

**Arenig and younger evolution of the Gander margin:
a comparison of the New Brunswick and Newfoundland segments**

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The tectonic evolution of the Gander margin of the northern Appalachians likely will only be understood by combining critical data from different segments. In the New Brunswick segment a marginal basin formed by splitting an Arenig arc

that was partly developed on the Gander margin during the late Arenig to Llanvirn (= 470 Ma). The time of closure of this back-arc basin and initial collision between Avalon and Laurentia are well constrained as blueschist formed in Gander cover rocks on the Ashgill (447 Ma). Collision continued until the Late Silurian (\approx 415 Ma).

Remnants of a coeval arc-backarc system are also well preserved in the Exploits Subzone in Newfoundland, but a link with the Gander margin is only clear in southwest Newfoundland. Here, a dense tholeiitic dike swarm and associated intrusives (U/Pb zircon: 470 Ma) in the Gander margin rocks and spatially related basalts in its cover represent evidence for an Early to Middle Ordovician rifting event. Deformation in southwest Newfoundland is constrained by the Port aux Basques granite (U/Pb zircon: 453 ± 3 Ma), which cuts S_1 , but locally contains a S_1 foliation that is

folded by F_2 . Hence, we interpret the granite as a late syn- D_1 intrusion. D_1 and D_2 in southwest Newfoundland form part of a continuous deformation characterized by recumbent folding and late-syn D_2 thrusting. Growth of kyanite probably started late during D_1 and continued to grow during D_2 . D_2 coincided with peak temperature conditions (*ca.* 700°C), which have been dated by monazites and syn- D_2 granites at 420 to 414 Ma. Metamorphic pressure during D_2 reached 7 to 9 kb, which required a minimum of 25 km of tectonic overburden during a clockwise P-T-t path. Although the tectonic setting and style of deformation in the New Brunswick and Newfoundland segments are similar, the much higher P-T conditions in southwest Newfoundland are interpreted to reflect the collision between two promontories.