Earth **Surface**
Dynamics

Open Access

EGU

Supplement of

Geomorphic imprint of high-mountain floods: insights from the 2022 hydrological extreme across the upper Indus River catchment in the northwestern Himalayas

Abhishek Kashyap et al.

Correspondence to: Mukunda Dev Behera (mdbehera@coral.iitkgp.ac.in)
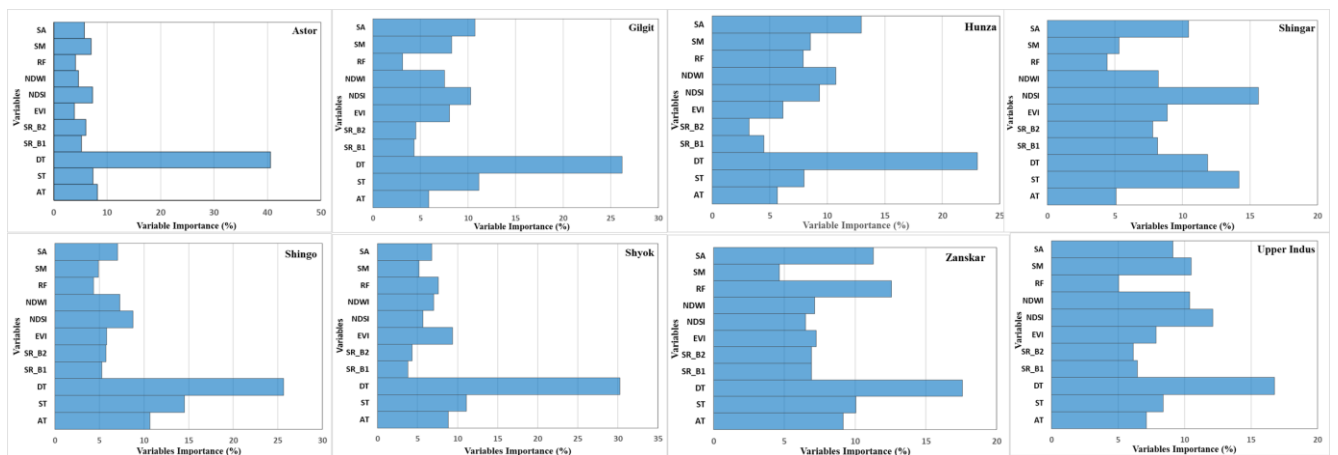
Supplementary Figures:

Fig.S1. Random Forest-Regression based variables importance for quantifying anomalous precipitation from July 1 to August 31, 2022 across Upper Indus catchment as well as along all the major tributaries:
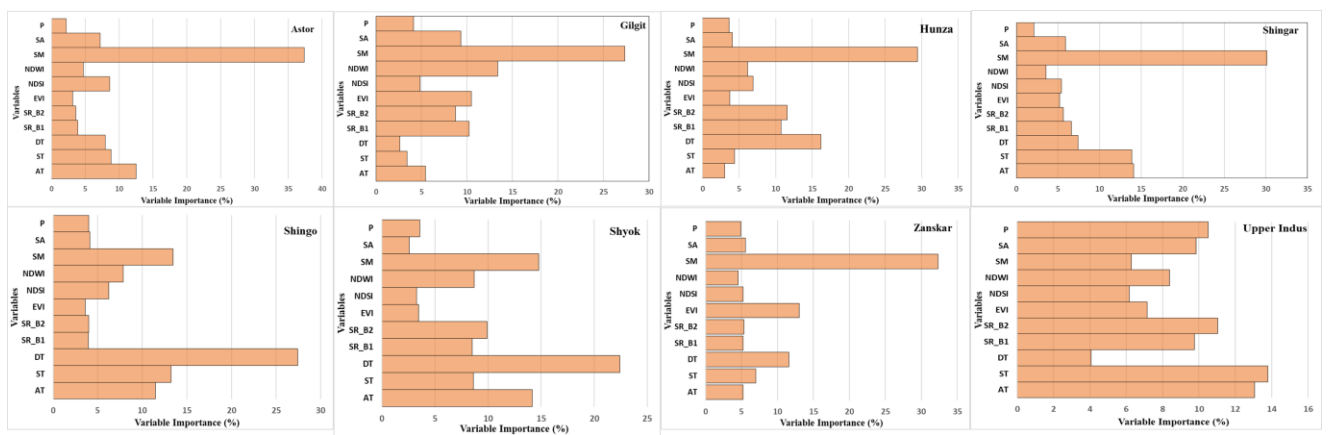

Fig.S2. Random Forest-Regression based variables importance for quantifying anomalous runoff from July 1 to August 31, 2022 across Upper Indus catchment as well as along the major tributaries:
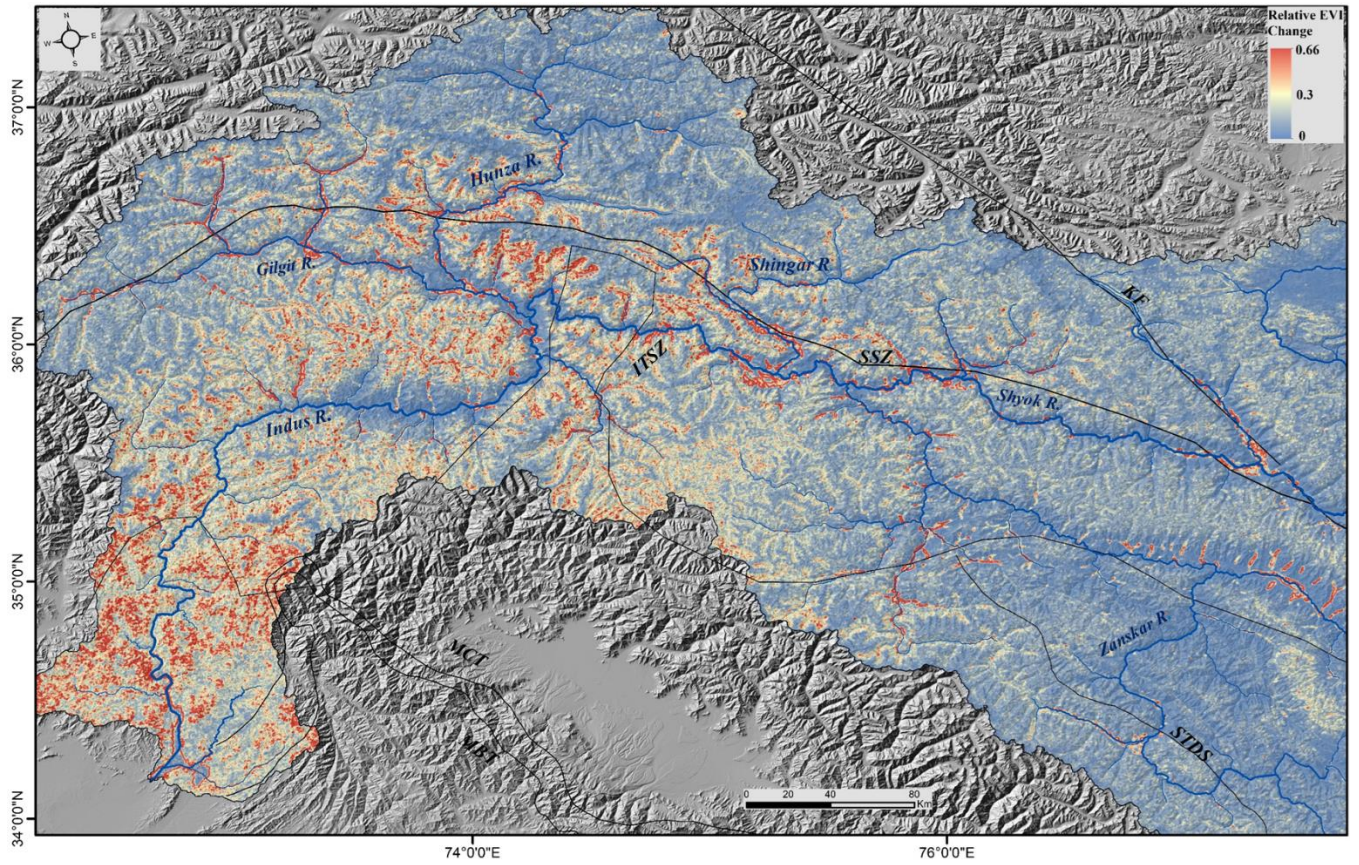
Fig. S3. The spatial map of Relative EVI derived from Landsat-8 (We used mean composite datasets from July 1 to August 31, 2022, and subtracted them from previous 5-year composite datasets of the July-August period to estimate the relative difference).
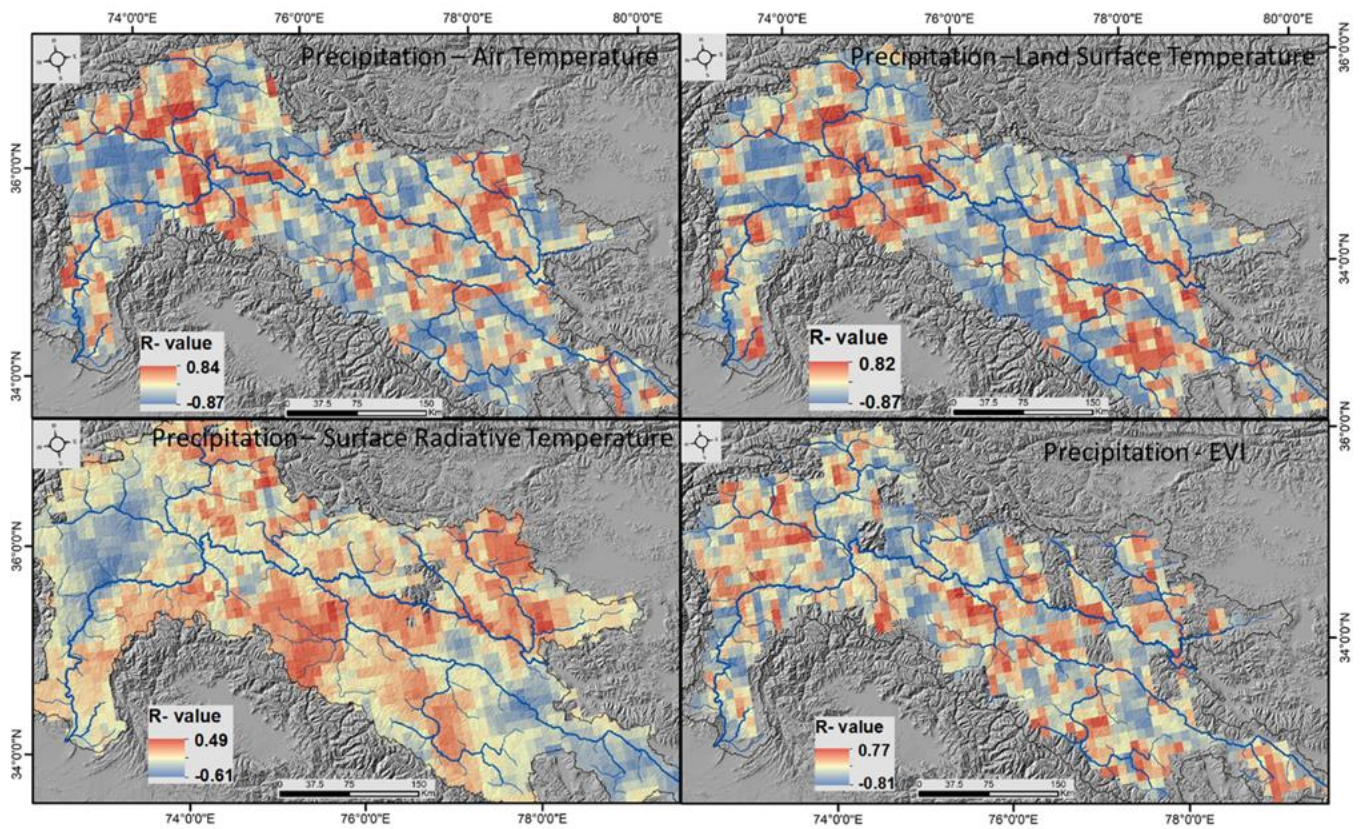
Fig. S4. The spatial correlation map between event characteristics such as Precipitation anomalies with (a) Air-Temperature (b) Land surface temperature (c) Surface radiative temperature (d) relative EVI; across Upper Indus catchment.

Performance metrics of Random Forest Regression model:

Catchments	MAE (%)	MSE (%)	RMSE (%)	R-squared
Astor	47.26	63.43	52.14	0.0093
Gilgit	53.78	67.42	56.82	0.00324
Hunza	61.84	77.83	68.74	0.0026
Shingar	42.32	64.25	47.32	0.01562
Shingo	49.85	71.22	54.22	0.05429
Shyok	37.68	49.84	41.23	0.1782
Upper Indus	31.24	42.2	32.42	0.1243
Zanskar	29.41	39.46	31.57	0.2143

Table S1. Random Forest based Regression Performance Metrics (For Precipitation estimation).

Catchments	MAE (%)	MSE (%)	RMSE (%)	R-squared
Astor	37.41	43.19	39.24	0.01549
Gilgit	27.62	37.84	28.62	0.02846
Hunza	33.54	41.854	34.621	0.05624
Shingar	21.654	29.5436	22.4863	0.1864
Shingo	17.864	24.894	19.2432	0.19435
Shyok	43.6524	63.9476	49.3278	0.005327
Upper Indus	39.5384	51.6493	44.6524	0.006348
Zanskar	14.6354	19.5439	15.01945	0.1349

Table S2. Random Forest based Regression Performance Metrics (For Discharge estimation).