





# Flash flood hazards and land cover classification Sarata river case study

Roman Sizo, Yevgen Gazetov, Katya Stepanova, Oleg Rubel







### **Ukraine: Study area**





#### Tatarbunar and Sarata rayons











Length 120 km catchment area of 1 250 km<sup>2</sup>. Sloping is 1 m / km. Valley trapezoidal, with flat, dissected ravines, slopes; its average width of 1.2 km, depth of 40-50 m. Floodplain width of 500 m. There are gateways. It is used for water supply, irrigation.







### Flooding areas in Ukraine









### Floods in Sarata, 06.07.2013









### Floods in Sarata 06.07.2013









### Tatarbunari 17.09.2013









### Tatarbunari 17.09.2013



## Tatarbunari, Kunduk (Novoalekseevka), 18.09.2013



### Software used

- •QGIS 2.8
- •Semi-Automatic Classification Plugin for QGIS
- •GRASS 6.4.4 Geographic Resources Analysis Support System
- •SAGA 2.1.2

#### Data

- •Shuttle radar topographic mission (SRTM)
- •LandSat 8
- •ENSEMBLES database (precipitation data)
- •Topographic map

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#### **Processing Landsat 8 in QGIS**

Band 2 = Blue; Band 5 = Near-Infrared;

Band 3 = Green; Band 6 = Short Wavelength Infrared 1;

Band 4 = Red; Band 7 = Short Wavelength Infrared 2.

Creating virtual raster, applying atmospheric correction using the DOS1 method (Dark Object Subtraction 1) and visualization



#### **Collection of Spectral Signatures**



Semi-Automatic Classification Plugin, collection of spectral signatures.

#### Visualizations and checking of signatures



#### Classification



#### Classification



Some fields were identified as water. Adding new signatures.

#### Classification





#### **Evaluation of accuracy**

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#### Flash flood hazards Factors that influence the damage and losses

- Orographic characteristics (catchment , slopes)
- Intensity and the quatity of simultaneous precipitation
- Potential volume of accumulated water
- Width of the floodplain,
- Presence of obstacles in the way of watercourses: bridges, dams, landfills soil
- Presence of reservoirs and canals

#### DEM

digital elevation model







Distribution of maximum values of precipitation based on ENSEMBLES data



### Location of potentially dangerous areas of flash floods



#### Thank you for your attention!

