

Overview of fault data-derived extension directions associated with recent tectonic deformation along the Western Margin - Frank Zwaan, 17 Dec 2019

Italic text with pink background: not used in main calculation (see comments for reason)

Zwaan et al. (2019)				
Location	WGS84 Latitude	WGS84 Longitude	Extension direction (°N)	Comments
ER1	14.613906°	39.924439°	73	
1.1	13.364244°	39.709006°	155	Pre-rift extension
1.2	13.351897°	39.743987°	70	
2.2	13.329172°	39.746686°	N/A	Only fault plane
2.4	13.275122°	39.828552°	79	
2.5	13.280766°	39.828414°	75	Average solution
			83	phase 1
			77	phase 2
			32	phase 3
2.6	13.285701°	39.826859°	19	Jurassic?
2.7	13.423969°	39.863124°	91	
2.8	13.436628°	39.856025°	78	
2.9	13.442214°	39.856008°	57	
2.10	13.412517°	39.856988°	68	
3.1	13.474332°	39.867624°	N/A	Only fault plane
3.2	13.485969°	39.871661°	97	
3.3	13.648923°	39.868427°	82	Dike
3.4	13.654454°	39.868905°	84	Dike
3.6	13.650817°	39.841988°	147	Pre-rift compression
4.5	12.928489°	39.523116°	136	Compression?
			91	
4.6	12.896378°	39.519347°	66	
4.9	12.560264°	39.523166°	96	
4.11	12.523768°	39.479168°	124	
4.12	12.491339°	39.501815°	25	
5.1	12.775328°	39.558916°	0	error?
5.2	12.769619°	39.591035°	47	
5.3	12.775577°	39.594529°	85	
5.4	12.778730°	39.616549°	80	
5.6	12.741659°	39.816747°	41	
5.7	12.729976°	39.810663°	69	
6.4	12.594005°	39.797641°	64	
6.5	12.566182°	39.743481°	109	
6.7	12.571225°	39.741587°	88	
6.8	12.571467°	39.740983°	76	
6.9	12.437413°	39.725822°	19	Earliest rift phase?
6.10	12.424435°	39.688453°	117	
6.11	12.449573°	39.677745°	82	
6.12	12.477242°	39.683586°	76	
7.1	12.416923°	39.552496°	24	Earliest rift phase?
			128	
7.4	12.203431°	39.712167°	140	Earliest rift phase?
7.5	12.203273°	39.723484°	116	
7.6	12.197903°	39.719247°	104	
8.1	11.883937°	39.523957°	94	
8.2	11.909421°	39.435208°	N/A	Only fault plane
8.6	11.832700°	39.603950°	79	
8.7	11.831049°	39.602688°	78	
9.1	10.961942°	39.776965°	135	
9.3	10.893177°	39.813008°	75	
9.4	10.758972°	39.830416°	67	
9.7	10.415248°	39.936547°	105	
9.10	10.365494°	39.934283°	104	

Data Sani et al. (2017)				
Location	WGS84 Latitude	WGS84 Longitude	Extension direction (°N)	Comments
MW1	15.513103°	39.445181°	89	
MW2	15.462825°	39.456317°	64	
FO1	15.319456°	39.567733°	64	
FO2	15.298839°	39.573644°	62	
FO3	15.290300°	39.597689°	98	
FO4	15.229533°	39.618122°	96	
AR1	15.058025°	39.784061°	108	
AR2	15.017489°	39.789219°	83	
AR3	15.079867°	39.697947°	85	
D1	14.777089°	39.877931°	69	
D2	14.697756°	39.909414°	83	

Data Chorowicz et al. (1999) (locations are approximated)				
Author's Phase 3 (development of marginal grabens)				
Location	WGS84 Latitude	WGS84 Longitude	Extension direction (°N)	Comments
1	9.810044°	39.739278°	108	
2	9.849553°	39.793681°	85	stria
3b	10.115781°	39.963992°	75	
4	10.073358°	39.945583°	114	
5	10.380014°	39.940428°	46	stria
6	10.362631°	39.939142°	91	stria
7	10.410303°	39.928111°	91	stria
10	10.504525°	39.961972°	97	dike
11	10.804342°	39.849544°	91	stria
14	10.976761°	39.768447°	69	stria
15	11.086517°	39.670144°	77	stria
16	11.026937°	39.671286°	90	
19	11.211856°	40.343572°	55	stria
22	11.205097°	40.146200°	104	Dike
23	11.204569°	40.160131°	57	Dike
27	11.172125°	40.013894°	59	Dike
28	11.168408°	39.981847°	58	Dike
29	11.112803°	39.877408°	69	stria
31	11.173469°	39.682264°	108	stria
32	11.846611°	39.696342°	63	stria
33	11.706103°	39.686081°	82	
34	11.585619°	39.691761°	86	

References:

Chorowicz, J., Collet, B., Bonavia, F., Korme, T., 1999. Left-lateral strike-slip tectonics and gravity induced individualisation of wide continental blocks in the western Afar margin. *Eclogae Geologicae Helvetiae*, 92, 149-158. <http://doi.org/10.5169/seals-168656>

Sani, F., Ghinassi, M., Papini, M., Oms, O., Finotello, A. 2017. Evolution of the northern tip of Afar triangle: inferences from the Quaternary succession of the Dandiero – Massawa area (Eritrea). *Tectonophysics* 717, 339-357. <https://doi.org/10.1016/j.tecto.2017.08.026>

Fault data-derived extension directions related to preceding tectonic phases in Afar

Data Chorowicz et al. (1999) (locations are approximated)				
Author's Phase 1 (early sinistral oblique extension)				
Location	WGS84 Latitude	WGS84 Longitude	Extension direction (°N)	Comments
3	9.868308°	39.909072°	14	Older phase
4	10.073358°	39.945583°	22	Older phase
5	10.380014°	39.940428°	20	Older phase
11	10.804342°	39.849544°	11	Older phase
12	10.914542°	39.790767°	17	Older phase
13	10.945328°	39.779183°	17	Older phase
15	11.086517°	39.670144°	19	Older phase
23	11.204569°	40.160131°	26	Older phase
27	11.172125°	40.013894°	26	Older phase
29	11.112803°	39.877408°	10	Older phase
30	11.087914°	39.846103°	19	Older phase
33	11.706103°	39.686081°	34	Older phase
35	11.261636°	39.694047°	21	Older phase

Data Chorowicz et al. (1999) (locations are approximated)				
Author's Phase 2 (formation of MER)				
Location	WGS84 Latitude	WGS84 Longitude	Extension direction (°N)	Comments
2	9.849553°	39.793681°	158	Older phase
3b	10.115781°	39.963992°	140	Older phase
5	10.380014°	39.940428°	142	Older phase
6	10.362631°	39.939142°	133	Older phase
7	10.410303°	39.928111°	138	Older phase
10	10.504525°	39.961972°	131	Older phase
11	10.804342°	39.849544°	140	Older phase
13	10.945328°	39.779183°	126	Older phase
14	10.976761°	39.768447°	137	Older phase
15	11.086517°	39.670144°	126	Older phase
24	11.184694°	40.069697°	135	Older phase
25	11.179731°	40.056217°	142	Older phase
28	11.168408°	39.981847°	136	Older phase
29	11.112803°	39.877408°	127	Older phase
30	11.087914°	39.846103°	153	Older phase
32	11.846611°	39.696342°	125	Older phase
33	11.706103°	39.686081°	138	Older phase
dike (NW)	11.820664°	39.656614°	135	Older phase
dike (NE)	11.822394°	39.832244°	122	Older phase
dike (SW)	11.688633°	39.823219°	139	Older phase
35	11.261636°	39.694047°	134	Older phase