

## Supplementary

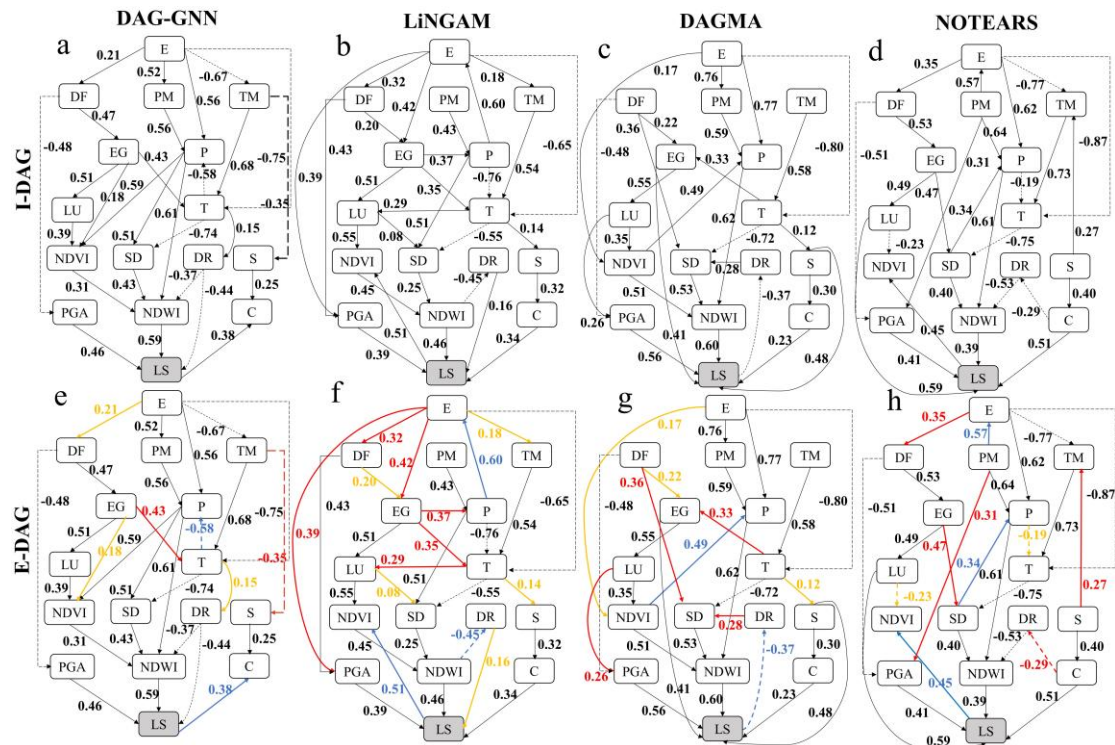


Figure S1: DAG structures under different data sampling ratios. Panels a–d show the DAGs obtained at sampling ratios of 80%, 60%, 40%, and 20%, respectively. Blue, yellow, red, and black edges denote implausible links requiring reversal, unreliable links to be removed, evidently implausible links to be eliminated, and reasonable links retained, respectively. Solid and dashed lines indicate positive and negative contribution, respectively

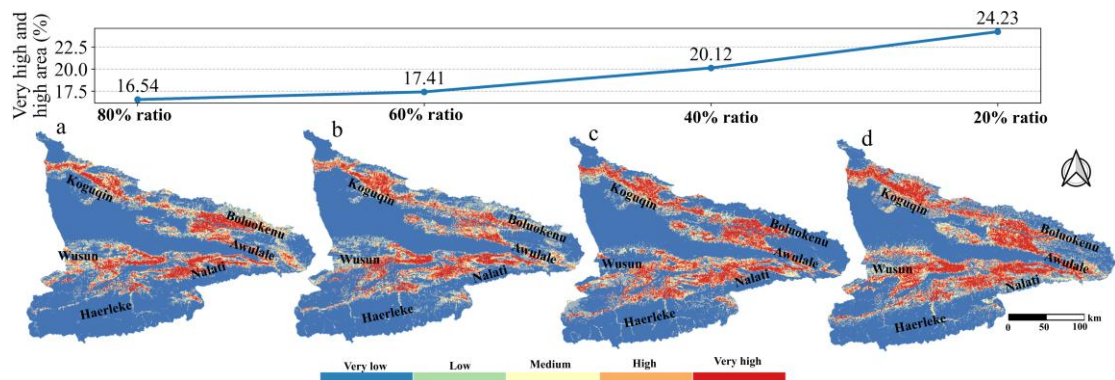


Figure S2: LSA under different data sampling ratios. Panels a–d respectively show the LSA results obtained by EDNN at 80%, 60%, 40%, and 20% sampling ratios. The line chart at the top indicates the area proportions of very high and high susceptibility zones for the four LSA results