

# Kinematics of the South Atlantic Rift

## Supplementary Material

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This PDF is supplementary material to the paper “Kinematics of the South Atlantic Rift” by C. Heine, J. Zoethout and R. Dietmar Müller, submitted to [Solid Earth](#) on 2013–01–05.

The supplementary material contains a continuous set of paleo-tectonic maps from 140 Ma to 100 Ma in 1 Million year timesteps.

Bottom color scales indicate geological stages and magnetic reversals with red diamond indicating time of reconstruction, abbreviations here: T - Tithonian, Val. - Valagininian, Haut'n - Hauterivian, Barrem. - Barremian. Rigid lithospheric blocks denoted by black labels: SAf - Austral African Plate, BoP - NE Brazilian Borborema Province plate, Jos - Jos Plateau Subplate, NEA - NE African Plate, NPM - North Patagonian Massif, PT - Pampean Terrane, RaB - Rawson Block, Sal - Salado Subplate, SAm - Main South American Plate, SJuB - San Julian Block, SLC - Sao Luis Craton Block. Actively extending basins are indicated by red background in label, postrift basins are indicated by light gray background in label, abbreviations: BeT - Benoue Trough, CaR - Canelones Rift, D/D B. - Doba and Doseo Basins, ColB - Colorado Basin, luB - Iullemmeden Basin, MarB - Marajo Basin, MugB - Muglad Basin, NFB - North Falkland Basin, PotB - Potiguar Basin, TRJ - Reconavo, Jatoba, Tucano Basins, SaB - Salado Basin. Other abbreviations: RdJ - Rio de Janeiro, B. - Basin, GPI. - Guyana Plateau, DeR - Demerara Rise.

In the reconstructions, Southern Africa (SAf) is held fixed in present-day position for reference. Flowlines and plate velocity vectors for margin segments are plotted with reference to Southern Africa. Hotspots shown as volcano symbol in the maps are derived from their present day position and assumed to be stationary (dashed magenta colored circle with hachured fill). Their present-day position is plotted with a circle of 200 km radius to indicate the uncertainty of the hotspot location over time. It is further not assumed that these hotspot operate continuously over geological time. Abbreviations are: A - Ascension, B - Bouvet, Ch - Chad/Tibesti, Ca - Mount Cameroon, Cd - Cardno Seamount, D - Discovery, T - Tristan da Cunha.

The geological time scale used for the reconstructions is a hybrid model between the

GTS2004 chronostratigraphic timescale (Gradstein et al., 2004) and the Gee and Kent geomagnetic polarity timescale (Gee & Kent, 2007), please see the main paper for background information.

The best way to display these maps is to use any PDF viewer in full screen mode and flip pagewise through the reconstruction. Please see the map legend for a key to the different map units and symbols.

For details on the data base of these maps and which reconstruction parameters, were used, please refer to the accompanying manuscript.

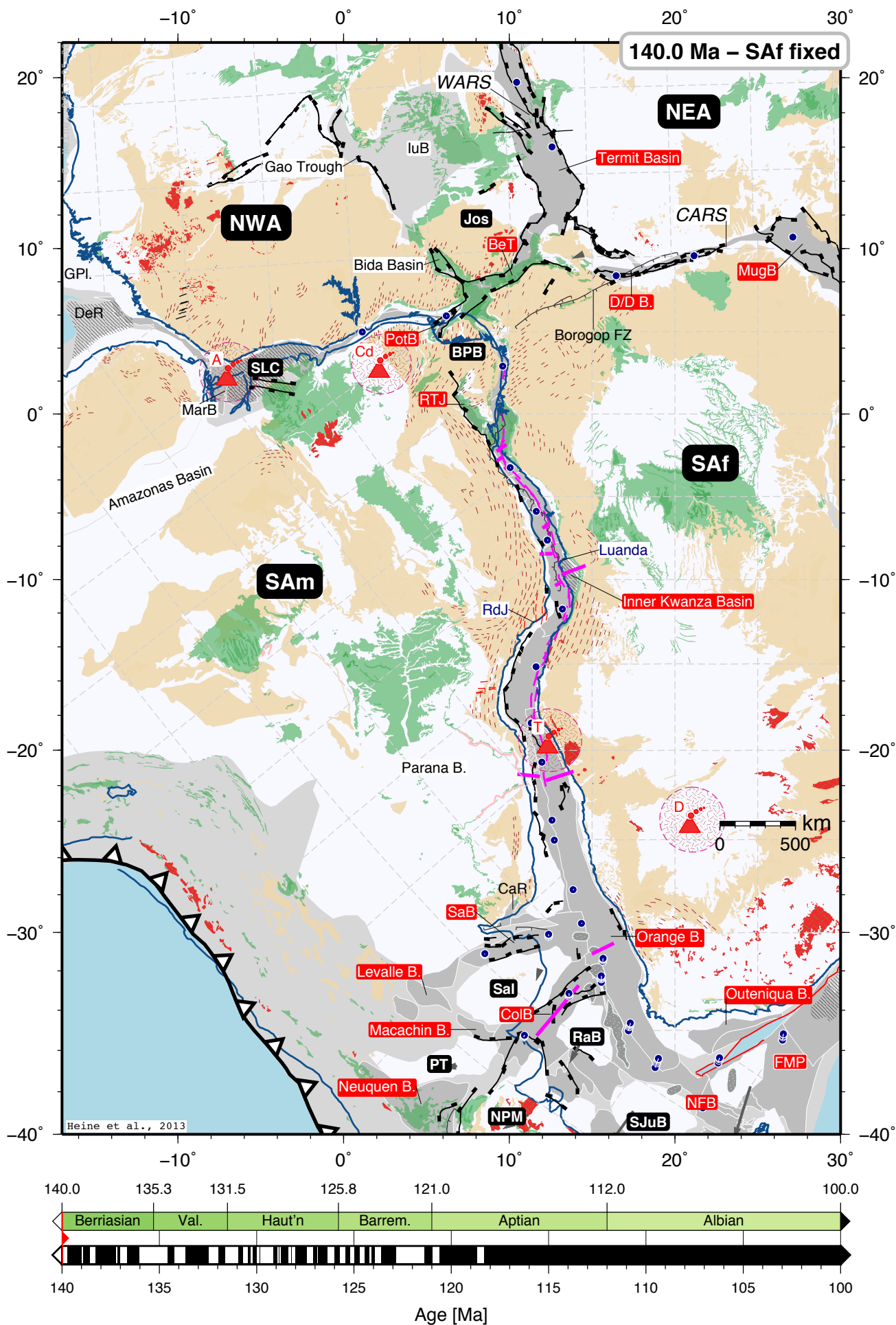
Christian Heine, USYD, 2013–05–28

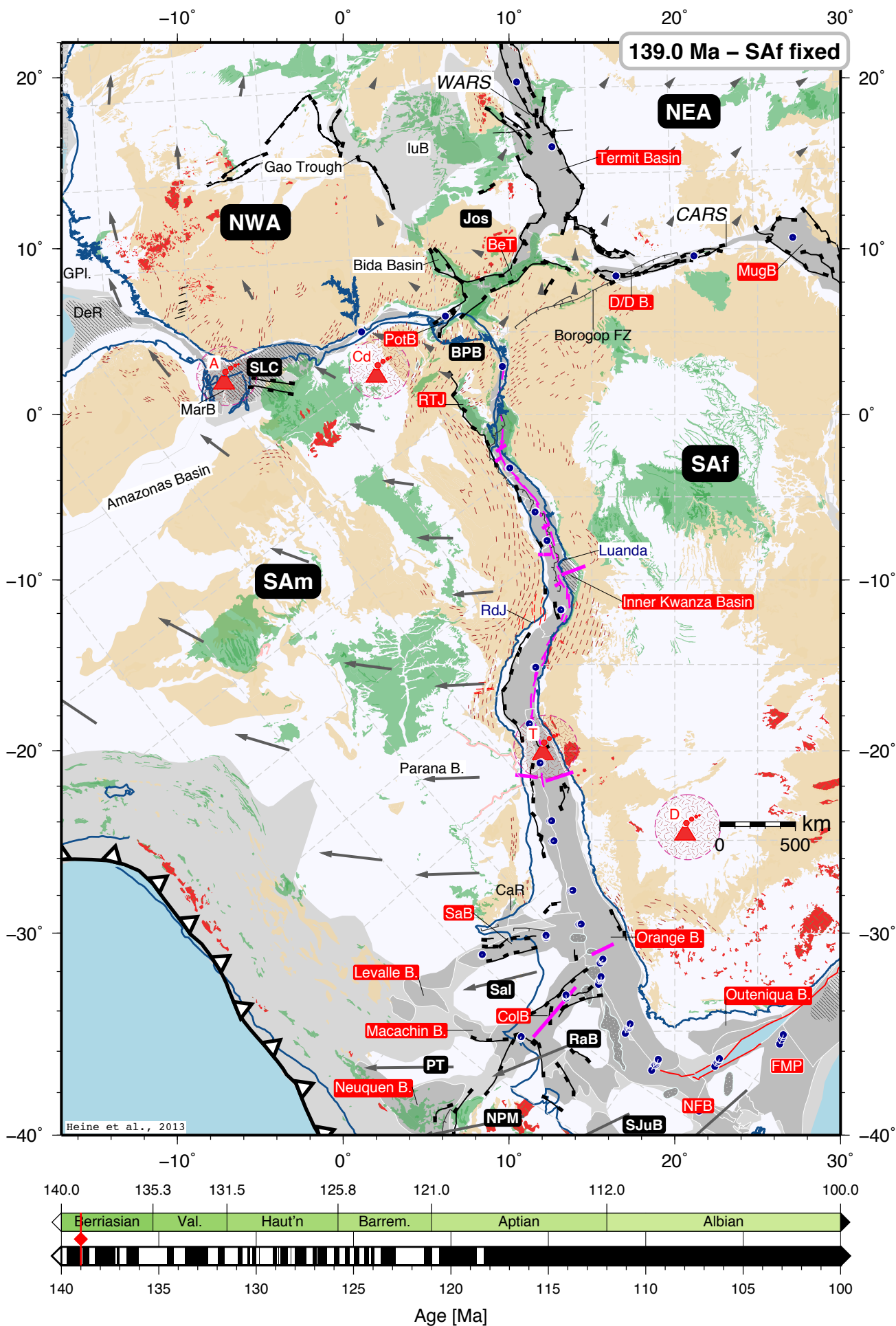
## References

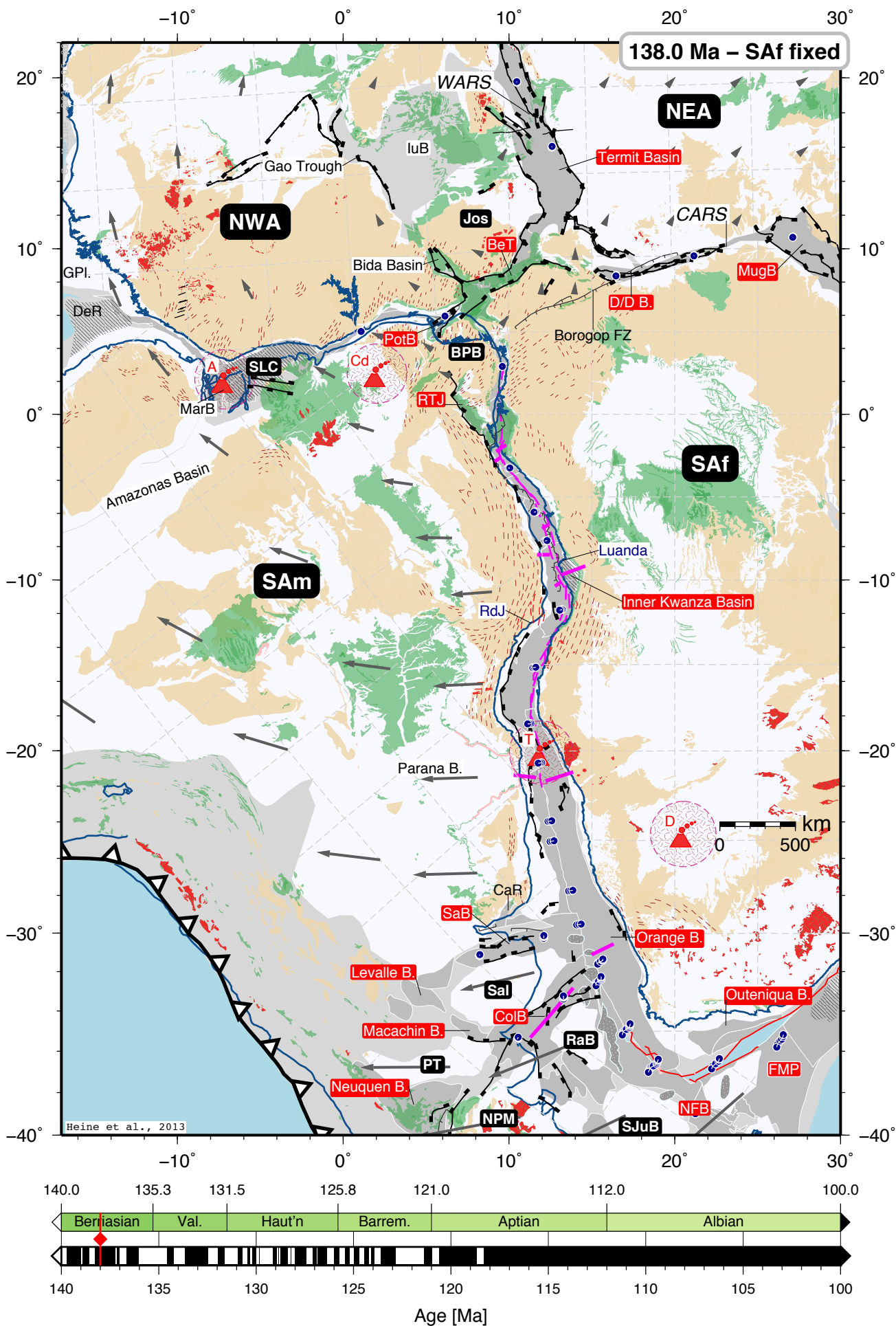
J. S. Gee and D. V. Kent. Source of Oceanic Magnetic Anomalies and the Geomagnetic Polarity Timescale. In M. Kono, editor, *Treatise on Geophysics*, volume 5, chapter 12, pages 455–507. Elsevier, Amsterdam, 2007. ISBN 978–0–444–52748–6. doi: [10.1016/B978–044452748–6.00097–3](https://doi.org/10.1016/B978-044452748-6.00097-3).

F. Gradstein, J. Ogg, A. Smith, F. Agterberg, W. Bleeker, R. Cooper, V. Davydov, P. Gibbard, L. Hinnov, M. House, L. Lourens, H. Luterbacher, J. McArthur, M. Melchin, L. Robb, J. Shergold, M. Villeneuve, B. Wardlaw, J. Ali, H. Brinkhuis, F. Hilgen, J. Hooker, R. Howarth, A. Knoll, J. Laskar, S. Monechi, K. Plumb, J. Powell, I. Raffi, U. Röhl, P. Sadler, A. Sanfilippo, B. Schmitz, N. Shackleton, G. Shields, H. Strauss, J. Van Dam, T. van Kolfschoten, J. Veizer, and D. Wilson. *A Geologic Time Scale*. Cambridge University Press, 2004. URL <http://www.stratigraphy.org>.

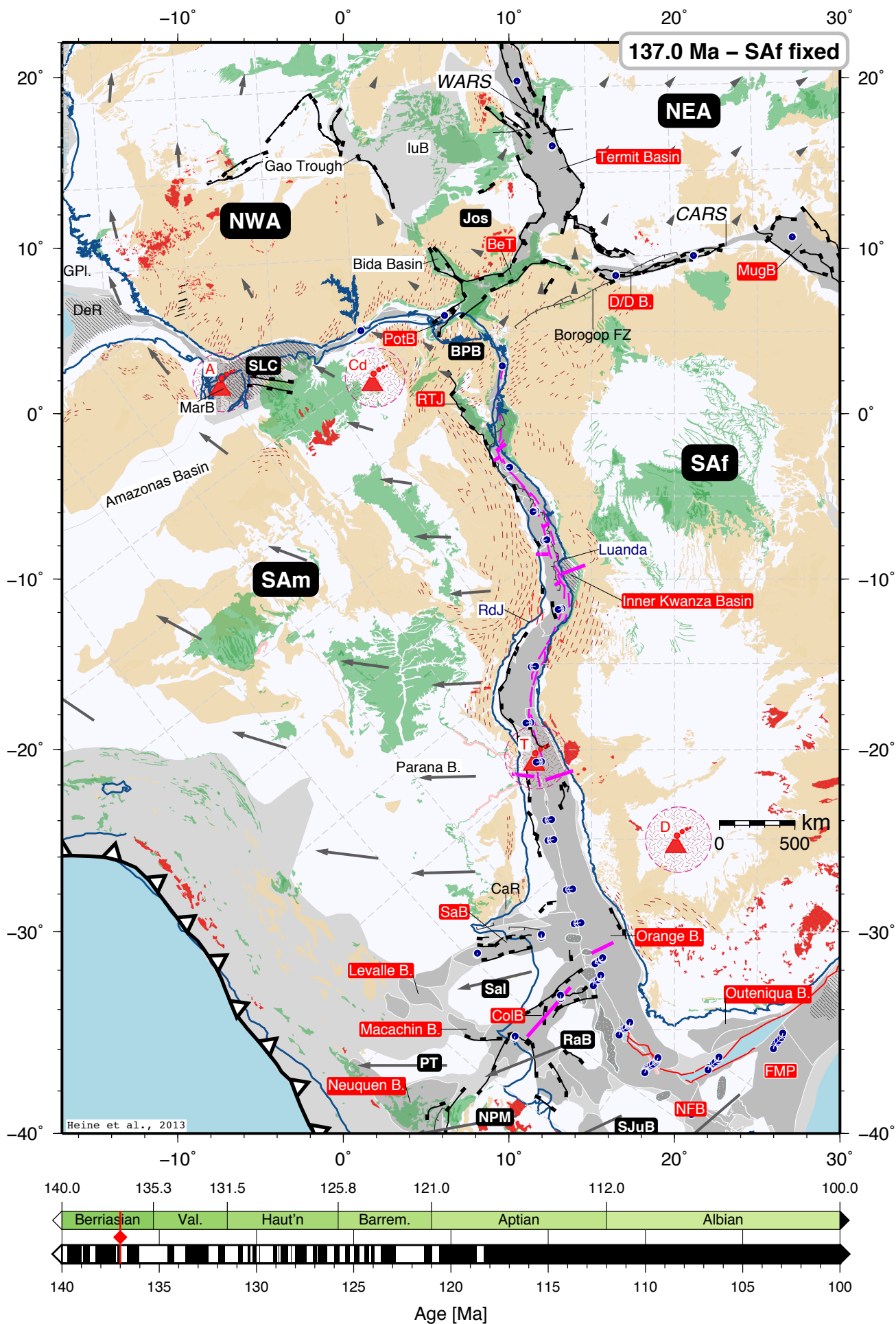


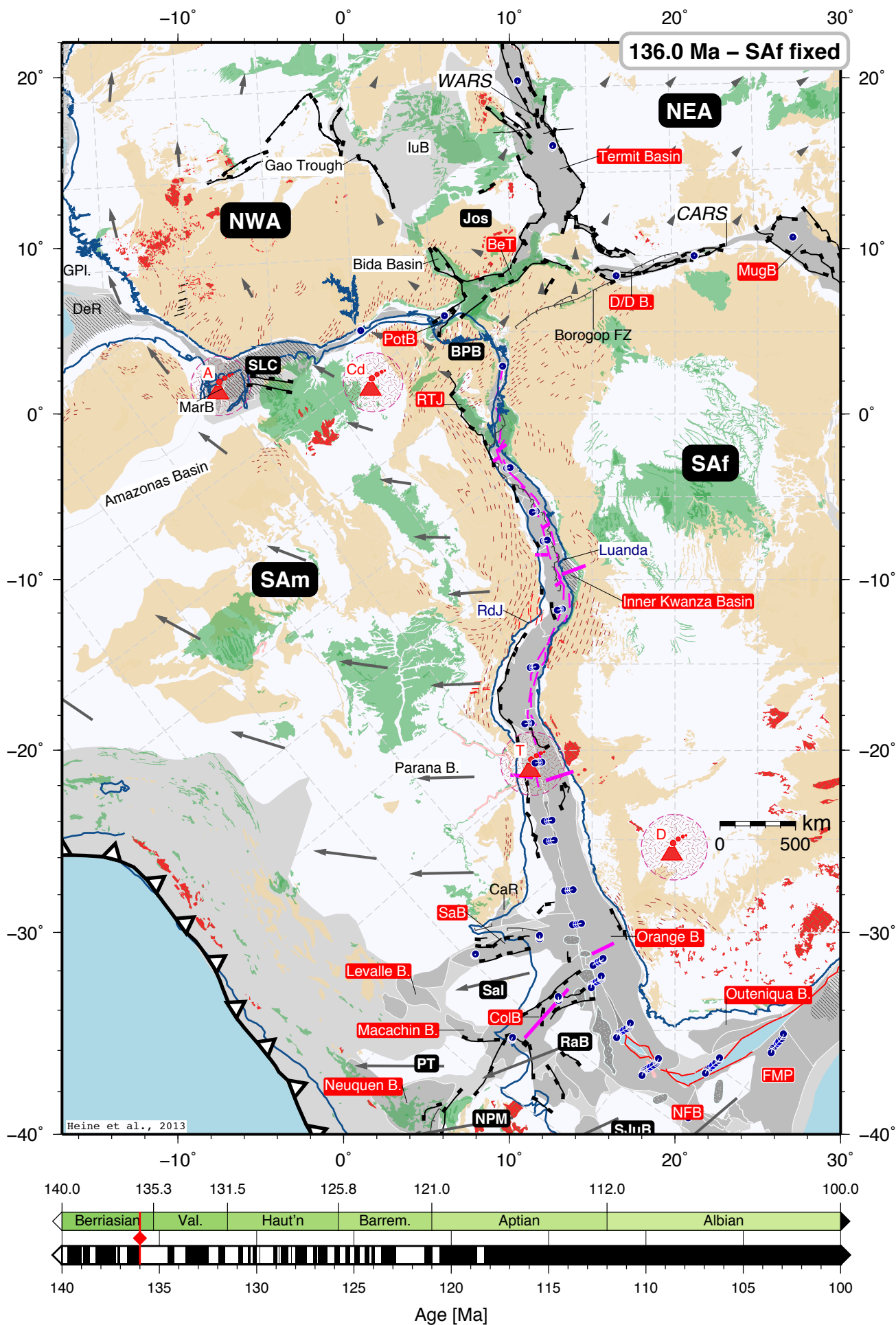


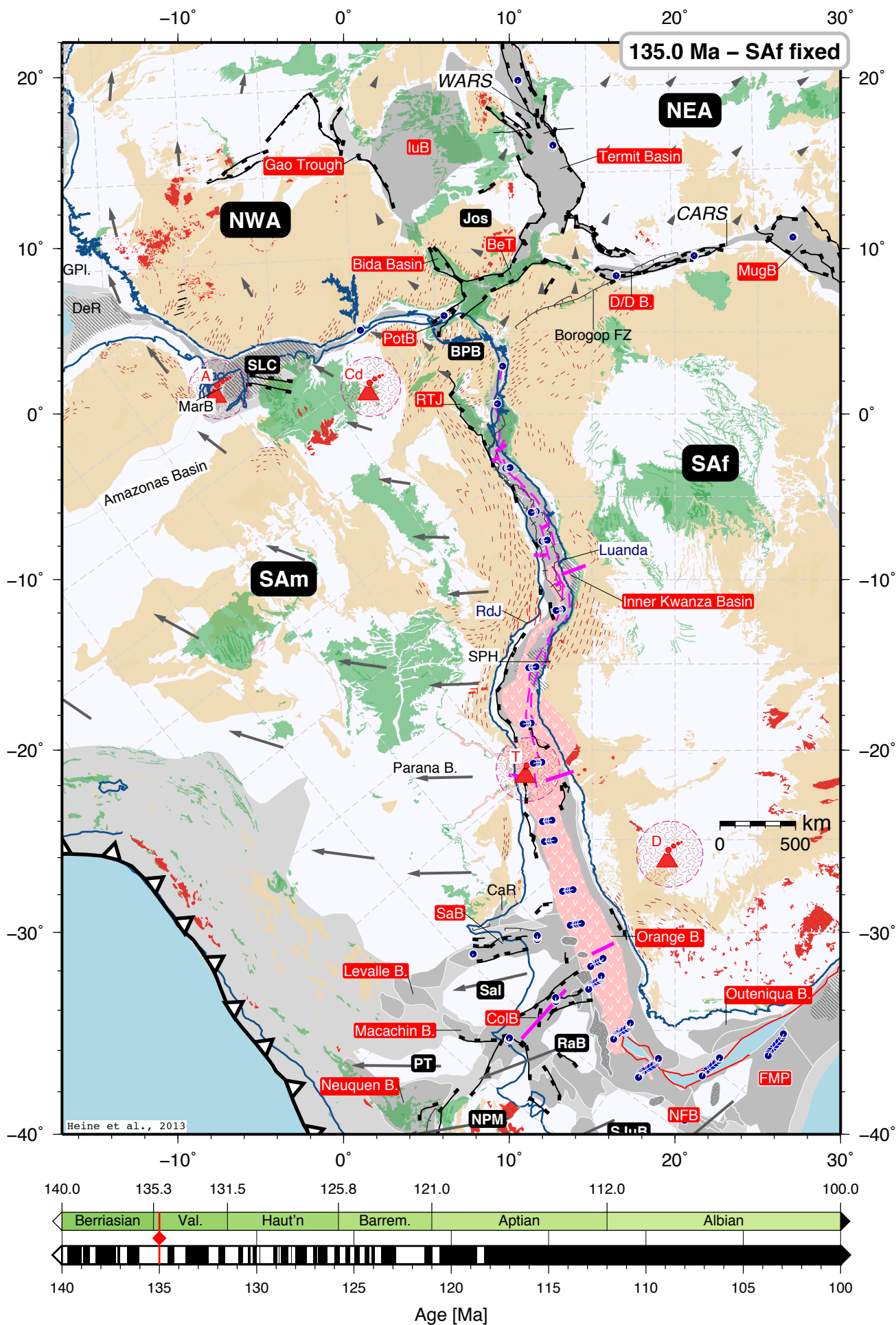




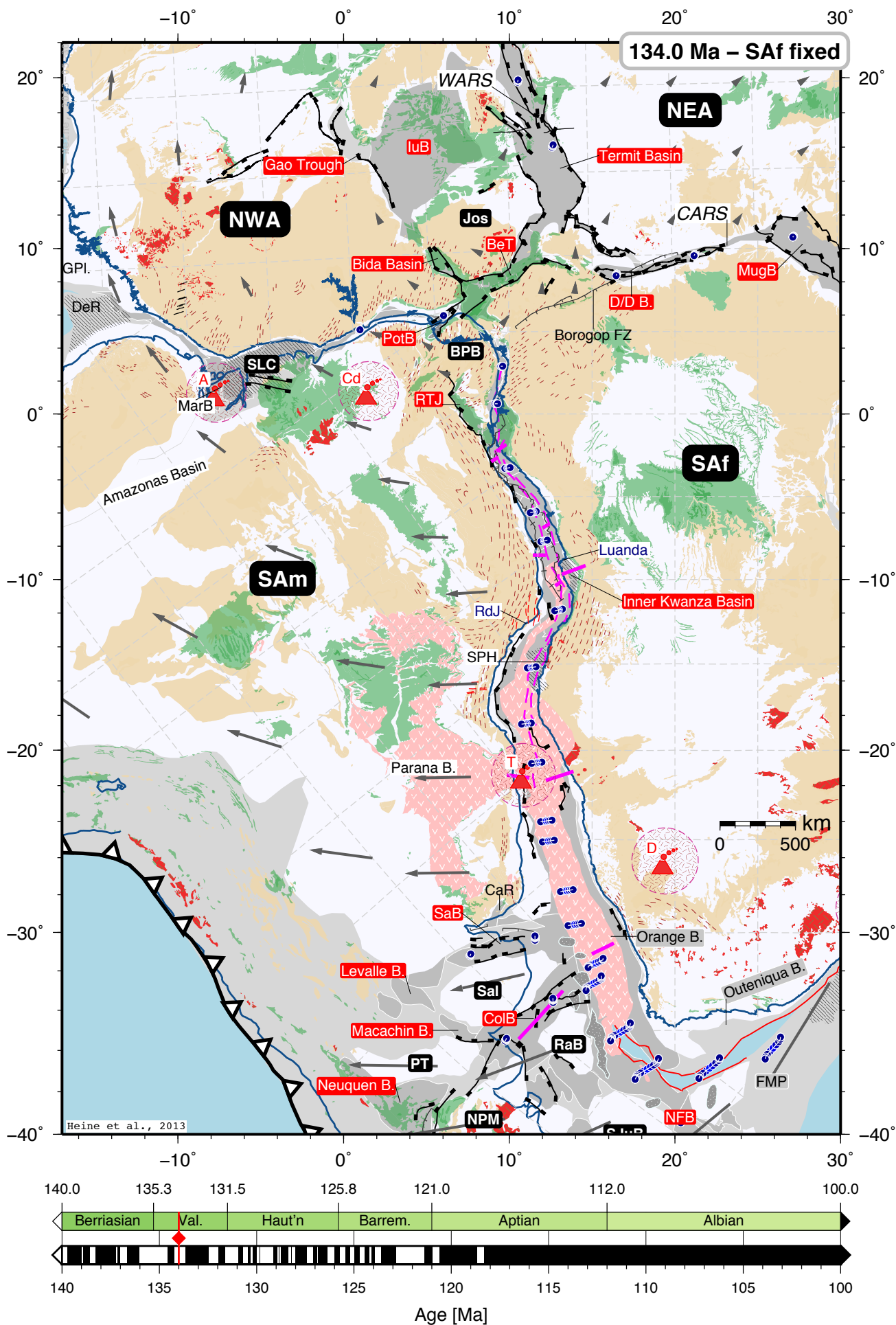


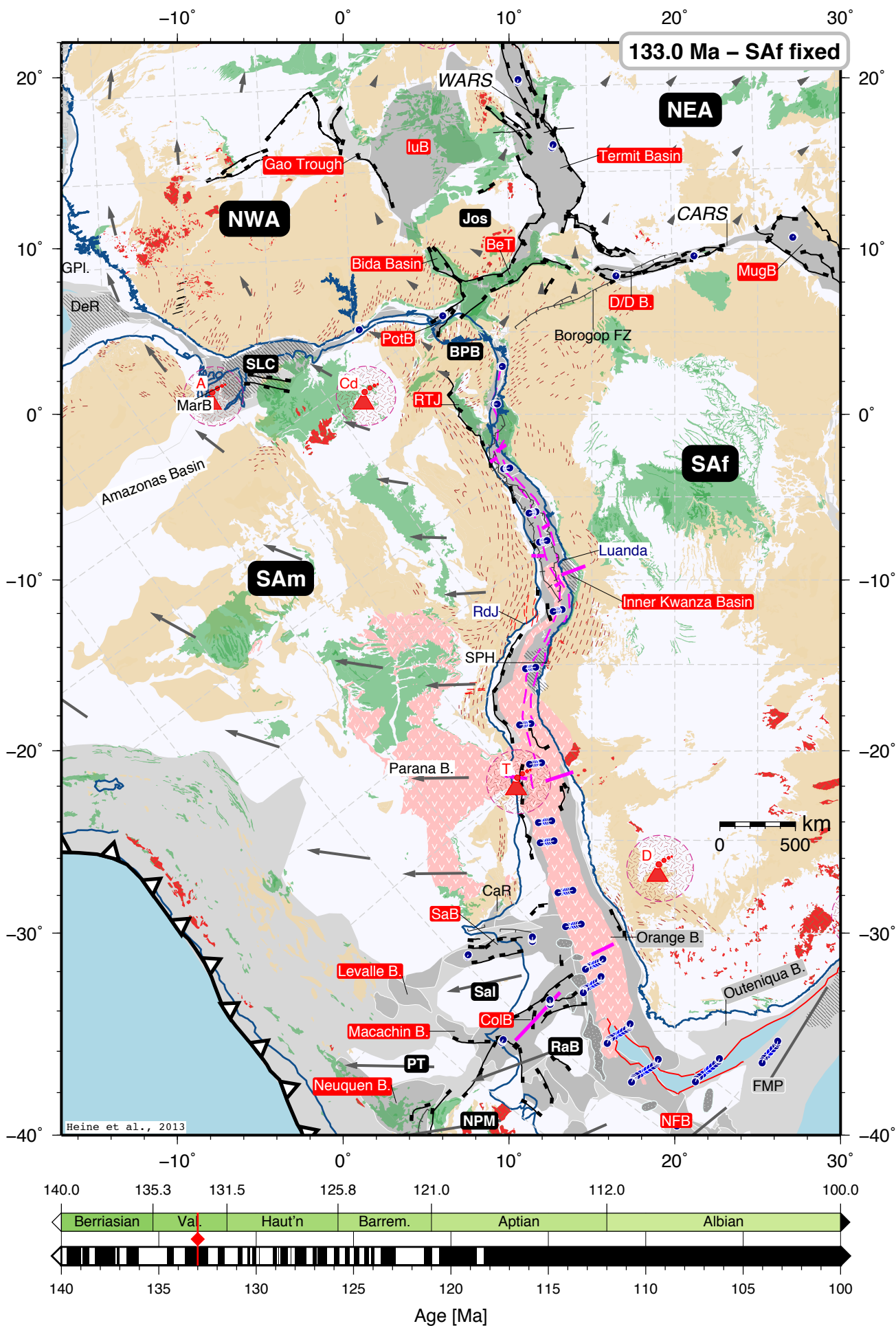




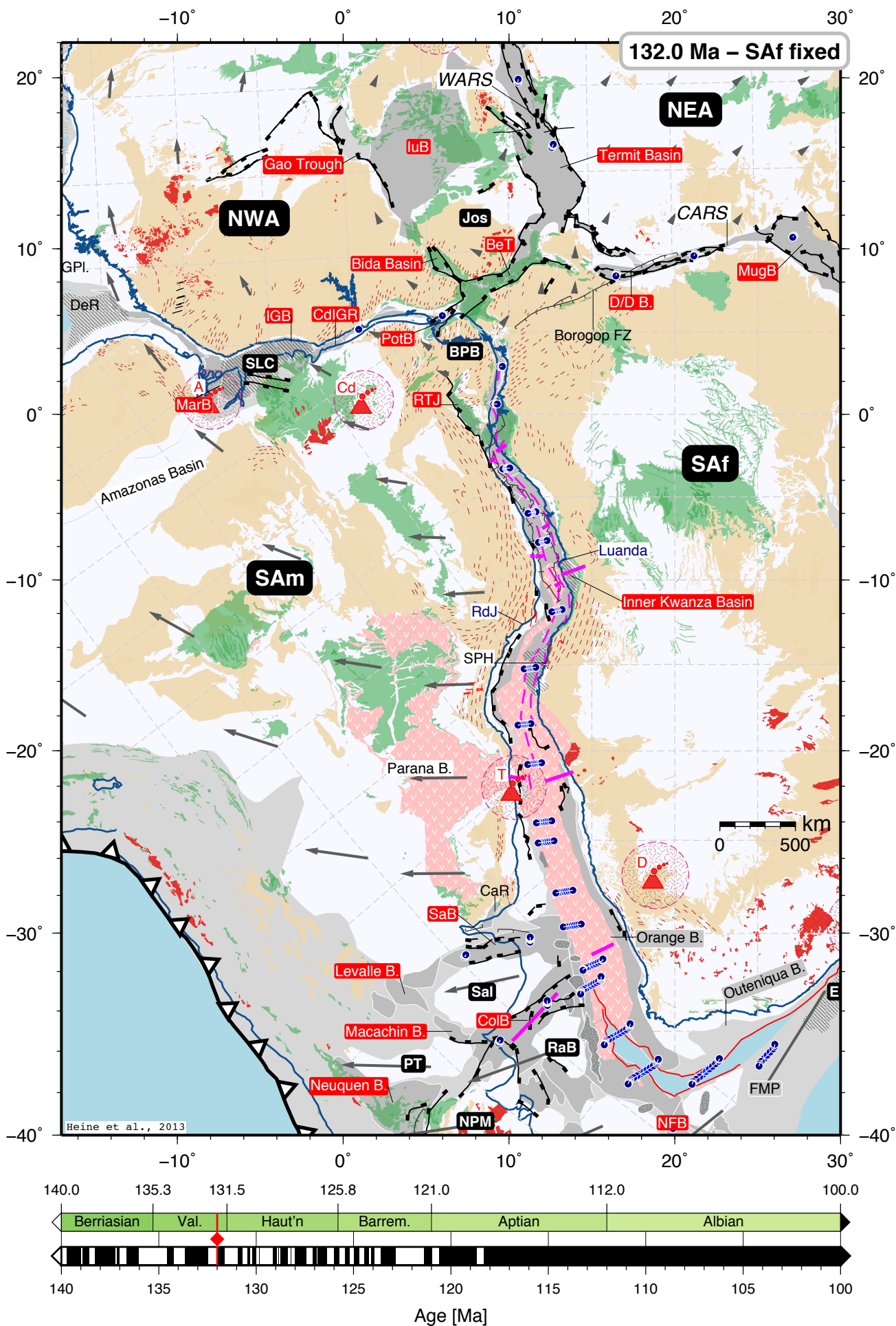


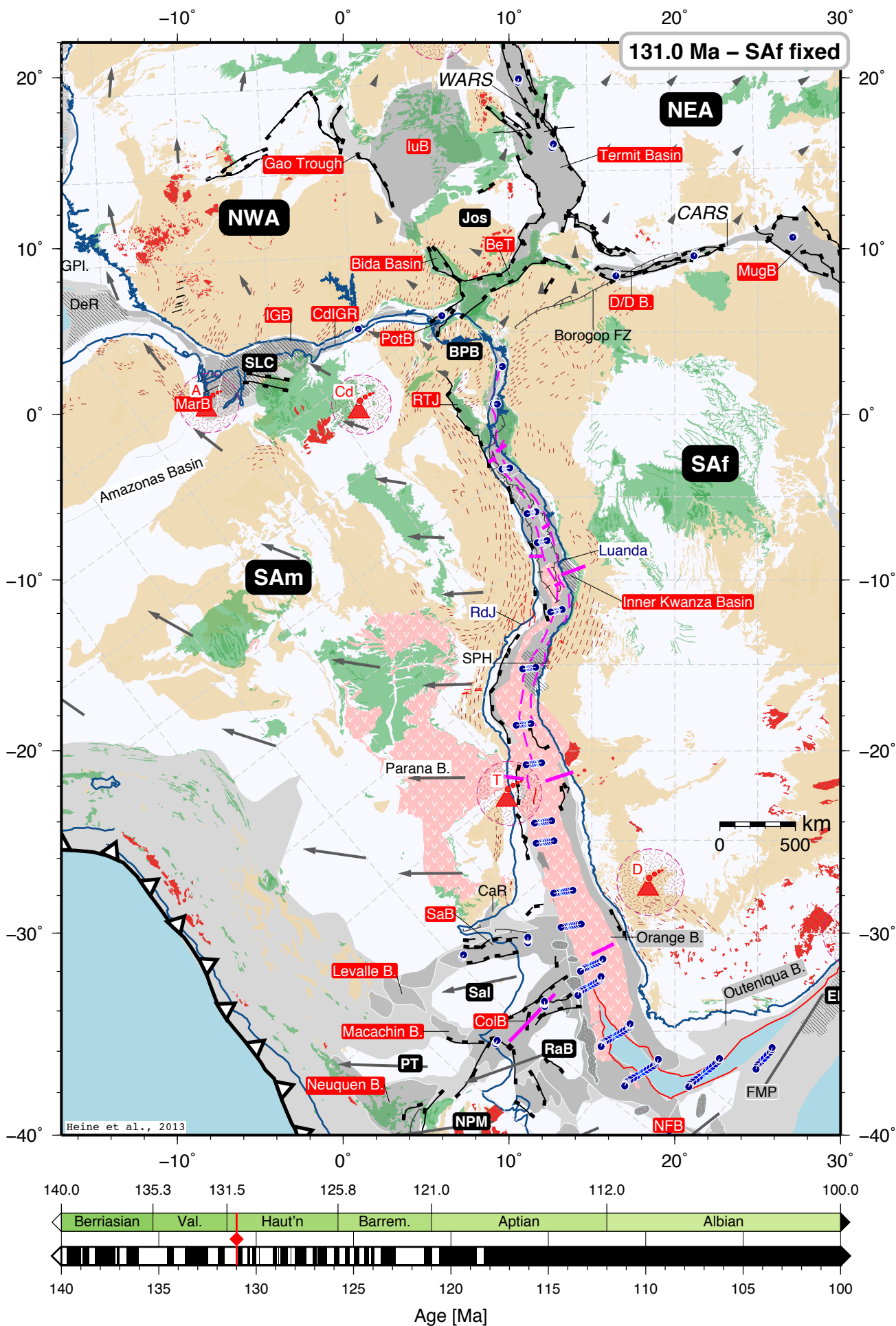


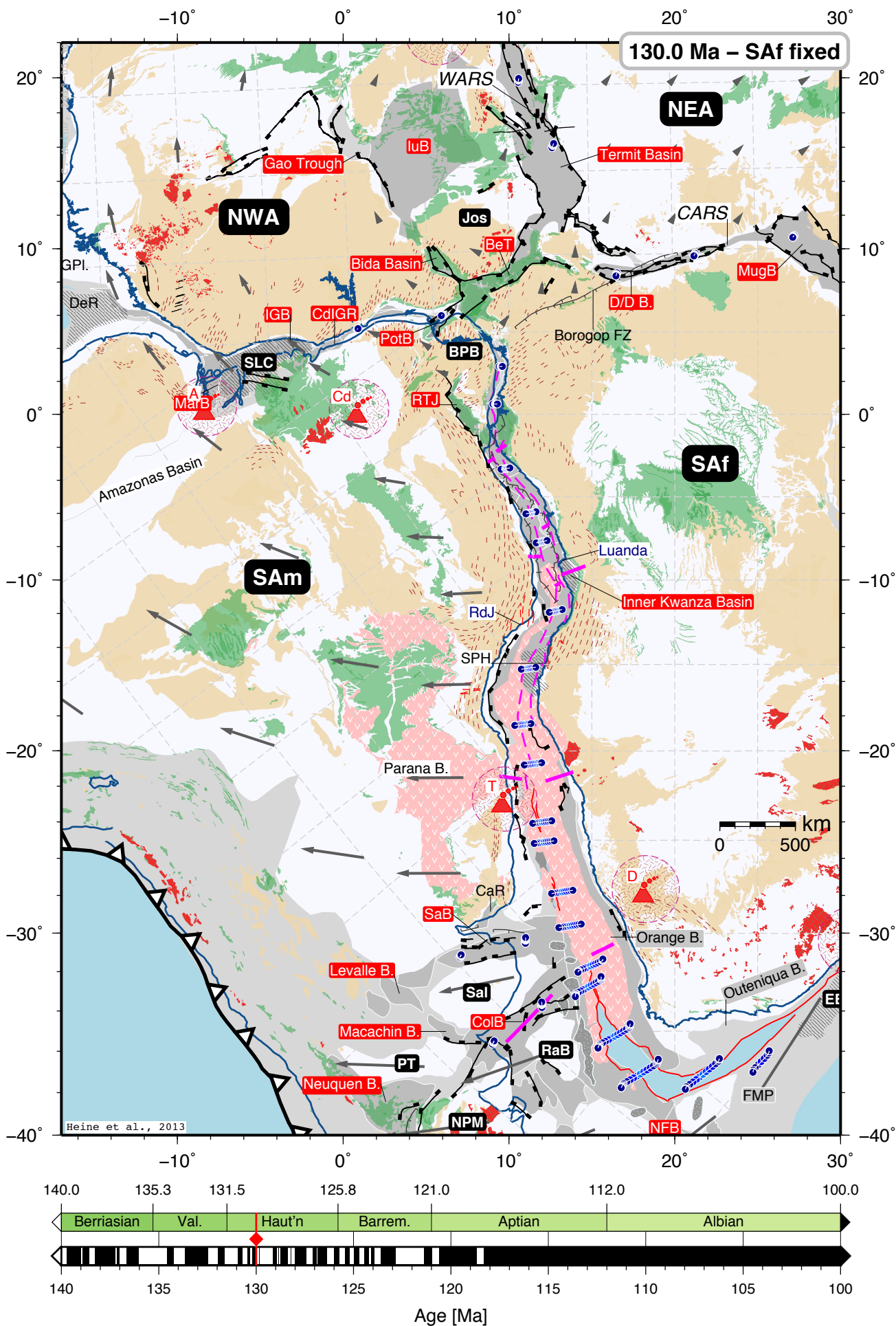




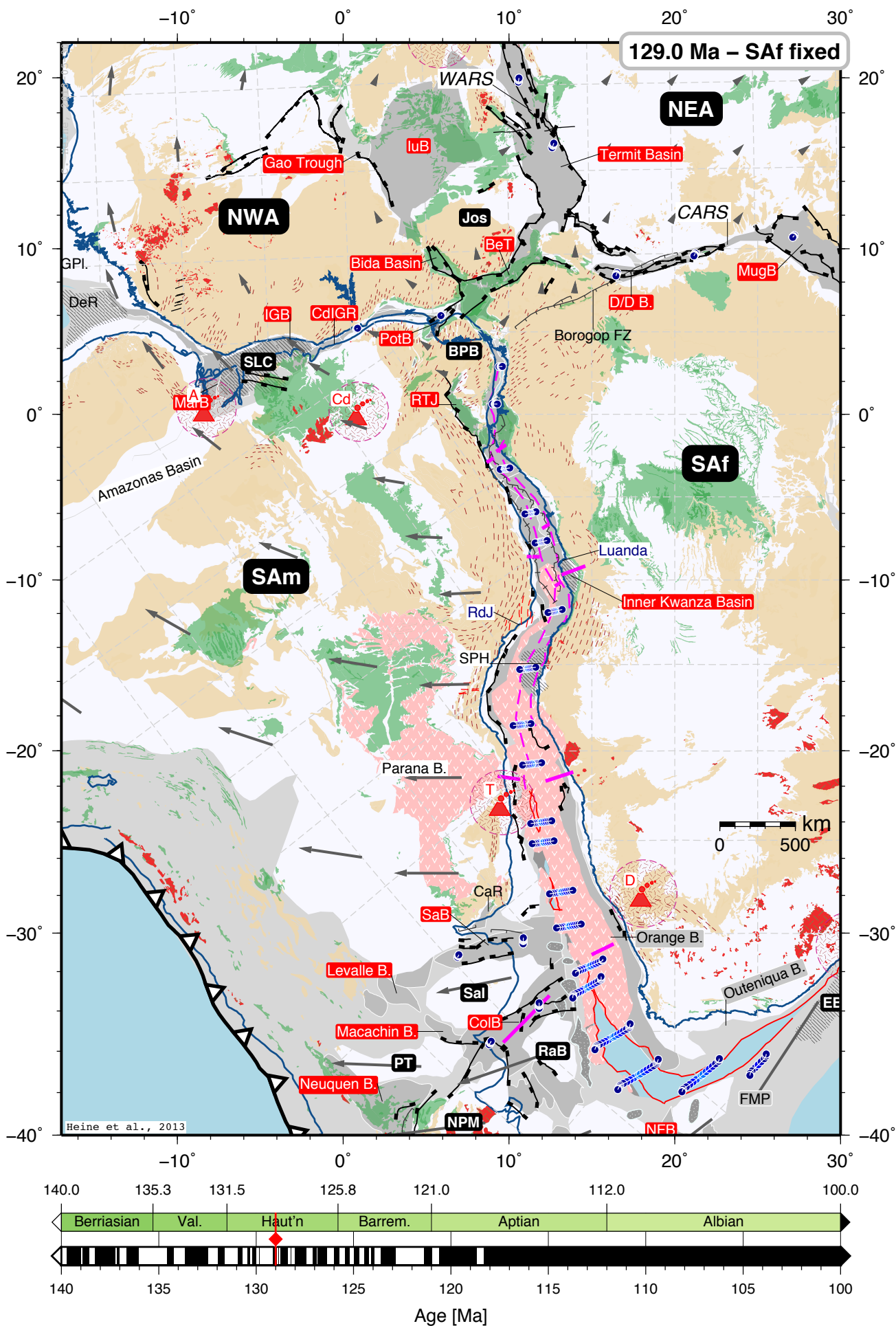


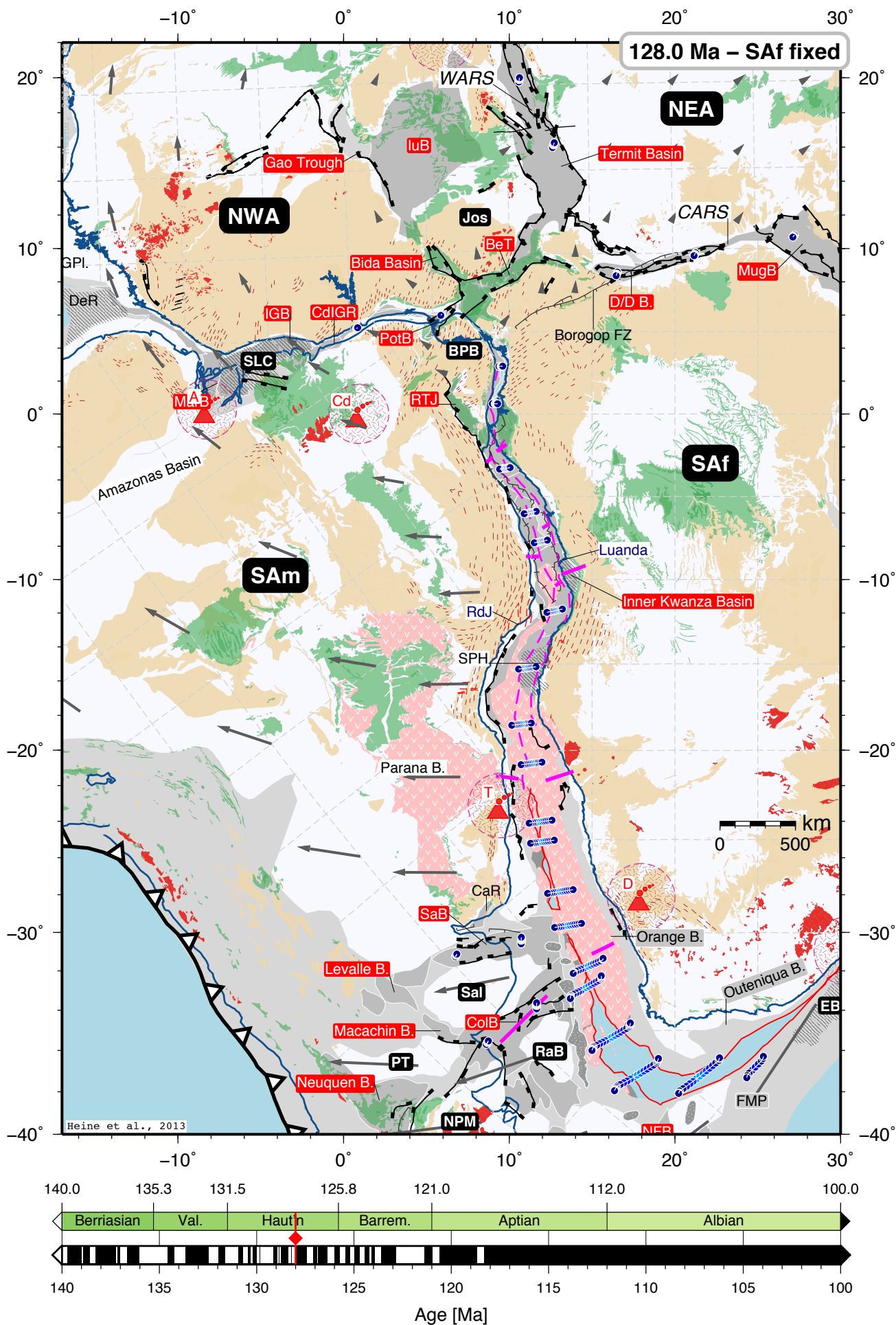


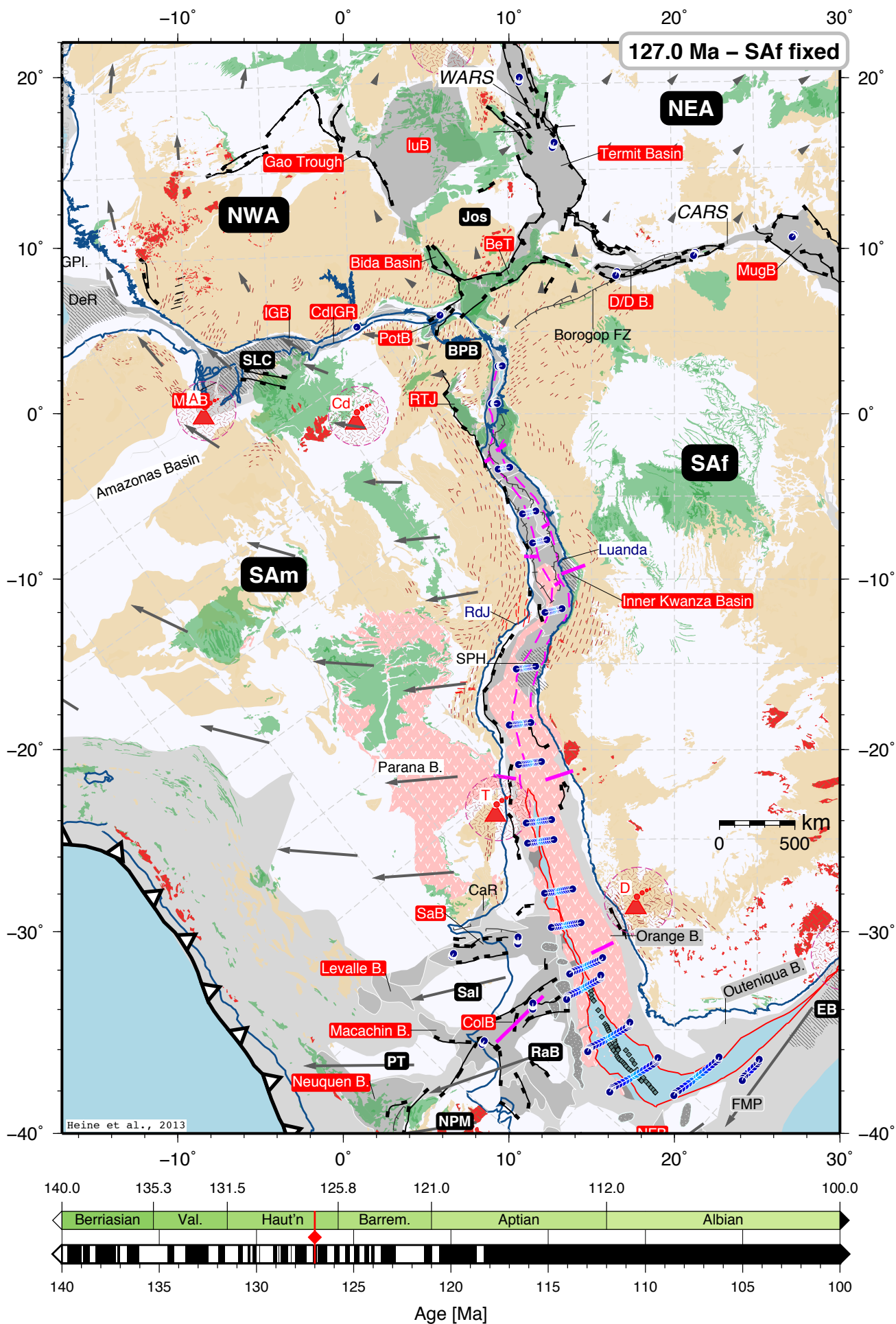




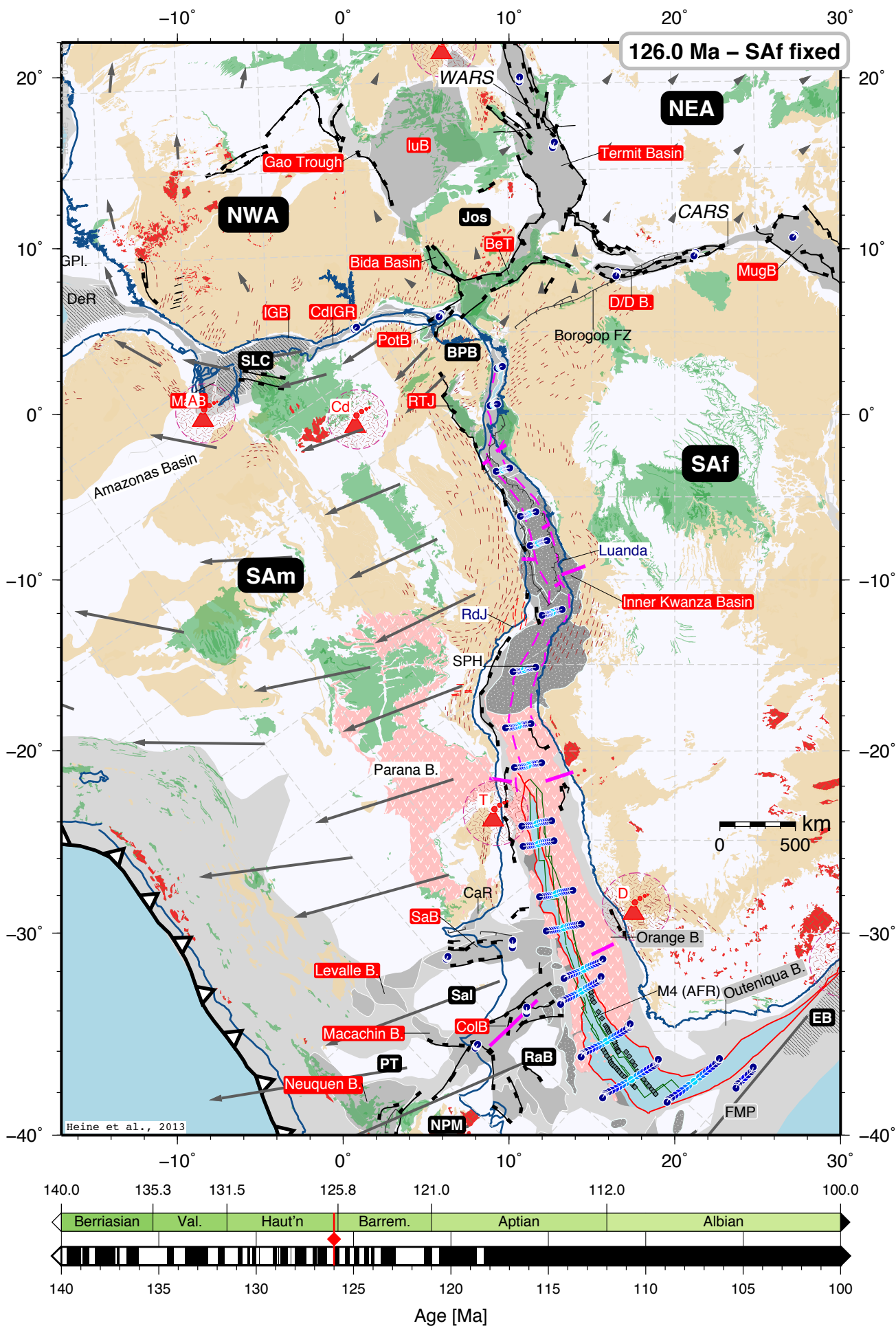


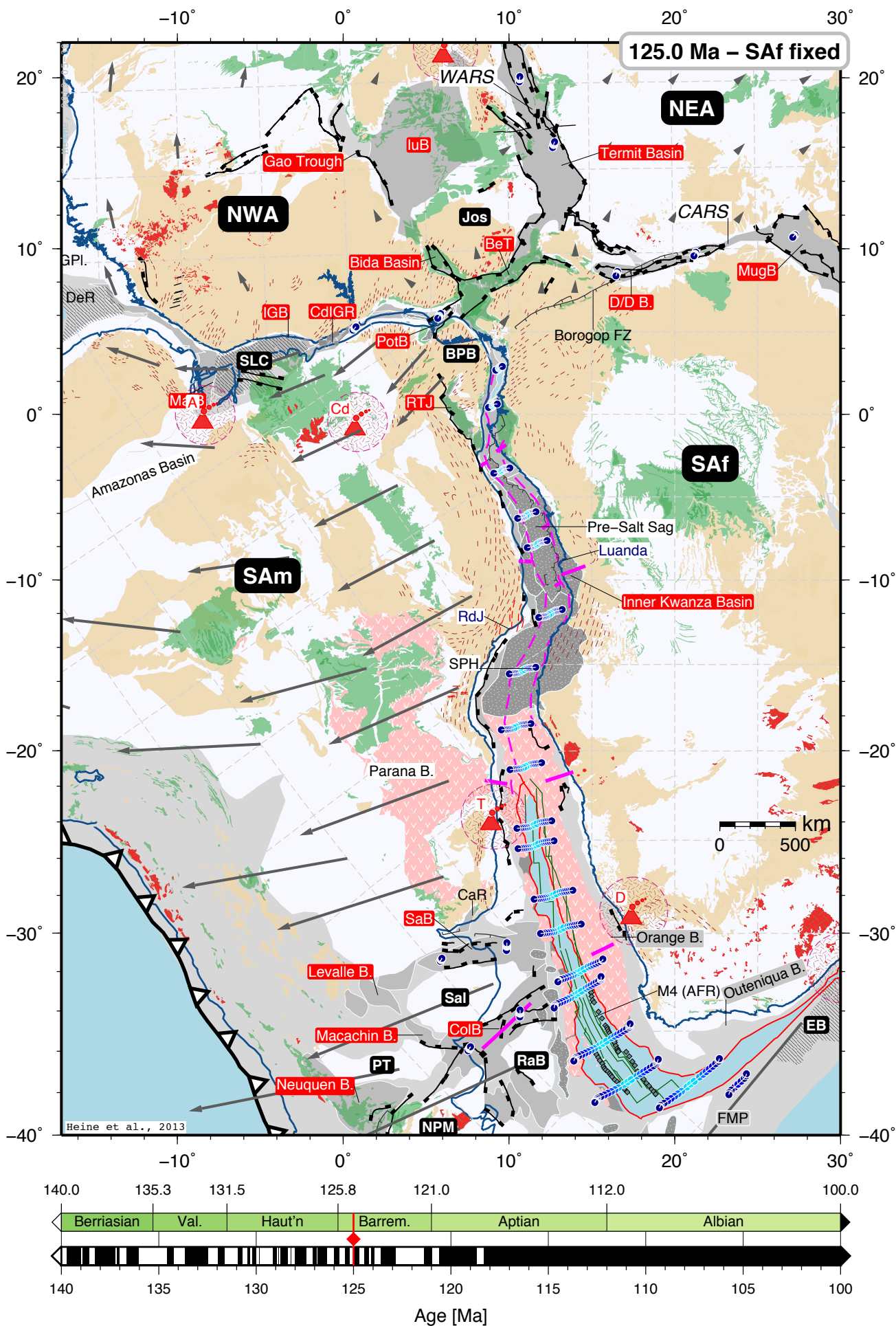




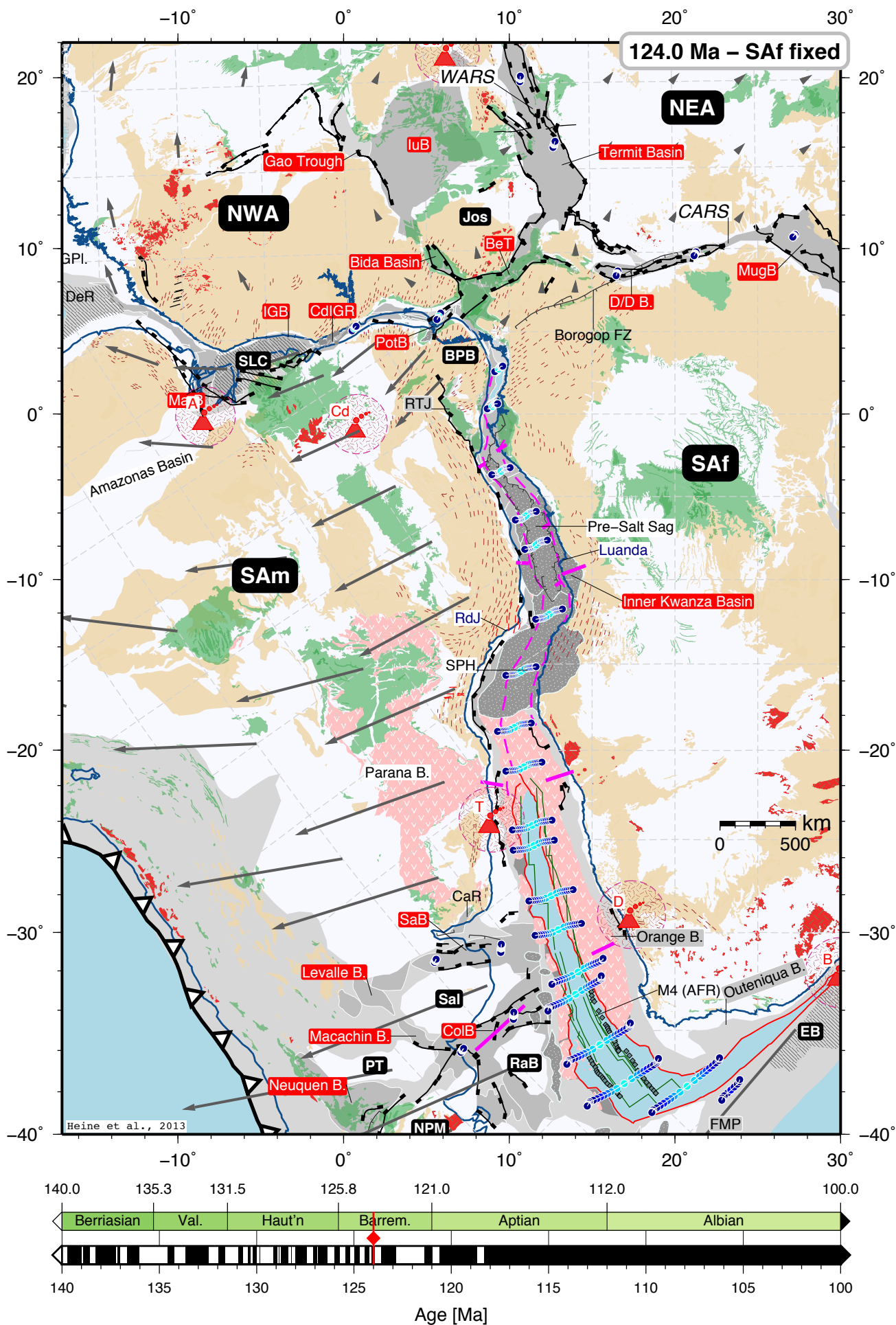


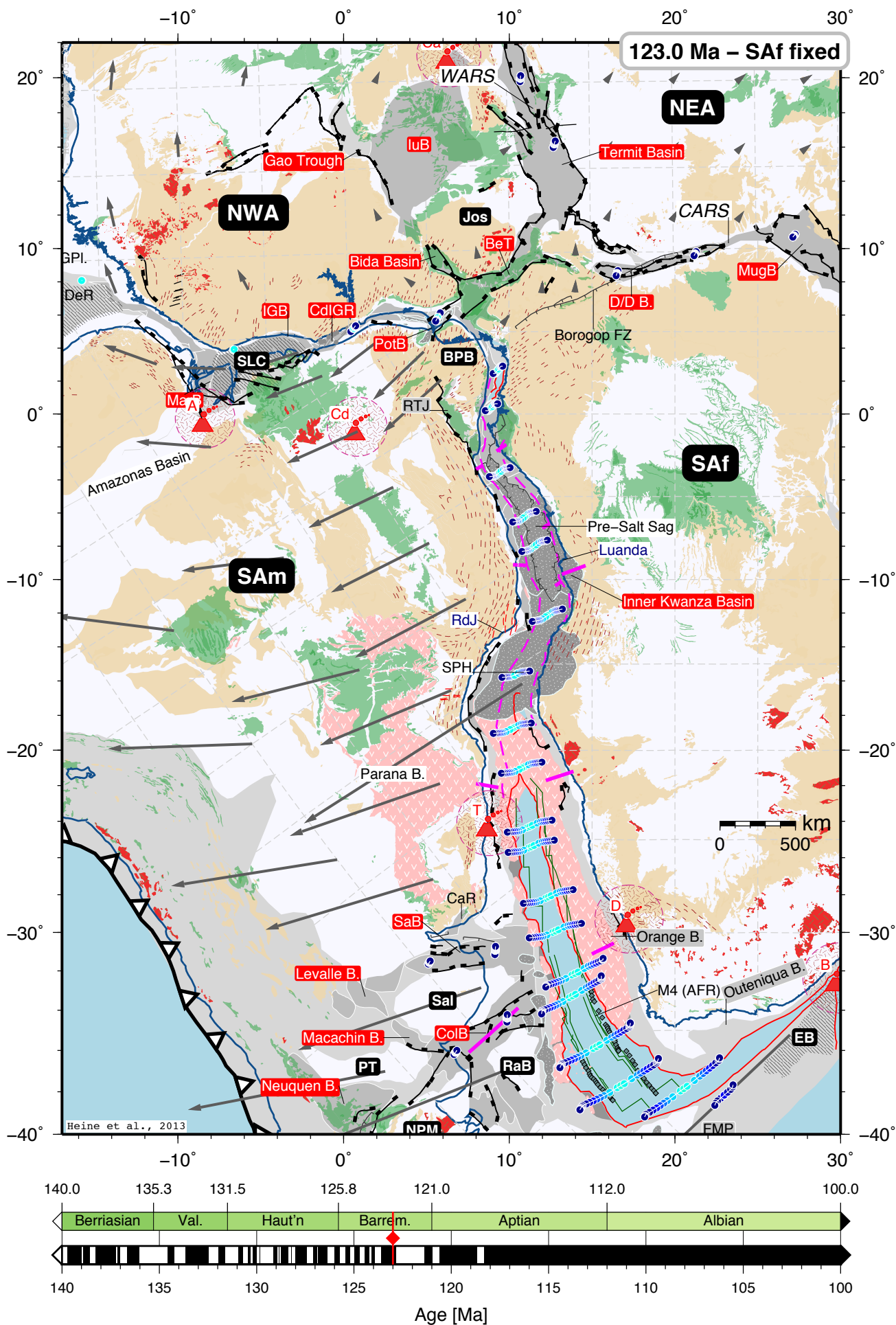


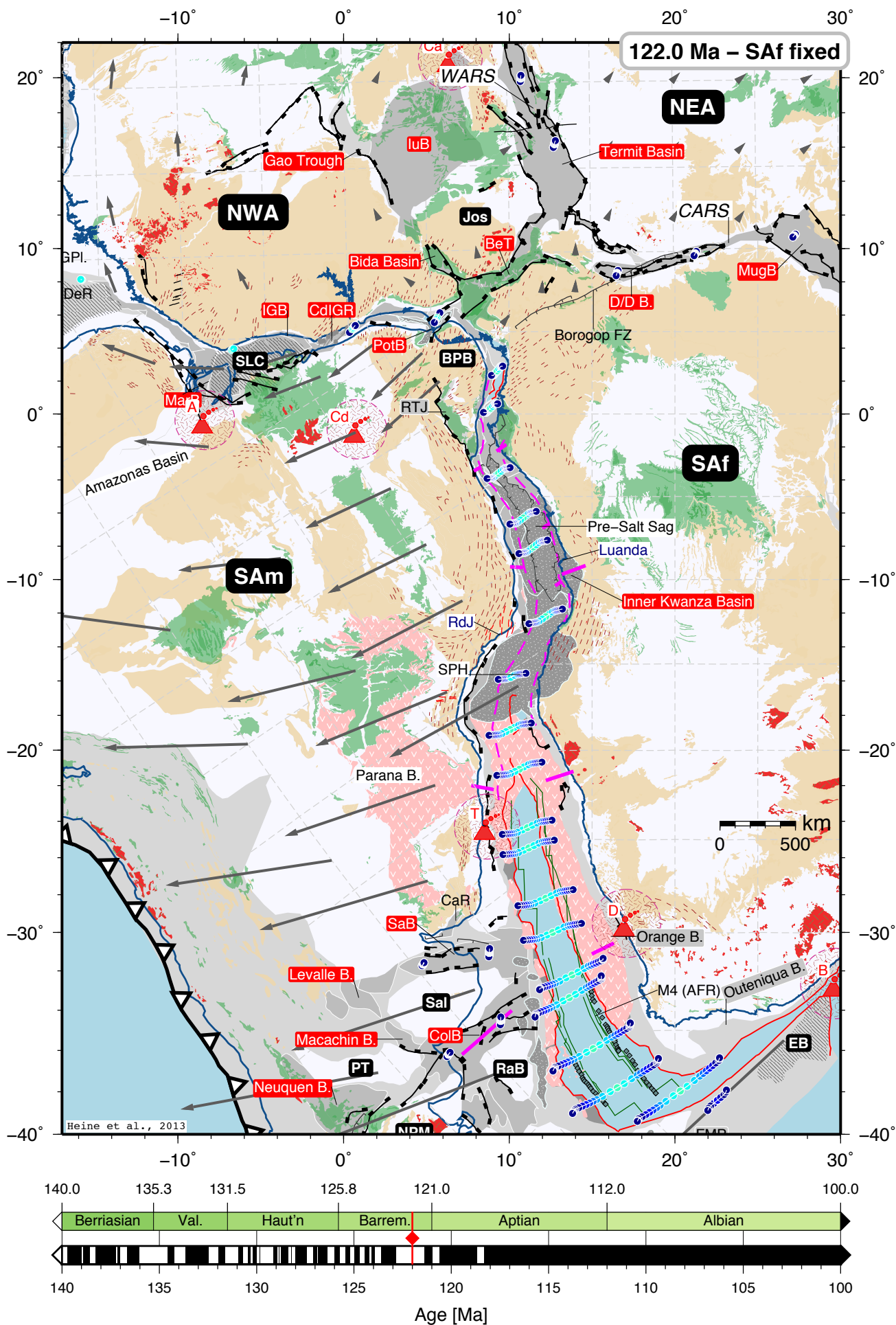




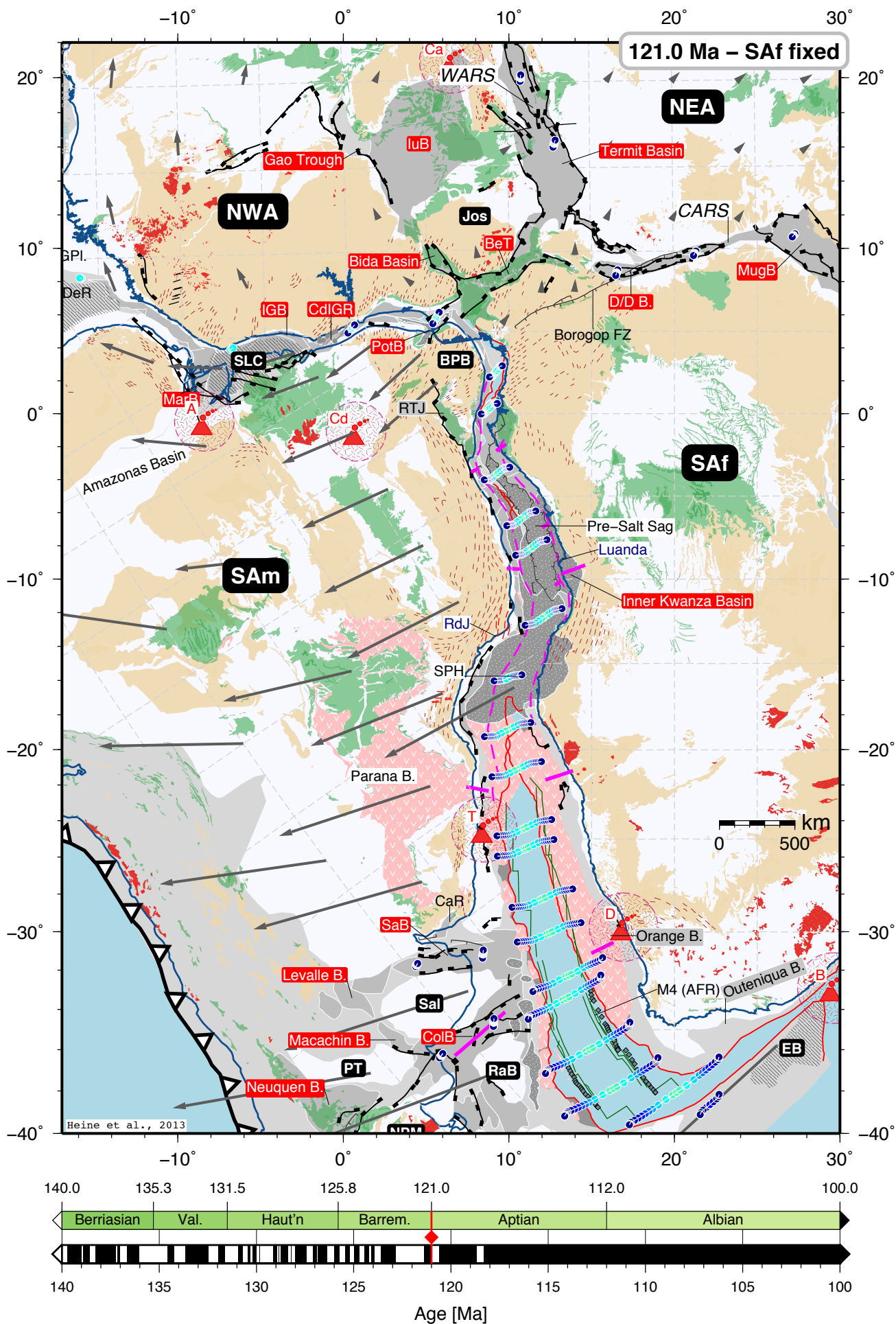


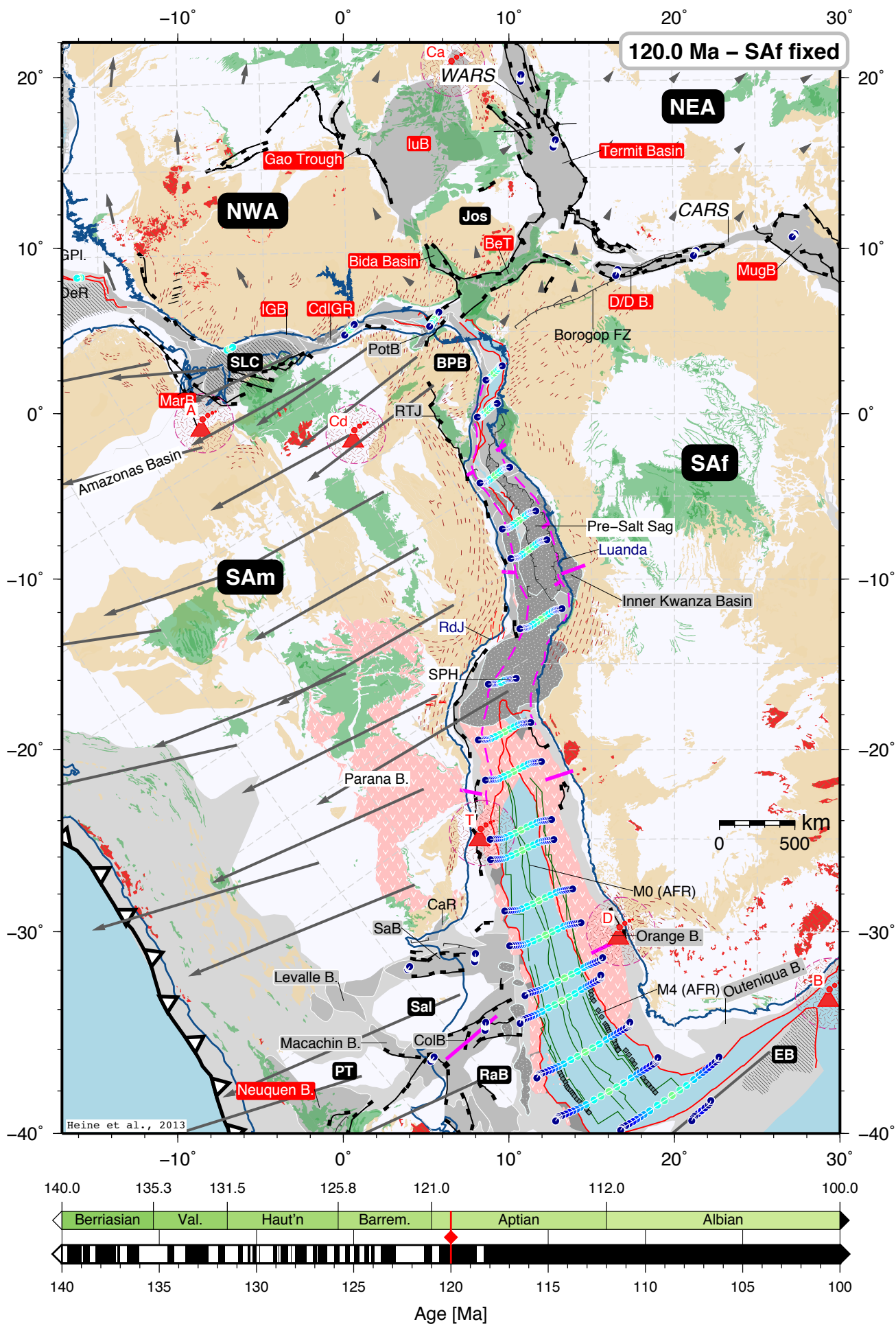




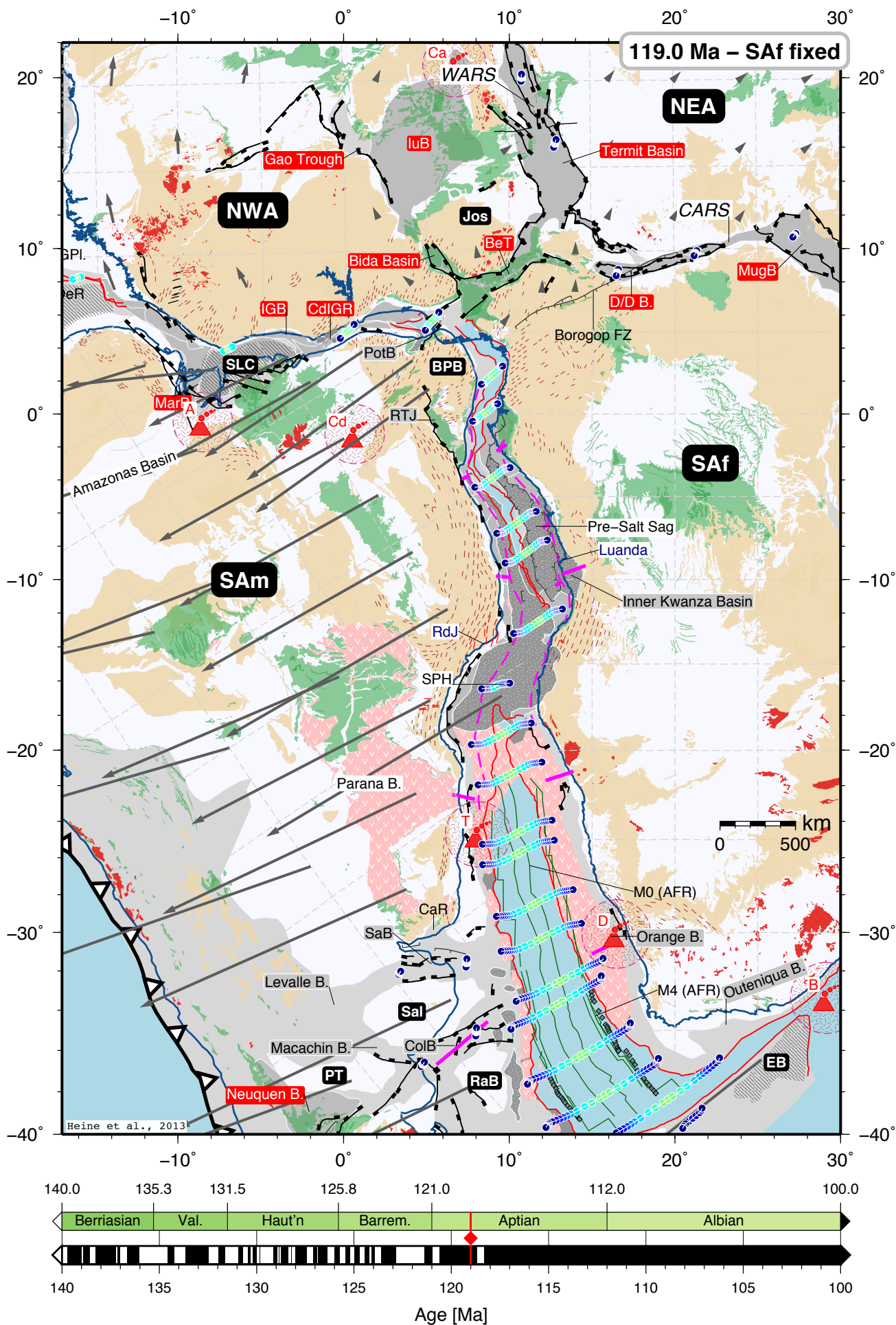


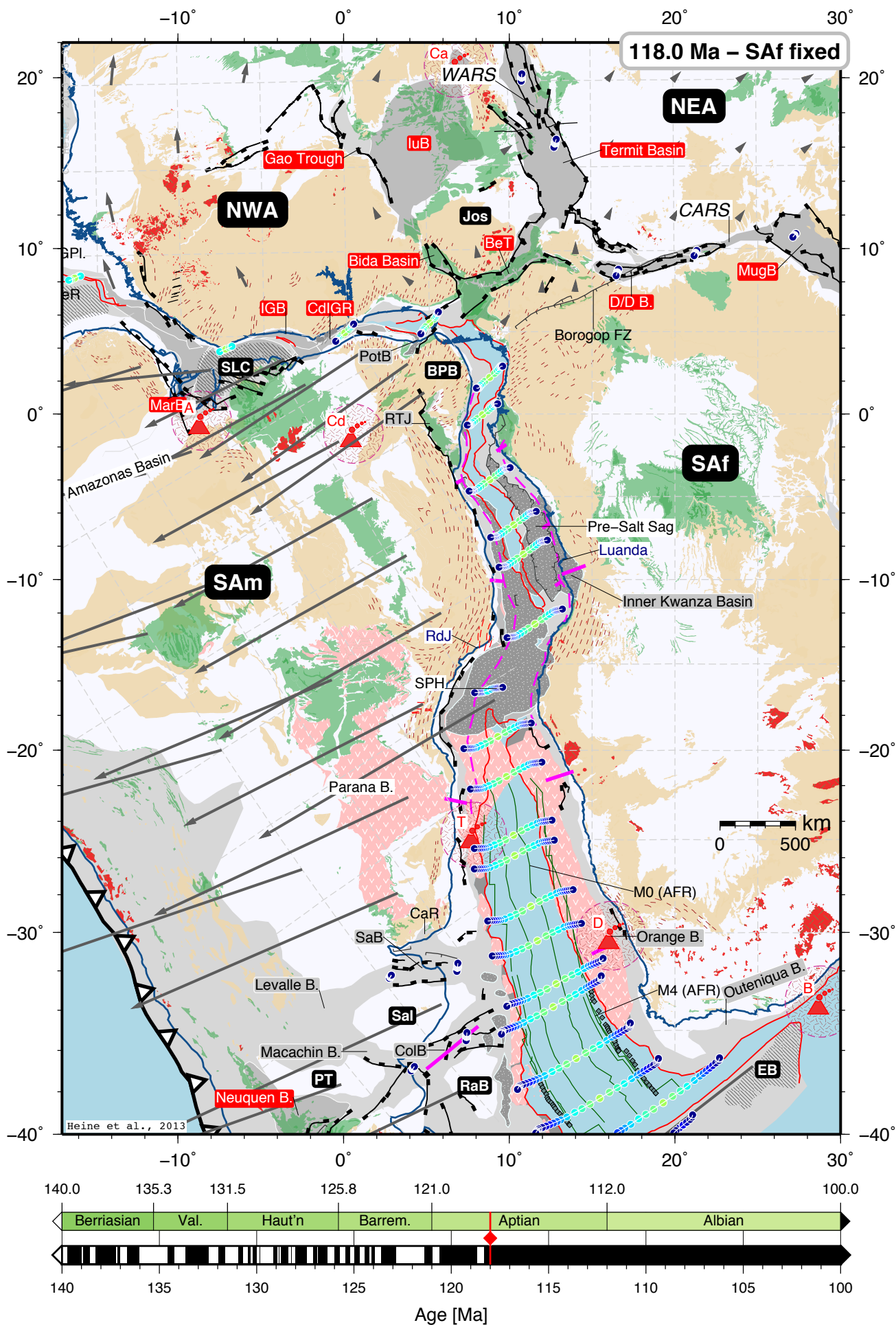




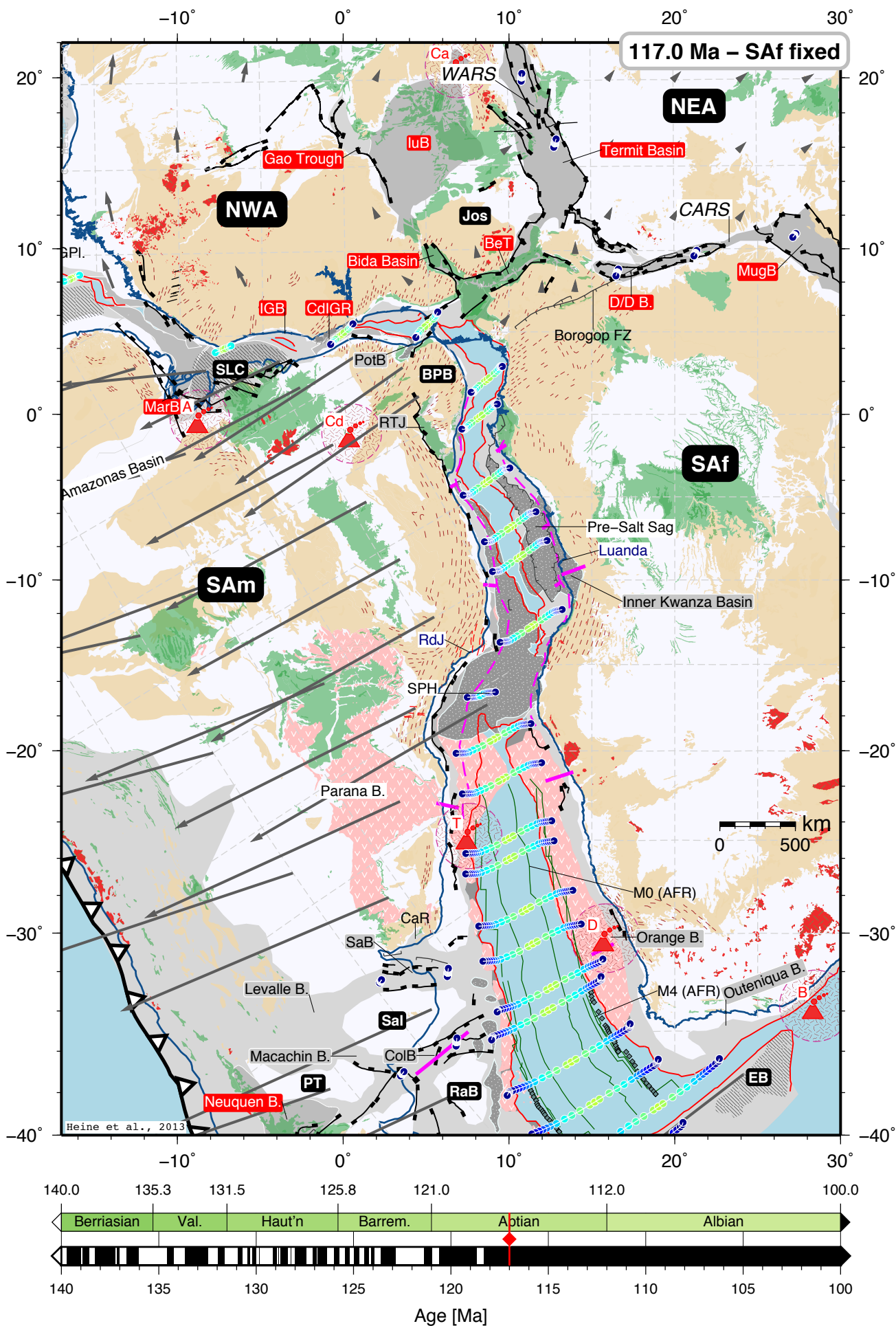




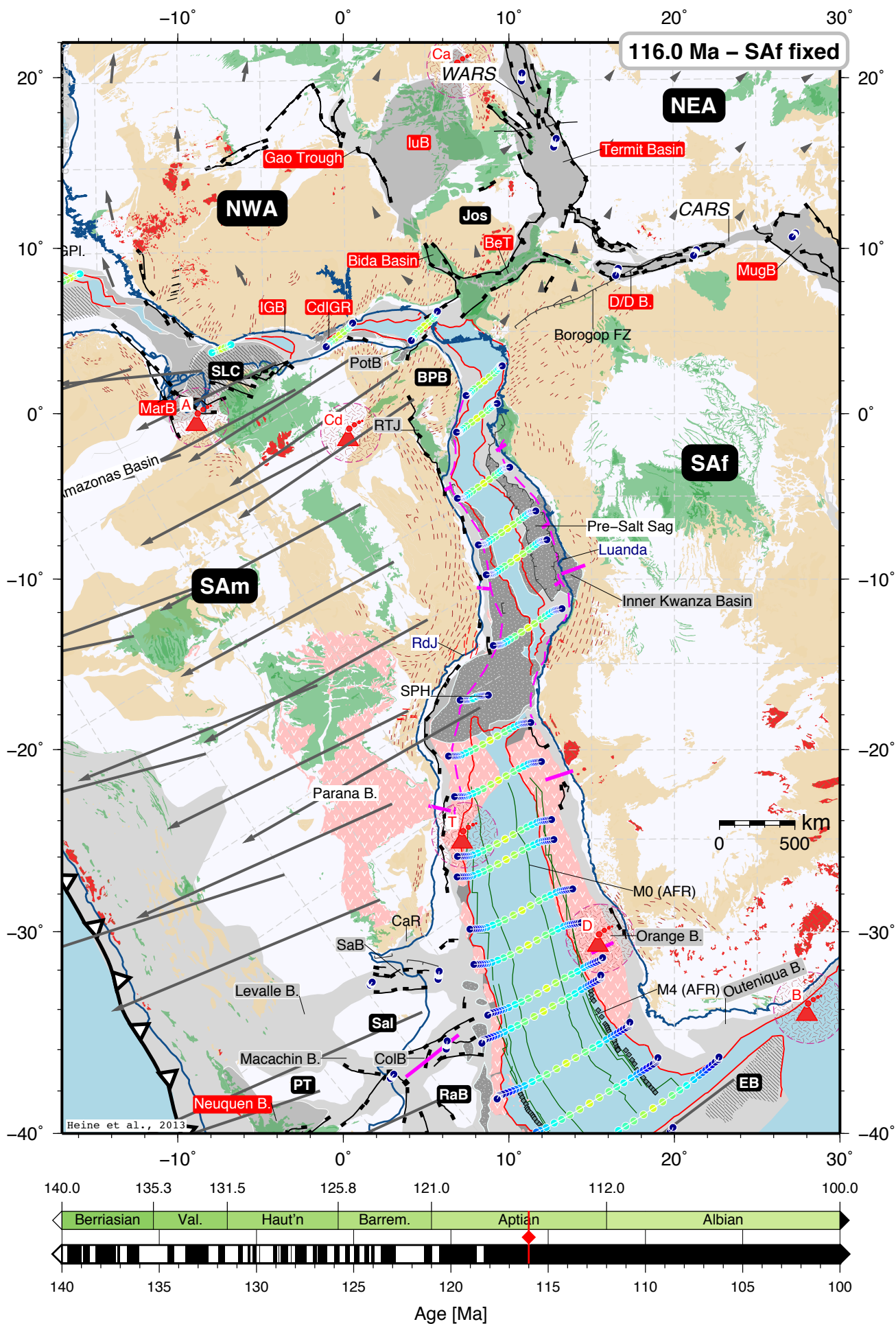


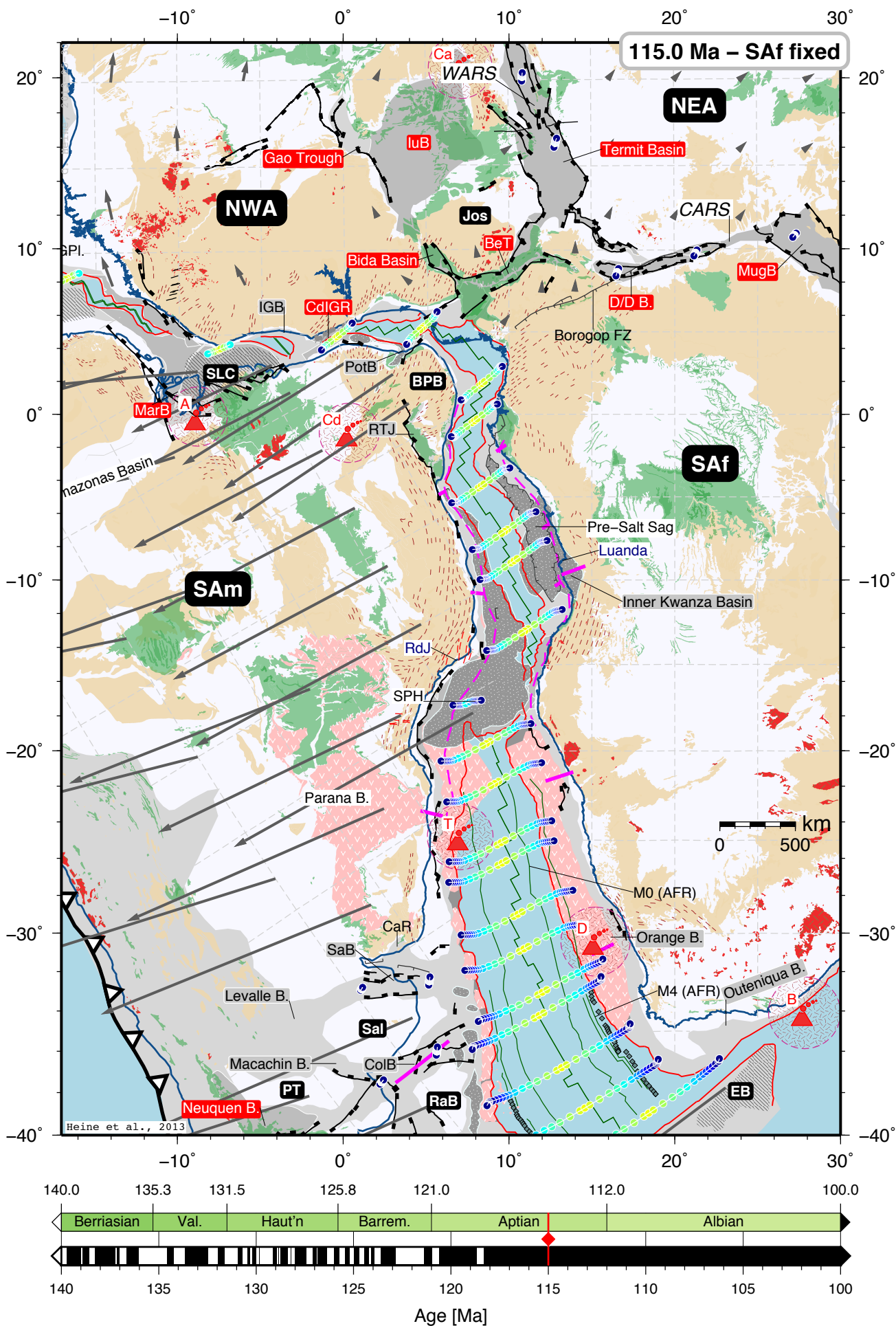




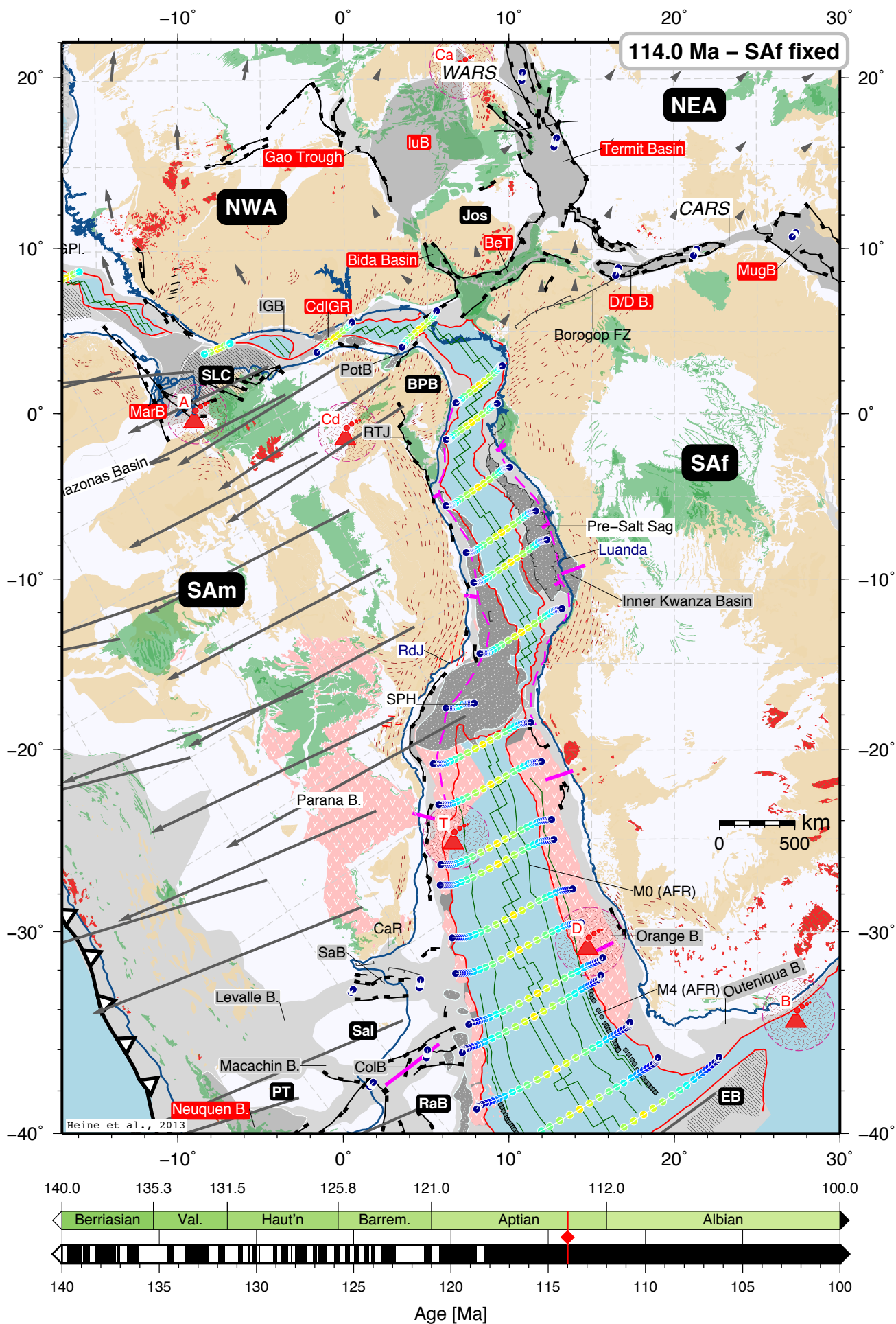


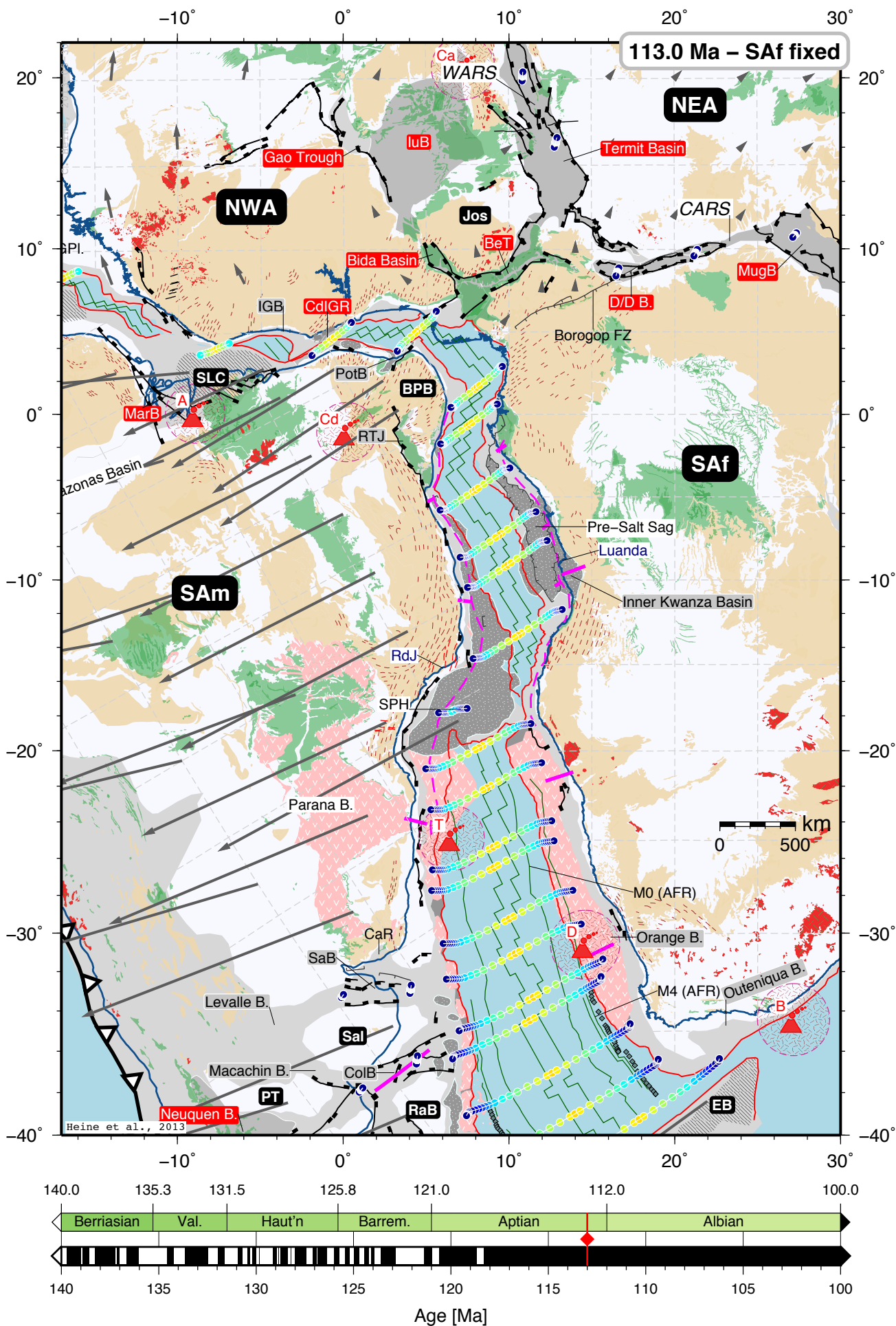




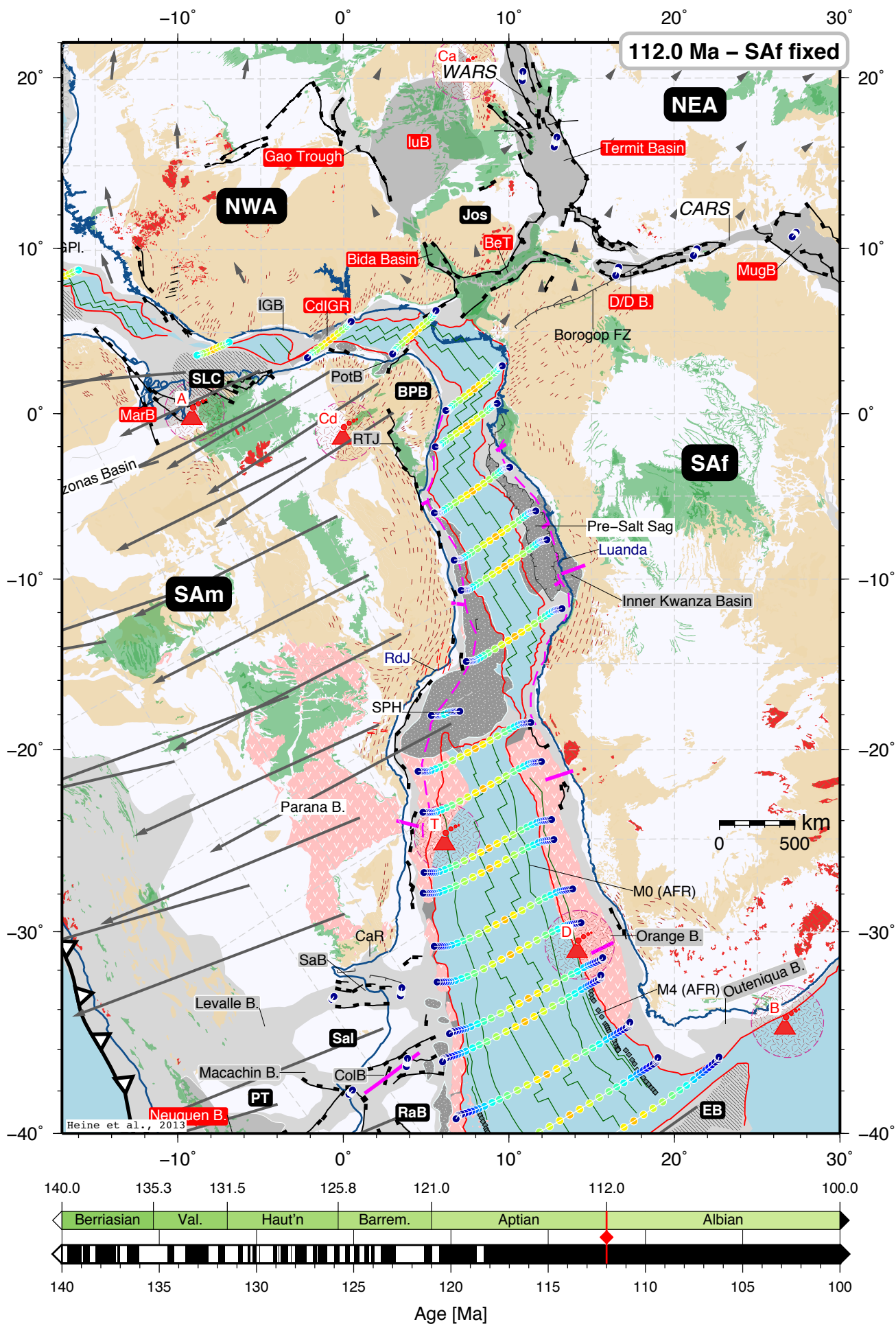


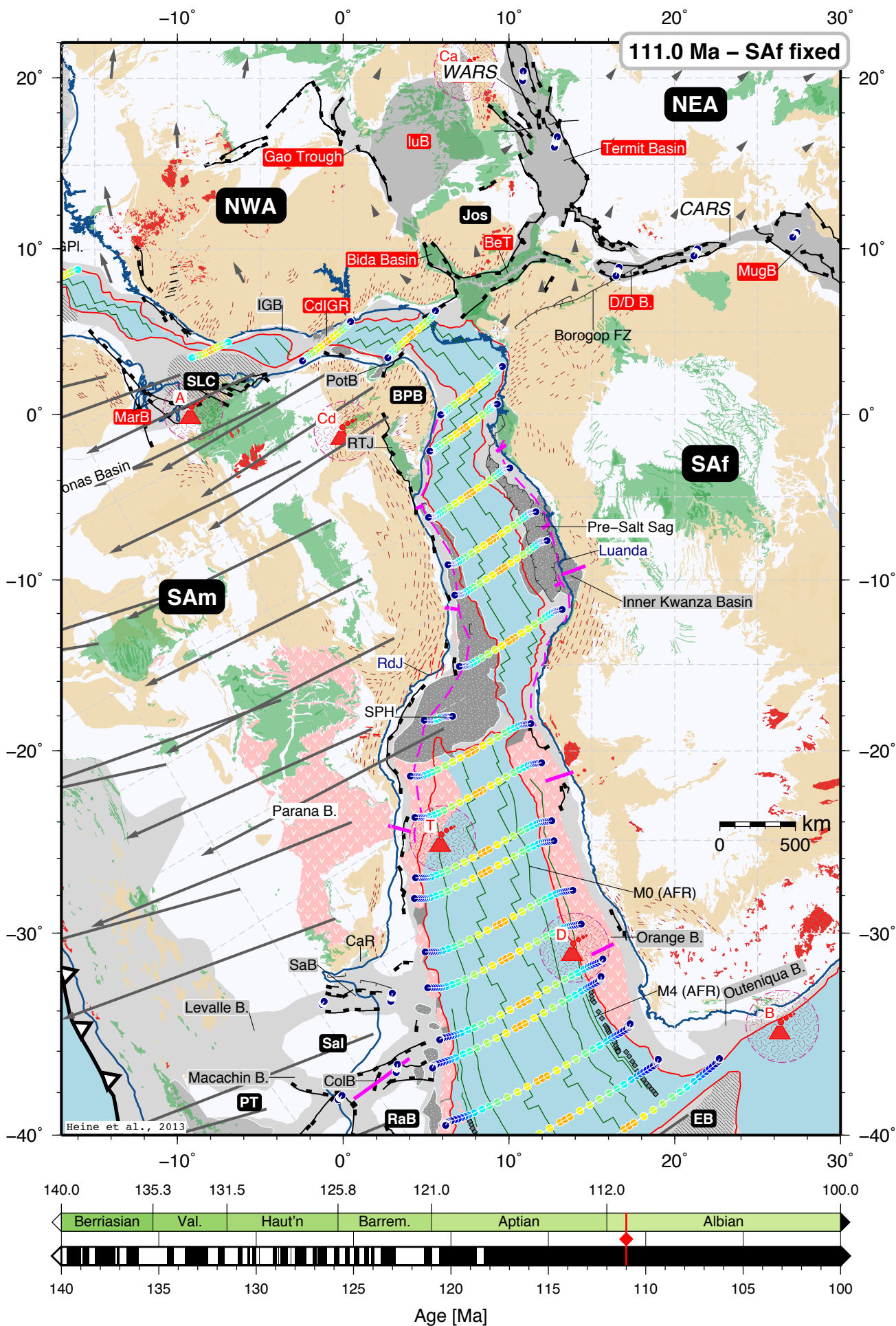




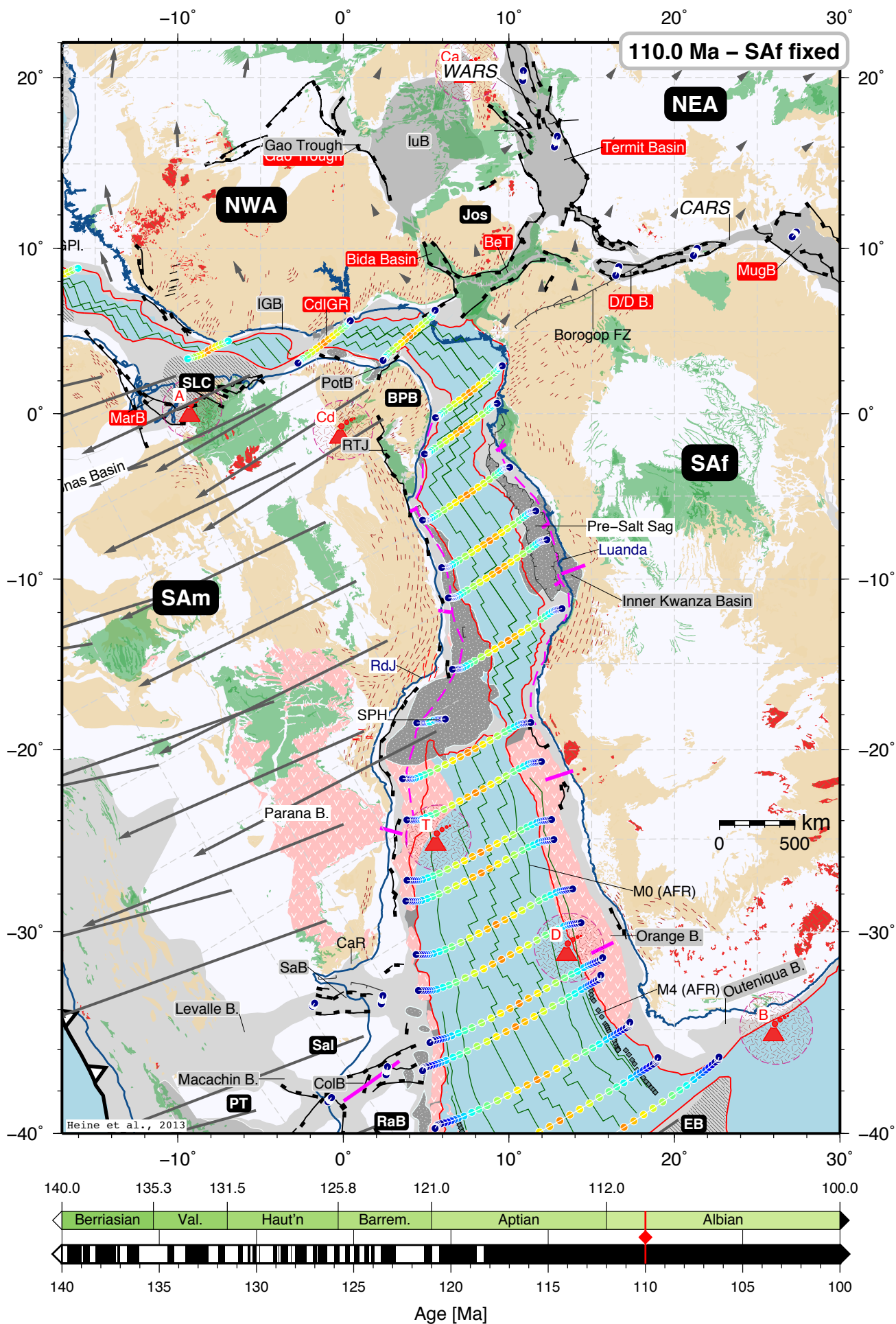


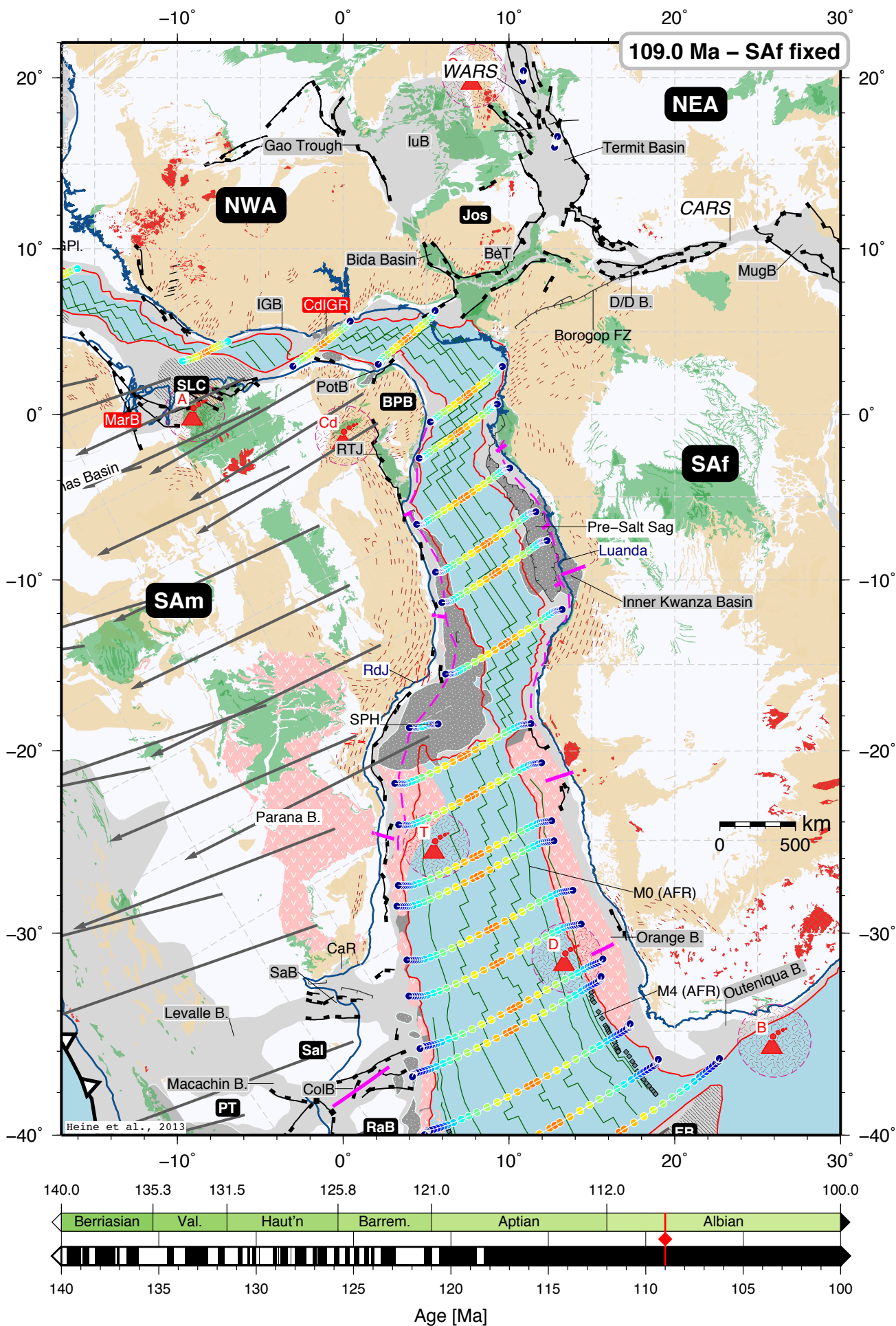




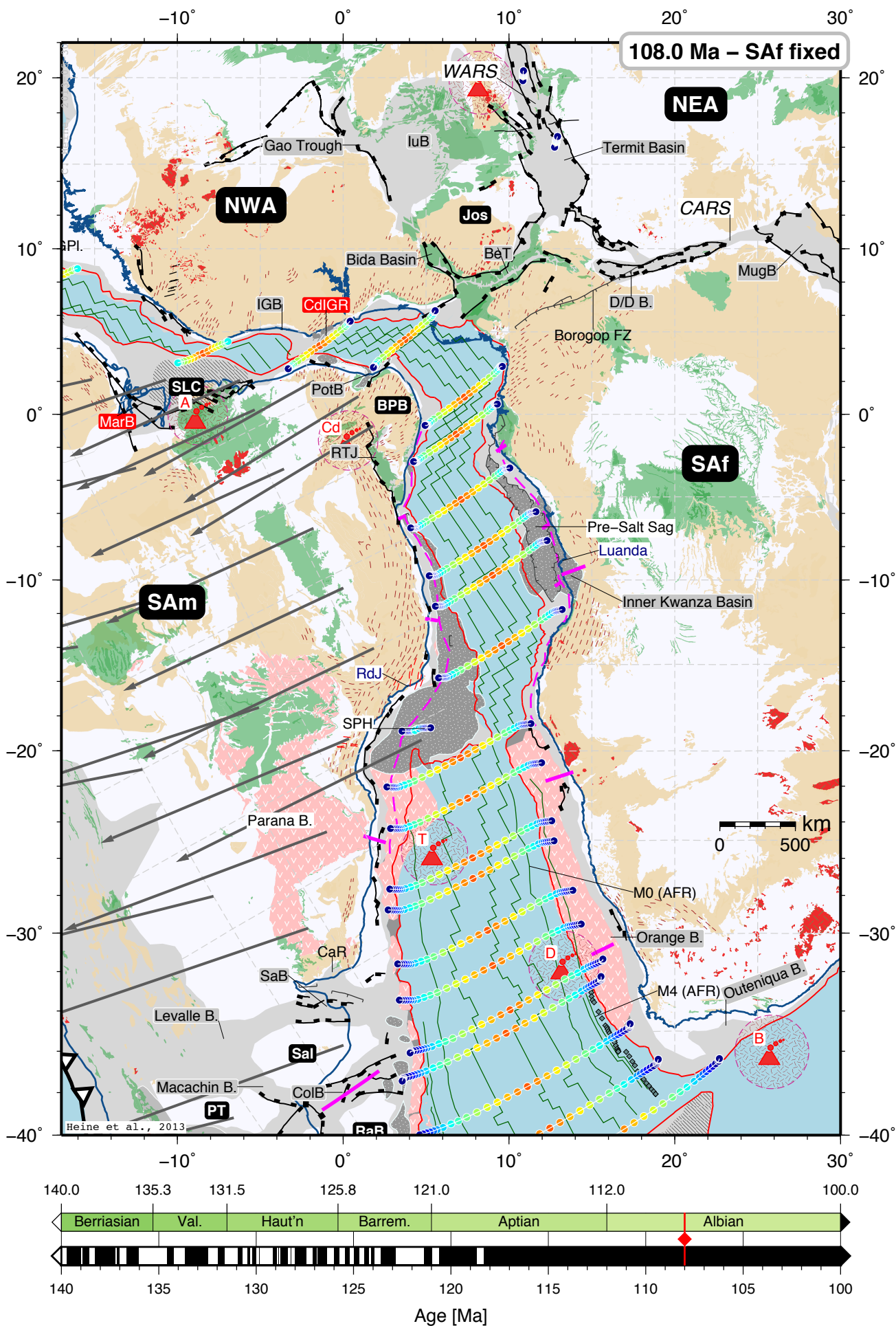


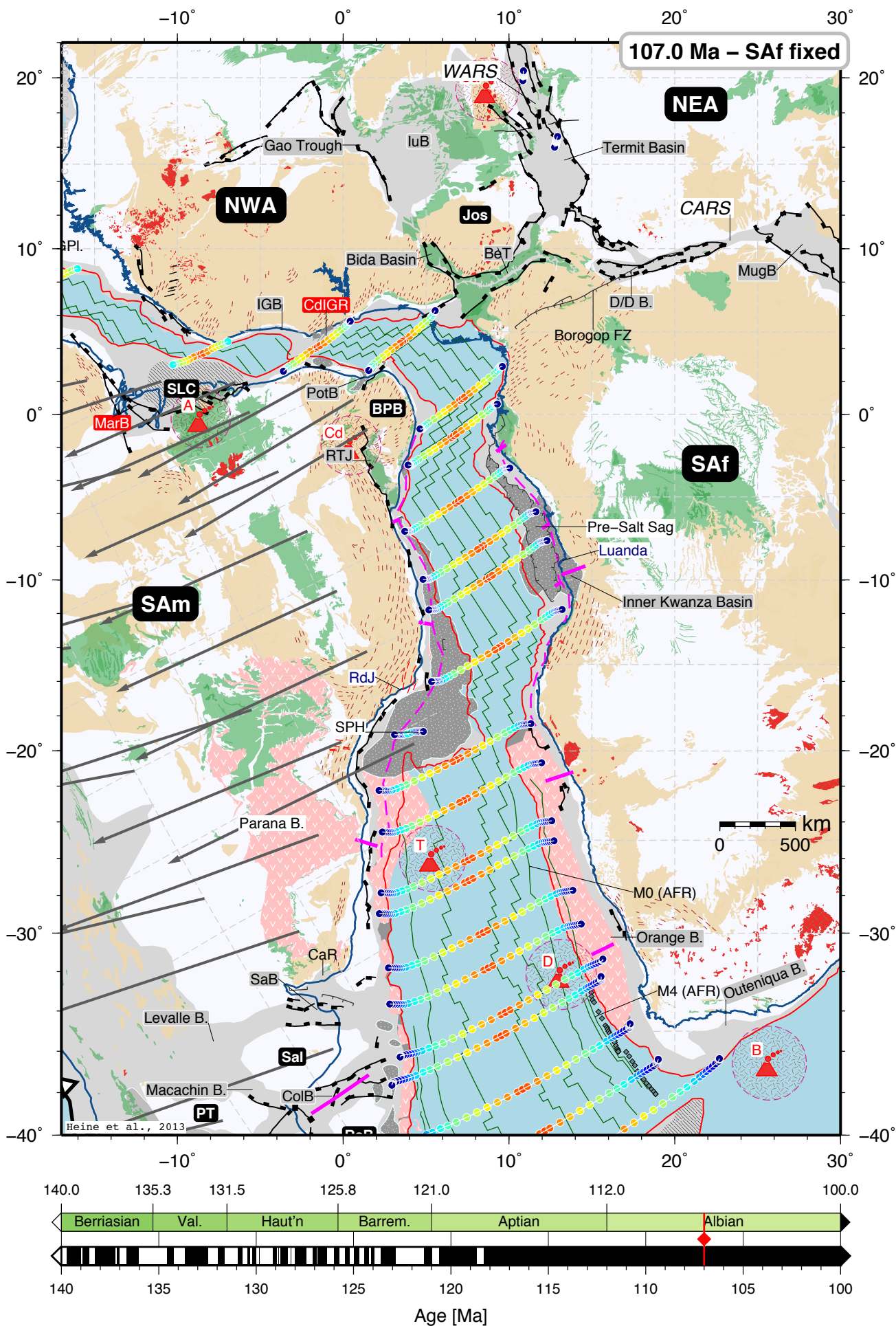




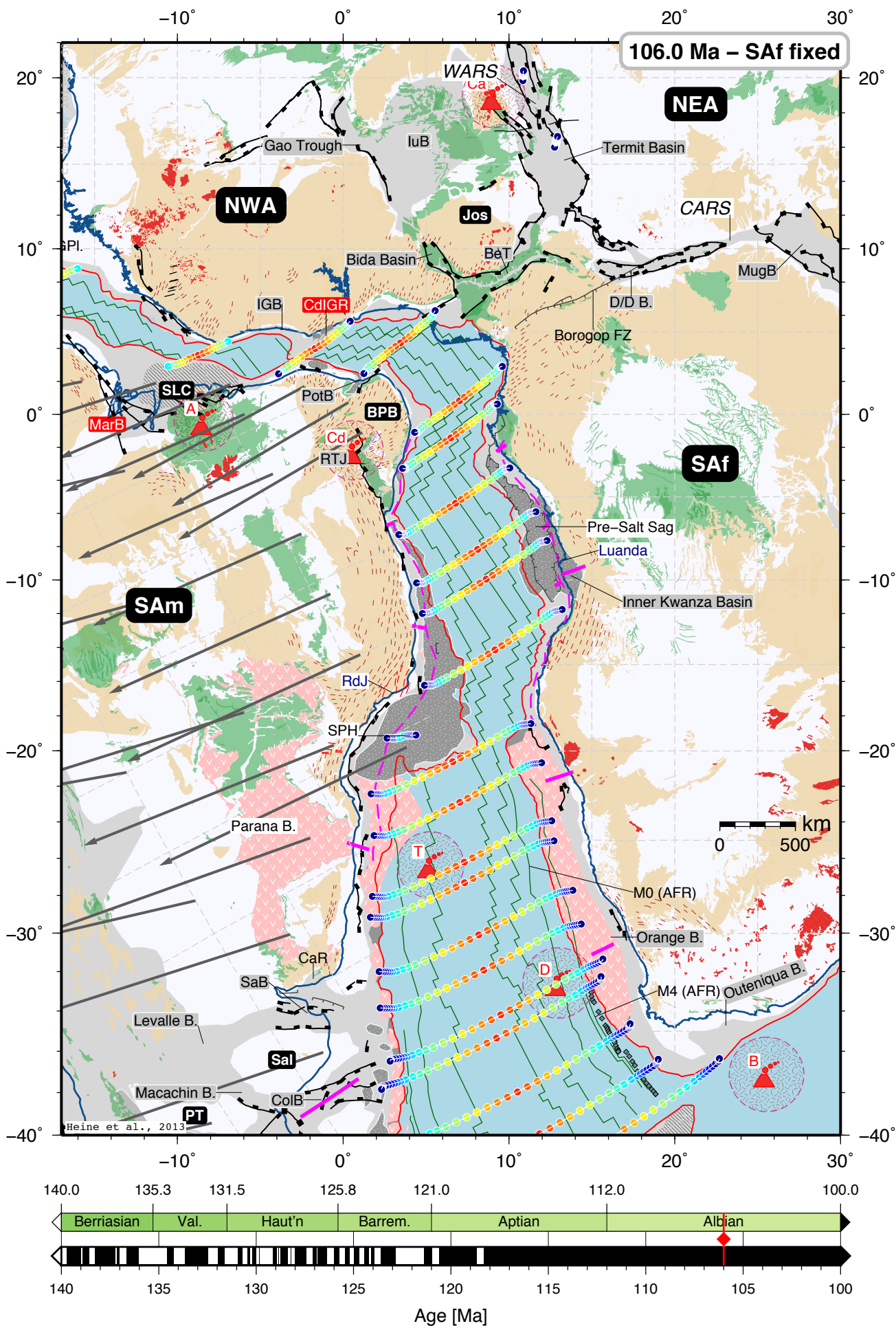




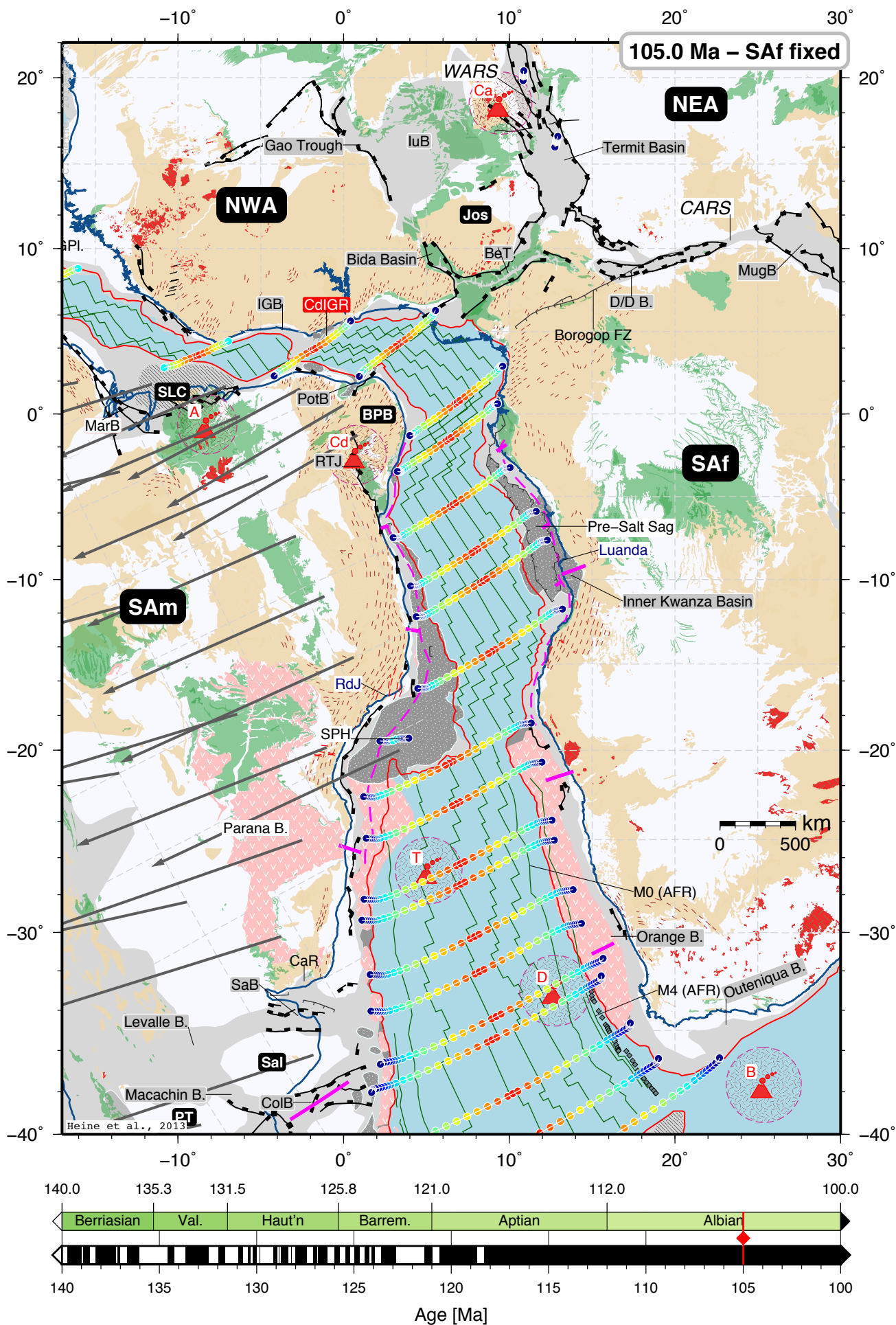


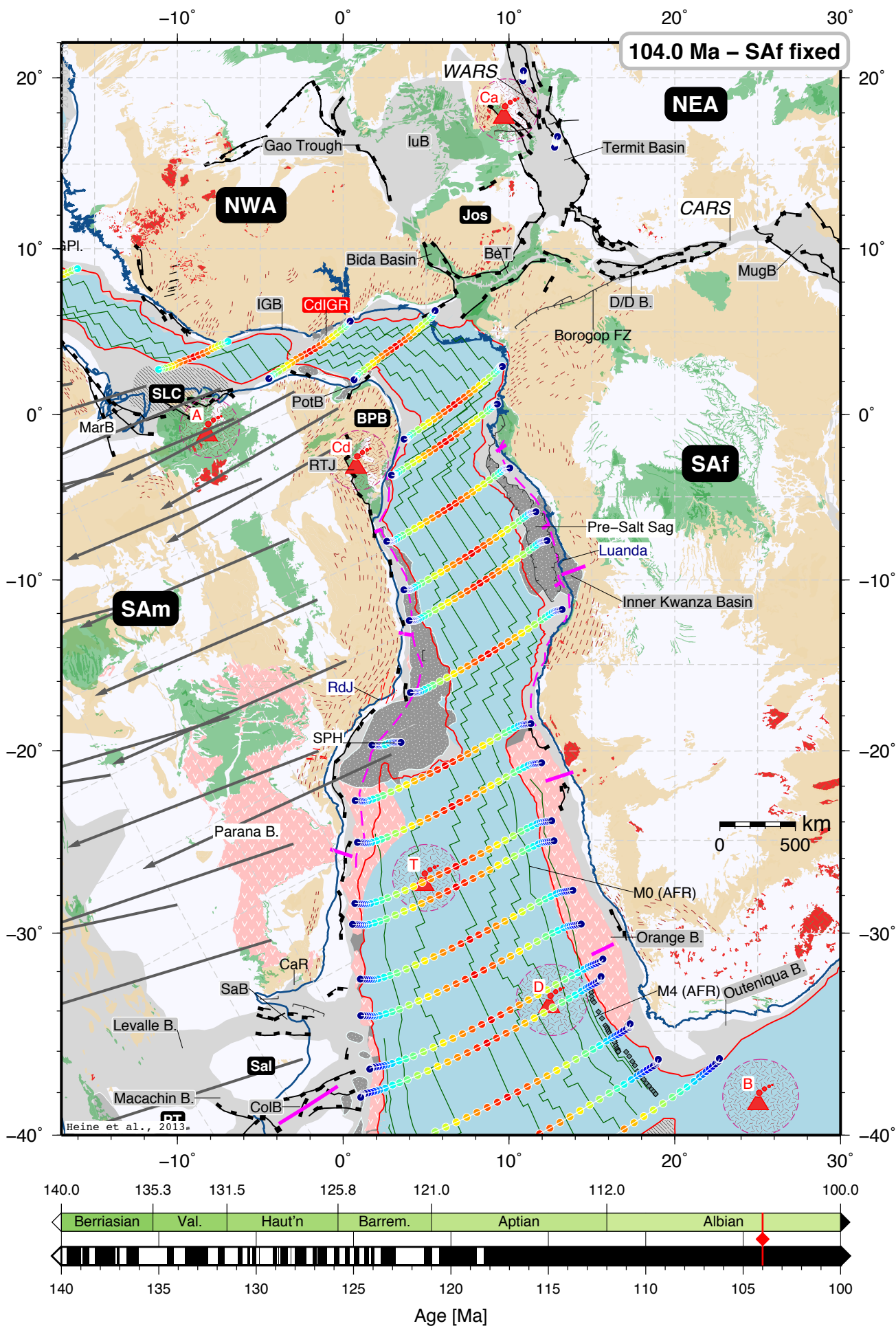




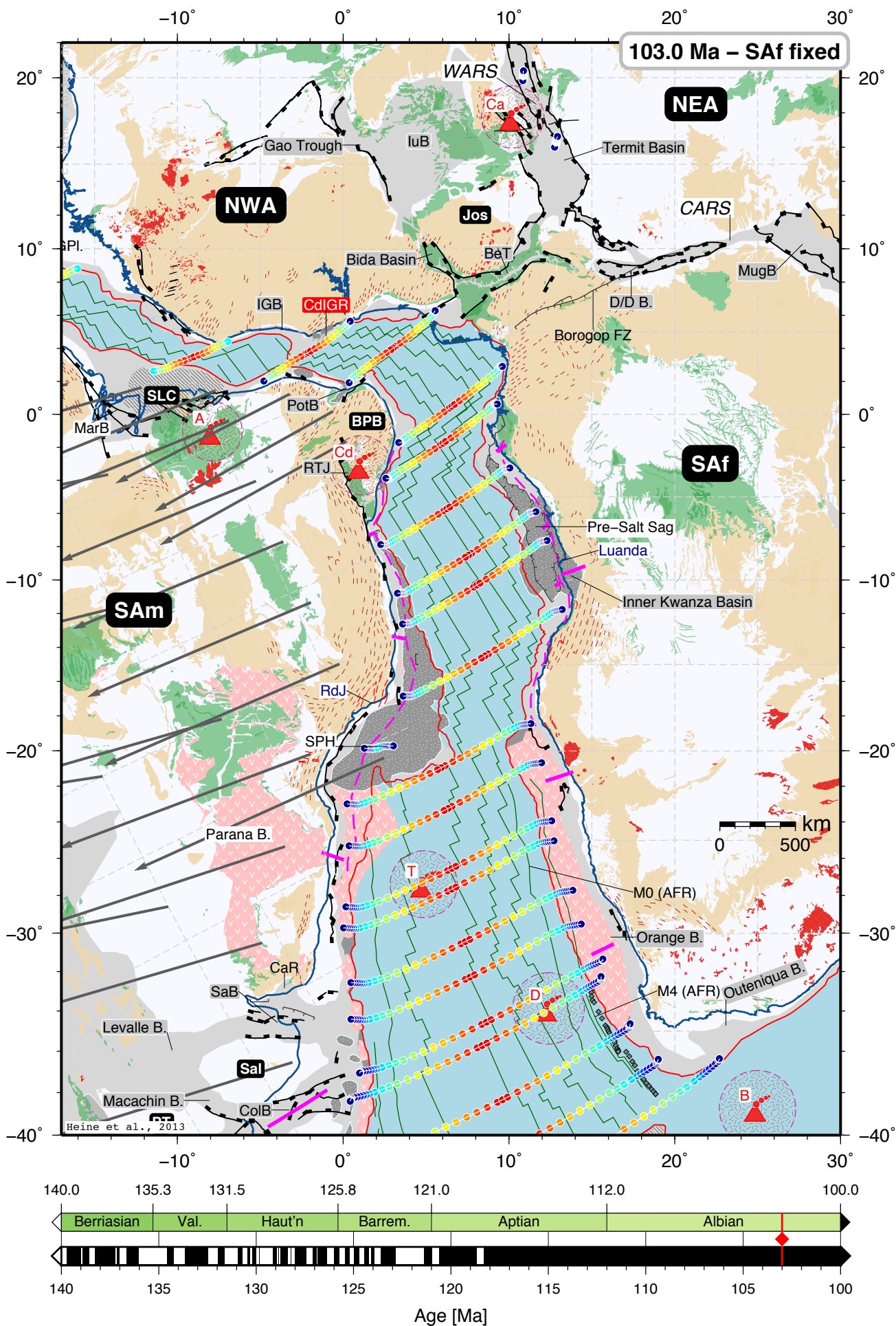




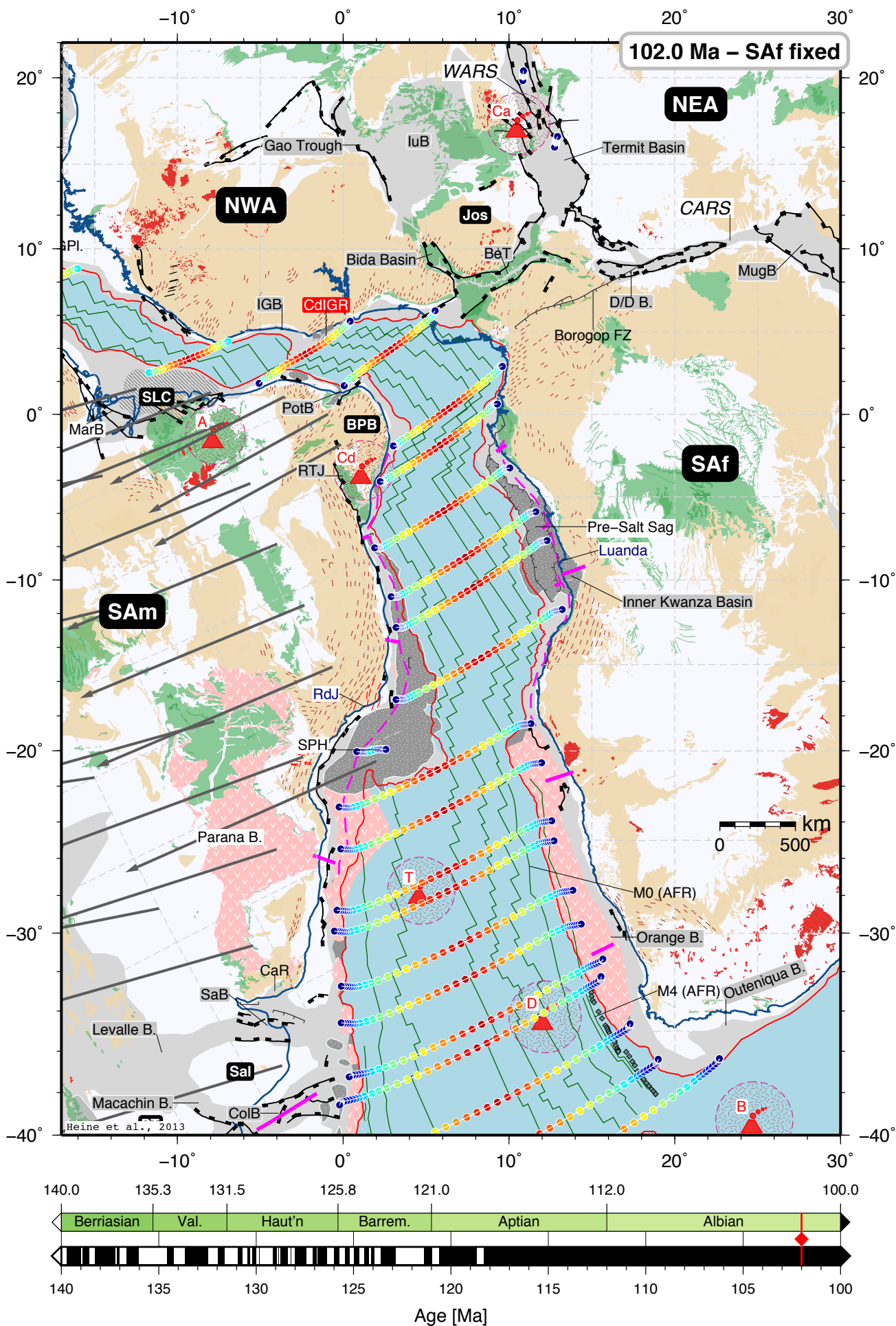


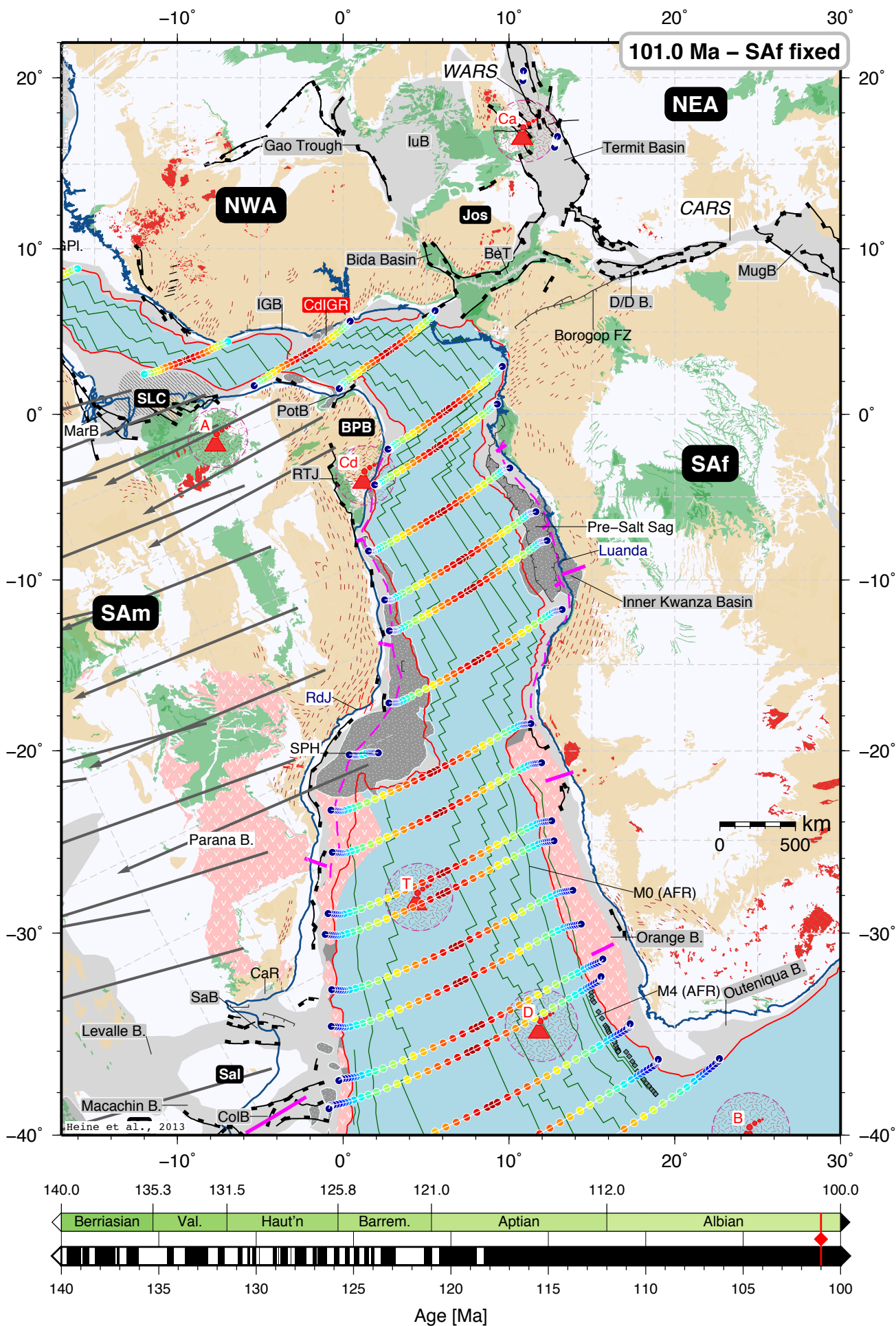




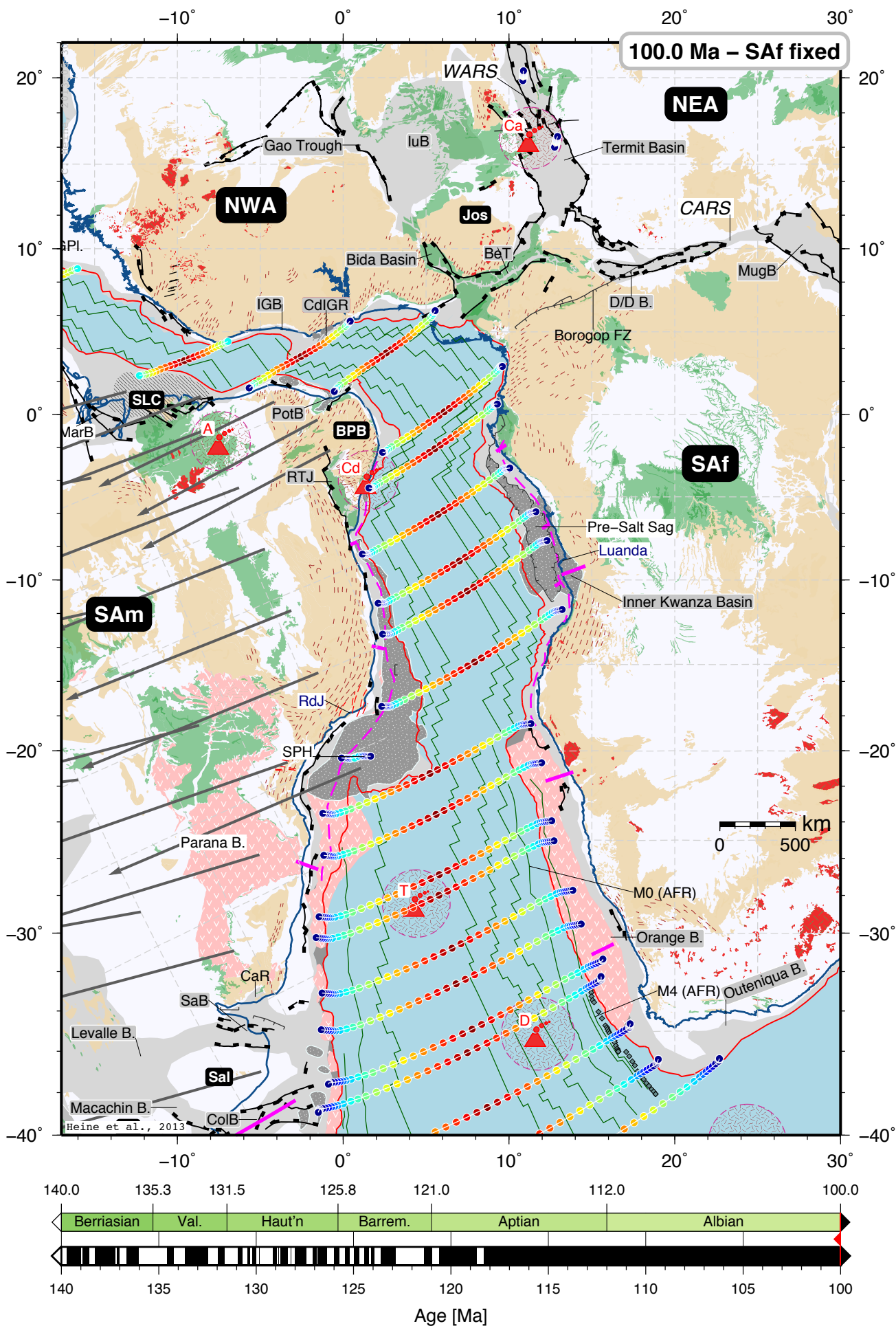












































## -- Map legend --

-  Transitional crust
-  Present-day continental crust
-  Actively deforming continental crust
-  Non-deforming crust
-  Proterozoic rocks (USGS, 2012)
-  Strong upper crustal blocks in extensional domain
-  Sedimentary rocks (Jurassic–Cretaceous; USGS, CGMW)
-  Igneous rocks (Mesozoic)
-  Igneous rocks (Mesozoic)
-  Large igneous province
-  Pre-/Synrift Basin
-  Edge of Parana Flood Basalts
-  Landward limit oceanic crust (LALOC)
-  Restored cont. margin
-  Present-day coastline
-  Metam. basement grain
-  Magnetic isochron
-  Tectonic Lineament (regional)
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-  Fault (regional)
-  Normal Fault (regional)
-  Thrust Fault
-  Anticline
-  Transfer zone dextral/sinistral (regional)
-  Subduction zone
-  Dyke swarm (major)
-  Magnetic anomaly pick
-  5-Degree graticule
-  Hotspot (fixed, with 200 km diameter marked)
-  Velocity vector, here: 2 cm/a

