# Web application for Intensity of Erosion and Outflow

Name of the River Basin: Boljanska rijeka

**Country: Montenegro** 

**Year: 2018** 

GPS coordinates, latitude and longitude with Google Maps: 43.070876,19.789726

## **INPUT DATA**

#### Geometric characteristics of the river basins

F = 27.41804 km<sup>2</sup> (Surface area of the drainage basin)

O = 30.97936 km (Length of the watershed)

 $Fv = 18.45877 \text{ km}^2$  (Surface area of greater portion of the drainage basin)

Fm = 8.95927 km<sup>2</sup> (Surface area of smaller portion of the drainage basin)

Lv = 6.39141 km (Natural length of main water course)

Lb = 12.95975 km (Length of the drainage basin measured by a series of paraller lines)

## **Topograpfic characteristics of the river basins**

Contour line length - Liz [km]: ["2.49506

The area between the two neighboring contour lines - f [km²]: ["5.12456 ","6.41788 ","7.99236 ","5.26434 ","1.74621 ","0.66440 ","0.14745 ","0.05252 ","0.00833 "]

**h0** = 600 m (Altitude of the initial contour)

 $\Delta h = 100 \text{ m (Equidistance)}$ 

**Hmin = 550 (Lowest altitude in the drainage basin)** 

Hmax = 1314 (Highest altitude in the draigane basin

## Hydrological characteristics of the river basins

 $\Sigma L = 8.66268$  km (The total length of the main watercourse with tributaries of 1<sup>st</sup> and 2<sup>nd</sup> class)

Lm = 6.05424 km (The shortest distance between the fountain (head and mouth))

## Water permeability

fp = 0.0281 (Part of the surface area of the drainage basin which is composed of highly water permeable structures from the rocks (limestone, sand, gravel))

fpp = 0.0747 (Part of the surface area of the drainage basin which is composed of the rocks of medium water permeability (schist, marls, sandstone))

fo = 0.8972 (Part of the surface area of the drainage basin which is composed of the rocks of poor water permeability (heavy clay, compact eruptive))

#### Land use

fs = 0.625657604 (Part of the surface area of the drainage basin under the forest)

ft = 0.233619677 (Part of the surface area of the drainage basin which is under the grass, meadows, pastures and orchards)

fg = 0.140722719 (Part of the surface area of the drainage basin which is bare or under the soils without grass vegetation)

#### Meteorological data

hb = 157.6 mm (Level of torrent rain)

Up (years) = 100

to = 8.9 °C (Average annual air temperature)

**Hgod = 873.7 mm (Average annual quantity of precipitation)** 

### **Erosion coefficients**

Y = 1.24112 (Types of soil structures and allied types)

15.68 % (Sand, gravel and incoherent soils)

0 % (Saline soils)

0 % (Decomposed limestone and marls)

84.32 % (Serpentines, red sand stones, flishe deposits)

0 % (Podzols and parapodzols, decomposed schist)

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0 % (Solid and Schist limestone, Terra Rosa and Humic soil)
0 % (Brown forest soils and Mountain soils)
0 % (Epieugleysol and Marshlands)
0 % (Good structured Chernozems and alluvial well-structured deposits)
0 % (Bare, compact igneous)
Xa = 0.50131 (Planning of the drainage basin, rate of drainage basin regulation)
0 % (Bare lands)
14.07 % (Plough-lands)
4.25 % (Orchards and vineyards)
6.76 % (Mountain pastures)
12.35 % (Meadows)
40.67 % (Degraded forests)
21.9 % (Well-constituted forests)
\phi = 0.216265 (Numerical coefficient of visible and clearly pointed processes of soil erosion)
1.74 % (Depth erosion)
1.54 % (80% of the river basin under rill and gully erosion)
1.35 % (50% of the river basin under rill and gully erosion)
1.16 % (100% of the river basin under surface erosion)
12.35 % (100% of the river basin under surface erosion, without visible furrows, ravines and
land slides)
0.58 % (50% of the river basin under surface erosion)
0.39 % (20% of the river basin under surface erosion)
0 % (There are smaller slides in the watercourse beds)
14.07 % (The river basin mostly under plough-land)
66.81 % (The river basin under forests and perennial vegetation)
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#### **INPUT DATA**

A = 0.94517097166353 (Coefficient of the river basin form)

m = 0.34432895375695 (Coefficient of the watershed development)

**B** = 2.1156303169428 km (Average river basin width)

a = 0.69293793429436 ((A)symmetry of the river basin)

G = 0.31594818593889 (Density of the river network of the basin)

K = 1.0556915484024 (Coefficient of the river basin tortuousness)  $H_{sr} = 736.37018948109 \text{ m (Average river basin altitude)}$  D = 186.37018948109 m (Average elevation difference of the river basin)  $I_{sr} = 41.882745812611 \text{ % (Average river basin decline)}$   $H_{leb} = 764 \text{ m (The height of the local erosion base of the river basin)}$   $E_r = 106.27580039673 \text{ (Coefficient of the erosion energy of the river basins relief)}$   $S_1 = 0.96073 \text{ (Coefficient of the regions permeability)}$   $S_2 = 0.703013023 \text{ (Coefficient of the vegetation cover)}$  W = 1.6980395862509 m (Analytical presentation of the water retention in inflow)  $2gDF^{1/2} = 316.63281918052 \text{ m km s}^{-1} \text{ (Energetic potential of water flow during torrent rains)}$   $Q_{max} = 343.22493855429 \text{ m}^3 \text{ s}^{-1} \text{ (Maximal outflow from the river basin)}$  T = 0.99498743710662 (Temperature coefficient of the region) Z = 0.53721630879217 (Coefficient of the river basin erosion)  $W_{god} = 29484.243832512 \text{ m}^3 \text{ god}^{-1} \text{ (Production of erosion material in the river basin)}$   $R_u = 0.29318255569147 \text{ (Coefficient of the deposit retention)}$ 

 $G_{god} = 8644.2659594463 \text{ m}^3 \text{ god}^{-1} \text{ (Real soil losses)}$ 

 $G_{god} \text{ km}^{-2} = 315.27658284277 \text{ m}^3 \text{ km}^{-2} \text{ god}^{-1} \text{ (Real soil losses per km}^2\text{)}$ 

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