

## A method to refine the palinspastic restoration of Late Proterozoic Avalonian-Cadomian belt

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The Avalonian-Cadomian orogenic belt developed at the periphery of a Late Proterozoic supercontinent oblique to interior collisional orogenic sutures associated with supercontinent assembly. As a result, segments of the peripheral orogenic belt are likely to have evolved upon different cratonic basements. Contrasting basement signatures are indicated by available Nd and U-Pb (detrital zircon) isotopic data which suggest that West Avalonia lay adjacent to the Amazonian Craton during the Late Proterozoic whereas East Avalonia, Cadomia and the Meguma Terrane occupied positions adjacent to the West African Craton.

Initial  $\epsilon_{\text{Nd}}$  data for crustally derived felsic igneous rocks from Avalonian and Cadomian terranes define  $\epsilon_{\text{Nd}}$  growth lines typical of upper crustal rocks. However,  $\epsilon_{\text{Nd}}$  values for West Avalonia are strongly positive and yield depleted mantle model ages of 0.8 to 1.1 Ga, whereas  $\epsilon_{\text{Nd}}$  data for Cadomia are predominantly negative and give crustal residence ages of 1.0 to 1.9 Ga. The envelope of Nd isotopic compositions for West Avalonia, defined by  $\epsilon_{\text{Nd}}$  growth lines, shows little overlap with that for Cadomia, suggesting basements of contrasting isotopic characteristics. A similar envelope

to that of West Avalonian is defined by  $\epsilon_{\text{Nd}}$  data for the Tocantins Province of Central Brazil, supporting the peri-Amazonia position for West Avalonia suggested by detrital zircon data which match all age provinces of the Amazonian Craton.

Nd isotopic data for Cadomian basement (2.0 Ga Icart Gneiss) closely resemble those for 2.0 to 2.1 Ga (Eburnian) granitoids in the West African Craton. Basement of very similar isotopic characteristics to that of Cadomia, is also suggested by the envelope of Nd isotopic compositions for the Meguma Terrane, where a West African connection is supported by detrital zircon data which match age provinces of the West African Craton. East Avalonia shows  $\epsilon_{\text{Nd}}$  affinities with West Avalonia and Cadomia, and may have lain adjacent to a suture between their basements.

Such variations in basement isotopic contrasts provide important constraints for the Late Proterozoic reconstruction of the now-dismembered Avalonian-Cadomian orogenic belt and may be of more general application to the palinspastic restoration of dispersed Precambrian terranes.