



### Annotations:

#### CAOS

- (1) Kazakhstan-Yili microcontinent
- (2) Mongol-Tuva microcontinent
- (3) Erguna, Xing'an, and Songliao microcontinents
- (4) Bureya-Jiamsui-Khanka microcontinents from Wilde (2015) and Zhou and Wilde (2015)
- (5) Detrital zircon ages from Han et al. (2011)
- (6) Detrital zircon ages from Rojas-Agramonte et al. (2011)
- (7) Paleomagnetism and geochronology from the Baydaric (or Dzabkhan) microcontinent by Levashova et al. (2010)
- (8) Paleomagnetic data and geochronology from the Lesser Karatau microcontinent by Levashova et al. (2011)
- (9) ~770 Ma passive margin, bimodal volcanism, and glacial tillites reported by Meert et al. (2011)
- (10) Detrital zircon ages from Ma et al. (2012)
- (11) 1.2-1.1 Ga gneiss in basement of Tian Shan from Kröner et al. (2013)

#### Urals

- (12) Paleomagnetism and geochronology from eastern Baltica by Levashova et al. (2013) showing relatively low paleolatitude at ~550 Ma
- (13) Mesoproterozoic-Neoproterozoic aulacogens filled with passive margin sediments
- (14) ~700-500 Bolezhezemel arc and Timanide orogen (e.g., Kuznetsov et al., 2010)
- (15) Opening of the Ural Ocean (part of the Paleo-Asian Ocean) by the Phanerozoic (Zonenshain et al., 1984)
- (16) Late Carboniferous arc volcanism in Kazakhstan from Bea et al. (2002)
- (17) Syn-collisional granites young to the north: ~305 Ma to 265 Ma (Fershtater et al., 2007; Fershtater, 2013)
- (18) Triassic deformation during the collision of Baltica and Siberia in the Taimyr fold belt (Torsvik and Andersen, 2002)

**Supplemental Figure.** Tectonic map of Eurasia showing the outlines of regional domain-specific maps discussed throughout the text, and the locations key data points, regional names, and other information sources used in our reconstruction. Cited references are all listed in the main text.

## **Annotations (continued):**

### ***Turan Domain***

- (19) Peri-Caspian Basin
- (20) Turan Domain
- (21) Scythian Domain
- (22) Silurian-Devonian carbonate (Zonenshain et al., 1990)
- (23) Carboniferous-Triassic arc magmatism (Garzanti and Gaetani, 2002)
- (24) Deformed Permian-Triassic flysch unconformably overlain by Jurassic strata (Marcinowski et al., 1996; Ulmishek, 2001)

### ***Karakum***

- (25) Carboniferous ophiolite and Paleo-Asian Ocean suture (Burtman, 2006)
- (26) Carboniferous seamounts and mid-ocean ridge basalt (Biske and Seltmann, 2010)
- (27) Neoproterozoic-Cambrian to Early Carboniferous marine sedimentation (Biske and Seltmann, 2010)

### ***Tarim***

- (28) Aksu
- (29) Quruqtagh
- (30) Tiekklik
- (31) Paleomagnetic data from North Tarim (Chen et al., 2004; Huang et al., 2005; Zhang et al., 2007; Wen et al., 2013)
- (32) ~1.94-1.93 Ga magmatism and ~1.92-1.91 granulite-facies metamorphism (Ge et al., 2015)
- (33) Unpublished ~872-862 Ma metamorphism of the Aksu blueschist cross cut by 807 Ma dike (e.g., Chen et al., 2004)
- (34) ~830 Ma metamorphism associated with crustal thickening in North Tarim (Ge et al., 2016)
- (35) ~970 Ma granitoid (Cowgill et al., 2003)
- (36) Drill-core sample with >790 Ma granitoid (Guo et al., 2005)
- (37) Tarim suture between North and South Tarim (Guo et al., 2005; Xu et al., 2013)
- (38) Neoproterozoic rifting, bimodal volcanism, and passive margin development (e.g., Zhang et al., 2007; Lu et al., 2008; Zhu et al., 2008; Zheng et al., 2010; Shu et al., 2011; Wang et al., 2015a, 2015b)

### ***Qaidam-Kunlun (Qilian Shan region)***

- (39) Westmost extent of early Paleozoic Qilian suture in Altyn Tagh Range (e.g., Sobel and Arnaud, 1999)
- (40) Quanji Massif with ~2.4 Ga granitic gneiss overprinted by 1.95-1.93 Ga crustal-thickening and metamorphism (Wang et al., 2008; Lu et al., 2008; Chen et al., 2009, 2013b; Gong et al., 2012)
- (41) 1.0-0.9 Ga granitoids exposed throughout the Qilian Shan (Tung et al., 2013; Wu et al., 2016)
- (42) 790-750 Ma intrusions, possibly associated with the opening of the Qilian Ocean (Tseng et al., 2006; Song et al., 2013; Wu et al., 2016)
- (43) Early Paleozoic Qilian arc and orogen including Cambrian-Ordovician ophiolites, Ordovician arc-related intrusions, and Ordovician-Silurian metamorphic ages (e.g., Gehrels et al., 2003a, 2003b; Liu et al., 2006; Xiao et al., 2009; Song et al., 2013; Wu et al., 2016)
- (44) Qinling orogen/suture, which may have linked to the northwest with the Qilian orogen (e.g., Xu et al., 2008; Tseng et al., 2009; Dong et al., 2011)
- (45) North Qaidam ultra-high pressure (UHP) metamorphic rocks resulting from the collision of the Qaidam-Kunlun continent with the North China craton (Menold et al., 2009, 2016; Song et al., 2014)
- (46) Paleo-Kunlun and Kunlun arc record northward subduction beneath the Qaidam continent (Wu et al., 2016)

### ***North China***

- (47) Paleomagnetic data from the North China craton (Huang et al., 1999; Zhang et al., 2006; Fu et al., 2015)
- (48) Debated ~2.5 Ga, ~1.9 Ga, and ~1.8 Ga orogens in North China; interpretation of these is not within the scope of this current study (see Zhao et al., 1998, 2005, 2012; Kusky and Li, 2003; Zhao et al., 2005; Santosh et al., 2006, 2007; Kusky et al., 2007; Trap et al., 2012; Zhao and Cawood, 2012; Zhao et al., 2012 and many others)
- (49) Mesoproterozoic-Neoproterozoic sedimentation in Jixian County, North China (Wan et al., 2011; Sun et al., 2012; H. Li et al., 2013)
- (50) 850-800 Ma bimodal and ultra-mafic volcanic rocks and rifting along the margins of the North China craton (Li et al., 2005; Wang et al., 2011b; Liu et al., 2012)
- (51) ~900 Ma dikes in North China (Peng et al., 2011a, 2011b; Liu et al., 2012)
- (52) Cambrian passive margin strata (Ying et al., 2011; Sun et al., 2012; Myrow et al., 2015)
- (53) Permian-Triassic collision between North and South China (Yin and Nie, 1993; Hacker et al., 2004, 2006; Dong et al., 2013)

**Supplemental Figure (continued).** Tectonic map of Eurasia showing the outlines of regional domain-specific maps discussed throughout the text, and the locations key data points, regional names, and other information sources used in our reconstruction. Cited references are all listed in the main text.