The world according to zircon - monazite and apatite disagree

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Early models of continental crustal growth based on the ages of crystallization of granitoids were abandoned once it was understood that many silicic magmas form by remelting pre-existing crustal materials. Subsequent crustal evolution models focused on the age and whole-rock isotopic composition of granitoids or on the isotopic composition of fine-grained clastic sedimentary rocks. Recently there has been a resurgence of emphasizing major crustal growth events by compiling the ages of detrital zircon. More sophisticated models also employ oxygen and hafnium isotopic composition of zircon as well as U-Pb ages. However, viewing the production of continental crust through the eyes of zircon can produce a significant bias because of the extreme 'zircon fertility' of some magmas. If a large amount of zircon is produced during a high fertility orogenic event then that could be mistaken for a large volume of magma being produced. That detrital zircon can be very misleading is demonstrated in two modern environments: a granitic 'point' source and the local sediment derivd from it and in Modern alluvium from a large river in a more chemically weathered environment. Apatite from the point source and from the sediment may more accurately reflect the parent material. Similarly, the ages of monazite from the Modern alluvium far more accurately reflect the area of the different crustal regions being drained. Thus it is suggested that analysis of these two phosphates may be a very impart part of properly testing for bias based solely on analysis of zircon.