FAQ's about Great Falls Geology

What type of rocks make up Great Falls and Mather Gorge?
Mostly Mica Schist and Metagraywacke. These rocks have been folded and refolded upright or vertically.

What type of rocks make up Bear Island?
Mostly Granite, Amphibolite, and Mica Schist. All of these rocks have been folded and torn apart.

How long ago were these rocks formed?
Approximately 1 billion-500 million years ago.

What kind of environment were these rocks formed in?
Originally these sediments were deposited on the seafloor over 600 million years ago and eventually became layers of mudstone and muddy sandstone.

Between 450-500 million years ago the layers were folded and heated to recrystalize to form the mica schists. The rocks are refolded and fractured and molten material welled up along the cracks to form granite intrusions and quartz veins.

300-250 million years ago the continents collided to form the super-continent Pangaea. The Piedmont rocks were picked up and moved and flipped vertically.

200 Million years ago, Pangaea split and only erosion occurs after this time period. No other major geologic events significantly alter the present appearance of the rocks.

What processes occurred to create the present look of the Falls?
When the last ice age started about 2 million years ago, rivers slowly began to cut through the Peidmont. The Falls as we see them today began to form 25,000-30,000 years ago. The cracking of the rocks during previous folding processes allowed places for water to flow. Over the last 30,000 years The water has slowly been eroding and cutting down the rock to create the falls that we see today.

What is Widewater?
This is an ancient, abandoned channel of the Potomac River, utilized by the Canal Company for a section of the canal.

Can fossils be found here?
No. Due to the metamorphism of the area, any fossils from the ocean depositional environment would have been folded or melted away.

Did the great glaciers of the most recent ice age advance to the Falls area?
No, but this area was affected by lowering sea levels and ice melt slowly started to down cut the rocks at Great Falls.

What geological processes are happening now?
The falls will continue to cut down the rock, making the drop even more spectacular.

Why do we have gold mines in this area?
The quartz veins that filled in the mica schist over 200 million years ago contained gold. The gold deposits occur along an interconnecting system of veins and shear zones that extends from the East end of Widewater northward to the mouth of Cool Spring Branch, about 2 ½ miles. The distribution of gold in the veins is erratic.

Why are the lock stones called Seneca Sandstone red?
This sandstone formed during the Triassic Age (200 million years ago) contains high amounts of iron.

What geologic province of Maryland are we in?
The Piedmont. This is characterized by very old faults and is located in the middle of a crustal plate. There is little chance of earthquakes.

How much water goes over the falls?
Average flow is 350,000 liters per second but in low times it may be as little as 38,000 liters per second up to 40 million liters per second in flood times.

Definitions:
Metagreywacke- Metamorphosed rock composed of fine grained quartz, feldspar and some mica. Has a sugary texture. Originally a muddy sandstone.
Mica Schist- Metamorphic rock containing abundant coarse flakes of mica and includes thin veins of quarts . Originally was a shale or mudstone.
Amphibolite- Metamorphic rock composed of dark green to black crystals of hornblende in white to pink fledspar. Originally was the igneous rock basalt.