

Supplementary material for the article “A new conceptual methodology for interpretation of mass transport processes from seismic data”

Details on Figure_Supplementary_1_a, Figure_Supplementary_1_b, Figure_Supplementary_2, Table_Supplementary_1, Table_Supplementary_2

Here we give the full list of edges of the knowledge-based graph (relation map)

(Table_Supplementary 1). The reference column provides non-exhaustive examples of previous studies whose results support the corresponding edges. Studies by Lafuerza *et al.* (2009), Lacoste *et al.* (2012), Frey-Martínez *et al.* (2011), Goujon *et al.* (2007), Chemenda *et al.* (2009), Elverhoi *et al.* (2010), Laberg *et al.* (2017), Li *et al.* (2017), Ogiesoba & Hammes (2012), and the Geological Survey of Norway website (<https://www.ngu.no>, last accessed in January, 2018) were also used as contributions to our knowledge base, although they are not mentioned in the text of this article.

Table_Supplementary 1. Edges of the graph. Columns indicate the source node and target node, the directed/undirected character of the edge, and reference(s) that support its definition. The second tab in the table gives all the references used in the first tab. The third tab gives all the edges connected to MTD descriptors nodes.

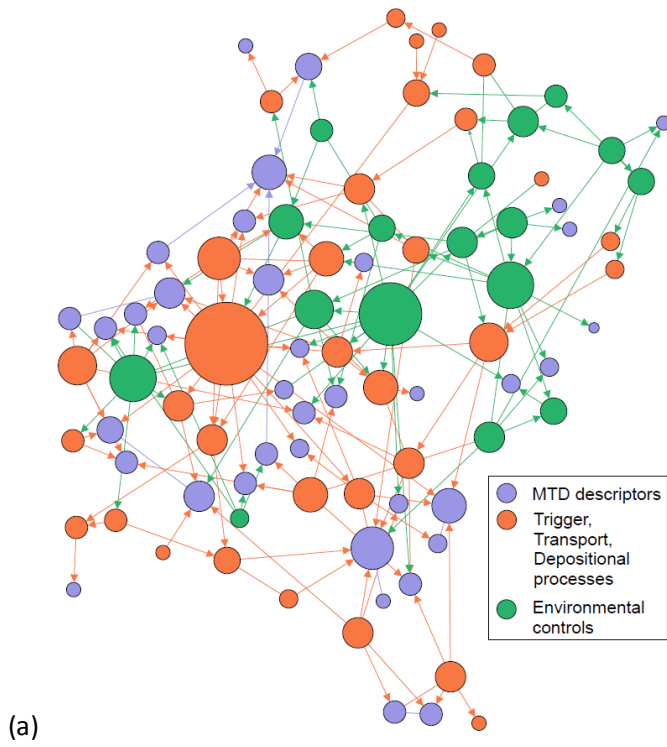
(Attached in a separate file.)

Table_Supplementary 2 provides details on the limits of detection for the MTD descriptors listed in Table 1.

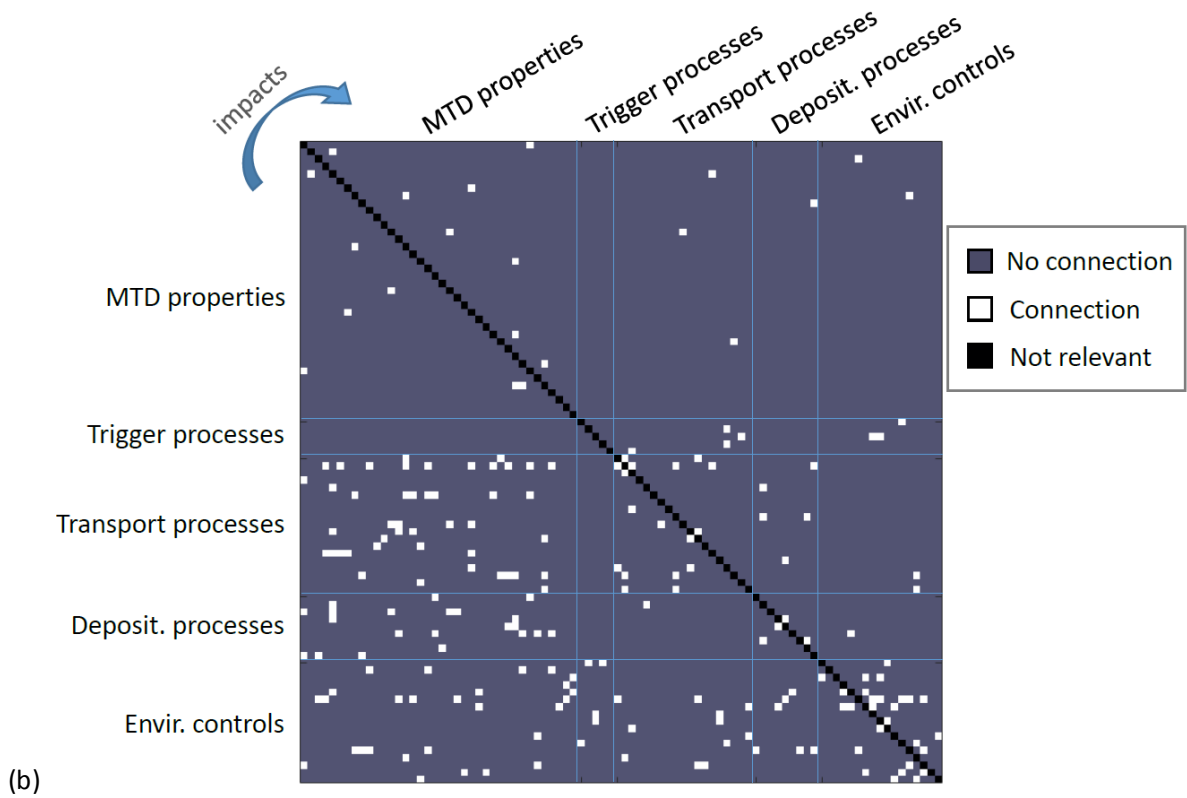
Table_Supplementary 2. Detection limit for descriptors of Table 1, in terms of dataset coverage, resolution, and other aspects.

(Attached in a separate file.)

We also provide a figure illustrating one possible visualization of the graph (Figure_Supplementary 1 (a)) and the adjacency matrix of the graph (Figure_Supplementary 1 (b)). The visualization highlights the variation in ‘degree’ between nodes (represented by the size of the node), indicating which nodes have the highest number of connecting nodes. The adjacency matrix shows the links between nodes directly in a less graphical way; with this matrix, we show that no direct impact has yet been proven in the literature between trigger processes and MTD descriptors. These representations were obtained using the Gephi software (<https://gephi.org/>).

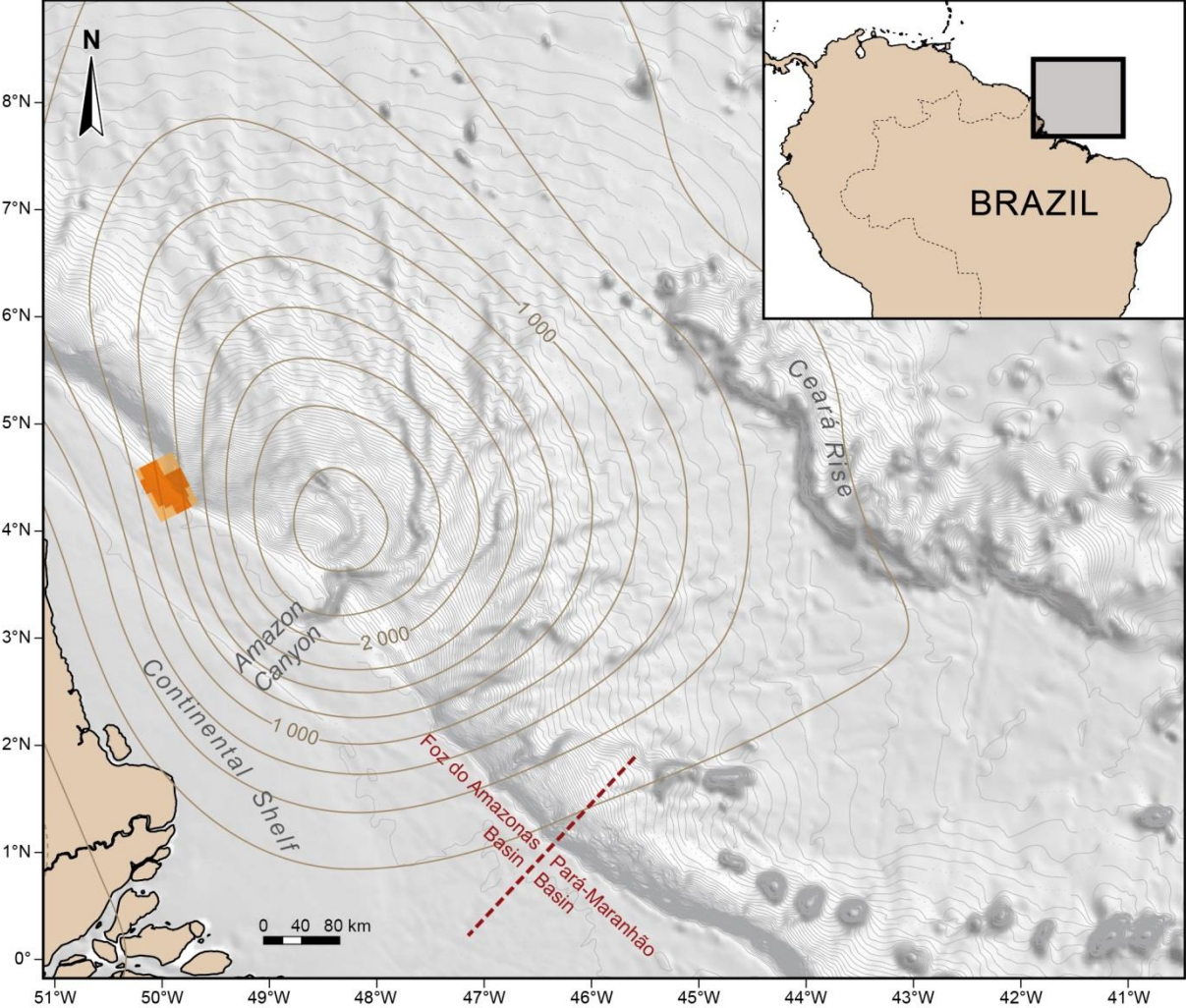


Figure_Supplementary 1. Knowledge-based graph representations: (a) one possible visualization, and (b) adjacency matrix. Figures obtained using the Gephi software (<https://gephi.org/>).



(Figure_Supplementary 1 - continued)

Finally, we include a bathymetric map by Watts et al., 2009 (Figure_Supplementary 2), showing results of their calculation of flexure due to the fan load. The position of the seismic cube used in the present study has been added, to demonstrate its critical position and potential variations in fan-induced flexure inside the cube.



Figure_Supplementary 2. Bathymetric map of the Offshore Amazon Basin showing the impact of flexure caused by the fan load; from Watts et al., 2009 and Rodger, 2009. Solid lines show the flexural depression (contour interval: 250 m). The inland flexural bulge is not visible on this map. The 3D seismic cube is mapped with available seismic data in dark orange.