Figure 1. Geologic map of NE Minnesota (simplified from Jirsa et al., 2011) highlighting major intrusive complexes of the Midcontinent Rift and showing geochronology sample locations. U-Pb dates from the anorthositic and layered series of the Duluth Complex (shown in light and dark blue) indicate rapid emplacement in less than 1 million years.
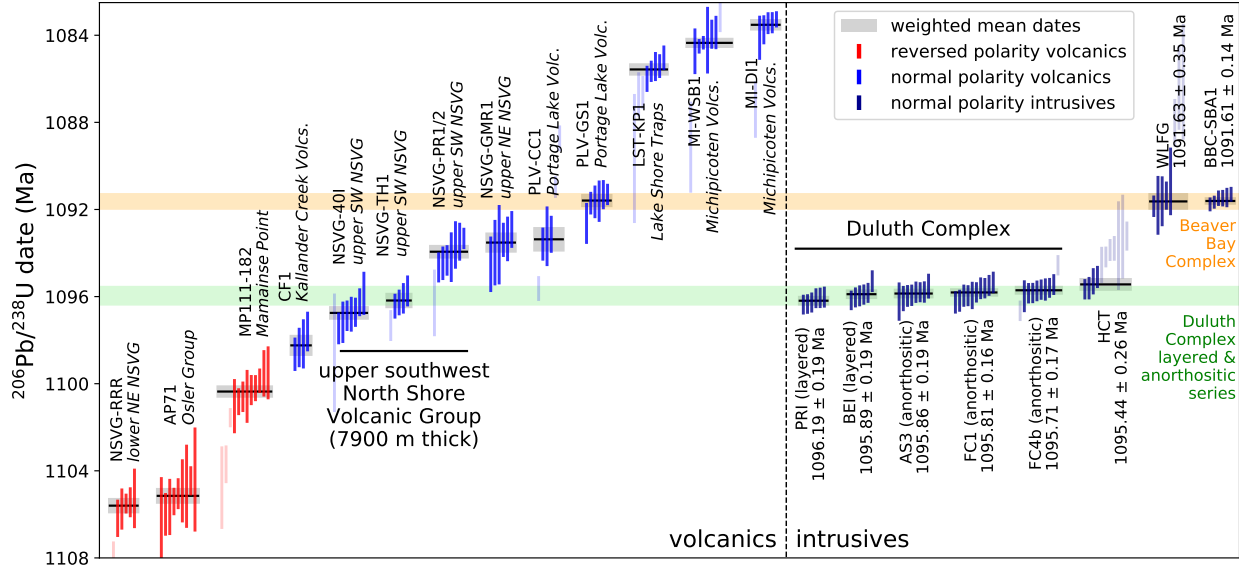
Figure 2. Date bar plot of CA-ID-TIMS ^{206}Pb/^{238}U dates for Midcontinent Rift volcanics and intrusives. Each vertical bar represents the date for an individual zircon while the horizontal lines and grey boxes represent the weighted means and their uncertainty.
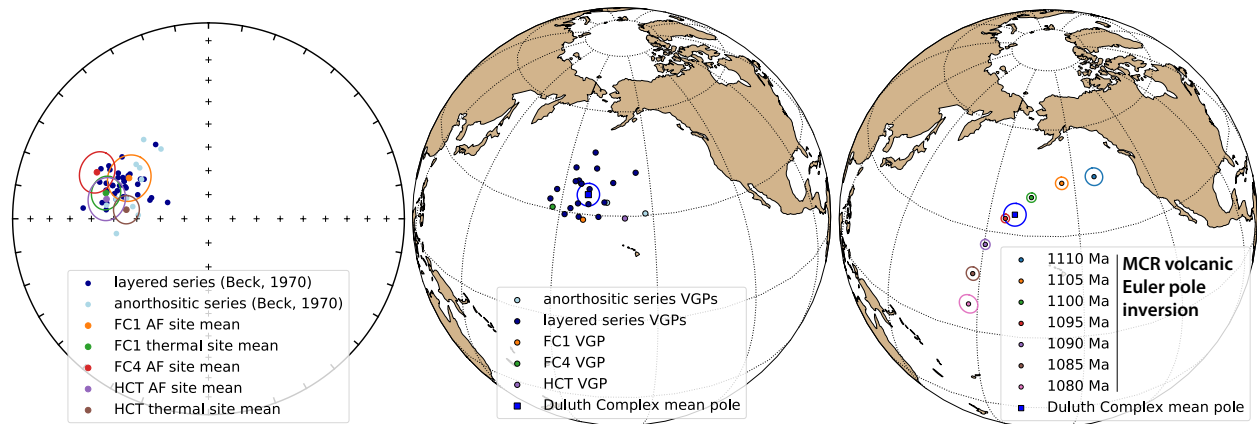

Figure 3. Left panel: tilt-corrected site mean paleomagnetic directions from anorthositic and layered series sites of Beck (1970) in the vicinity of Duluth and from the FC1, FC4, and HCT sites. Center panel: Virtual geomagnetic poles (VGPs) for sites with $\alpha_{95} < 15°$ give a mean pole of: 188.7° E, 35.6° N, N=24, A$_{95}$=3.1, k=92. Right panel: Duluth Complex paleomagnetic pole shown with a synthesized pole path developed using an Euler pole inversion of Midcontinent Rift volcanic poles.

Table 1. Summary of CA-ID-TIMS ^{206}Pb/^{238}U dates from Midcontinent Rift intrusions

Sample	Group	Latitude Longitude	^{206}Pb/^{238}U date (Ma)	Error (2σ) X	Y	Z	MSWD	n
PRI *Partridge River intrusion*	Duluth Complex (layered series)	47.5480° N 92.1074° W	1096.19	0.19	0.36	1.15	0.45	6
BEI *Bald Eagle intrusion*	Duluth Complex (layered series)	47.7516° N 91.5680° W	1095.89	0.19	0.36	1.15	1.59	6
AS3 *Duluth anorthosite*	Duluth Complex (anorthositic series)	46.7621° N 92.1590° W	1095.86	0.19	0.36	1.15	0.43	8
FC1 *Forest Center anorthosite*	Duluth Complex (anorthositic series)	47.7827° N 91.3266° W	1095.81	0.16	0.34	1.14	1.44	10
FC4b *Forest Center anorthosite*	Duluth Complex (anorthositic series)	47.7677° N 91.3753° W	1095.71	0.17	0.35	1.14	0.38	8
HCT *Houghtaling Creek troctolite*	Beaver Bay Complex	47.6009° N 91.1497° W	1095.44	0.26	0.40	1.16	1.13	4
WLFG *Wilson Lake ferrogabbro*	Beaver Bay Complex	47.6620° N 91.0619° W	1091.63	0.35	0.46	1.18	0.74	5
BBC-SBA1 *Silver Bay aplite*	Beaver Bay Complex	47.6620° N 91.0619° W	1091.61	0.14	0.30	1.2	1.0	6

Notes: X–internal (analytical) uncertainty in the absence of external or systematic errors; Y–uncertainty incorporating the U-Pb tracer calibration error; Z–uncertainty including X and Y, as well as ^{238}U decay constant uncertainty (0.108%; Jaffey et al., 1971). This Z error needs to be utilized when comparing to dates developed using other decay systems (e.g., ^{40}Ar/^{39}Ar, ^{187}Re-^{187}Os); MSWD–mean square of weighted deviates; n–number of individual zircon dates included in the calculated sample mean date. All dates are from this study with the exceptions of AS3 which was published in Schoene et al. (2006) and BBC-SBA1 which was published in Fairchild et al. (2017). Data for individual zircons are provided in the Data Repository.