

**Late Carboniferous Development of the Stellarton Graben, Nova Scotia:
Variation and Significance of Syn-tectonic Sedimentation Styles**

G.M. Yeo

Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario K1A 0E8

Stellarton Graben, which contains the Late Westphalian Pictou Coalfield, lies between the Cobequid and Antigonish Highlands in northern Nova Scotia. It is bounded by the eastern Cobequid and Hollow faults. Detailed structural analysis shows that Late Westphalian movement on these faults was dextral. Facies changes and coarsening of clastics toward the faults, and localization of conglomerates adjacent to them, indicates that they were a major control of Late Carboniferous sedimentation.

Before graben formation, conglomerates and sandstones of the Westphalian B Cumberland Group were shed northerly, away from the eastern Cobequid-Hollow fault system as alluvial fan deposits. Within the graben, grey and red lacustrine and deltaic shales and sandstones, with oil shales and economic coals of the Westphalian C-D Stellarton Formation were deposited disconformably on Cumberland and unconformably on older strata. The Stellarton Formation contrasts with the grey and red fluvial sandstones and shales of the Merigomish Formation (Pictou Group), deposited at the same time north of the graben. Predominance of fine-grained clastics, except near the graben margins,

indicates that graben subsidence was gradual, with relatively little relief developed. Three cycles of basin subsidence and infill recognized in the Stellarton Formation suggest three syn-sedimentary pulses of faulting.

Comparison of coalification curves for the Stellarton and Merigomish coals corroborates observations of anomalously high heat flow within the graben. This accounts for the high rank of the lower Stellarton coals, compared to other northern Appalachian coals.

Stellarton Graben is the youngest of an array of pull-apart graben within the Maritimes Carboniferous Basin, the Hercynian successor basin complex of the northern Appalachians. These graben developed along E- and NE-trending strike-slip faults in response to regional SE-NW compression as the West African craton collided with eastern North America during the Alleghanian-Hercynian Orogeny. The end of subsidence in Stellarton Graben signals the end of this orogeny in the Canadian Appalachians.