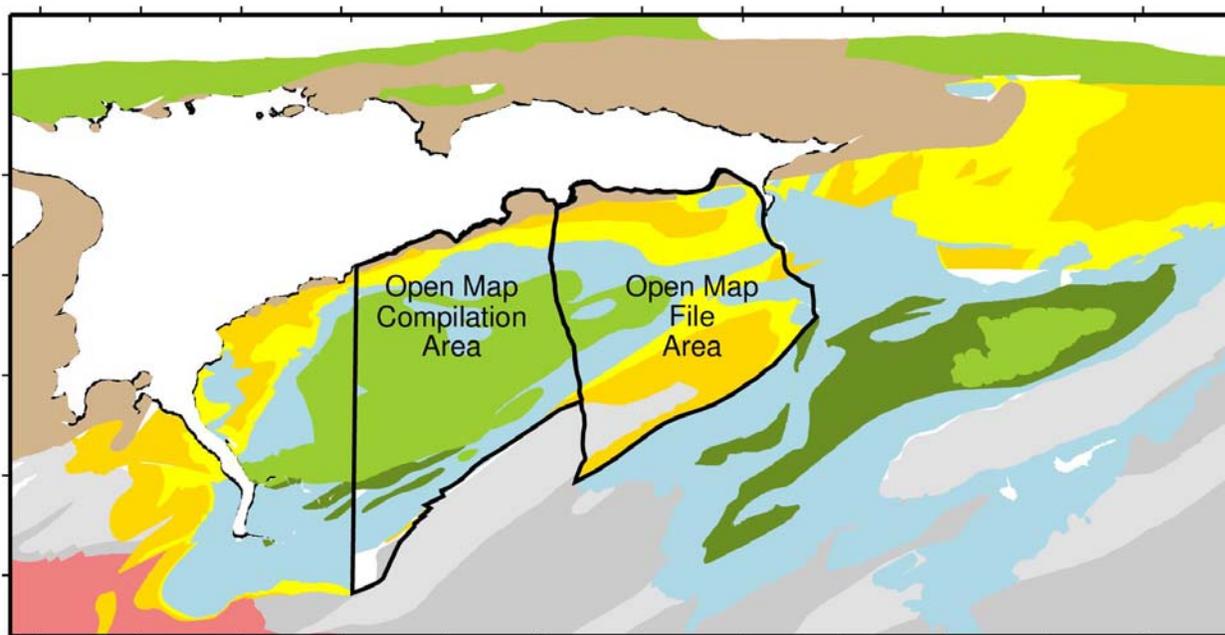


# Economic Implications of Tectonic Constraints in the Kennetcook Basin

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Tectonic constraints, inferred from new bedrock mapping in the eastern part of the Kennetcook Basin, Meguma Terrane, Nova Scotia, have implications for the formation and evolution of hydrocarbon and mineral systems in the Devonian-Carboniferous strata of Nova Scotia. Broadly, doubly-plunging upright fold systems, with hinge traces trending ENE across the Kennetcook Basin, appear to explain much of the geometry and distribution of both the basement (Goldenville, Halifax, and Rockville Notch Groups) and basin (Horton, Windsor, Mabou, and Cumberland Groups) strata. Basement fold systems appear to be out-of-phase with basin folding, however; synclinalia in basement strata are draped by anticlinalia in the basin strata, and vice versa, to a first approximation. This geometry is consistent with the following tectonic history: (1) Neocadian shortening of the Meguma Terrane, prior to formation of the Kennetcook Basin in the late Devonian (ca. 406-388 Ma); (2) formation of a regional erosion surface and the Kennetcook Basin's initial topography, in the late Devonian/early Carboniferous (ca. 370-350? Ma); (3) deposition of Kennetcook Basin strata, between ca. 360-280 Ma; and, (4) Alleghenian upright folding of both basement and basin strata in the late Carboniferous/early Permian (ca. 325-275 Ma). Alleghenian thrusting and recumbent folding has modified the above general pattern as well, with the consequence that basin strata are duplicated and/or overturned, in places. Also, migrations of Windsor salt, and sinistral displacements on a set of NW-SE trending faults, have affected the geometry of basin strata after deposition. In detail, the new bedrock mapping and structural analysis helps to advance our knowledge of the nature of sedimentary and structural contacts, where basin strata has been duplicated, and the distribution of both structural permeability and potential traps for both hydrocarbon-bearing and ore-bearing fluids.



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