

Investigations into the geology of the Sweet Bay – Ocean Pond area, Bonavista Peninsula; NTS 2C/5E and 2C/12SE

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Introduction

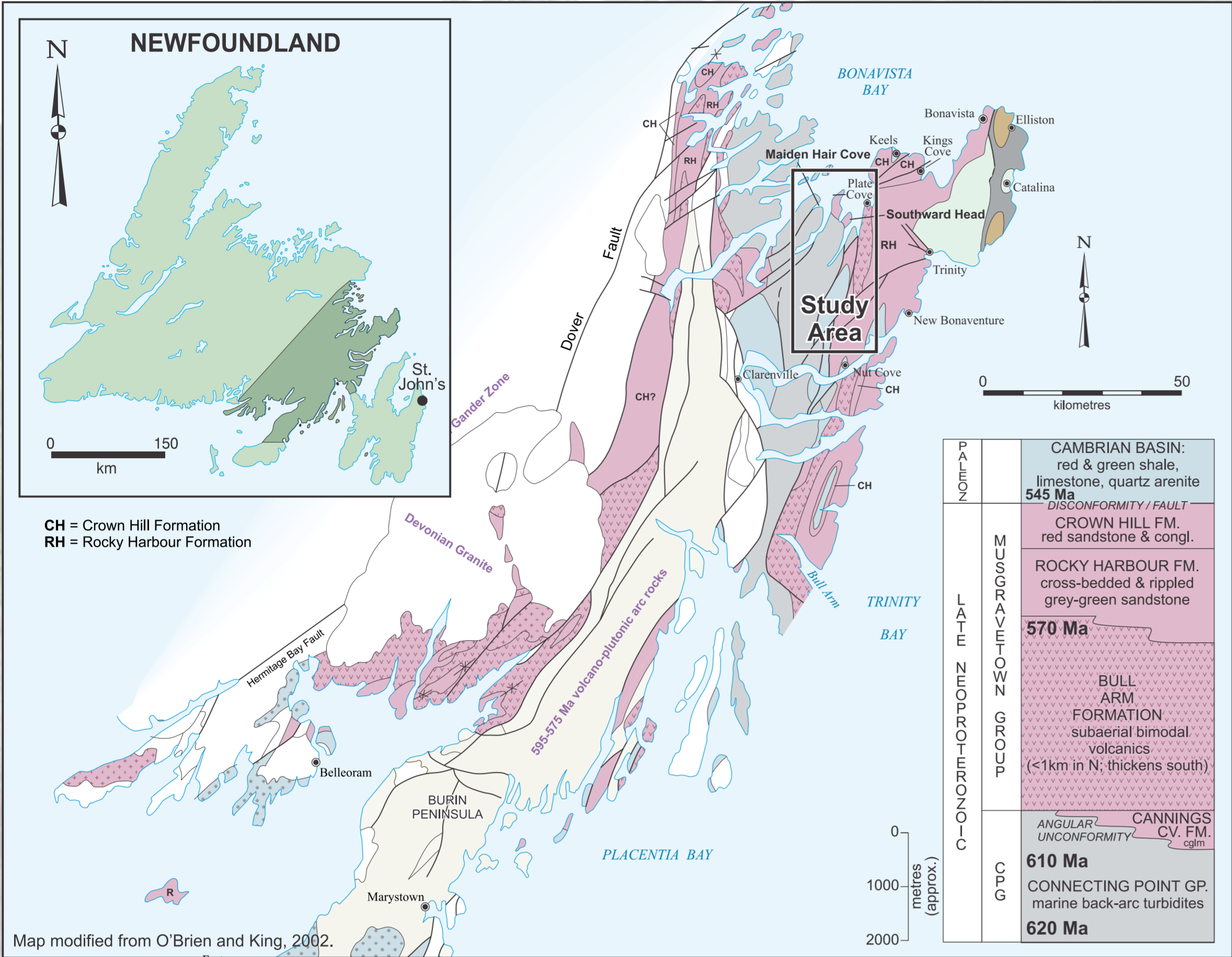
A regional (1:50 000 scale) bedrock mapping project began in 2013 in the Sweet Bay area of Bonavista Bay (2C/5E and 2C/12SE) and builds upon previous 1:50 000 scale mapping of the same area by O'Brien (1993). The project is intended to compliment same-scale recent bedrock mapping of the Bonavista, Trinity and Random 1:50 000 NTS map sheets (Normore, 2010, 2011, 2012) to cover most of the Bonavista Peninsula.

The Sweet Bay area is part of the Avalon Zone of the Newfoundland Appalachians and is underlain by Neoproterozoic siliciclastic rocks of the marine-dominated Connecting Point Group to the west, terrestrial-dominated Musgravetown Group to the east, and a shale-dominated Cambrian platformal succession in the south-central part of the map area.

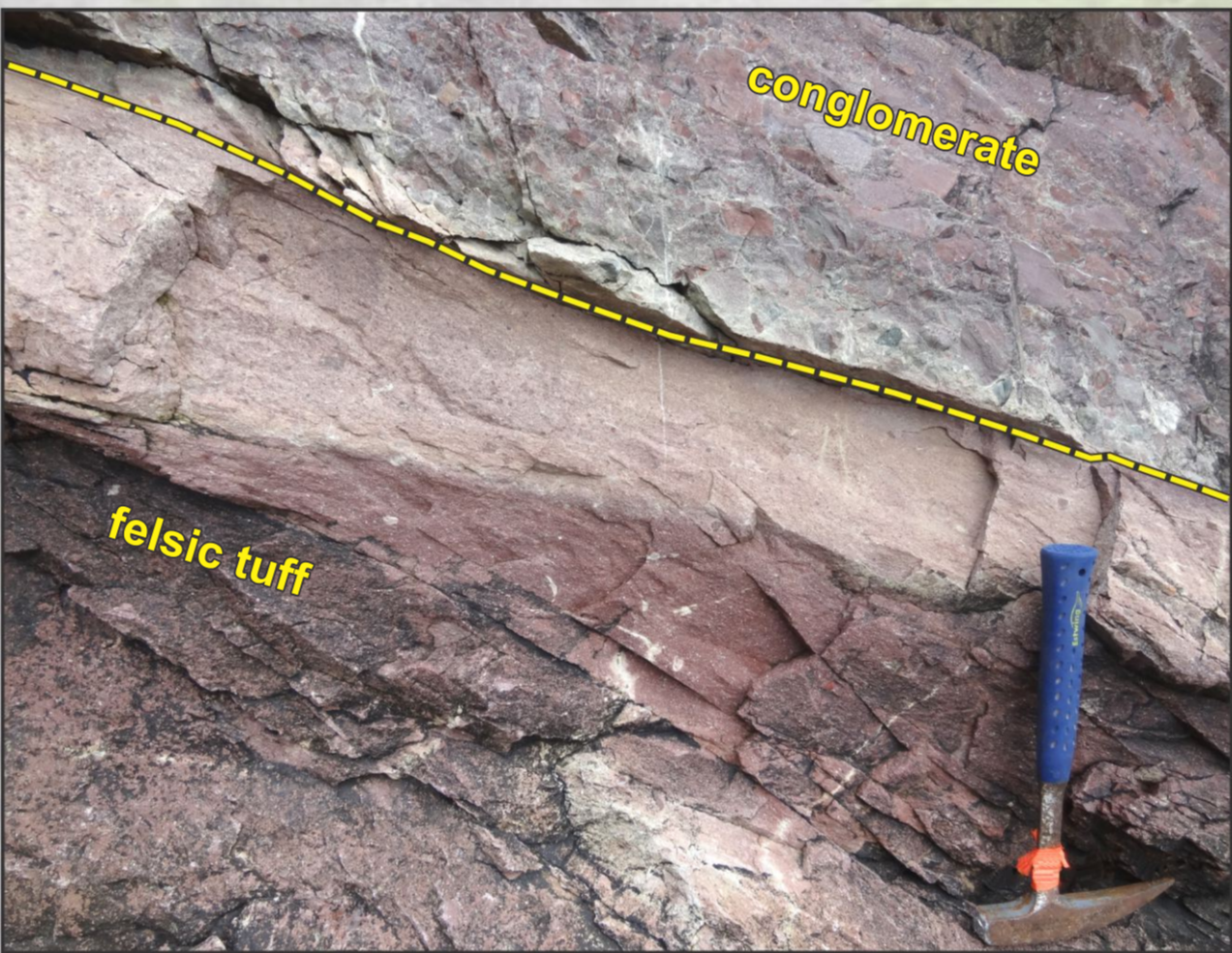
The Connecting Point Group is the oldest and most areally extensive unit in the study area. It forms a southward-narrowing clastic belt, stretching from Bonavista Bay to Placentia Bay. The ~3500 m thick package lies conformably above the ca. 620 Ma, volcanic-dominated Love Cove Group, and below the ca. 570 Ma Musgravetown Group. The Connecting Point Group rocks are interpreted to have been deposited in two turbiditic basin-fill events separated by an olistostrome resulting from basin collapse (Knight and O'Brien, 1988). The Connecting Point Group youngs to the southeast in the study area. Gabbro dykes are common throughout the Connecting Point Group and are interpreted to be synsedimentary (O'Brien and Knight, 1988).

The Musgravetown Group (Hayes, 1948) consists of a thick succession of red and green, coarse-grained siliciclastic fluvial and alluvial rocks and interbedded terrestrial rhyolites and basalts. Volcanic rocks of the Bull Arm Formation comprise a 2 km thick, north-trending, moderately east-dipping belt that marks the base of the Musgravetown Group in the eastern part of the study area. Cobble to pebble conglomerate of variable thickness (Cannings Cove Formation) locally underlies the volcanic rocks and is best exposed at the headlands. Red, grey and green pebble to cobble conglomerate, arkosic sandstone and minor siltstone to shale overlie the volcanics to the east. Red sandstones and conglomerates also occur north of the overlying Cambrian basin and are infolded with these younger platformal rocks.

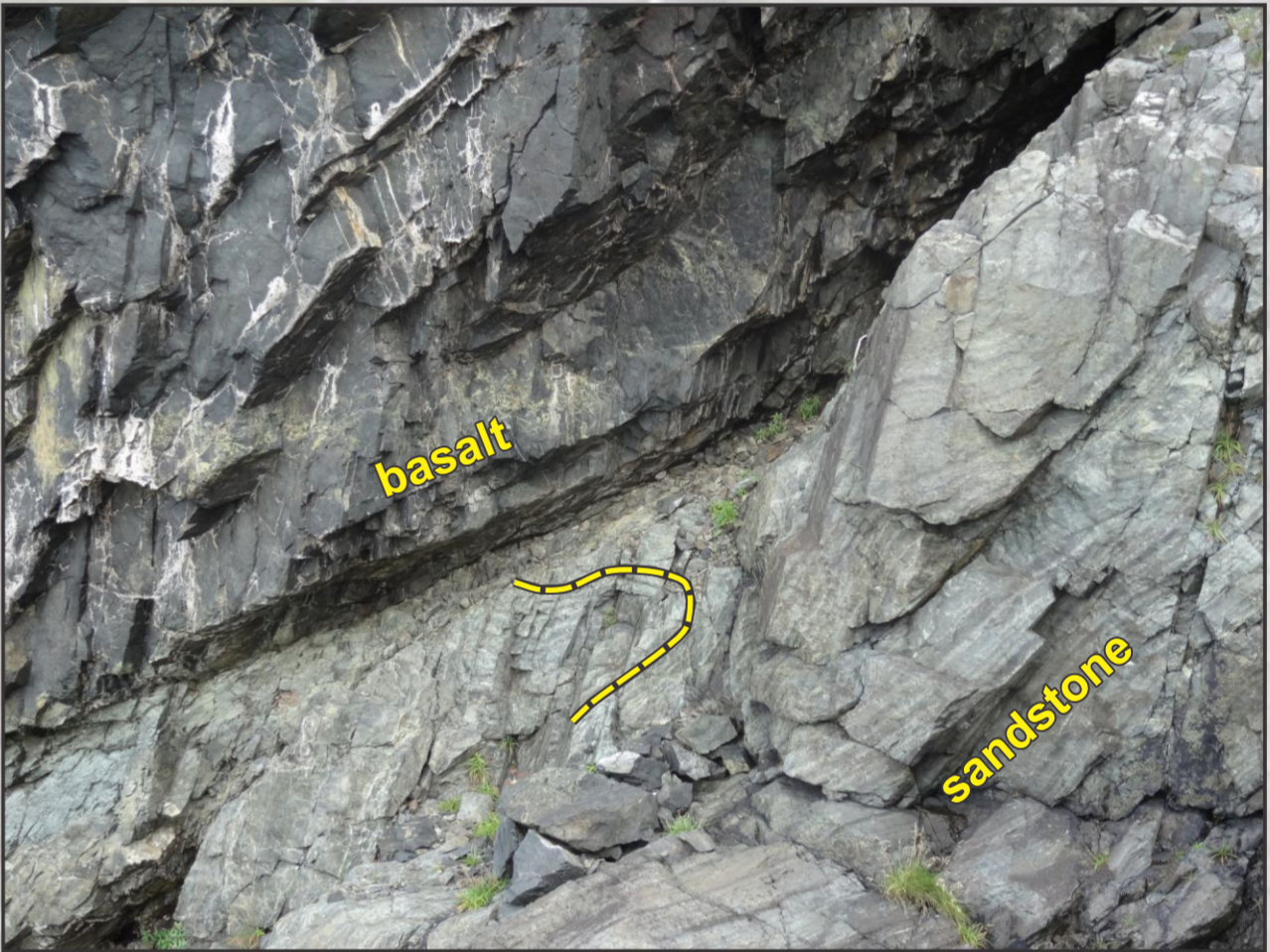
An Early to Middle Cambrian platformal succession conformably (?) overlies and is infolded with Neoproterozoic rocks of the Musgravetown Group in the southern part of the map area. The overall geometry resembles a north-northeast-trending, doubly-plunging synclinorium. The contact between the Early Paleozoic rocks and underlying Neoproterozoic rocks is not exposed in the study area.



Angular unconformity at east side of Southward Head dips 20° to the northwest (view to the NW). Shallowly NW-dipping red cobble conglomerates overlie steeply-northeast-dipping grey-green, thin-bedded, fine-grained siliceous sandstones. Mafic volcanic rocks occur farther to the north and are interbedded with the conglomerates.



Red to pink felsic tuff (bleached at top) containing 1-2 mm euhedral feldspars is interbedded with red pebble to cobble conglomerate on the east side of Southward Head. Clasts in the conglomerate include red siltstone and sandstone, feldspar porphyritic felsic volcanic rocks, and grey-green siliceous siltstone and sandstone. The felsic tuff was sampled for U-Pb geochronology to determine its age.



The angular unconformity on the west side of Southward Head dips shallowly to the north (view to NE). The red conglomerate, missing here, is interpreted to represent channel-fill debris that lacks significant lateral continuity. Note the tight slump fold within the underlying grey-green sandstones, interpreted as a soft-sediment feature consistent with a southward-dipping paleoslope.



Thin- and parallel-bedded sandstones show a colour transition along strike from grey-green to red at the headland south of Maiden Hair Cove (view to the SW). These red cherty rocks occur within a few hundred metres of rocks of the Musgravetown Group.



Thick- and convolute-bedded, red sandstones conformably (?) overlie green siliceous siltstones and black argillite of the upper Connecting Point Group (not shown). These rocks resemble red beds of the Crown Hill Formation of the upper Musgravetown Group and if correlative, then the lower units of the Musgravetown Group are not preserved here.



Quartz-epidote amygdaloidal basalt commonly occurs at the top of Bull Arm Formation basaltic flows. Subangular boulders of amygdaloidal basalt locally occur within red shale to siltstone and, more rarely, within flow-banded felsic volcanic rocks.



Columnar jointing in intermediate (?) volcanic rocks of the Bull Arm Formation exposed in the study area.

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