

Preliminary geological map of part of the Humber Arm Alittoway west of Corner Brook, N.L. (NTS: 12A/13, 12B/16, & 12G/1)

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Introduction and previous work
The Humber Arm area can be regarded as a "type area" for the major tectonic units that characterize the Humber Zone (Williams 1979) of the Appalachians. The allochthonous position of rocks on the shores of the Bay of Islands was recognized by Rodgers and Heale (1963) and by Stevens (1965, 1970).

Stratigraphic units
Several distinct stratigraphic successions appear overlapping portions of the time interval from Early Cambrian to Middle Ordovician. Each succession appears to be present in a distinct structural unit in the Humber Arm area.

Platform succession
The platform succession is the structurally lowest unit, represented by carbonate platform successions of the Port au Port, St. George, and Table Head Groups, representing the shelf succession of the eastern margin of Laurentia.

Watsons Brook succession
The Watsons Brook succession outcrops west of the platform succession. It includes rocks assigned to the Pinchgut Lake group named by Williams & Crowell (1986) and described in detail by Knight (1996).

Corner Brook succession
The lower Corner Brook succession refers to the stratigraphic succession of continental margin units described by Stevens (1965), Bruckner (1966), and Williams (1973) within the Humber Arm area.

Woods Island succession
The Woods Island succession is defined by a sandstone-shale unit, the Blow Me Down Brook formation, originally interpreted as Ordovician flysch, but subsequently shown by Lindholm and Casey (1996, 1999) to be of Early Cambrian age, on the basis of the presence of the trace fossil Ophiomorpha.

Structure
Structural studies concentrated on the shores of the Humber Arm were carried out by Bosworth (1985), and Waldron (1985, Waldron et al. 1988). Waldron et al. (2003) provide a more complete description and interpretation of structures in the area of the current map.

Synsedimentary and post-sedimentary deformation structures
Structures associated with synsedimentary or contemporaneous deformation include load structures, convoluted lamination or ball-and-pillow structure. A widespread zone of sandstone fracturing is found in the base of the Eagle Island formation.

Broken formation and mélange
The most characteristic deformation features of the Humber Arm Alittoway are zones of disrupted stratification, containing blocks of competent lithologies (igneous intrusions) in a matrix of deformed shale.

Thrust sheets
The tectonic contacts between units are typically sub-parallel to stratigraphy. They are referred to represent thrust faults that formed during the telescoping of the continental margin.

Waldron Brook shear
The Watsons Brook sheet contains at least two slices of Pinchgut Lake group and its cover. Most of the area of exposure is attributed to an upper slice; a tectonic window located at the culmination of a doubly-plunging F2 fold exposes mélange and a portion of a lower slice.

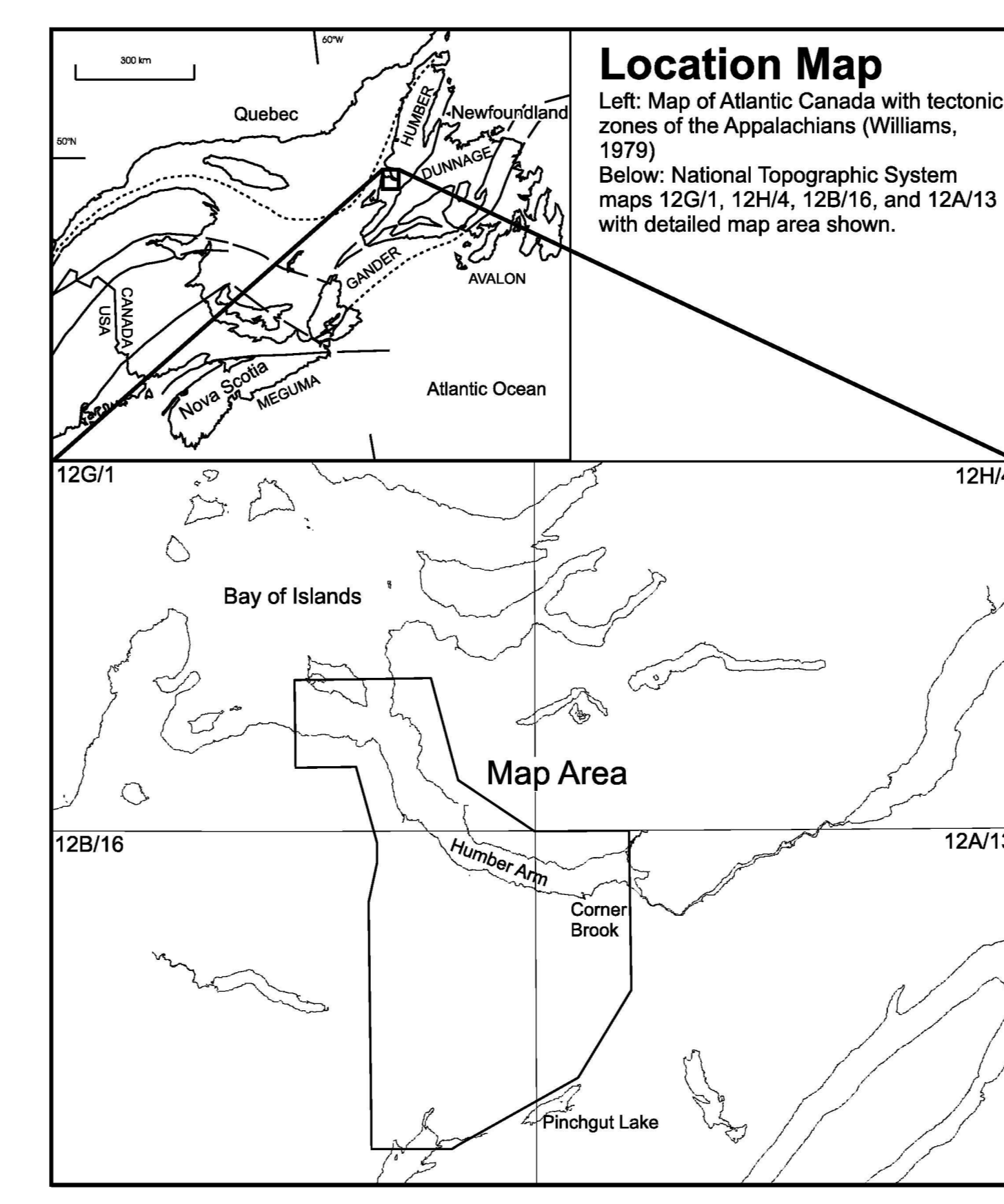
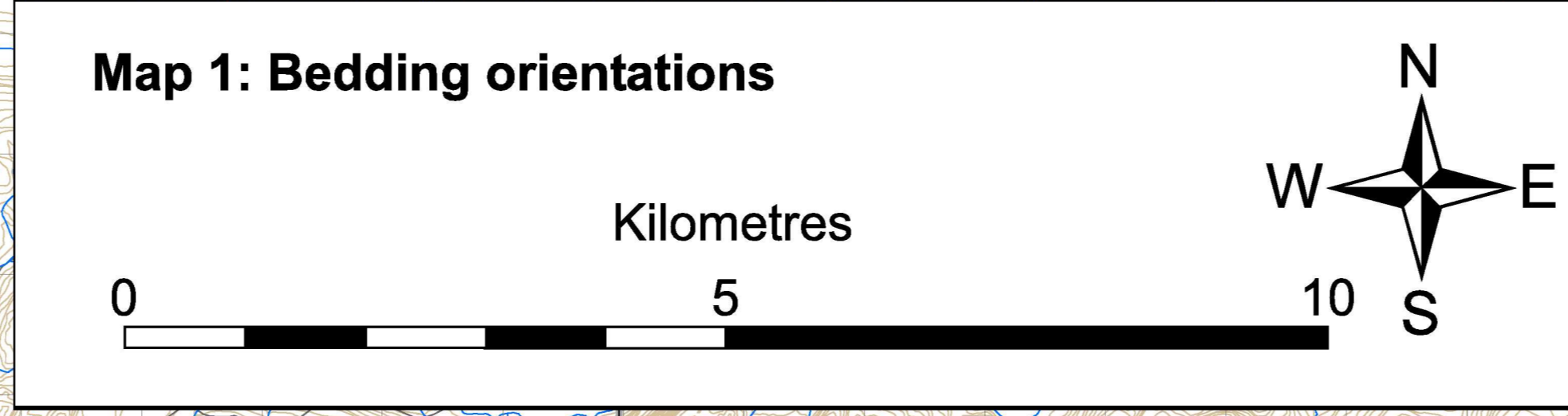
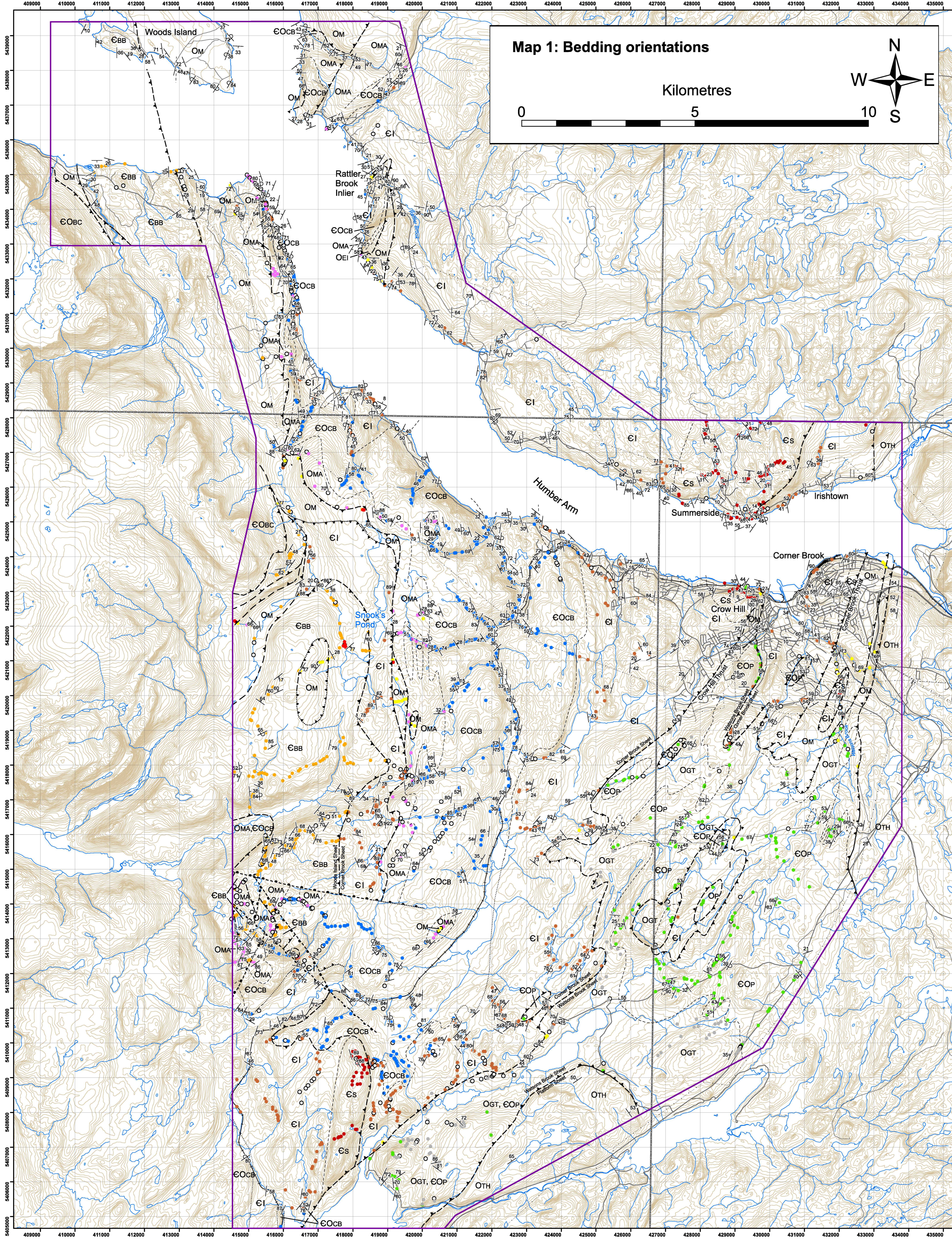
Corner Brook shear
The overlying Corner Brook sheet is dominated by a single large slice (the Crow Hill slice), within which a distinct stratigraphic succession is observed. The base of this slice is exposed in Corner Brook.

Blow Me Down Brook shear
The structurally highest sheet in the Humber Arm Alittoway is dominated by the Blow Me Down Brook formation. The base of the sheet is exposed on the south coast of Woods Island, where the levels of a highly sheared zone, dipping to the west.

Fabrics
Most of the coherently bedded fine-grained sedimentary rocks of the Humber Arm Alittoway display a strong D1 east-west-trending, axial planar to west F1 folds (see below). In the Summerside formation, structures typically show an S1 cleavage characterized by zones of irregularly spaced, curved, or non-planar axial planar to west F1 folds.

Topography and map scale
The region south of Humber Arm includes rocks of several distinct stratigraphic successions, emplaced above platform successions during D1 thrusting. Each succession is interpreted to represent a major tectonic sheet, derived from a distinct environment of the Laurentian margin.

Summary and conclusions
The region south of Humber Arm includes rocks of several distinct stratigraphic successions, emplaced above platform successions during D1 thrusting. Each succession is interpreted to represent a major tectonic sheet, derived from a distinct environment of the Laurentian margin.



References cited
Bosworth, W. 1985. Bedded-tilt and strike-slip faulting in the Humber Arm Alittoway west of Corner Brook, Newfoundland and Labrador. Department of Natural Resources, Geological Survey of Canada, Report 85-10.

Legend
Topographic Features: NTS Boundaries, Coast, Lakes, Powerlines, Railroad, Roads, Brooks, 100m Contours.
Faults: Conjectured, Inferred.
Stratigraphic Contacts: constrained, inferred, conjectured.
Thrust Contacts: constrained, inferred, conjectured.
Lithologic Units: OGT, OTH, Table Head Group, EOP, OEI, COCB, OMA, CS, GBB, OCB, OM, Undefined.
Structure Orientations: Bedding upright, overturned, unknown.
Map Coordinates: Universal Transverse Mercator Zone 21, Datum: NAD 83.

