

A global data set of location and distances to oceanic magnetic polarity block boundaries for anomalies 13ny-34ny

This README file describes the contents of directories and files in two data publications:

Malinverno, A., Quigley, K., Staro, A., & Dymant, J. (2019a). Location and distances to oceanic magnetic polarity block boundaries (anomalies 13ny-34ny) on a global ship track data set (South Atlantic, Indian, South Pacific, and North Pacific Oceans). Interdisciplinary Earth Data Alliance (IEDA). <https://doi.org/10.1594/IEDA/326490>

Malinverno, A., Quigley, K., Staro, A., & Dymant, J. (2019b). Summary distances to oceanic magnetic polarity block boundaries (anomalies 13ny-34ny) on a global set of mid-ocean ridge flanks (South Atlantic, Indian, South Pacific, and North Pacific Oceans). Interdisciplinary Earth Data Alliance (IEDA). <https://doi.org/10.1594/IEDA/326491>

The data published here are distances to magnetic polarity block boundaries determined in 154 ship tracks that measured total field magnetic anomalies. The ship tracks are located over 13 mid-ocean ridge flank regions denoted as follows:

SAMAFR-AFR	S. America-Africa, Africa plate, S. Atlantic Ocean
SAMAFR-SAM	S. America-Africa, S. America plate, S. Atlantic Ocean
CAPSOM-CAP	Capricorn-Somalia, Somalia plate, Indian Ocean
CAPSOM-SOM	Capricorn-Somalia, Capricorn plate, Indian Ocean
CAPANT-CAP	Capricorn-Antarctica, Capricorn plate, Indian Ocean
CAPANT-ANT	Capricorn-Antarctica, Antarctica plate, Indian Ocean
PACANT-PAC	Pacific-Antarctica, Pacific plate, S. Pacific Ocean
PACANT-ANT	Pacific-Antarctica, Antarctica plate, S. Pacific Ocean
PACBAN-PAC	Pacific-Bellingshausen-Antarctica, Pacific plate, S. Pacific Ocean
PACBAN-BAN	Pacific-Bellingshausen-Antarctica, Bellingshausen-Antarctica plate, S. Pacific Oc.
PACFAR-PAC	Pacific-Farallon, Pacific plate, N. Pacific Ocean
PACFAV-PAC	Pacific-Farallon-Vancouver, Pacific plate, N. Pacific Ocean
PACVAN-PAC	Pacific-Vancouver, Pacific plate, N. Pacific Ocean

The primary source of magnetic anomaly data was the NOAA-NCEI archive of trackline geophysical data, which was accessed at

<https://www.ngdc.noaa.gov/mgg/geodas/trackline.html>

Additional data in the Indian Ocean are from a recent survey of magnetic anomalies reported in

Yatheesh, V., Dymant, J., Bhattacharya, G. C., Royer, J. Y., Kamesh Raju, K. A., Ramprasad, T., et al. (2019). Detailed structure and plate reconstructions of the Central Indian Ocean between 83.0 and 42.5 Ma (Chrons 34 and 20). *Journal of Geophysical Research: Solid Earth*, 124, 4305-4322. <https://doi.org/10.1029/2018JB016812>

The analysis of the magnetic anomaly data to determine distances to magnetic polarity block boundaries is fully described in the paper cited in the data publications.

File bmdisttracklist.pdf

List of the 154 ship tracks in each of the 13 ridge flank regions. Ship track(s) that were used as a reference to rescale block model distances in each ridge flank region are denoted by asterisks (*). This file contains the following columns:

Ridge flank region	
Tracks	Number of tracks in each ridge flank region
Track ID	
Chron boundaries	Range of chron boundaries in each ship track
Midpoint latitude	(decimal degrees)
Midpoint longitude	(decimal degrees)
Skewness average	Average skewness angle sampled by the MCMC algorithm (decimal degrees)
Skewness st. dev.	Standard deviation of sampled skewness angle (decimal degrees)

Location of magnetic polarity block boundaries and distances measured along plate tectonic flow lines in 154 ship tracks. File names are, e.g.,

CAPANT-84000411_CAP_a.bmdisttrack.txt

where 'CAPANT' denotes the plate boundary, '84000411' is the cruise identifier, 'CAP' denoted the ridge flank, and 'a' is a character distinguishing different track segments from the same cruise (additional track segments would be denoted with characters 'b', 'c', etc.).

Each ship track file contains the following columns:

Boundary	Magnetic polarity block boundary (e.g., C13ny = young end of C13 normal block)
Long.	Longitude of block boundary on original track (decimal degrees)
Lat.	Latitude of block boundary on original track (decimal degrees)
Proj.long.	Longitude of block boundary on track projected on a flow line (decimal degrees)
Proj.lat.	Latitude of block boundary on track projected on a flow line (decimal degrees)
Proj.dist.	Distance to block boundary on track projected on a flow line (km)
Proj.dist.st.dev.	Standard deviation of distance to block boundary (km)

Summary distances to magnetic polarity block boundaries (anomalies 13ny-34ny) measured along plate tectonic flow lines in 13 ridge flank regions. These summary distances were obtained by rescaling and averaging the distances determined on each projected ship track in a ridge flank region. File names are, e.g.,

CAPANT-ANT-bmdist.txt

which denotes distances on the ANT plate ridge flank for anomalies formed at the CAPANT plate boundary.

Each distance file contains the following columns:

Chron	Magnetic polarity block boundary (e.g., C13ny = young end of C13 normal block)
bmdist(km)	Summary distance to block boundary measured on a flow line (km)
bmdistsdev(km)	Standard deviation of summary distance to block boundary (km)