

## **Provenance of Neoproterozoic Ocoee Supergroup Sediments, Eastern Great Smoky Mountains (NC-TN)**

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The Ocoee Supergroup is a sequence of Neoproterozoic feldspathic rift-facies clastic metasedimentary rocks; potential source terranes are Grenville basement orthogneisses and Neoproterozoic rift-related granitoids. The provenance of Ocoee sediments was assessed from modes of framework grains and mineral chemistry. Framework mineral abundances in Pigeon, Roaring Fork and Thunderhead siltstones and sandstones plot on ternary tectonic discrimination diagrams as a basement uplift source. Longarm quartzite plots as craton interior and Wading Branch sandstone plots as transitional continental source. Pigeon siltstones and Roaring Fork sandstones contain a higher abundance of alkali feldspar and less plagioclase (Alkali/Plagioclase=128 to 4) compared to Longarm, Wading Branch and Thunderhead sandstone (Alkali/Plagioclase= 3.6 to 0.3) suggesting different sources for the stratigraphically conformable but gradational units. Detrital feldspar compositions for all formations are remarkably homogeneous [Alkali feldspar: Orthoclase<sup>94</sup> Albite<sup>6</sup>; Plagioclase: Albite<sup>93</sup> Anorthite<sup>7</sup>] compared to feldspars in underlying basement granitic rocks [Alkali feldspar: Orthoclase<sup>94</sup> Albite<sup>6</sup>; Plagioclase: Albite<sup>83</sup> Anorthite<sup>17</sup>]. Although K-feldspar compositions are similar, plagioclase compositions are distinctly more sodic and more homogeneous than those in basement rocks. The Pigeon siltstone, the youngest Ocoee unit contains a bimodal plagioclase distribution, which is absent in other Ocoee formations. The high alkali content of the detrital feldspars in all units is indicative of an A-type peralkaline granite source terrane. Although the framework mineralogy indicates a continental basement source, the detrital mineral abundances and compositions are not consistent with that source being contiguous calc-alkaline basement of the Eastern Great Smoky Mountains. Detrital zircon geochronology in Ocoee sediments will provide additional constraints on provenance.