Tectonically driven fluid migration in the west Newfoundland platform: record of dolomitization, breccia, Pb-Zn and carbonate cements (poster)

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Regional fluid migration through the Humber Platform was associated with episodic Paleozoic tectonism. These events profoundly altered platform stratigraphy to extensive dolostones, and veins and breccias cemented by carbonate, quartz ± Pb-Zn sulphides and sulphates. Complex alteration and cement stratigraphy records a series of deformation events associated with fluid migration.

Four discrete events are identified at Daniel's Harbour zinc mine: (1) **Convergent Lithospheric Bulge**: faults on a gently uplifted, early Ordovician platform focused meteoric karst, and thermal saline brines dolomitized an emergent seafloor. (2) **Foreland Burial/Obduction**: calcite/dolomite cements with radiogenic Sr precipitated in ubiquitous microfractures from allochthonous fluids. (3) **Peak Thermal Convergence**: regional fractures and faults released voluminous hydrothermal fluids (100°-200°C) responsible for extensive coarse stratabound dolomitization, vein cements and sulphides. (4) **Late uplift**: fluid migrated along steep faults to form local dolostone bodies.

Extension in the St. George's Basin (Devonian-Carboniferous) resulted in several further generations of fluid movement: (1) **Initial Extension**: extensive fractures and breccias in Cambro-Ordovician carbonates filled with calcite-siderite-galena-sphalerite-silica. Only minor wall rock alteration resulted. (2) **"Post-Windsor" Convergence**: extensive precipitation of stratabound calcite, siderite, galena, sphalerite, barite and celestite occurred within basal carbonates of the Carboniferous Ship Cove Formation above sandstone aquifers. Minerals concentrated in fault-controlled, karst breccias - along joints and faults in Ordovician platform carbonates.

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