Problem 1 - Workflow diagram

Territory.gpkg

- GwPollVulnRegion
- River
- SoilType

study area coordinates
(in ETRS PT-TM06)

Xmin = -61800,0 m
Ymin = 37000,0 m

Xmax = -26300,0 m
Ymax = 70000,0 m

convert

study area coordinates
(in EPSG:4326 WGS 84)

min: 39°59'57.256" N
8°51'24.488" W

max: 40°17'53.81" N
8°26'32.795" W

*get data from
earthexplorer.usgs.gov/*

SRTM DEM data

n39_w009_1arc_v3.tif

n40_w009_1arc_v3.tif

import to QGIS

Territory -- River

n39_and_n40_merged.tif

GDAL
Raster miscellaneous
Merge

n39_w009_1arc_v3.tif

n40_w009_1arc_v3.tif

*Export... save as... GeoTIFF
extend: studyarea coordinates*

studyarea.tif

GDAL
Raster conversion
Polygonize (raster to vector)

name of the field to create: elevation

Probl1_27492 -- studyarea_vectorized

Select Features by Expression...
`"elevation" <=17`

cut off the features that the river can not reach:
Select Features by Freehand
Invert Feature Selection

Probl1_27492 -- lowelevation_regions

Probl1_27492 -- flood_vulnerable_regions

2.

Field Calculator :

Output field name: risk_level

`if ("elevation" >= 15, 'low risk',if ("elevation" >= 10, 'moderate risk' , 'high risk'))`

1.

Field Calculator - create new field:

Output field name: total_area_km2

`round(sum($area)*10^-6, 6)`

3.

Field Calculator :

Output field name: subtotal_area_ha

`round(sum($area,group_by:= "risk_level")*10^-4,4)`

Symbology: Select "Graduated", value:
elevation, color ramp "YlOrRd", invert color
ramp, add the respective classes

solution 1: total area of
vulnerable regions
= **234.6708 km^2**

solution 3:
Problem1.3_diagram.png

solution 2:

| total area of low risk zones = **2012.1453 ha** | total area of moderate risk zones = **4751.2267 ha** | total area of high risk zones = **16703.7123 ha** |