



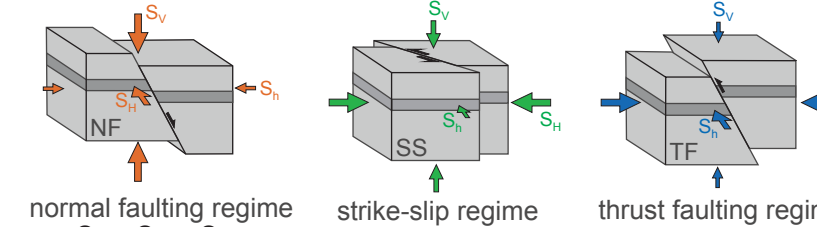
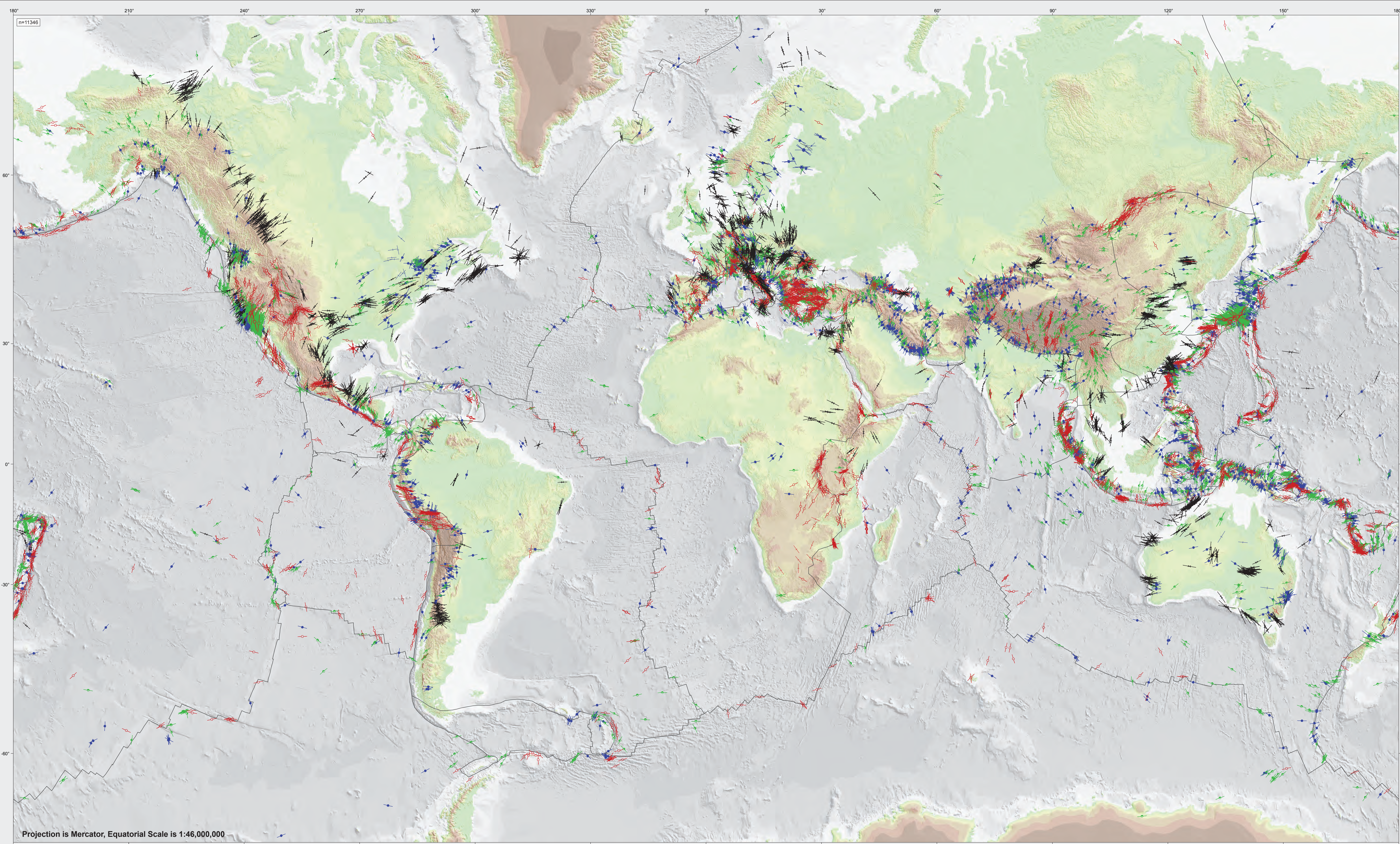
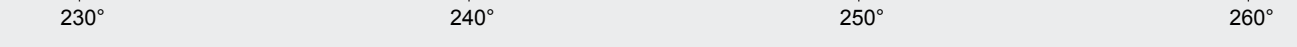
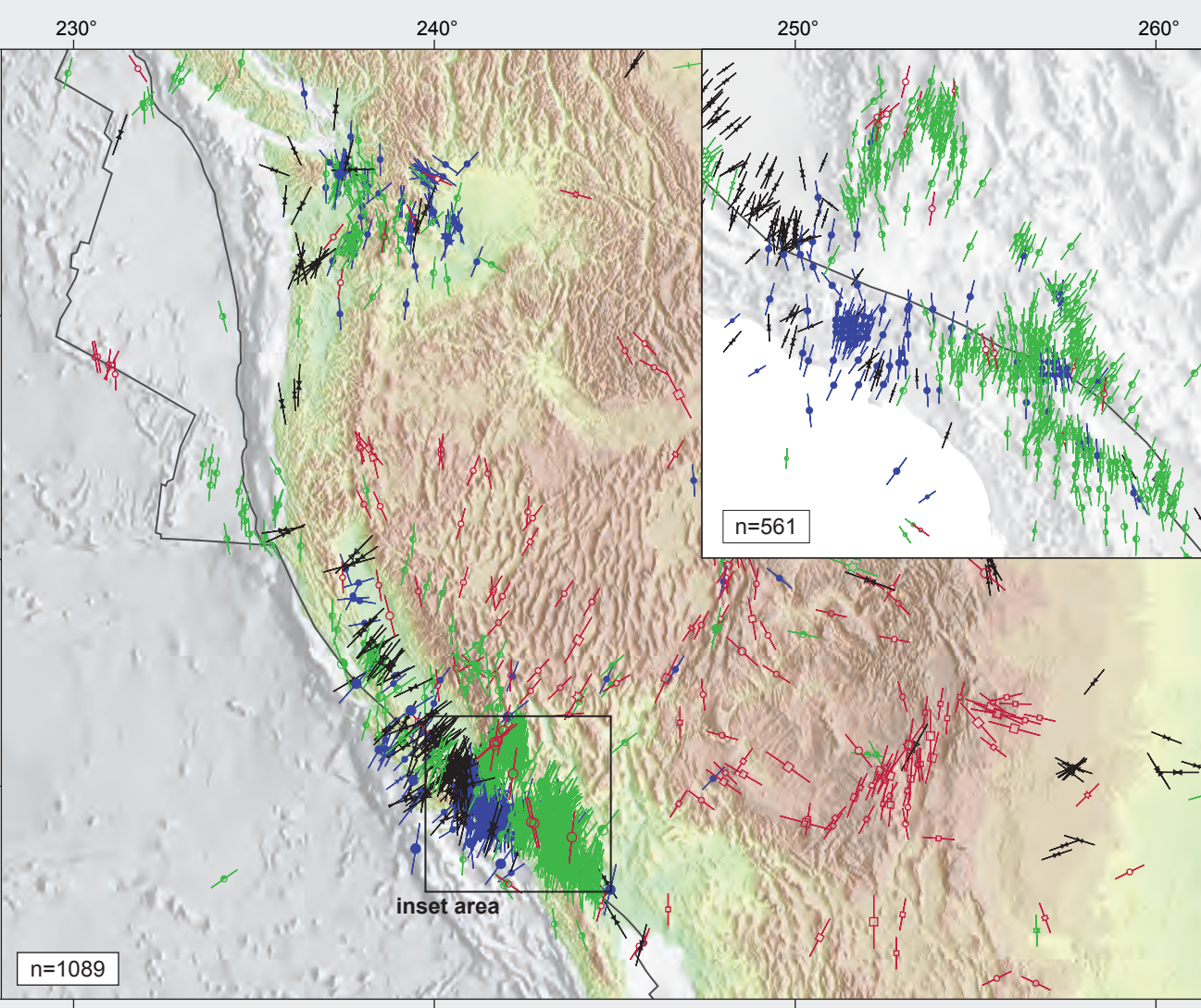
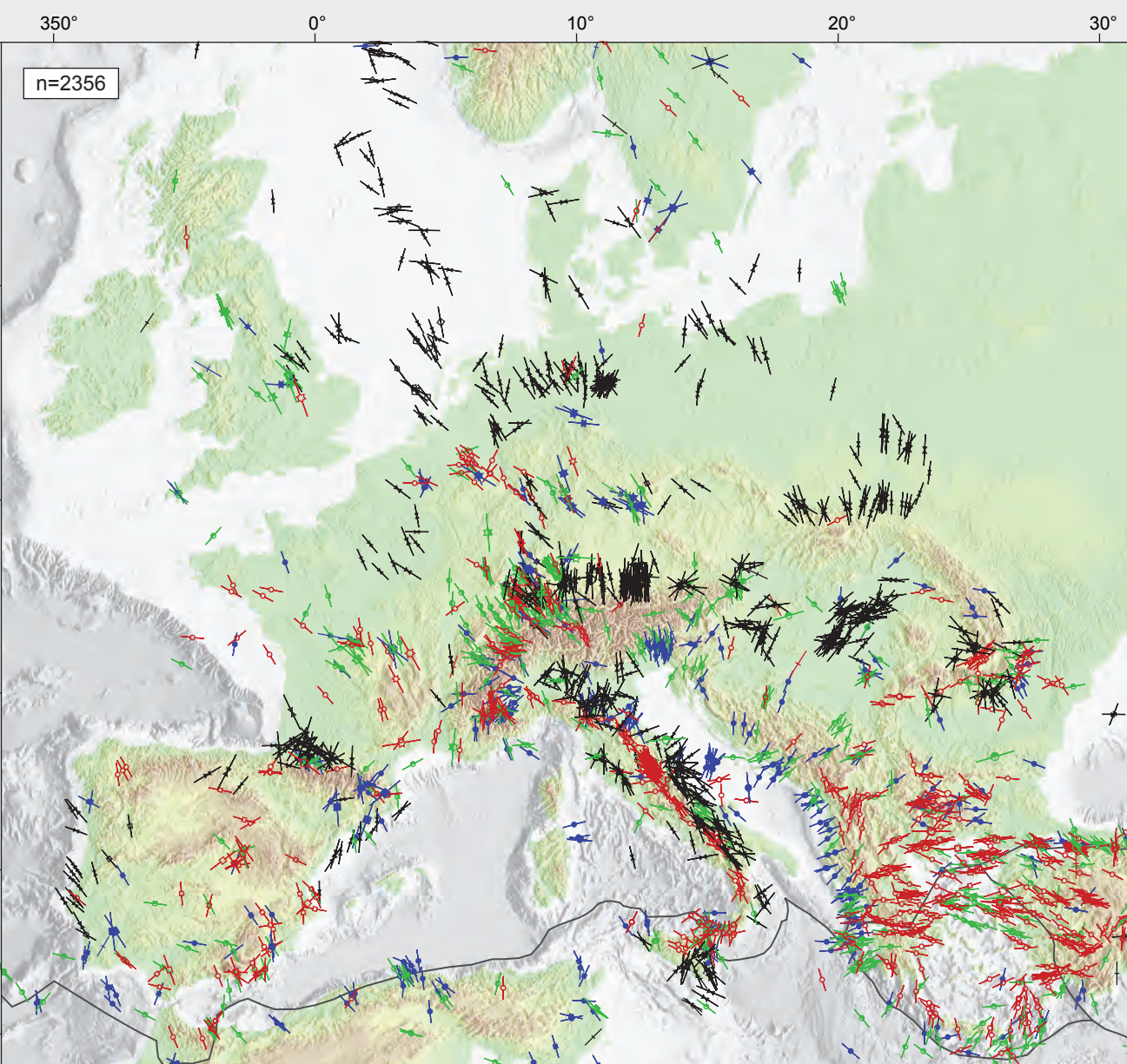
Explanatory Text

The World Stress Map (WSM) is the global compilation of information on the present-day stress field in the Earth's crust. It is a collaborative project between academia, industry and government that aims to characterize the crustal stress pattern and to understand the sources of tectonic stress. The project commenced in 1986 as a part of the International Lithosphere Program, under the leadership of Mary Lou Zoback. From 1995-2008, the WSM was a project of the Heidelberg Academy of Sciences and Humanities. Since 2009 it is maintained and further developed at the Helmholtz Centre Potsdam - GFZ German Research Centre for Geosciences.

All stress information is recorded in a standardized format and quality-ranked for reliability and comparability on a global scale. The stress maps on this poster display A/C quality stress data in the upper 40 km of the Earth's crust from the WSM database release 2008. Focal mechanism solutions determined as being potentially unreliable (labelled as Possible Plate Boundary Events in the database) are not displayed. Further detailed information on the quality ranking guidelines for various stress indicators, and software for stress map generation can be found on the WSM website at www.world-stress-map.org.

The stress maps display the maximum horizontal compressional stress S_H

Method	Quality	Stress Regime
focal mechanism	A S_H is within $\pm 15^\circ$	○ Normal faulting
breakouts	B S_H is within $\pm 20^\circ$	● Strike-slip faulting
drill induced frac.	C S_H is within $\pm 25^\circ$	● Thrust faulting
overcoring		○ Unknown regime
hydro. fractures		
geol. indicators		
Data depth range		
0-40 km		

Projection is Mercator, Equatorial Scale is 1:46,000,000

Major contributors
 Australasian Stress Map Project, The Global CMT Catalogue, European-Mediterranean Regional CMT solutions, DGMK, NAGRA, PETROM, BP, Schlumberger, CHEVRON-Texaco, Fennoscandian Rock Stress Database, Wintershall, Shell, Karasu, PTT, Eni, RWE-Dea, Daleel Petroleum, WEG, Daleel Petroleum, Premier Oil

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Advisory board
 We thank the long-term support from the members of the World Stress Map advisory board of the Heidelberg Academy of Sciences and Humanities, Egon Althaus, John Cook, Roy Gabrielsen, Domenico Giardini, Helmut Kipphan, Onno Oncken, Christoph Reigber, Markus Rothacher, and Mark Zoback.

Further information and data access
 All stress data, further information and software tools are available free of charge on the project website at:
www.world-stress-map.org

Citation of this map
 Heidbach, O., Tingay, M., Barth, A., Reinecker, J., Kurfes, D., Müller, B.: The World Stress Map based on the database release 2008, equatorial scale 1:46,000,000, Commission for the Geological Map of the World, Paris, doi:10.1594/GFZ.WSM.Map2009.2009.

References of used data and software
 This map made use of a number of datasets: Plate boundaries are from the global plate model P62002 (Bird, 2003), topography and bathymetry from Smith and Sandwell (1997). Stress maps are produced with CASMI (Heidbach and Höhne, 2008) which is based on GMT from Wessel and Smith (1998).
 Bird, P.: An updated digital model for plate boundaries. *Geochron. Geophys. Geosyst.*, 4 (3), 1027, doi:10.1029/2001GC002522, 2003.
 Heidbach, O., Höhne, J.: CASMI - a tool for the visualization of the World Stress Map data base. *Computers and Geosciences*, 34, 783-791, doi:10.1016/j.cageo.2007.06.004, 2008.
 Wessel, P., Smith, W.H.F.: New, improved version of Generic Mapping Tools released. *Eos Trans.*, 79 (47), 579, 1998.
 Smith, W.H.F. and Sandwell, D.T.: Global sea floor topography from satellite altimetry and ship depth soundings. *Science*, 277, 1956-1962, 1997.

Key references for the WSM project
 Fuchs, K. & Müller, B.: World Stress Map of the Earth: a key to tectonic processes and technological applications. *Naturwissenschaften*, 88, 357-371, 2001.
 Heidbach, O., Reinecker, J., Tingay, M., Müller, B., Spamer, B., Fuchs, K. & Wenzel, F.: Plate boundary forces are not enough: Second- and third-order stress patterns highlighted in the World Stress Map database. *Tectonics*, 26, TC6014, doi:10.1029/2007TC002153, 2007.
 Heidbach, O., Tingay, M., Barth, A., Reinecker, J., Kurfes, D. & Müller, B.: The World Stress Map database release 2008 doi:10.1594/GFZ.WSM.Re2008.2008.
 Heidbach, O., Tingay, M., Barth, A., Reinecker, J., Kurfes, D. & Müller, B.: Statistical analysis of global spatial wave-length stress patterns. *Tectonophysics*, in press.
 Spamer, B., Müller, B., Heidbach, O., Delvaux, D., Reinecker, J. & Fuchs, K.: Tectonic stress in the Earth's crust: advances in the World Stress Map project. In *New insights in structural interpretation and modeling*, pp. 101-116, ed. Nieuwland, D. A. Geological Society, London, 2003.
 Tingay, M., Müller, B., Reinecker, J., Heidbach, O., Wenzel, F. & Fleckenstein, P.: The World Stress Map Project Present-day Stress in Sedimentary Basins' initiative: building a valuable public resource to understand tectonic stress in the oil patch. *The Leading Edge*, 24, 1276-1282, 2005.
 Zoback, M.L.: First and second order patterns of stress in the lithosphere: The World Stress Map Project. *J. Geophys. Res.*, 97, 11703-11728, 1992.
 Zoback, M.L. & Zoback, M.D.: Tectonic stress field of the conterminous United States. In *Geophysical Framework of the Continental United States*, pp. 523-539, eds. Pakiser, L. C. & Mooney, W. D. Geol. Soc. Am. Mem., Boulder, Colorado, 1989.
 Zoback, M.D. & Zoback, M.L.: Tectonic stress field of North America and relative plate motions. In *Neotectonics of North America*, pp. 339-366, eds. Stiemmons, D. B., Engdahl, E. R., Zoback, M.D. & Blackwell, D. D. Geological Society of America, Boulder, Colorado, 1991.