Beautiful Boulders – Geology

We are uniquely situated here on the Downeast coast of Maine to have a mix of bold granite outcrops, folded and compressed rocks, fault zones that have sliced and diced the bedrock units, and glacial geology features that give this section of Maine a complex history. One feature that bridges the gap between hard rock and glacial geology is the glacial erratic. Technically, a glacial erratic is described as one rock type being moved from its native bedrock location and deposited in an area of a differing rock type. The classic erratic that we know of here in Downeast Maine is Balance Rock in Acadia National Park. The "erratic" is composed of a white and black grained granite from north of Lucerne, Maine and it is balancing on the pink grained Cadillac Mountain Granite.

Some of the "Beautiful Boulders" in this hiking challenge are considered erratics. However, about half have probably undergone some sort of glacial transport (just not the 40 plus miles that Balance Rock experienced). Ninety (90) percent of most local glacial erratics, here along the coast, probably travelled on glacial ice for a mile or less. These boulders are still unique, exhibiting shapes and adornments that make coastal Maine all the more special.

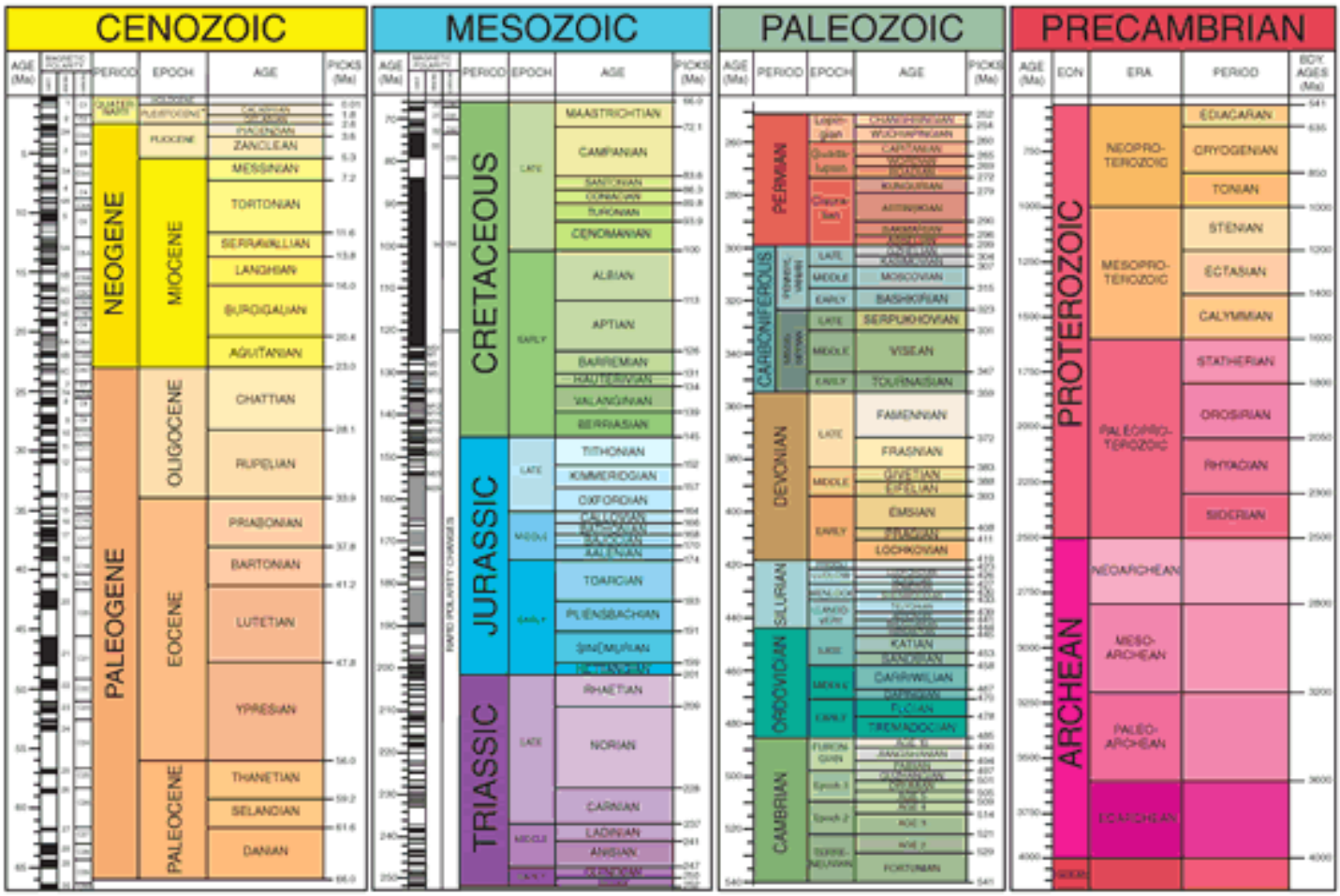
So grab a walking stick, a camera, a GPS if you want and hit the following Blue Hill Heritage Trust Trails. There is anagram puzzle to solve with letter clues at each boulder location. Go have fun and email your boulder pictures to landere@bluehillheritagetrust.org. If you decipher the anagram, your name will be entered for prize drawings in early September.

For those of you that love geology, here is a link to the Geology of Northern Penobscot Bay, Maine, by David B. Stewart, 1998.

https://ngmdb.usgs.gov/Prodesc/proddesc_19222.htm

Happy Bouldering.

Here are some of the important bedrock units in our area. The Geologic Time Scale below shows the Period relationships.

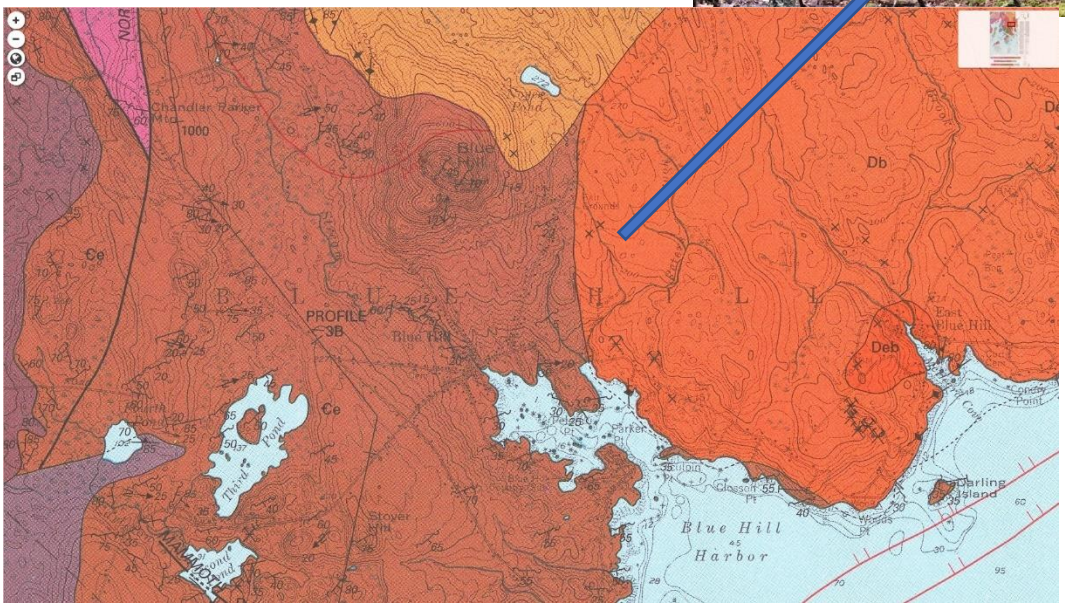


Lucerne Granite (Middle Devonian ~ 380±4 Ma)
Light-gray, white-weathering, coarse-grained locally foliated, seriate biotite granite. Intrudes granites of Gray Ridge, Wallamatogus Mountain, and Blue Hill. Reference: Zartman and Gallego, 1979; Stewart, D. B., 1998 (See BHHT Website – Beautiful Boulders – Hiking Challenge.)

Penny's Preserve

Located east of Albion Meadow on the North Loop, this boulder may not have travelled far, as there is outcropping granite close by. Smooth Rock Tripe and Liverworts adorn this boulder.

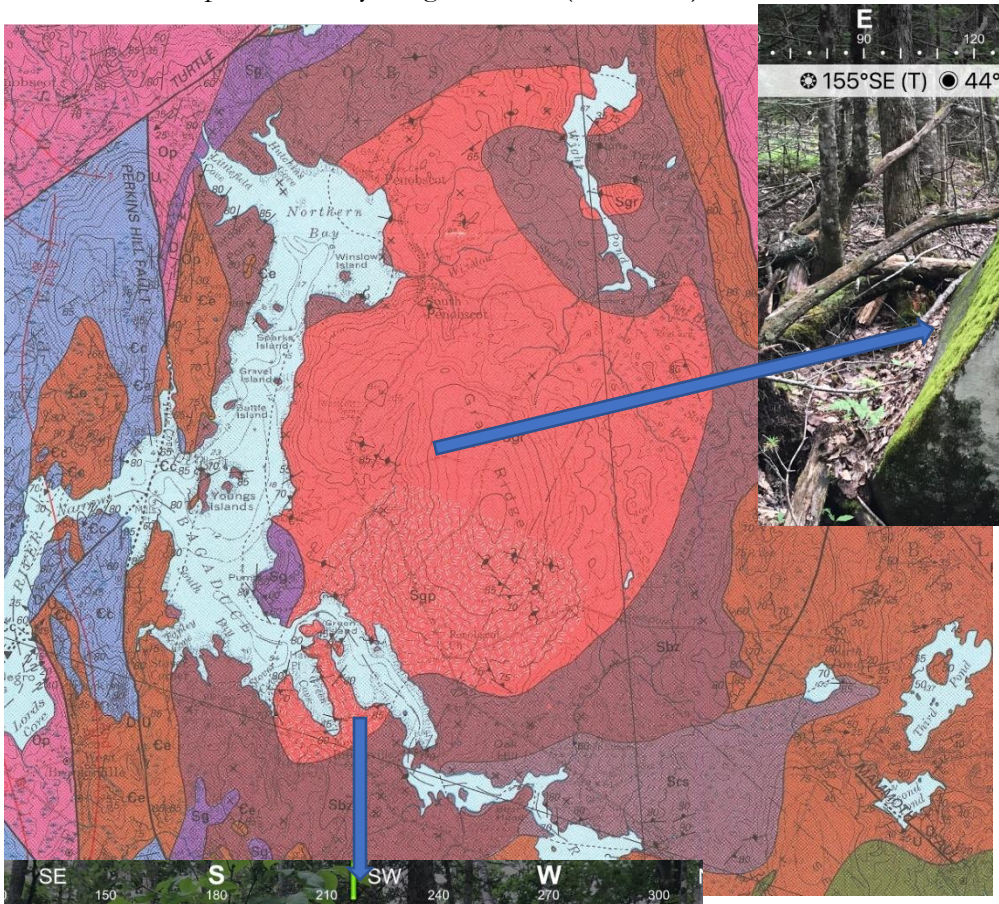
Granite of Blue Hill Db
(Devonian ~374±10 Ma)
Gray, medium-grained, equigranular muscovite bearing biotite granite. Intruded by Lucerne Granite.
Reference: Brookins, 1976; Stewart, D. B., 1998.



Granite of East Blue Hill
Deb **(Devonian)**
Light-gray, fine-grained biotite-muscovite granite containing up to 5 percent microcline phenocrysts and local, biotite-rich ovoidal segregations up to 5 cm long surrounded by a rim of biotite-free granite, 0.2 to 1 cm thick. Reference: Stewart, D. B., 1998

Weinland Nature Study Area & Snow Natural Area

Granite of Wallamatogus Mountain Dw **(Devonian ~397±2 Ma)**
Light-gray, gray-weathering, medium-grained, muscovite-bearing, biotite granite. Reference: D.R. Lux, unpublished data; Stewart, D. B., 1998 (See BHHT Website – Beautiful Boulders – Hiking Challenge.) This boulder is a true erratic, with its source area a minimum of 4 miles to the north. It sits on top of the Grey Ridge Granite (see below).



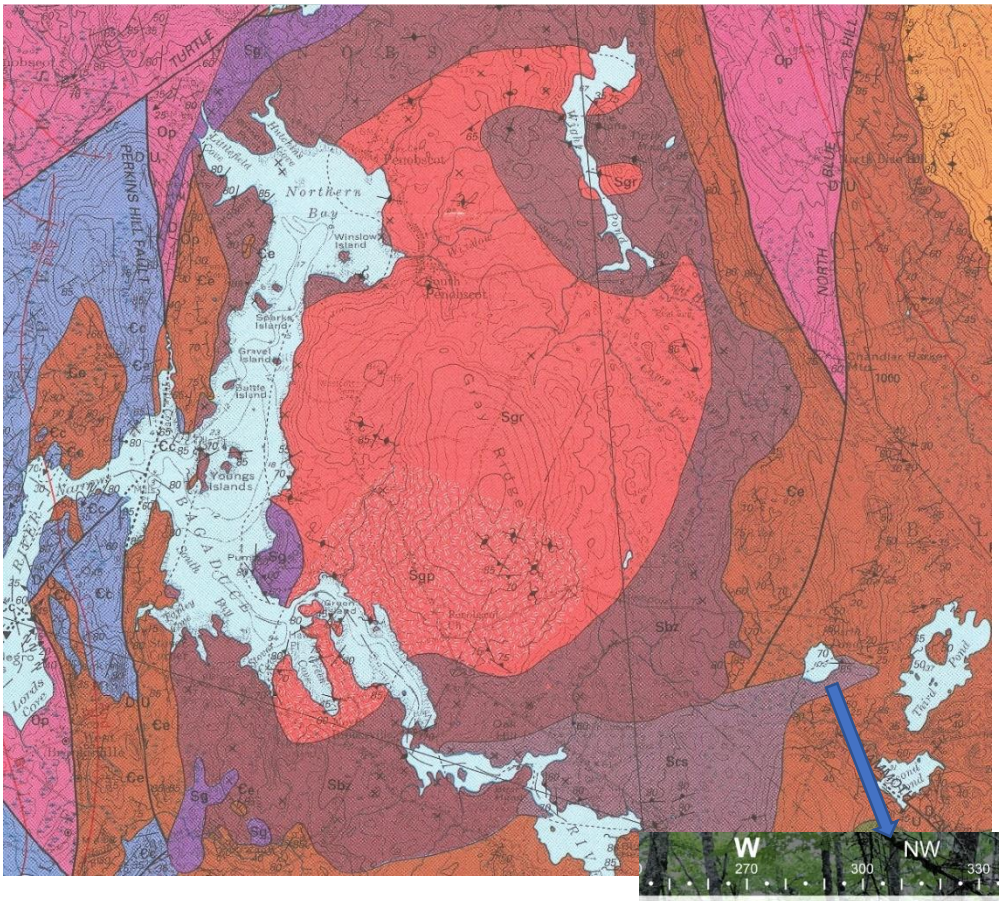
South Penobscot Intrusive Suite (Silurian)
A crudely zoned intrusion containing a variety of plutonic rocks that range from massive or layered gabbro, quartz diorite, tonalite, granodiorite to granite and resulted from complex mixing and fractionation of mafic and granitic magmas. Reference: Stewart and others, 1988).

Granite of Grey Ridge Sgr **(Silurian ~419.2±2.2 Ma)**
Light-gray, medium- to fine-grained, equigranular or weakly porphyritic biotite granite, which has rounded mosaics of quartz and up to 15 percent tabular microcline phenocrysts. Porphyritic granite is light-gray, medium-coarse grained biotite-muscovite granite containing 15 to 25 percent microline phenocrysts of to 4 cm long. Reference: R.D. Tucker, written communication, 1996; Stewart, D. B., 1998.

Kingdom Woods Conservation Area

Granite of Camp Stream Scs **(Silurian)**
Light-gray, medium- to fine-grained, equigranular biotite granite. Reference: Stewart, D. B., 1998.

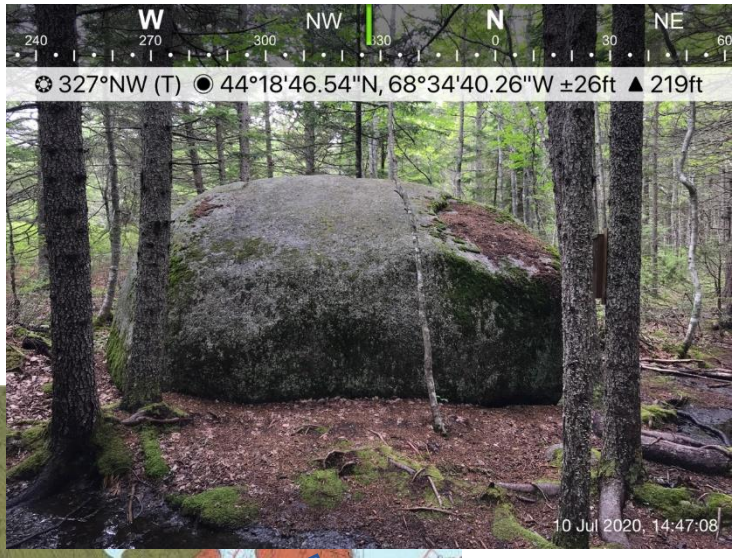
Plutonic rocks of the border zone **Sbz** – medium- to fine-grained, equigranular rocks that vary in composition from hypersthene diorite through quartz diorite, tonalite, and granodiorite. Locally they intrude each other and all are intruded by granite. Some granite in the border zone also is intruded by mafic rocks. Inclusions of country rock and brecciated mafic rocks are common in tonalite and granodiorite. Reference: Stewart, D. B., 1998

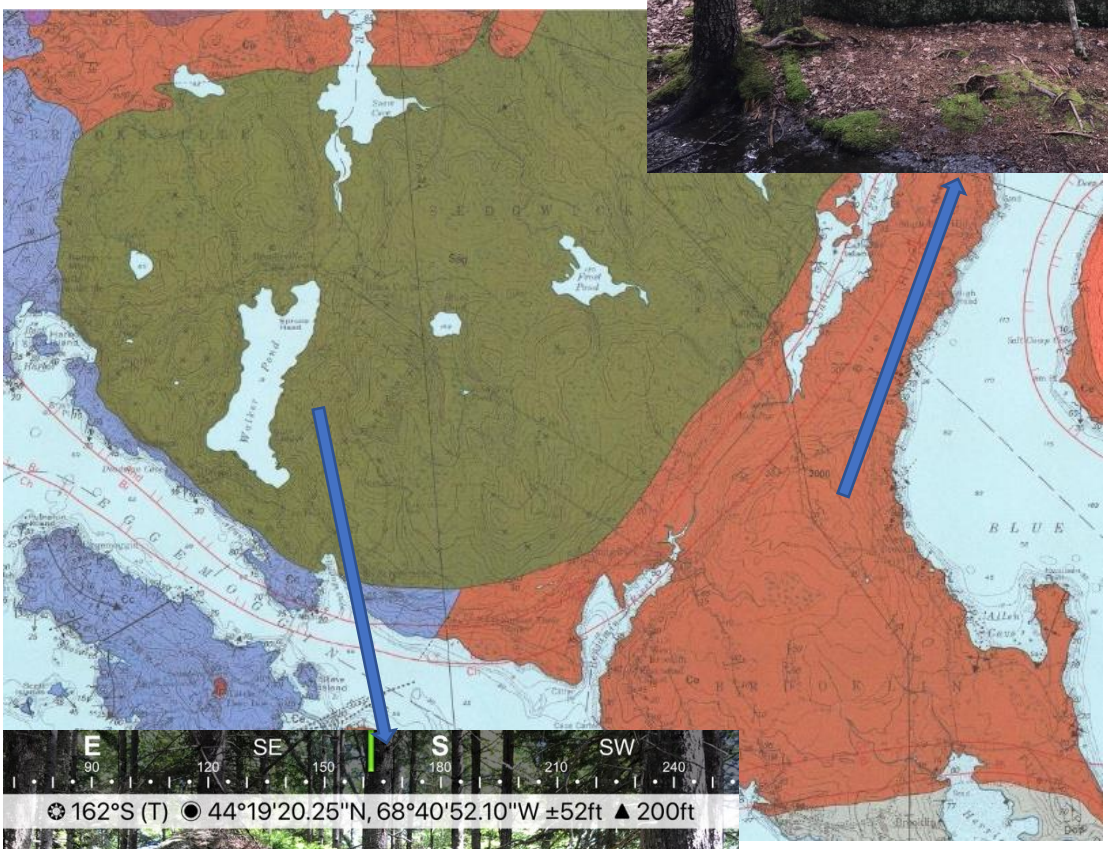


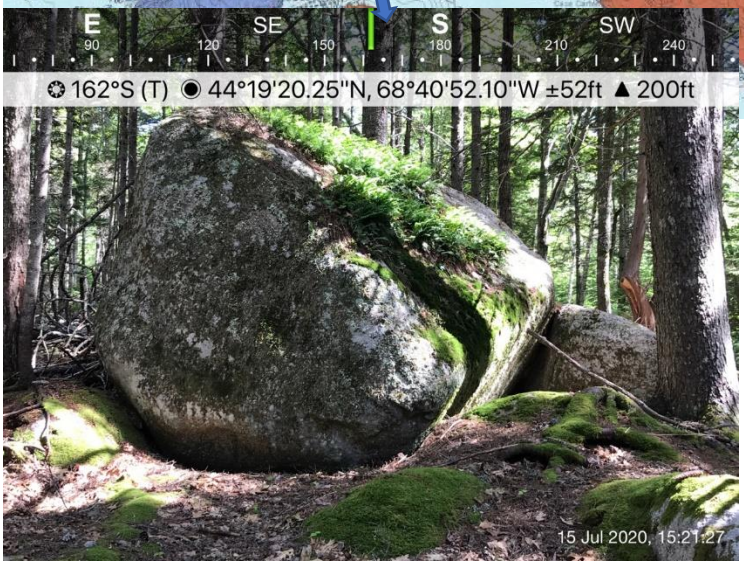
Locally known as….Turtle Rock

Caterpillar Hill-Cooper Farm & Hundred Acre Wood

Granite of Sedgwick Ssg
(Silurian ~419.5±1 Ma)
Gray, medium- to coarse-grained, equigranular biotite granite. Reference: Stewart, Tucker, and West, 1995; Stewart, D. B., 1998. At Hundred Acre Wood, the Sedgwick Granite boulder is lying on top of Ellsworth Schist. This erratic has travelled 1.5 miles at a minimum from the current edge of the Sedgwick pluton.



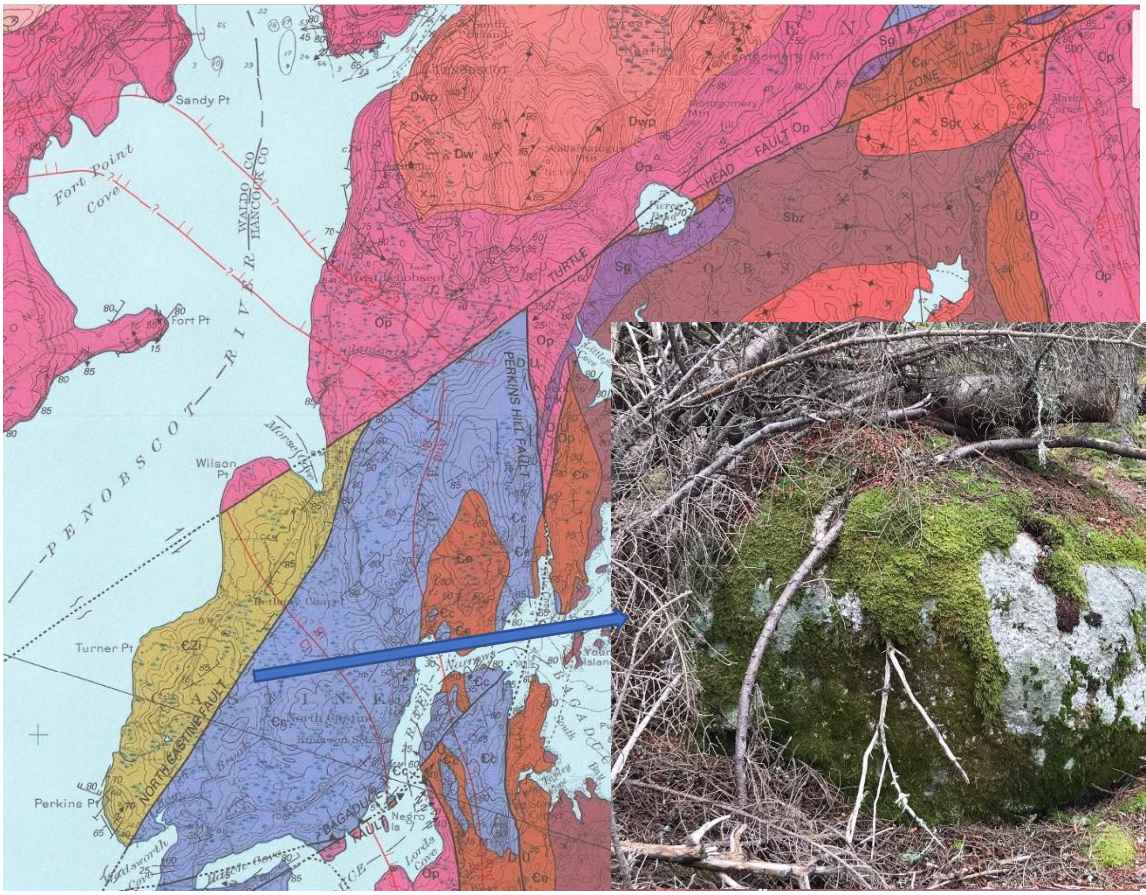




Here at **Cooper Farm**, there are a number of boulders along the southern edges of the loop trails. A former gravel pit is located at the edge of the property. These boulders may have been part of a former glacial delta sequence of sands and gravels.

Vlasta Greenbie Preserve

Granite of Wallamatogus Mountain Dw **(Devonian ~397±2 Ma)**
Light-gray, gray-weathering, medium-grained, muscovite-bearing, biotite granite. Reference: D.R. Lux, unpublished data; Stewart, D. B., 1998. This boulder and two others like it along the trail are true erratics, with its source area a minimum of 5 miles to the north. It sits on top of the Castine Volcanics unit. (see below).



BONUS ROCKS

Look in the stone wall just east of the parking area for a piece of basalt from the Castine Volcanics.

Castine Volcanics (Late Cambrian ~502.5±4 Ma)
Irregularly interbedded beds and flows, 1 to 100 m thick, of variegated felsic and mafic volcanic and volcaniclastic rocks and some beds of gray, grey, or reddish-purple slate or phyllite; overall section at least 2 km thick. Beds of conglomerate and coarse grit occur near the base of the formation close to the unconformity with the Ellsworth Schist. Reference: Ruitenberg and others, 1993; R.D. Tucker, written communication, 1996; Stewart, D. B., 1998.

Patten Stream Preserve