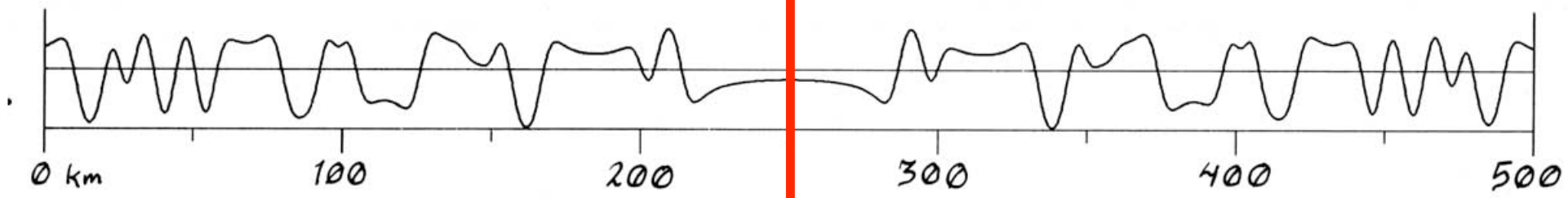
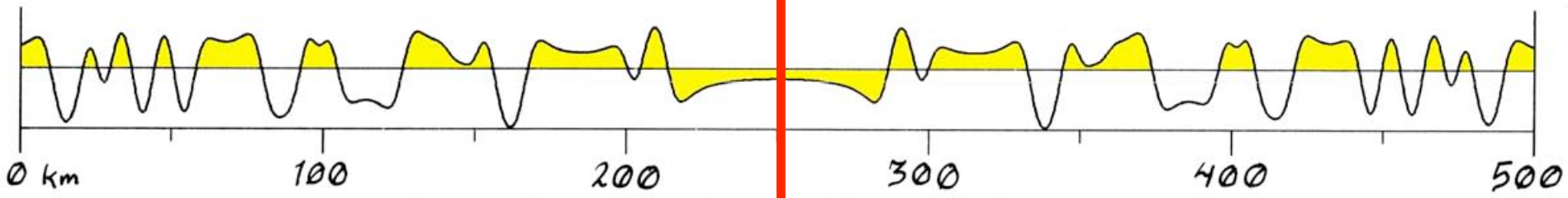
mid-ocean ridge

Symmetrical magnetic field intensity



mid-ocean ridge

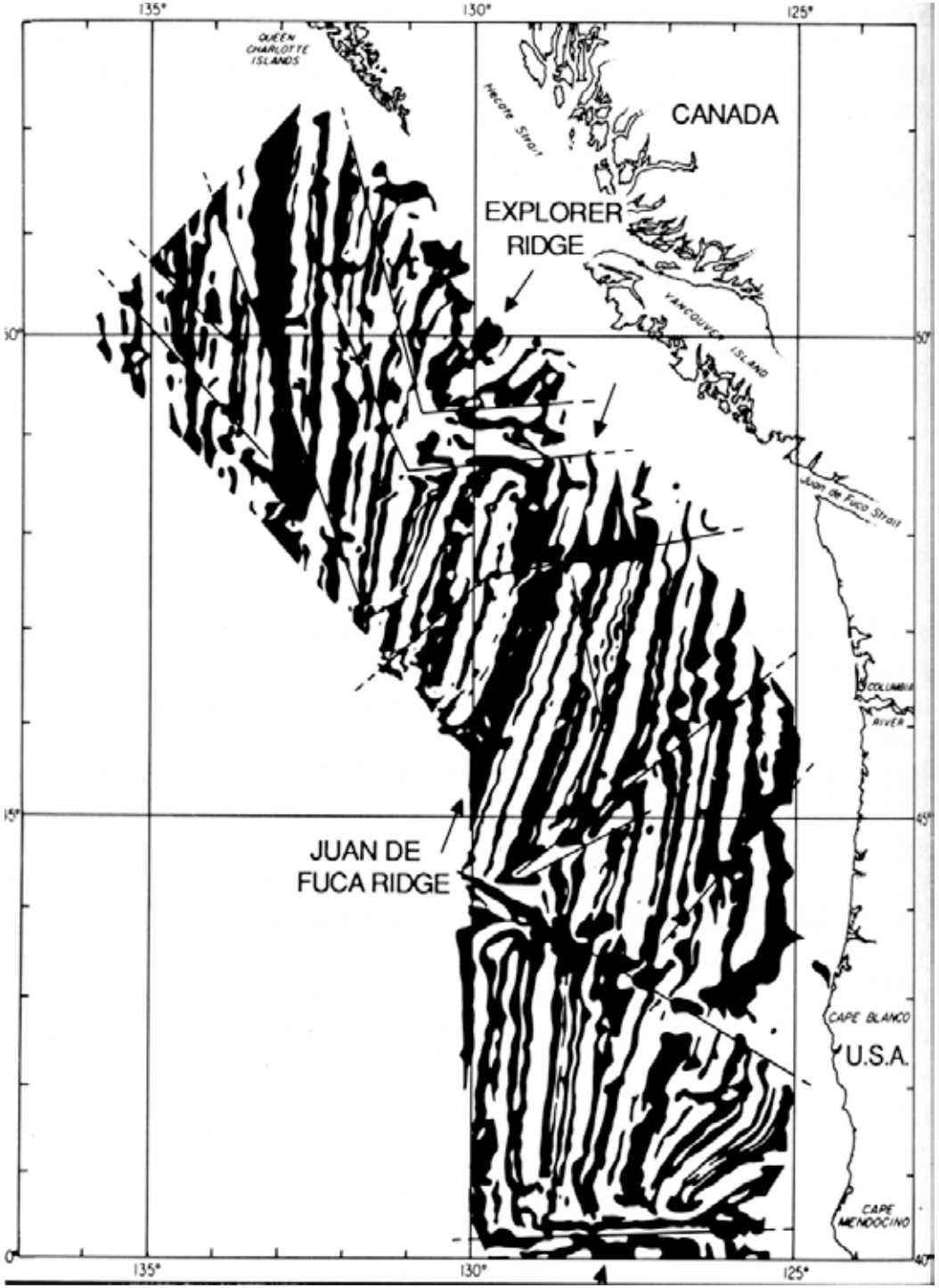
Magnetic highs are positive anomalies



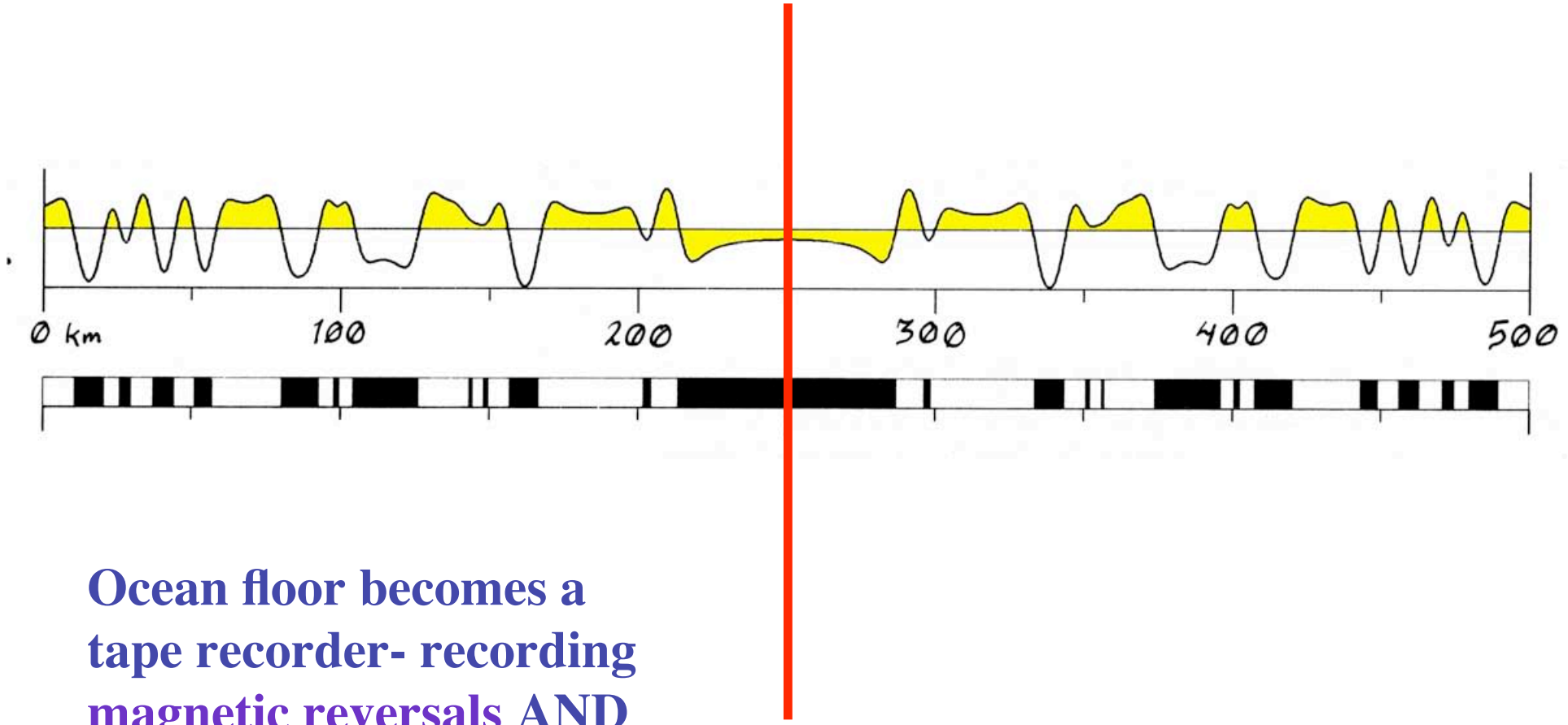
Magnetic lows are negative anomalies

Magnetic anomalies make a striped pattern on the ocean floor.

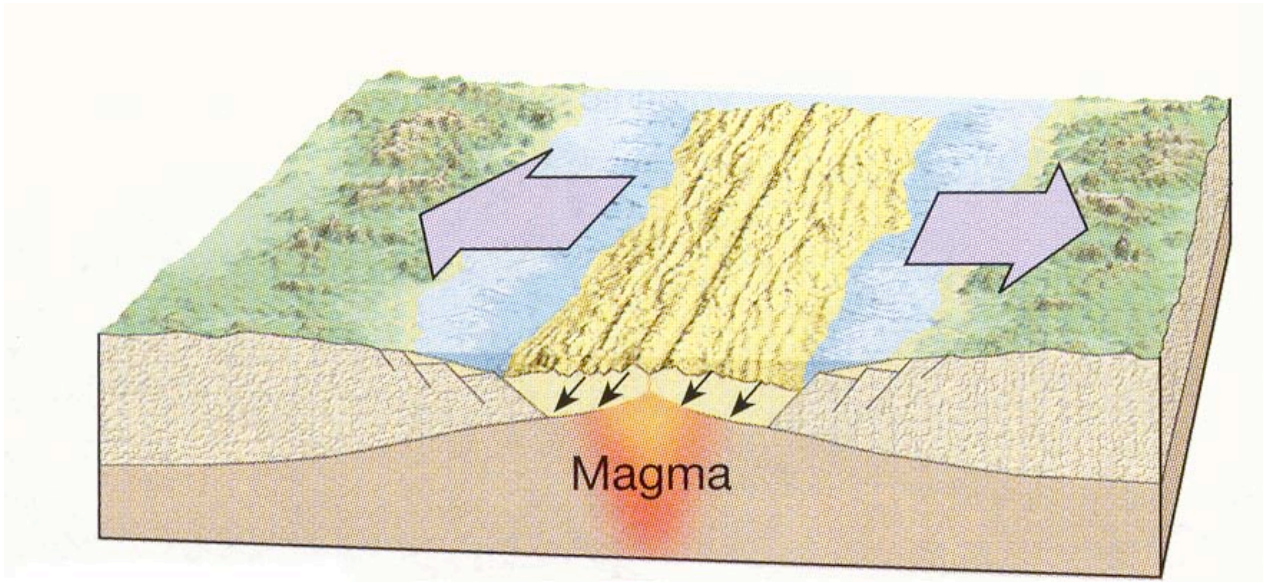
The stripes are parallel to mid-ocean ridges and the stripe widths are symmetrical across the ridge

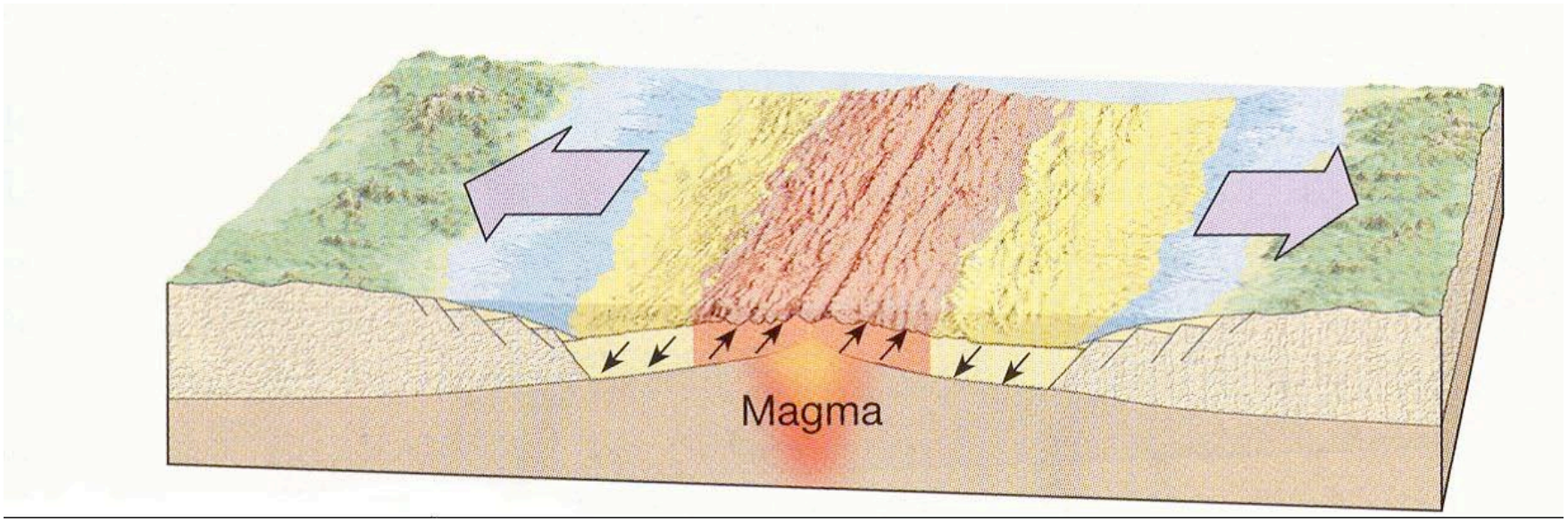


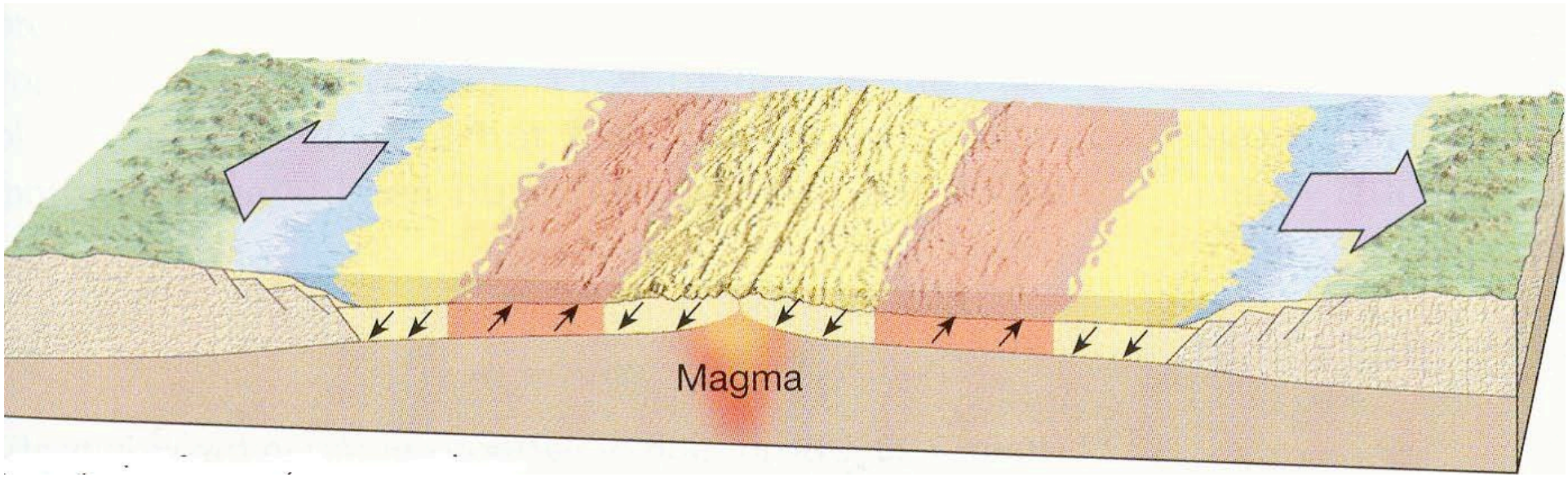
mid-ocean ridge



Ocean floor becomes a tape recorder- recording magnetic reversals AND sea-floor spreading


Magma


Magma


Magma

Sea-floor magnetic anomalies create a VERY PRECISE absolute time scale the

MAGNETIC REVERSAL TIME SCALE

Good for as long as we have ocean floor
….approx. the past 200 Ma

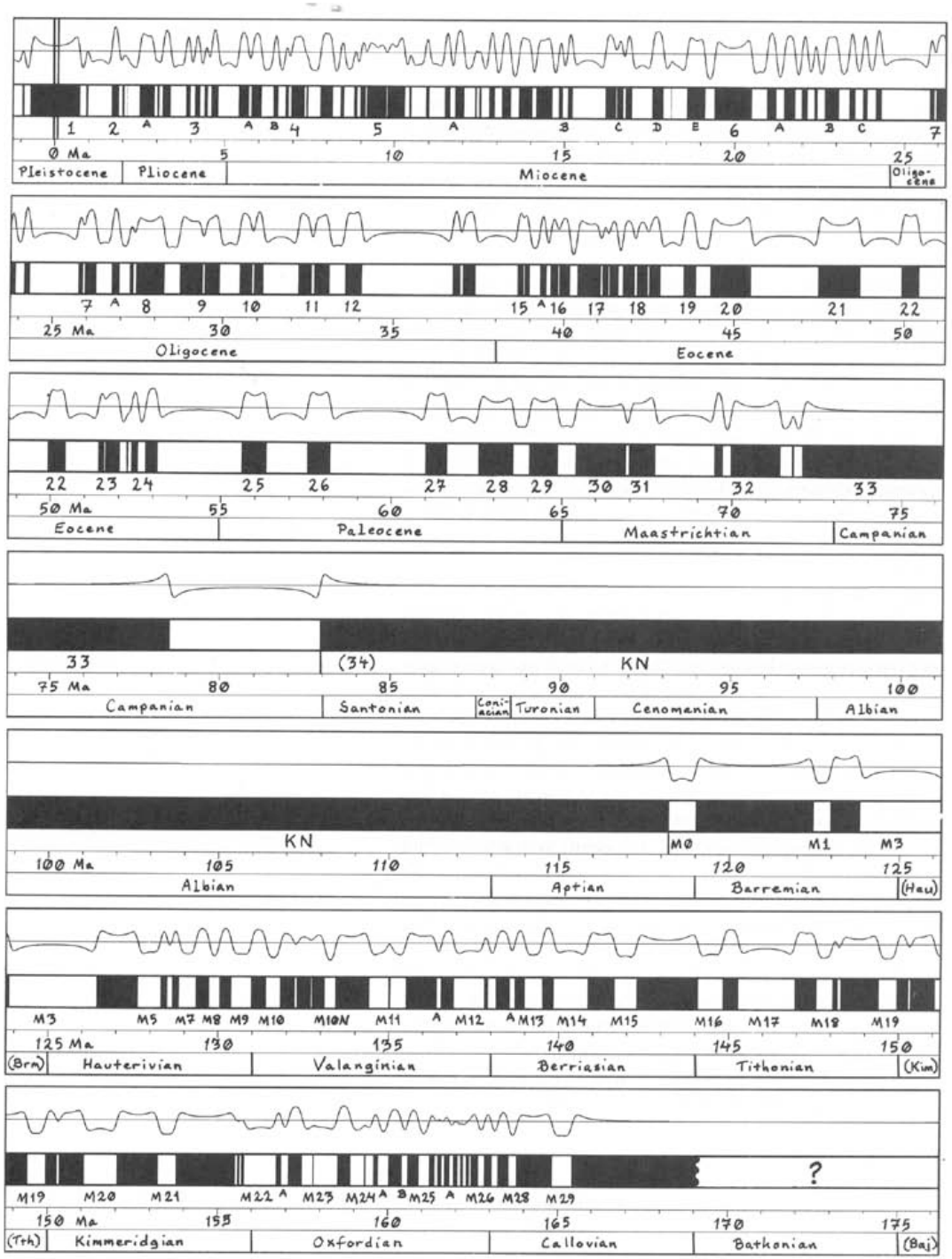
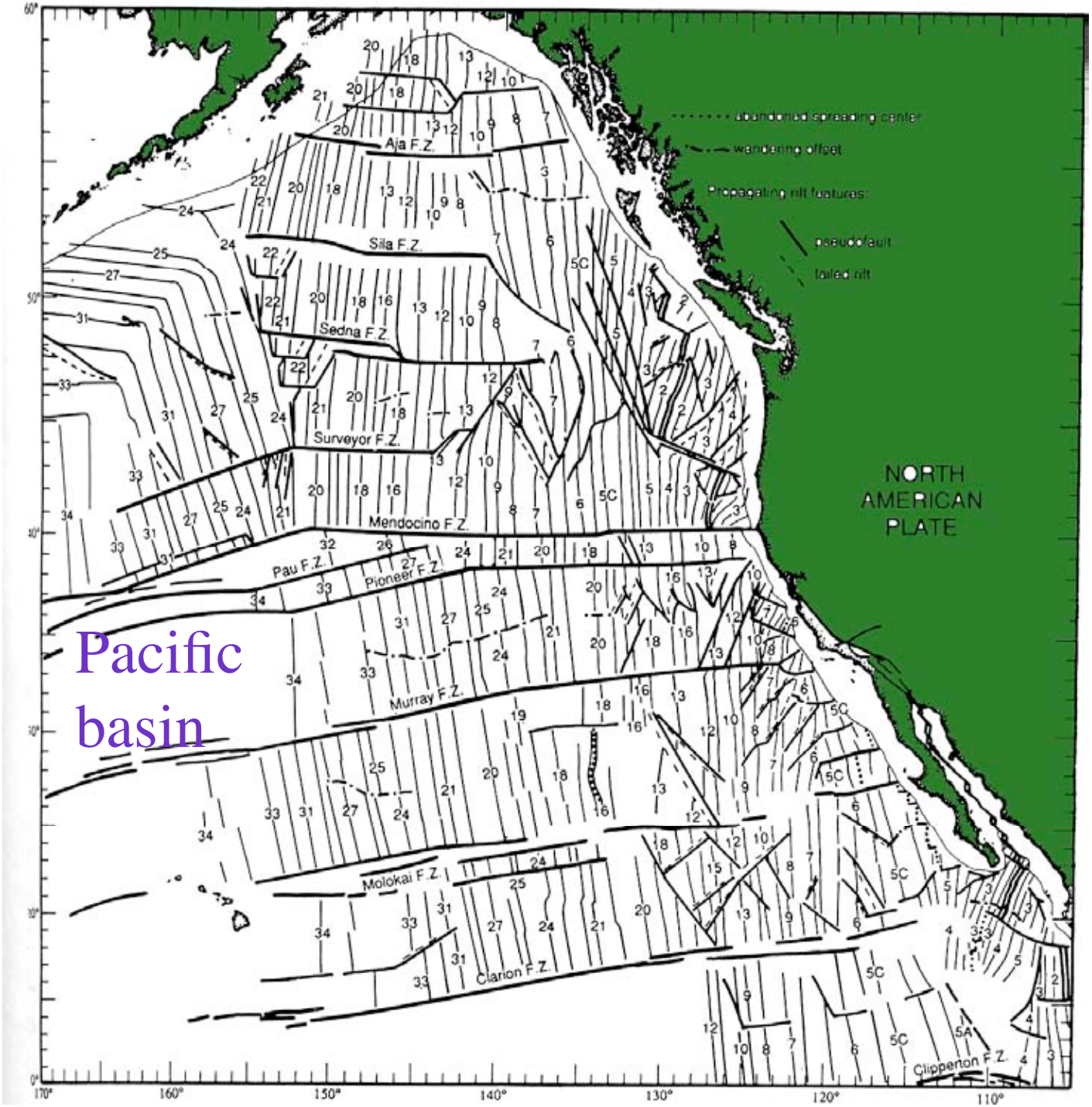


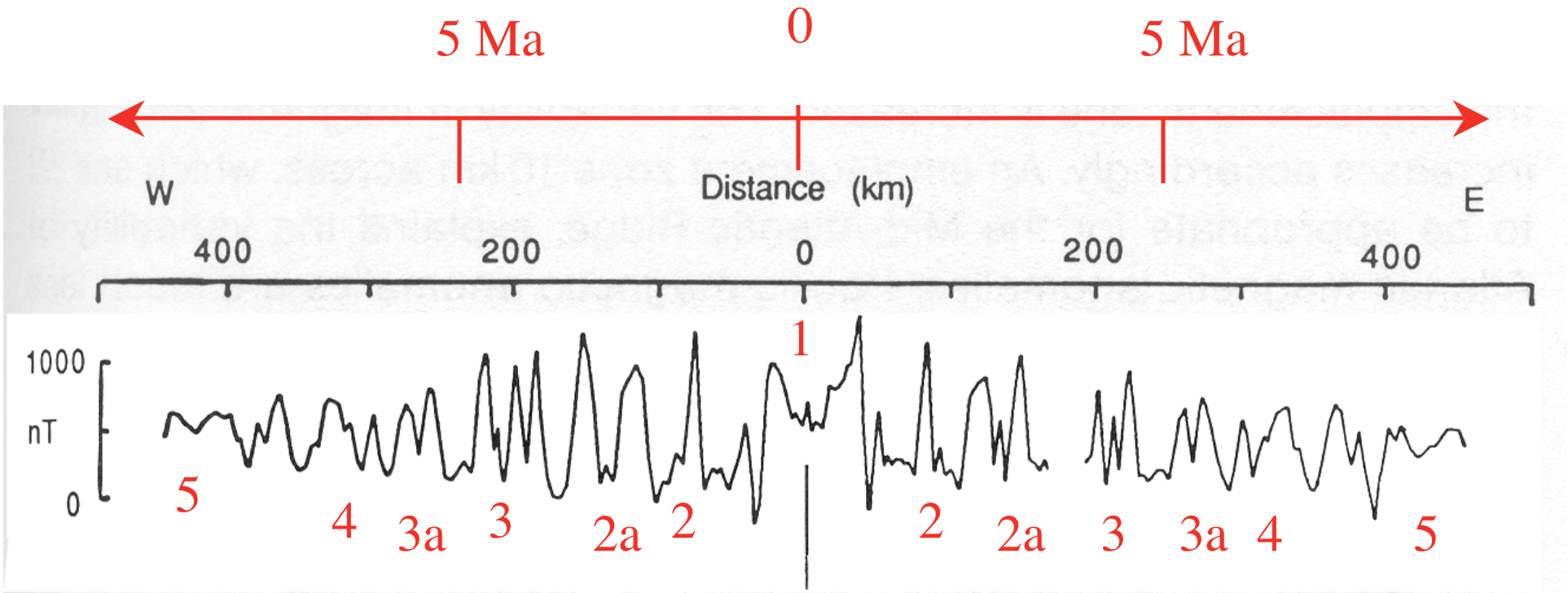
Figure 8-9.

Based on anomaly shape, magnetic anomalies can be correlated across ocean basins

From anomaly spacing, spreading rates can be determined



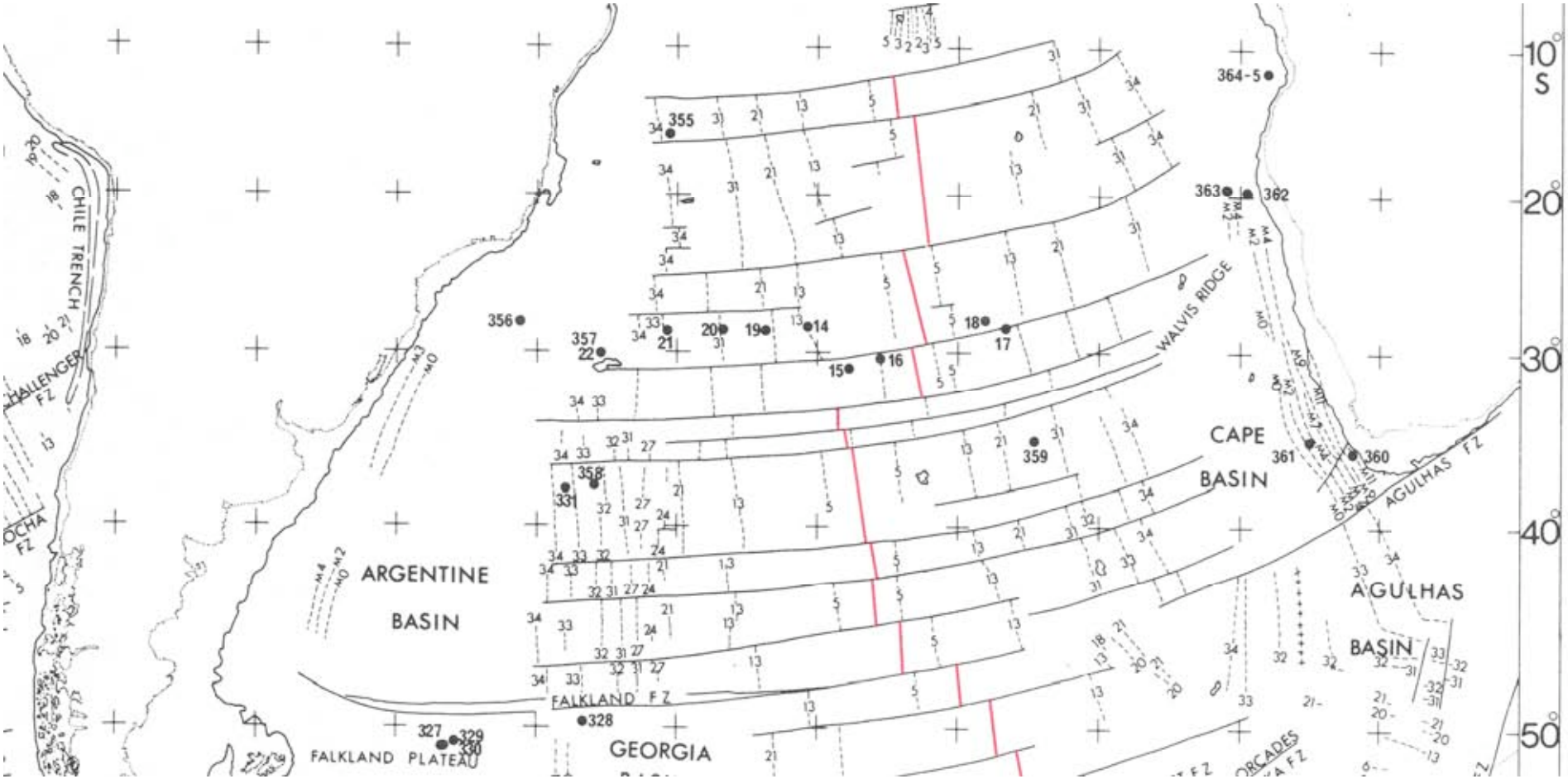
Mid-Atlantic ridge



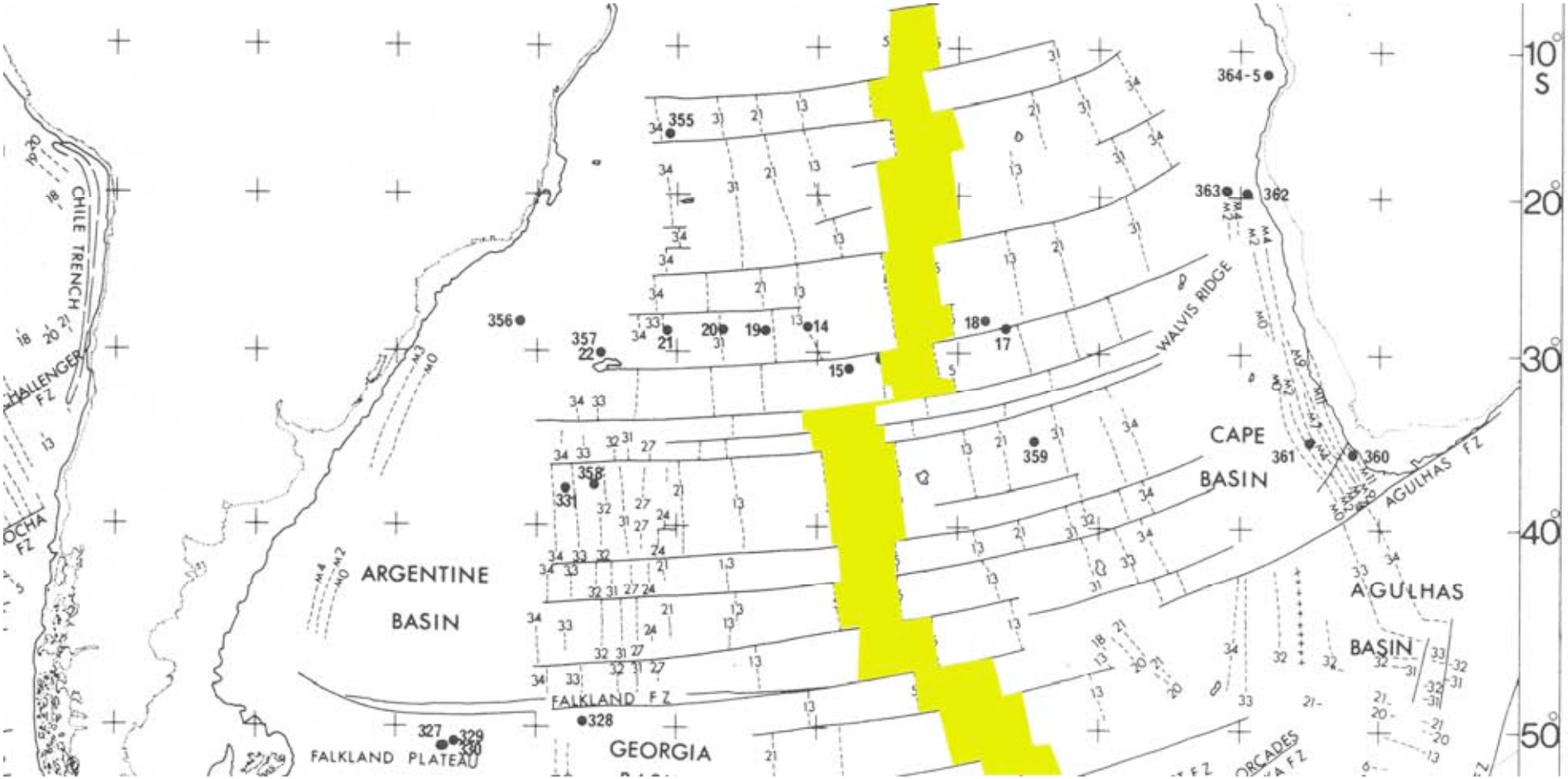
ridge axis

Spreading rate = 225 km/ 5 Ma
= 45 km/Ma
= 4.5 cm/yr

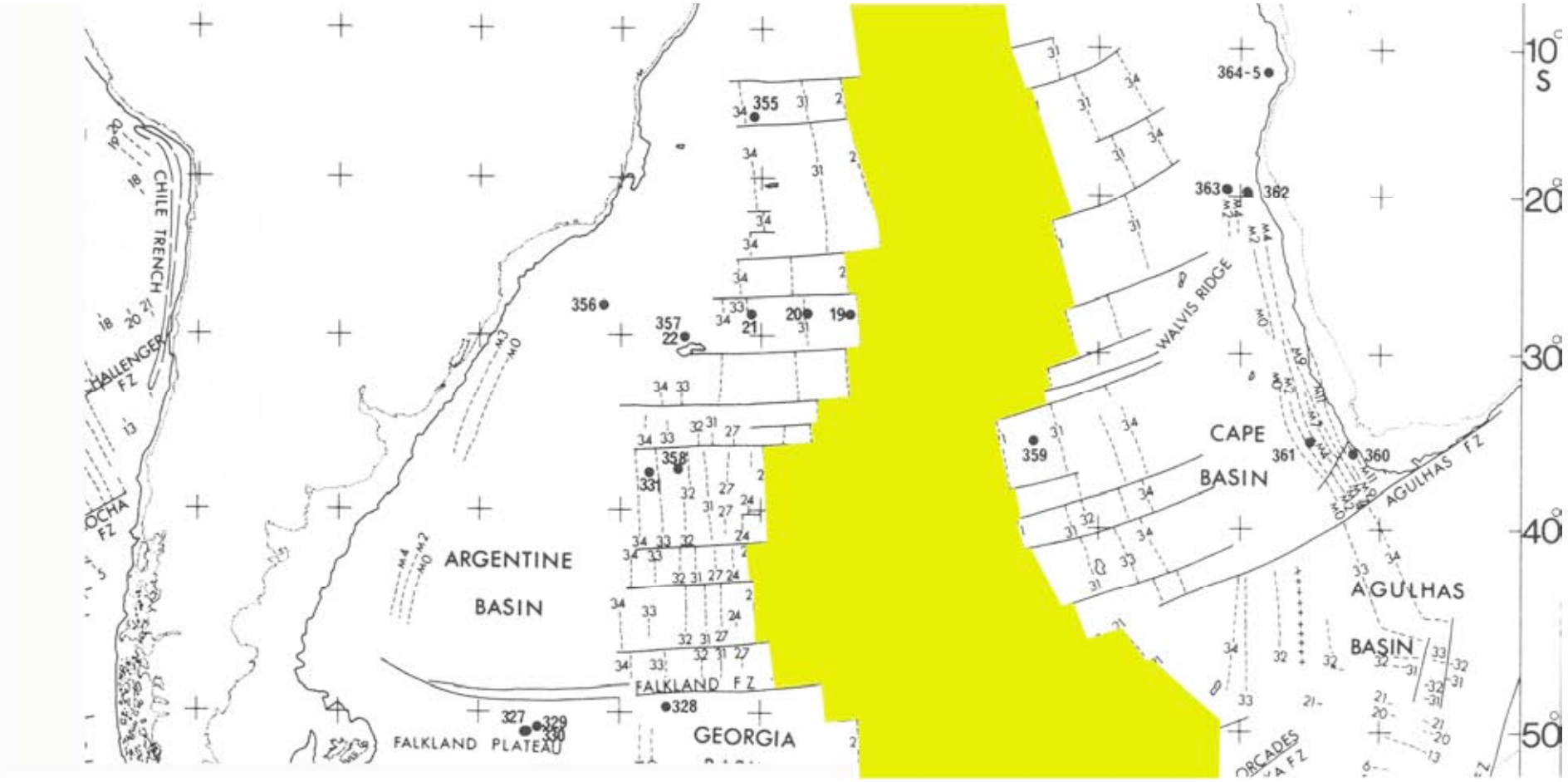
South Atlantic magnetic anomalies



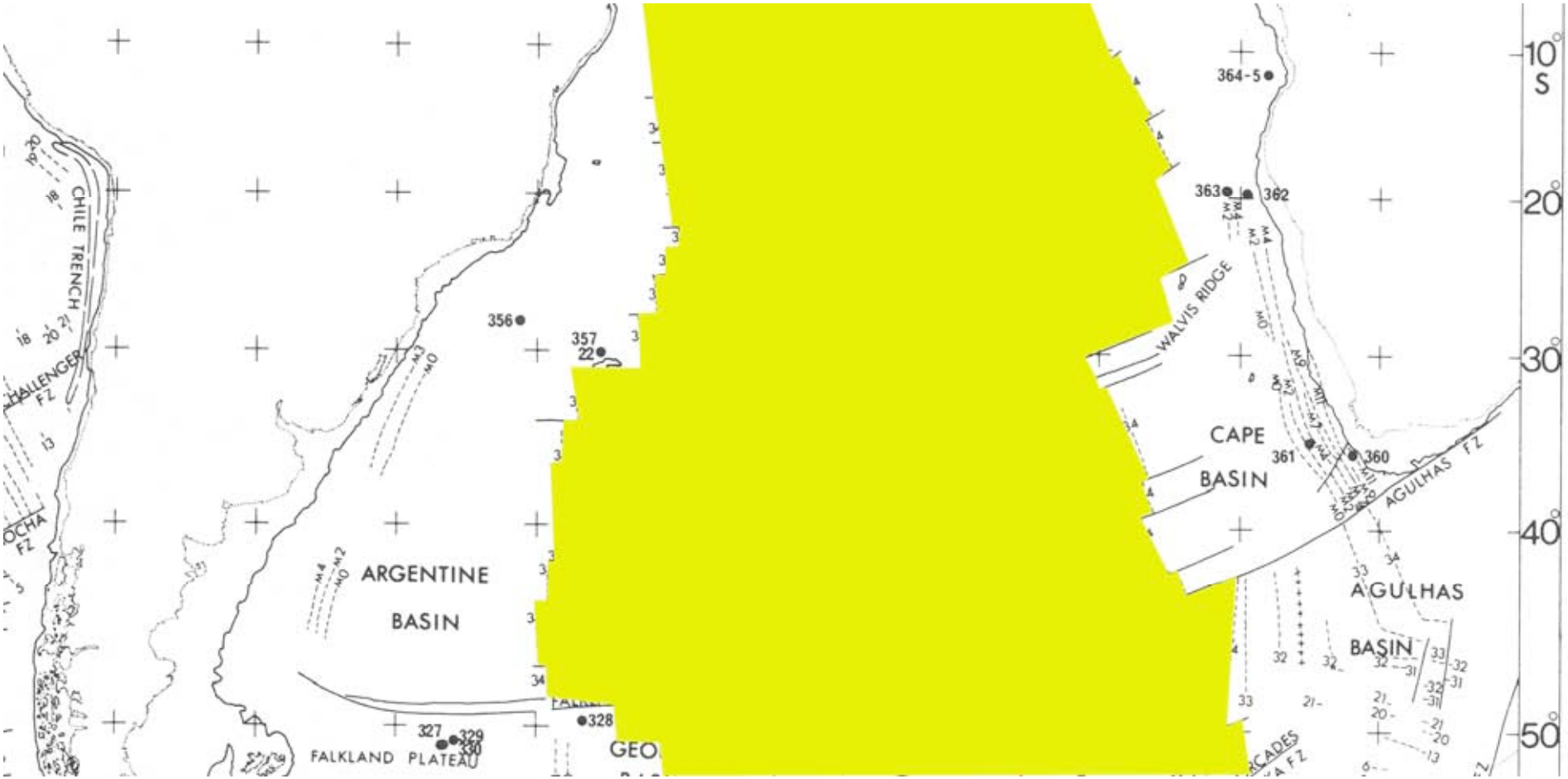
Sea floor younger than anomaly 5 (< 10 Ma)



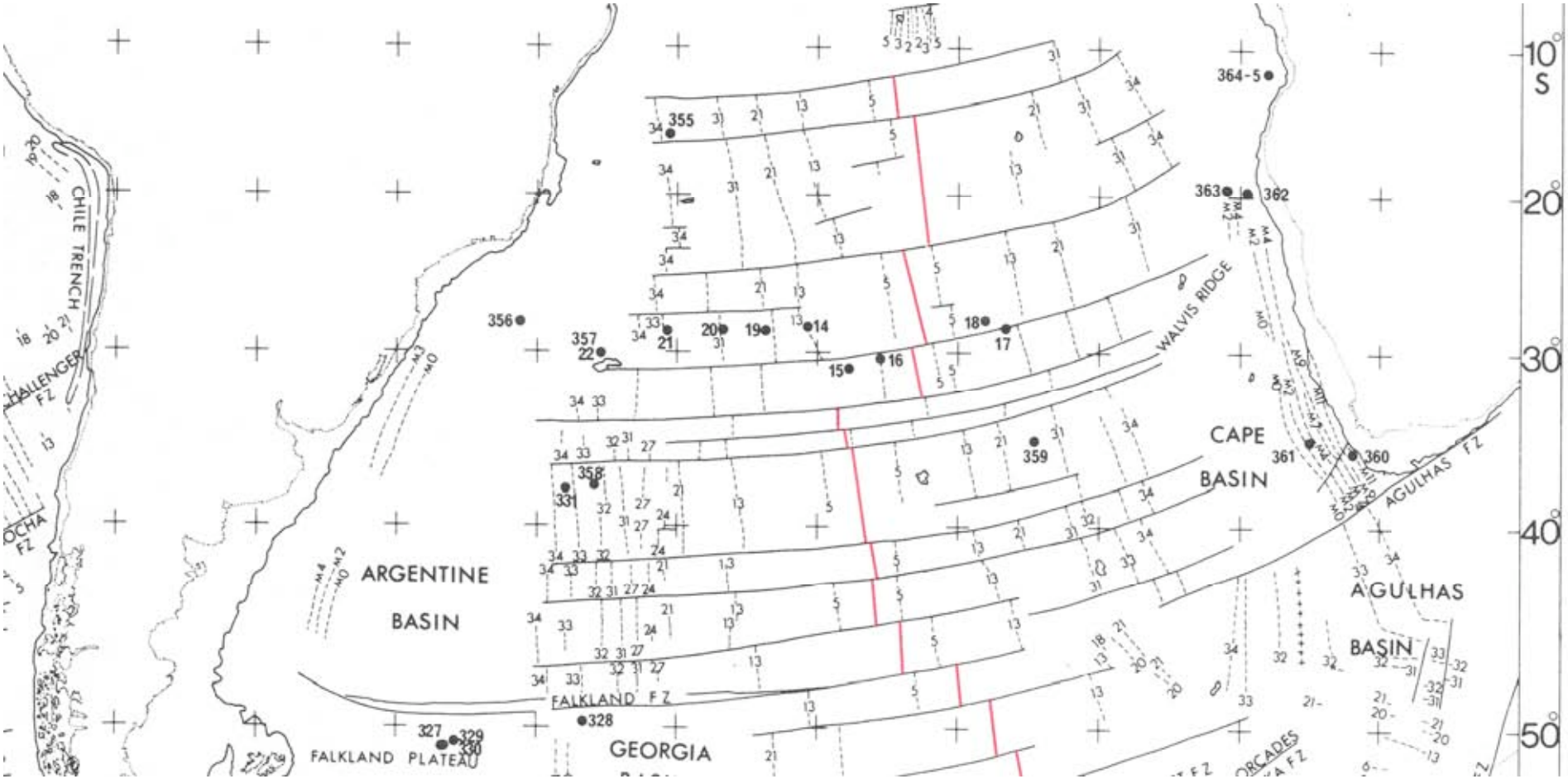
Sea floor younger than anomaly 21 (< 50 Ma)



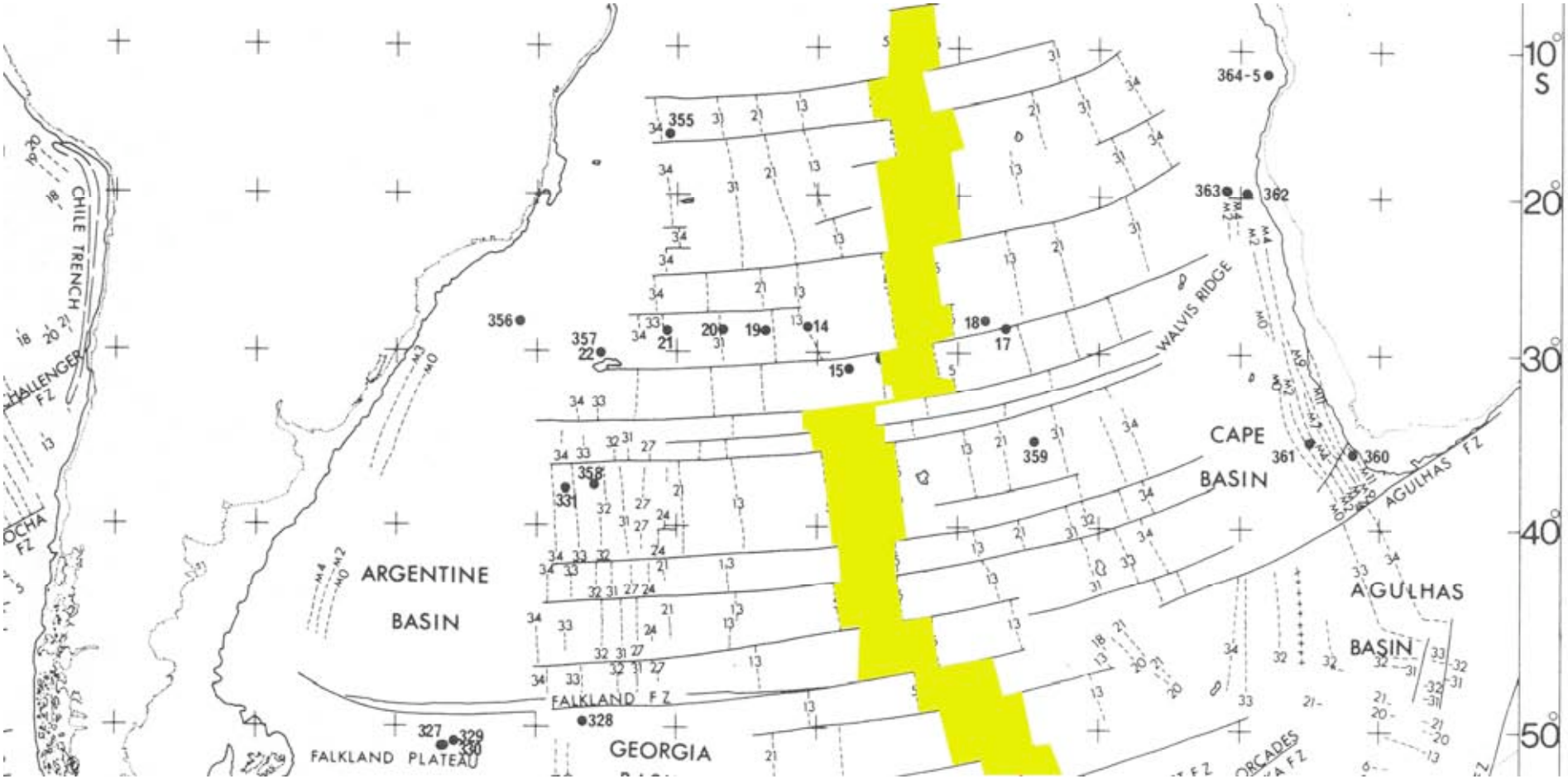
Sea floor younger than anomaly 34 (< 90 Ma)



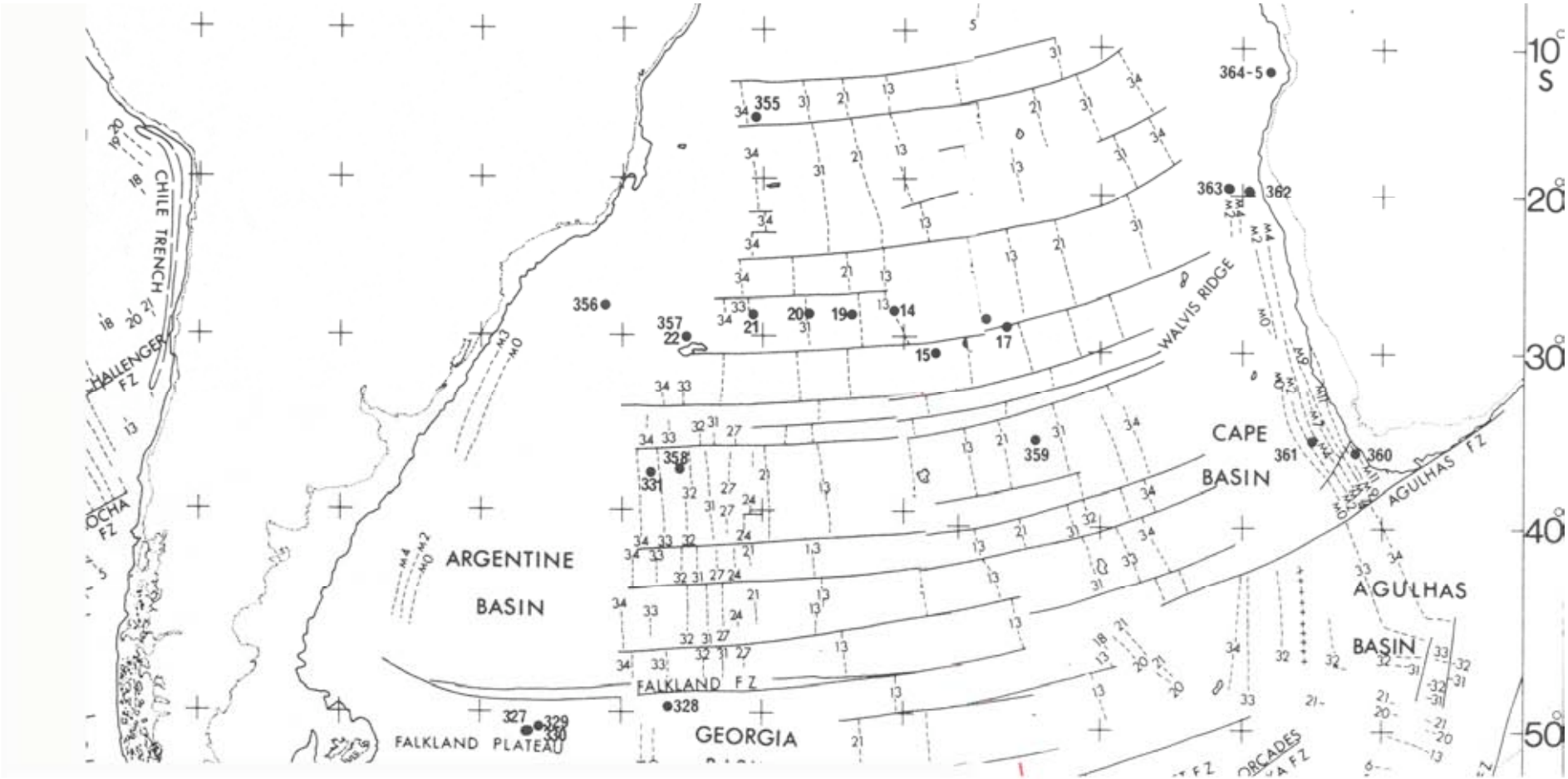
South Atlantic magnetic anomalies



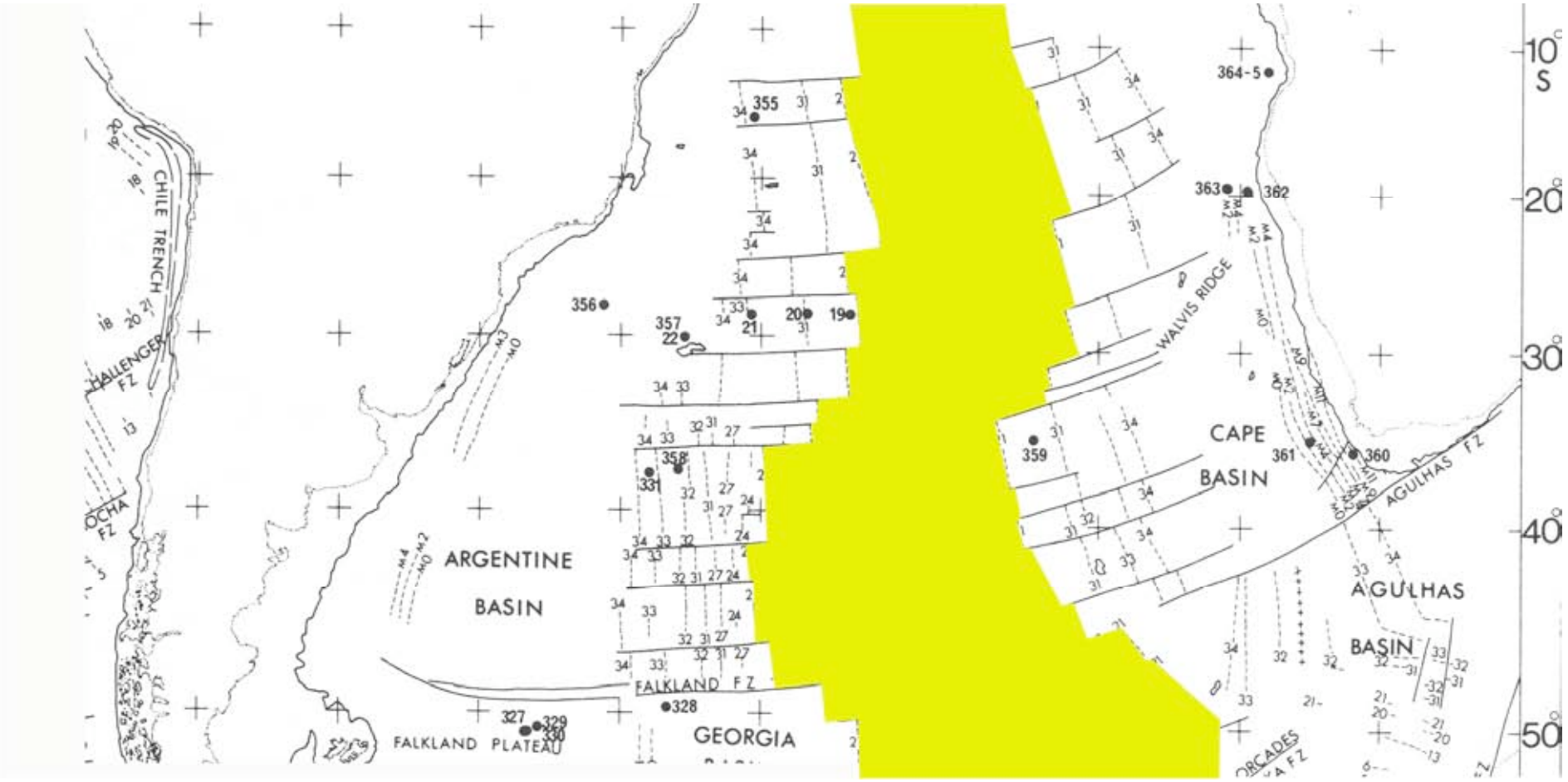
Sea floor younger than anomaly 5 (< 10 Ma)



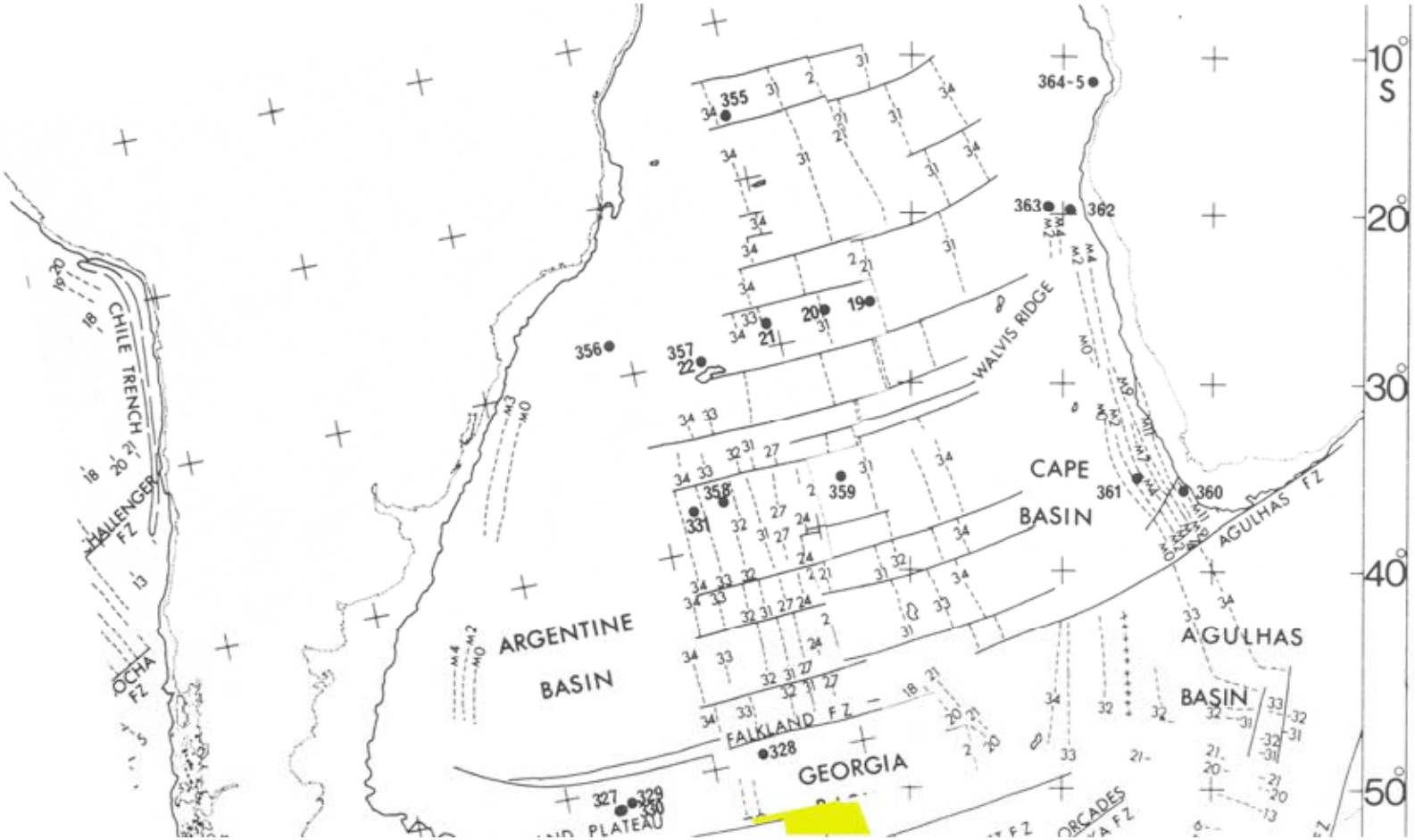
Anomaly 5 (10 Ma) reconstruction



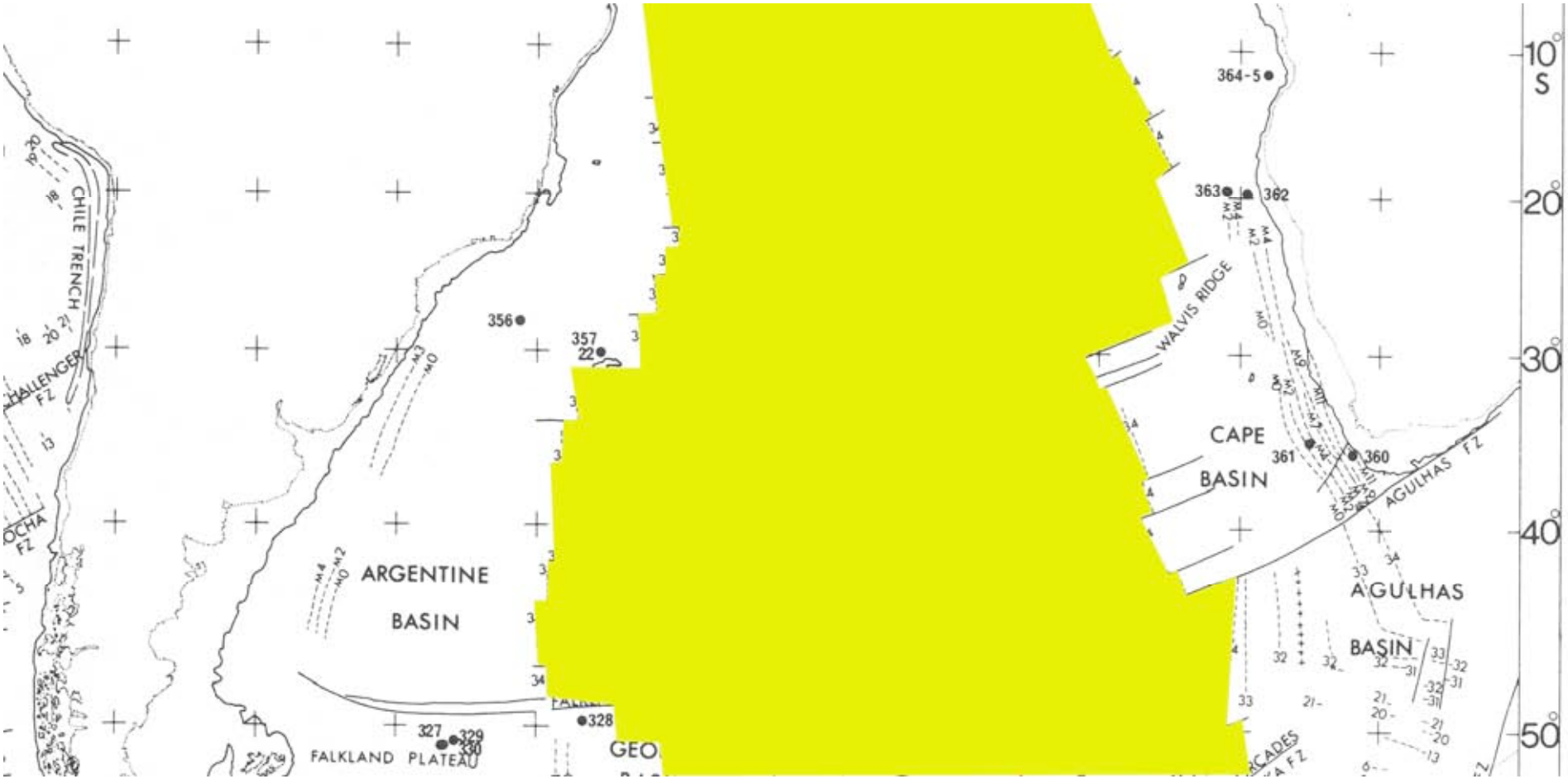
Sea floor younger than anomaly 21 (< 50 Ma)



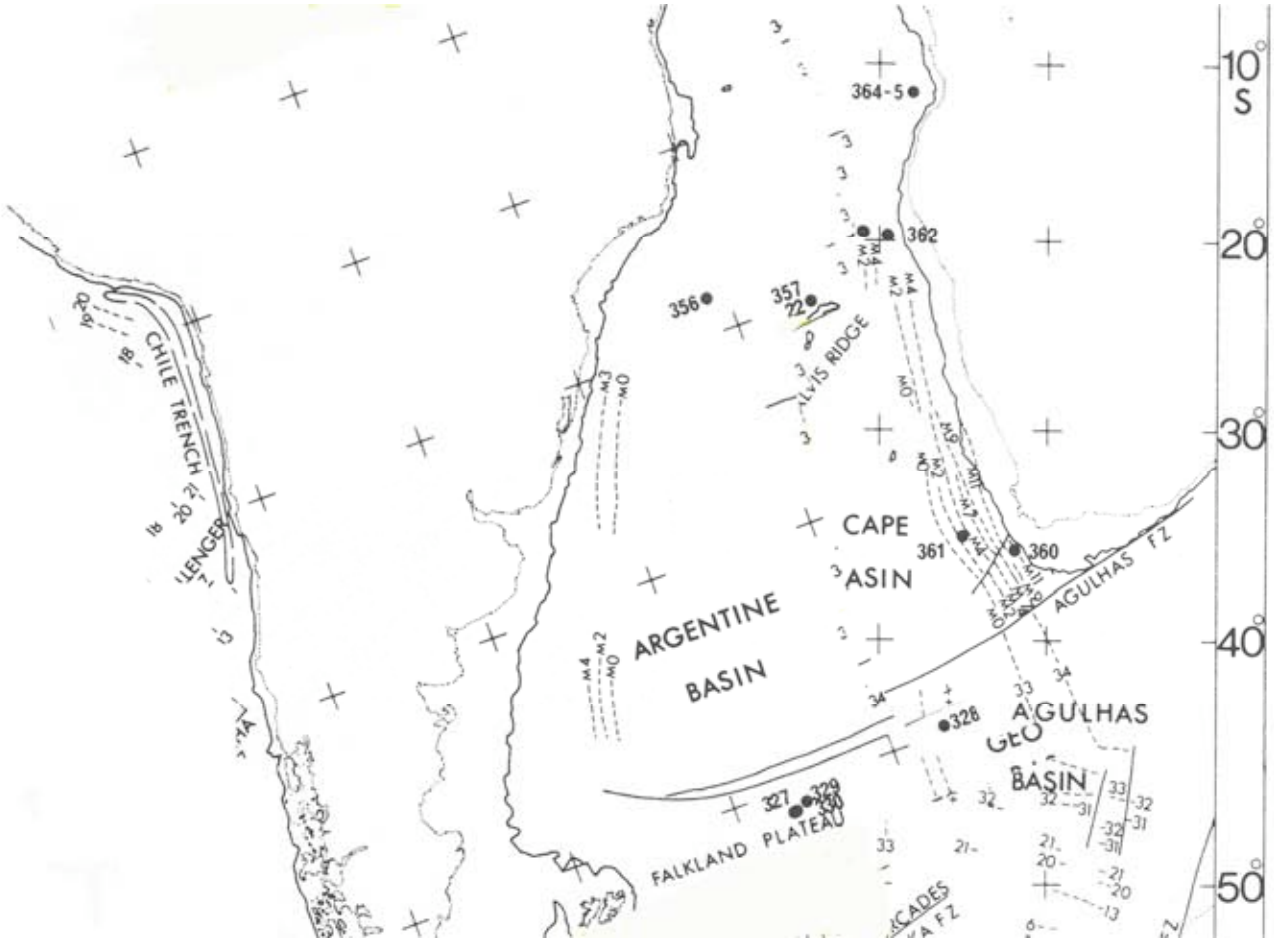
Anomaly 21 (50 Ma) reconstruction



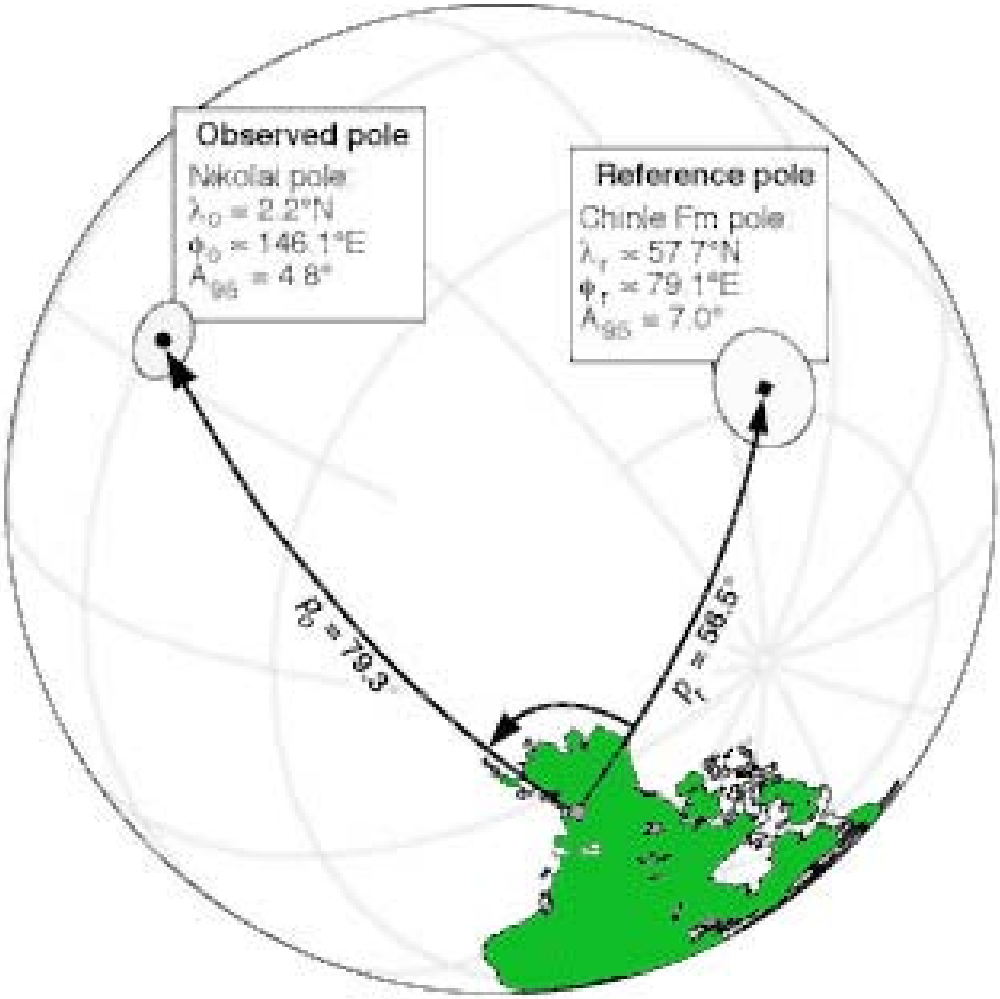
Sea floor younger than anomaly 34 (< 90 Ma)



Anomaly 34 (90 Ma) reconstruction



Apparent magnetic pole position



Paleomagnetic-

Inclination: distance from the magnetic pole. Steep inclination means short distance

Declination: direction towards the pole

Apparent polar wander:

Apparent pole positions from rocks of different ages

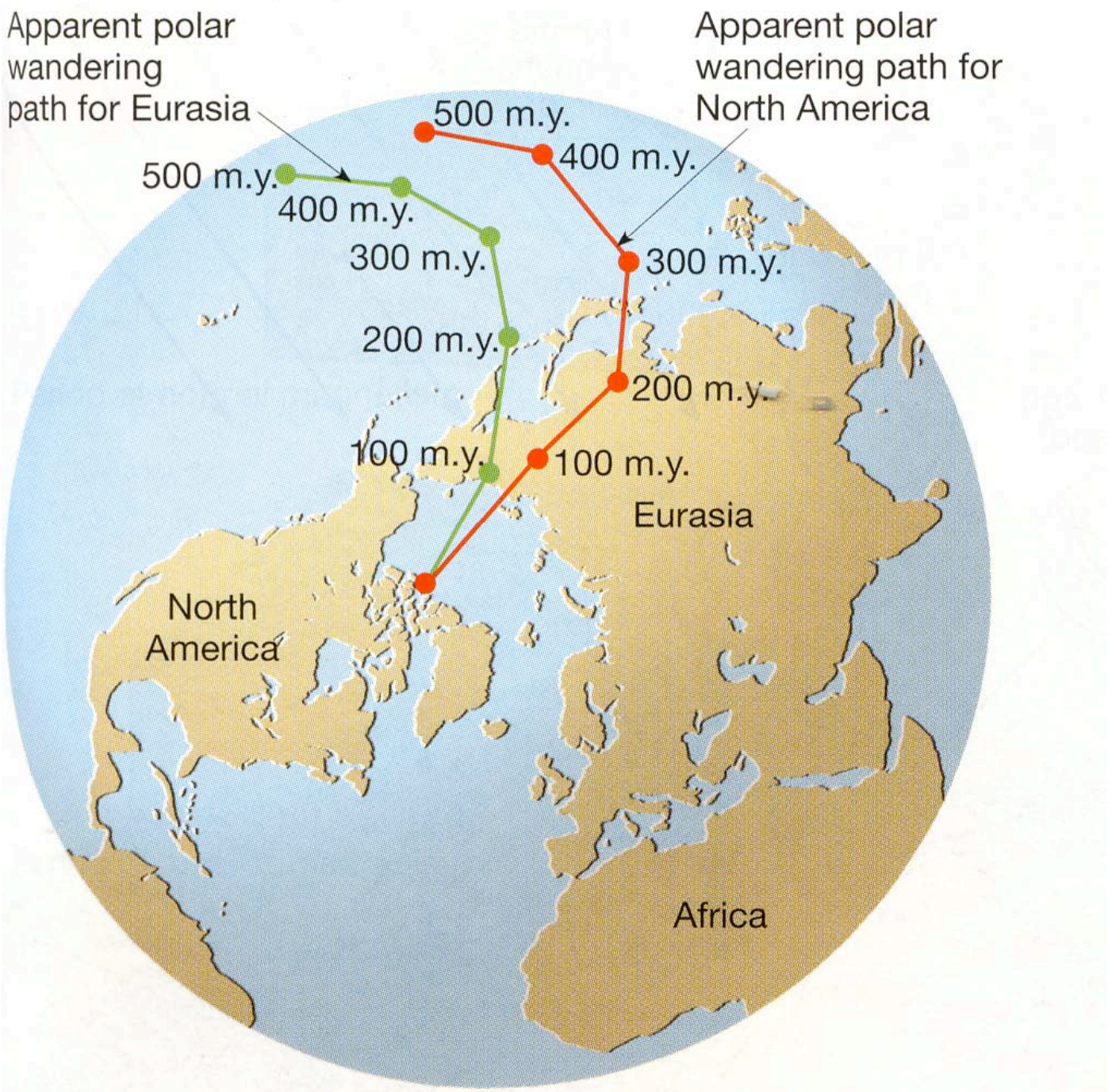
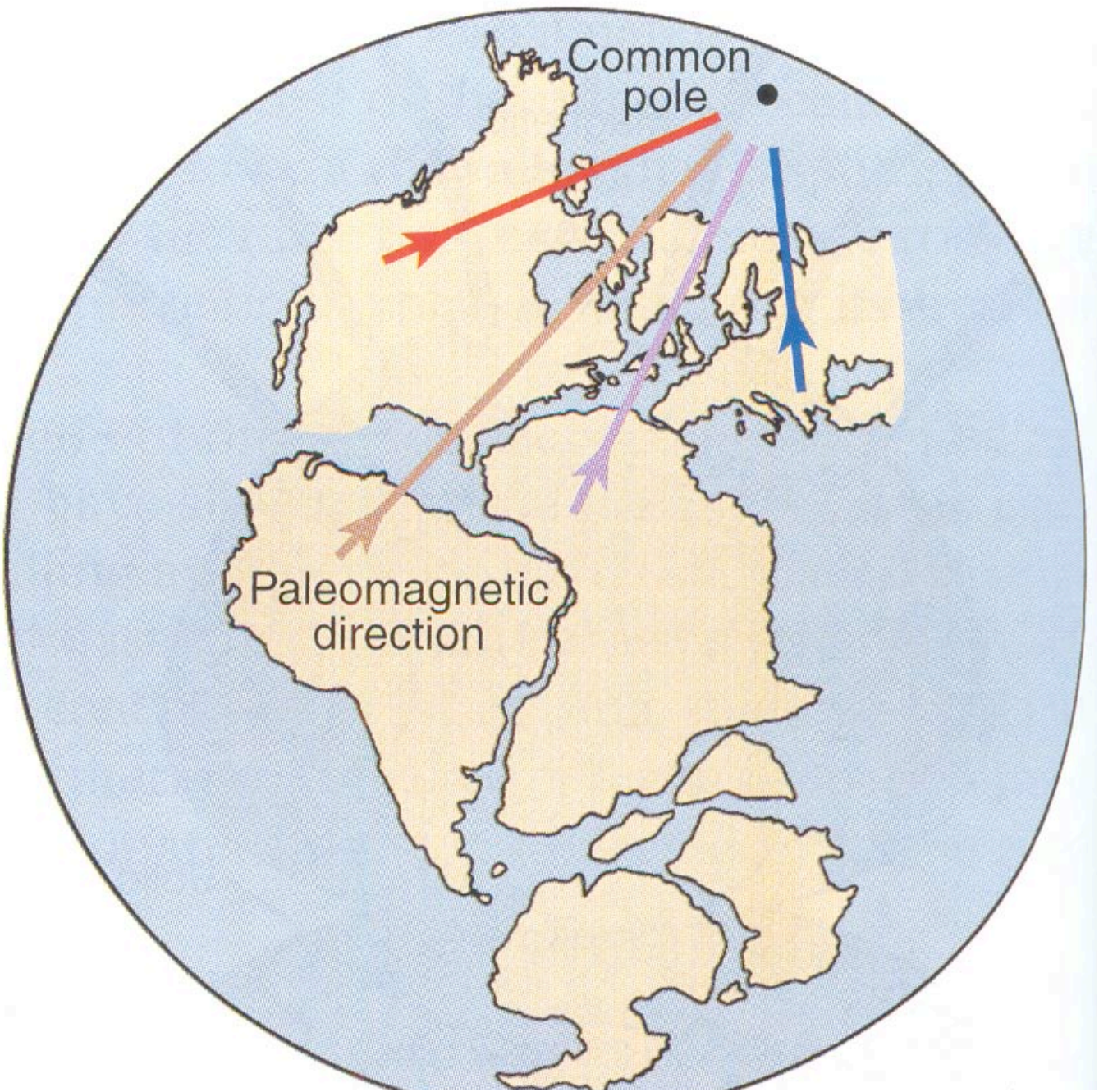


Plate reconstruction FROM apparent polar wander curves.

For a viable reconstruction, APW curves MUST point towards a common pole



Apparent polar wandering path for Eurasia
Apparent polar wandering path for North America
Eurasia
North America
Africa