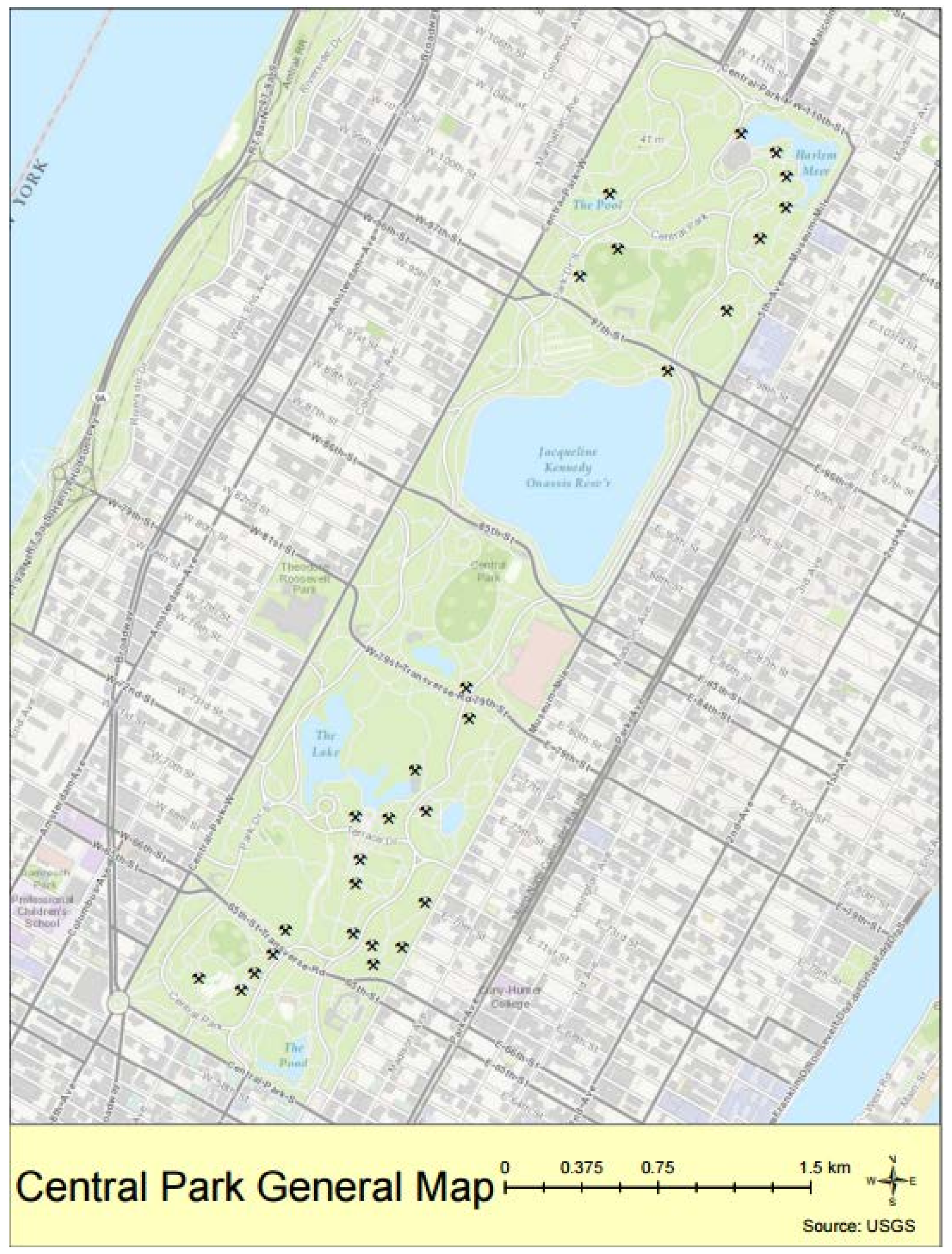

Fig 5 – Rouche Moutonèe with rust and joints


Fig 6 – Schist (top) and Amphibolite (bottom)


Fig 7 – Milky Quartz vein


Fig 8 – Pegmatite erratic


Fig 9 – Glacial grooves in Schist



Conclusion

Central Park consists of many different geologic features with noticeable evidence of glacial history. Such evidence includes: glacial striations, glacial erosion, erratics, roche moutonee. The glacial striations are orientated from North to South which show the direction to where the glaciers retreated. Furthermore, foliation and folding is evidence of orogenic events. A majority of the rocks are metamorphic. There is an abundant amount of milky quartz veins which indicate squeezing under high pressure during compressional events. Numerous dykes are scattered throughout Central Park rocks.

Bibliography

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