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Northeastern Section - 51st Annual Meeting - 2016

Paper No. 30-7

Presentation Time: 10:00 AM

PROVENANCE OF DETRITAL ZIRCON IN TACONIC FORELAND FLYSCH, IN THE HUDSON AND MOHAWK VALLEYS OF EASTERN NEW YORK

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The Taconic Foreland basin formed during the Late Ordovician collision between Taconic Arcs and the Grenville-based passive margin of eastern Laurentia. Strata in the basin record a westward-progressing depocenter, with oldest deformed synorogenic flysch exposed to the east, adjacent to and within the Taconic allochthon, and younger strata to the west in the autochthon. Detrital zircons from the flysch were separated from the western facies (Schenectady Fm) and the eastern facies (Austin Glen Fm) of the basin to determine sediment provenance, which is dominated by recycled sedimentary and metasedimentary rocks. U-Pb dates of detrital zircon grains were acquired using LA-ICPMS. The dominant grain-age distribution in the basin reflects a clear Grenville source dominated by grains of Ottawan age, and less of Shawinigan age. In the eastern facies (Austin Glen Fm), the majority of zircon grains from a typical sample yield ages diagnostic of Grenville terrane (~1.0-1.3 Ga), with a small population of grains <1000 Ma. A distinctive and unusual light-colored sandstone sample from the Taconic Unconformity outcrop near Catskill (*C. Bicornis* graptolite zone) appears to be a mix of about half volcanic grains (~457-470 Ma), and half with the same Grenville signature. A separate of picked acicular grains from this sample reveal a predominantly concordant population of grains undoubtedly from the Taconic arc. In the western facies (Schenectady Fm, Burtonsville), the majority of zircon grains are also Grenville. A sub-sample of rounded to very well rounded grains (likely multicycle) that have low radiation damage as assessed by Raman Spectroscopy also have a distinct Grenville age distribution. Five zircons from the eastern facies have grain ages of ~510-700 Ma, and thus can be tied to Laurentian rifting. Grains from western facies primarily exhibit Grenville ages, but 5 grains (~565-700 Ma) define the Laurentian rift interval. Dated grains from the syn-rift, latest Proterozoic Rensselaer Graywacke (highest slice in the Taconic allochthon) show entirely Grenville ages, but this sample is dominated by zircons from the Shawinigan Orogeny, and thus there may be important differences in the age distribution of rocks in the Grenville basement complexes that are external and east of the Adirondacks.

Session No. 30

[T8. Integrating Complementary Records of Paleozoic Orogenies in the Appalachians: Bridging the Foreland and Hinterland](#)

Tuesday, 22 March 2016: 8:00 AM-12:00 PM

Meeting Room 2 (Empire State Plaza Convention Center)

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[Back to: T8. Integrating Complementary Records of Paleozoic Orogenies in the Appalachians: Bridging the Foreland and Hinterland](#)

[<< Previous Abstract](#) | [Next Abstract >>](#)
