Explanatory notes of the dataset 'COLOSSEO-1' related to the paper:

Late-Quaternary tectonics along the peri-Adriatic sector of the Apenninic chain (central-southern Italy): inspecting active shortening through topographic relief and fluvial network analysis

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Contents of this file

This file contains the explanatory notes and metadata related to:

- Tables 1 and 2 (.xlsx) as embedded in the paper *Ferrarini et al. (submitted)* (see Summary);
- shapefiles (.shp ESRI format) as generated by the computation performed in the paper *Ferrarini et al. (submitted)* and used to make Figures 6, 7 and 10 (see Summary and Metadata).

Summary

In **Table1.xlsx** we reported, in a table format, the main morphometric parameters and geomorphic indices of each river computed and discussed in the paper, as well as the average concavity index (**Θ**) and the channel steepness (ks) computed by Log Slope-Log Area regression.
The morphometric parameters and geomorphic indices were computed starting from the 10m-px resolution Digital Elevation Model available from *Tarquini et al., 2012,* and using the tools available in Topotoolbox (*Schwanghart and Kuhn, 2010; Schwanghart and Scherler, 2014)*. A critical area A_{crit}=0.1 km^2 was assumed in the computations (see sect. 3.2 and Figure 6B, in the paper).

The headers of the different columns in the table stand for:

#= river number (as attributed in the paper)
NAME= river name
TRUNK LENGTH (KM)= length of the river trunk
WATERSHED AREA (KM^2)= watershed of the river network
K_S=channel steepness

Θ (THETA)=concavity index
AVERAGE Θ (THETA)=average concavity index
$\mathbf{X_{b-a}}$=approximate along-river distance (from the outlet) at which the transition between bedrock- and alluvial channel conditions (X_{b-a}) is inferred to occur (see paper for details)

In **Table2.xlsx** we reported, in a table format, the normalized channel steepness (k_{sn}) values computed by linear regression for the different segments picked along the transformed-river profiles (χ-z plots) analyzed and discussed in the paper (see sect. 3.3 and Figures 7 and 10, in the paper). The values were computed using the *'KsnProfile'* tool available in Topographic Analysis Kit (TAK) for TopoToolbox (*Forte and Whipple, 2019*), and assuming a θ_{ref}=0.36 which corresponds to the average concavity index (**AVERAGE Θ**) reported in Table1.xlsx.
For each river analyzed, the first k_{sn} value corresponds to the first value regressed along the picked segment from the mouth to the first knickpoint (i.e. field 'mouth to ksn1'). The other values reported (upstream) represent the k_{sn} value regressed between two adjacent knickpoints (e.g. 'k_{sn}1-2' stands for k_{sn} between the 1st and 2nd picked knickpoint). Bold values correspond to k_{sn} increases interpreted as tectonic-related.

The headers of the different columns in the table stand for:

#= river number (as attributed in the paper)
NAME= river name
mouth to k_{sn} 1=k_{sn} value from the mouth to the 1st knickpoint
k_{sn} 1-2= k_{sn} value from the 1st to the 2nd knickpoint
k_{sn} 2-3= k_{sn} value from the 2nd to the 3rd knickpoint
k_{sn} 3-4= k_{sn} value from the 3rd to the 4th knickpoint
k_{sn} 4-5= k_{sn} value from the 4th to the 5th knickpoint
k_{sn} 5-6= k_{sn} value from the 5th to the 6th knickpoint
k_{sn} 6-7= k_{sn} value from the 6th to the 7th knickpoint
k_{sn} 7-8= k_{sn} value from the 7th to the 8th knickpoint
k_{sn} 8-9= k_{sn} value from the 8th to the 9th knickpoint
k_{sn} 9-10= k_{sn} value from the 9th to the 10th knickpoint
k_{sn} 10-11= k_{sn} value from the 10th to the 11th knickpoint
k_{sn} 11-12= k_{sn} value from the 11th to the 12th knickpoint
k_{sn} 12-13= k_{sn} value from the 12th to the 13th knickpoint
k_{sn} 13-14= k_{sn} value from the 13th to the 14th knickpoint

The **shapefiles *'Drainage_Basins.shp'*** and ***'Ksn.shp'*** store the output vector data used to support the findings of this study and to delimit the drainage basins (of the investigated rivers) and the k_{sn}-map as reported in Figures 6A and 6C, respectively (see sect. *3.2* in the paper). To follow, information stored in each shapefile is reported:

- ***'Drainage_Basins.shp'*** provides the polygons including the drainage basins of the rivers reported in Figure 6A of the paper. The fields in the attribute table contain:

  FID= object unique identifier
  Shape=feature type
  Area_km=drainage basin area (km^2)
  name=name of the river the drainage basin is referred to
  number= river number (as reported in the paper)

- ***'Ksn.shp'*** provides the normalized channel steepness (k_{sn}) values computed for the whole fluvial network (Figure 6C, in the paper) delimited by the study area. The fields in the attribute table contain:

  FID= object unique identifier
  Shape=feature type
  ksn= k_{sn} values computed along the fluvial network of the whole area
  uparea=upstream area
  Gradient=gradient

The **shapefiles *'ksn_knicks_#'number'-'name.shp', 'ksn_#'number'-'name.shp'*** included in the folder *'KSN-KNICK.zip'*, store the output vector data used to support the findings of this study and to draw Figures 7 and 10, respectively (see sect. 3.3). To follow, information stored in each shapefile is reported:

- ***'ksn_knicks_#'number'-'name.shp'*** provides the location of the knickpoints picked along the transformed-river (χ-z) profiles (Figures 7 and 10 in the paper). In the shape name, the number and the name of the river (as cited in the paper) are indicated. The fields in the attribute table contain:

- *FID*= object unique identifier
- *Shape*=feature type
- *Elevation*=knickpoint elevation (in meter)
- *StrNum*= river number (as in the paper)
- *Knick_type*=interpretation of the knickpoints as in the paper (e. g. possibly driven by active rock uplift, related to rock type variation, or bounding segments connected to an upstream decrease of k_{sn}, or due to extensional tectonics, with doubtful interpretation)

- ***'ksn_#'number'-'name.shp'*** provides the k_{sn} values computed by regression along the picked knickpoint-bounded segment of the river trunks. A synthesis of the same is reported in Table 2.xlsx. The fields in the attribute table contain:

- *FID*= object unique identifier
- *Shape*=feature type
- *ksn*= k_{sn} values computed in between the knickpoints picked along the transformed-river (χ-z) profiles
- *uparea*=upstream area
- *gradient*=gradient
- *theta*=average concavity index (Θ) used for the computation of the transformed profiles (see also Table1.xlsx)
- *resid*= residuals on k_{sn} fit (see also Supplementary Material S6 of the paper)
- *riv_num*= river number (as in the paper)

Metadata:

Area including the shapefiles released to the study: 43,434.95 km^2

Spatial Bounds:
North: 42.991629°
South: 41.272003°
East: 15.382342°
West: 13.055245°

Projected Coordinates System:
UTM Zone 33N
Datum: D_WGS_1984
Spheroid: WGS_1984
Semi-major Axis: 6378137.0
Semi-minor Axis: 6356752.314245179
Inverse Flattening: 298.257223563

References:

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