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Appendix 1 – Tectonic erosion rate calculations

The volume of missing material can be calculated by assuming that the cross-sectional geometry and surface profile of the present margin is similar to the configuration of the Miocene and Pliocene margin (Fig. 4). This assumption is in agreement with the presence of Oligocene slope sediments at DSDP Site 569. If, otherwise, the margin would have been characterized by an accretionary prism sitting in front of the igneous basement, the material removed by subduction erosion would have been more than our calculated volume. For our calculations, we assume that the erosion rate has been constant during the past ~25 m.y. Isostatic effects have been calculated using backstripping analysis.

Considering the thickness of the overriding plate at the shelf break of 13.5 km, calculated using Ye et al. (1996) profile of the margin, and the trench migration of 16 km, the volume loss since the Miocene (25 Ma) is 216 km^3. The erosion rate per kilometer along the trench is of 11.3 $km^3 \cdot m.y.^{-1} \cdot km^{-1}$. If the crustal thickness of 15 km inferred by Ibrahim et al. (1979) with reflection seismic is used for our calculations, the erosion rate would be of 9.6 $km^3 \cdot m.y.^{-1} \cdot km^{-1}$, verifying the results within the 10% error.

Ibrahim, A.K., Latham, J.V., and Ladd, J.W., 1979, Seismic refraction and reflection measurements in the Middle America Trench offshore Guatemala: Journal of Geophysical Research, v. 84, p. 5643–5649.

Ye, S., Bialas, J., Flueh, E.R., Stavenhagen, A., vonHuene, R., Leandro, G., and Hinz, K., 1996, Crustal structure of the Middle American Trench off Costa Rica from wide-angle seismic data: Tectonics, v. 15, p. 1006–1021.

TABLE DR1. COMPOSITION AND BATHYMETRIC SIGNIFICANCE OF PRINCIPAL COMPONENT ANALYSIS (PCA) BENTHIC FORAMINIFERAL ASSEMBLAGES FROM SITES 568, 569, AND 570

	PCA1	Loading Score	**PCA2**	Loading Score	**PCA3**	Loading Score
SITE 568						
Variance *	(25.8%)		(14.3%)		(8.8%)	
Ecology	middle-lower bathyal		abyssal		middle bathyal? Oxic environments?	
Foraminifera	*Uvigerina peregrina*	9.7	*Uvigerina senticosa*	4.7	*Hoeglundina elegans*	6.3
	Uvigerina rustica	8.7	*Cibicidoides wuellerstorfi*	3.3	*Cibicides mckannai*	3.1
	Cibicides mckannai	5.6		–		–
SITE 569						
Variance	(23.6%)		(16.2%)		(10.1%)	
Ecology	abyssal		lower bathyal		middle-lower bathyal	
Foraminifera	*Uvigerina senticosa*	10.6	*Oridorsalis umbonatus*	6.2	*Globocassidulina subglobosa*	5.5
	Melonis affinis	2.5	*Siphonodosaria gracilima*	3.4	*Hanzawaia elegans*	2.1
	Pullenia bulloides	2.3	*Nodosaria longiscata*	3.3	*Uvigerina gallowayi*	1.1
SITE 570						
Variance	(27.9%)		(18.9%)		(8.6%)	
Ecology	middle-lower bathyal		upper bathyal		upper-middle bathyal	
Foraminifera	*Uvigerina peregrina*	10.7	*Bolivina bicostata*	4.0	*Globocassidulina subglobosa*	5.5
	Bolivina bicostata	3.7	*Siphonodosaria gracillima*	3.4	*Bolivina seminuda*	3.4
	Bulimina mexicana	2.2	*Globocassidulina subglobosa*	3.3	*Hanzawaia elegans*	2.1
			Uvigerina incilis	3.1	*Epistominella obesa*	1.7

Note: Percent of total variance and loading scores of different taxa are given.
*Variance: measurement of the distribution spread

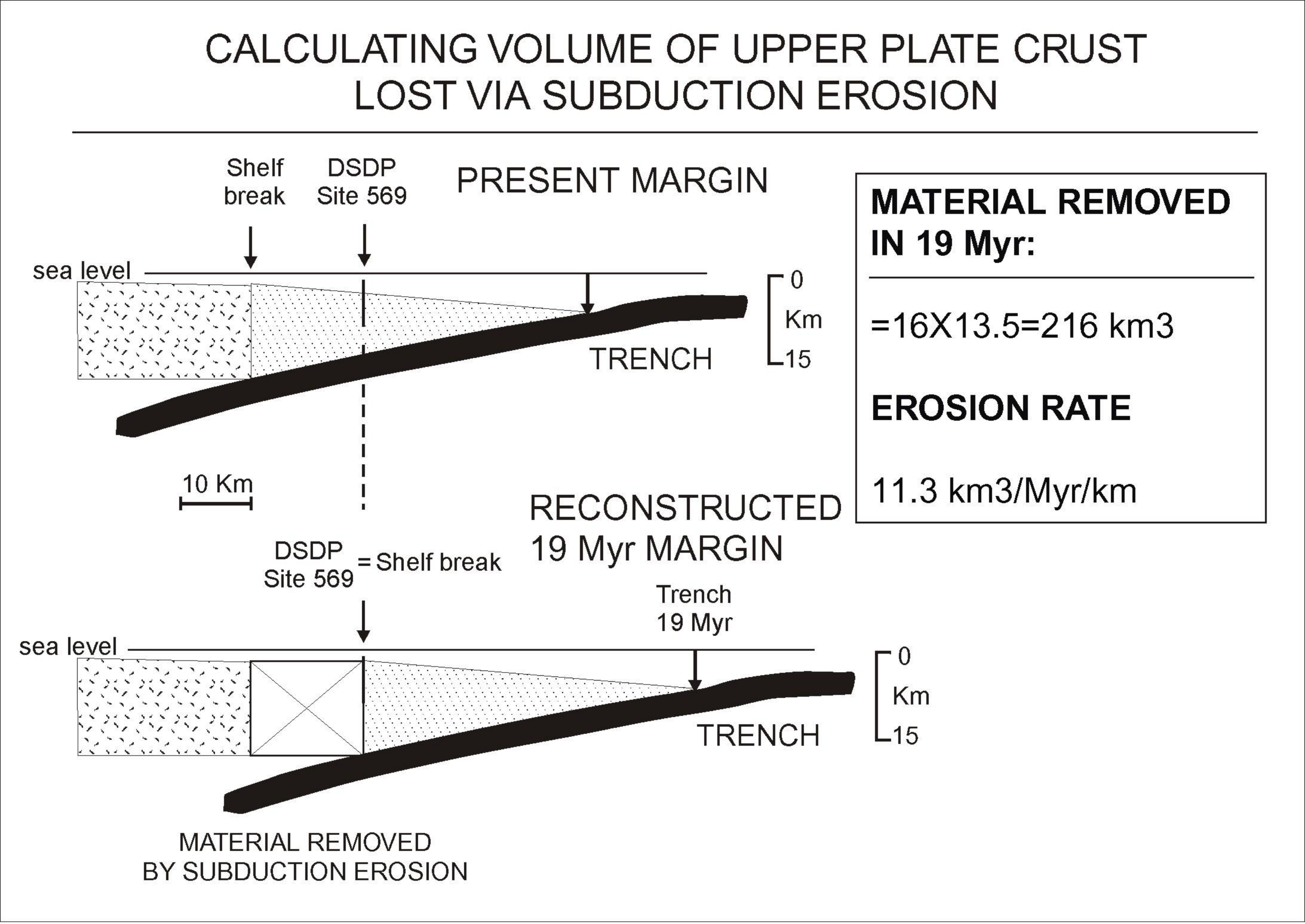

Fig. 4 Vannucchi et al.