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# Web application for Intensity of Erosion and Outflow

**Name of the River Basin: Bistrica (kod Bijelog Polja)**

**Country: Montenegro**

**Year: 2018**

**GPS coordinates, latitude and longitude with Google Maps:  
43.133479,19.779412**

## INPUT DATA

### Geometric characteristics of the river basins

**F = 208.3548 km<sup>2</sup> (Surface area of the drainage basin)**

**O = 77.39176 km (Length of the watershed)**

**Fv = 147.54953 km<sup>2</sup> (Surface area of greater portion of the drainage basin)**

**Fm = 60.80527 km<sup>2</sup> (Surface area of smaller portion of the drainage basin)**

**Lv = 20.19917 km (Natural length of main water course)**

**Lb = 30.99341 km (Length of the drainage basin measured by a series of parallel lines)**

### Topographic characteristics of the river basins

**Contour line length - Liz [km]: ["26.51452 ", "41.17613 ", "41.07684 ", "45.57509 ", "56.40767 ", "88.75072 ", "118.59031 ", "39.30942 ", "30.28807 ", "23.72393 "]**

**The area between the two neighboring contour lines - f [km<sup>2</sup>]: ["6.23615 ", "11.18257 ", "13.47651 ", "11.78466 ", "12.85439 ", "21.73429 ", "58.83183 ", "39.38577 ", "13.62419 ", "13.51338 ", "5.57253 "]**

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

**Δh = 100 m (Equidistance)**

**Hmin = 535 (Lowest altitude in the drainage basin)**

**Hmax = 1503 (Highest altitude in the drainage basin)**

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## Hydrological characteristics of the river basins

$\Sigma L = 45.63539$  km (The total length of the main watercourse with tributaries of 1<sup>st</sup> and 2<sup>nd</sup> class)

$L_m = 9.85582$  km (The shortest distance between the fountain (head and mouth))

### Water permeability

$f_p = 0.4971$  (Part of the surface area of the drainage basin which is composed of highly water permeable structures from the rocks (limestone, sand, gravel))

$f_{pp} = 0.3062$  (Part of the surface area of the drainage basin which is composed of the rocks of medium water permeability (schist, marls, sandstone))

$f_o = 0.1967$  (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

$f_s = 0.596205635$  (Part of the surface area of the drainage basin under the forest)

$f_t = 0.355037885$  (Part of the surface area of the drainage basin which is under the grass, meadows, pastures and orchards)

$f_g = 0.048756480$  (Part of the surface area of the drainage basin which is bare or under the soils without grass vegetation)

### Meteorological data

$h_b = 157.6$  mm (Level of torrent rain)

$U_p$  (years) = 100

$t_o = 8.9$  °C (Average annual air temperature)

$H_{god} = 873.7$  mm (Average annual quantity of precipitation)

### Erosion coefficients

$Y = 1.03199$  (Types of soil structures and allied types)

2.41 % (Sand, gravel and incoherent soils)

0 % (Saline soils)

0 % (Decomposed limestone and marls)

52.74 % (Serpentines, red sand stones, flishe deposits)

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**0 % (Podzols and parapodzols, decomposed schist)**

**44.85 % (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 = 0.456625 (Planning of the drainage basin, rate of drainage basin regulation)**

**0 % (Bare lands)**

**4.88 % (Plough-lands)**

**2.27 % (Orchards and vineyards)**

**10.46 % (Mountain pastures)**

**22.78 % (Meadows)**

**38.75 % (Degraded forests)**

**20.87 % (Well-constituted forests)**

**$\phi = 0.28985$  (Numerical coefficient of visible and clearly pointed processes of soil erosion)**

**2.69 % (Depth erosion)**

**2.39 % (80% of the river basin under rill and gully erosion)**

**2.09 % (50% of the river basin under rill and gully erosion)**

**1.79 % (100% of the river basin under surface erosion)**

**22.78 % (100% of the river basin under surface erosion, without visible furrows, ravines and land slides)**

**0.9 % (50% of the river basin under surface erosion)**

**0.6 % (20% of the river basin under surface erosion)**

**0 % (There are smaller slides in the watercourse beds)**

**4.88 % (The river basin mostly under plough-land)**

**61.89 % (The river basin under forests and perennial vegetation)**

## **INPUT DATA**

**A = 0.74712937214747 (Coefficient of the river basin form)**

**m = 0.39475427079801 (Coefficient of the watershed development)**

**B = 6.7225516650152 km (Average river basin width)**

**a = 0.83265909880646 ((A)symmetry of the river basin)**

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**G = 0.21902730342665 (Density of the river network of the basin)**  
**K = 2.0494662037253 (Coefficient of the river basin tortuousness)**  
**H<sub>sr</sub> = 1100.0837629851 m (Average river basin altitude)**  
**D = 565.0837629851 m (Average elevation difference of the river basin)**  
**I<sub>sr</sub> = 24.545280454302 % (Average river basin decline)**  
**H<sub>leb</sub> = 968 m (The height of the local erosion base of the river basin)**  
**E<sub>r</sub> = 81.100700817794 (Coefficient of the erosion energy of the river basins relief)**  
**S<sub>1</sub> = 0.60988 (Coefficient of the regions permeability)**  
**S<sub>2</sub> = 0.690510169 (Coefficient of the vegetation cover)**  
**W = 1.6050764747116 m (Analytical presentation of the water retention in inflow)**  
**2gDF<sup>1/2</sup> = 1519.8742977367 m km s<sup>-1</sup> (Energetic potential of water flow during torrent rains)**  
**Q<sub>max</sub> = 767.56238013145 m<sup>3</sup> s<sup>-1</sup> (Maximal outflow from the river basin)**  
**T = 0.99498743710662 (Temperature coefficient of the region)**  
**Z = 0.37005031851576 (Coefficient of the river basin erosion)**  
**W<sub>god</sub> = 128092.73222197 m<sup>3</sup> god<sup>-1</sup> (Production of erosion material in the river basin)**  
**R<sub>u</sub> = 0.4379643540408 (Coefficient of the deposit retention)**  
**G<sub>god</sub> = 56100.050724915 m<sup>3</sup> god<sup>-1</sup> (Real soil losses)**  
**G<sub>god</sub> km<sup>-2</sup> = 269.25249970202 m<sup>3</sup> km<sup>-2</sup> god<sup>-1</sup> (Real soil losses per km<sup>2</sup>)**