

England Batholith, NSW, Australia: Age implications for the Crust.

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Heading

Zircon Lu-Hf isotopic data for representative plutons from the five granite suites of the New England Batholith indicates a significant Late Proterozoic lower crustal input for all except one of the suites. Earlier published oxygen [1] and recently published Li isotopic data [2] support the view that the two Permo-Carboniferous suites (Bundarra and Hillgrove) are S-type but with $^{87}\text{Sr}/^{86}\text{Sr}$ ratios that are lower than those of Lachlan Fold Belt S-types and that of the three Permo-Triassic metaluminous suites, one, the Clarence River, is an isotopically primitive I-type, one, the Moonbi, is a more evolved I-type and the third, the Uralla, has isotopic and mineralogical characteristics transitional between I-type and S-type.

New $^{176}\text{Hf}/\text{Hf}^{177}$ data from single zircon grains obtained using the methods and elegant correction procedures in [3] show that only the Clarence River suite has T_{DM} model ages close to the emplacement ages. Zircon data for the other four suites suggests the crustal component underlying of the New England Batholith could be as old as Late Proterozoic. The data are consistent with the initiation of the Tasman Fold Belt System, of which New England is part, around 830 and 730 Ma .

References

- [1] O'Neil, J., Shaw, S.E. and Flood, R.H. *Contrib. Mineral Petrol.* 62, 313-328.
- [2] Bryant, C.J., Chappell, B.W., Bennett, V.C. and McCulloch, M.T. 2004, *Trans. Roy. Soc. Edin.* 95, 199-214.
- [3] Griffin, W.L., Xiang Wang, Jackson, S.E., Pearson, N.J., O'Reilly, S.Y., Xisheng Xu and Xinmin Zhou, 2000 *Lithos* 61, 237-269.