



“ Can my house be flooded?
- how to check if the plot is located
in a flood risk area

Agnieszka Bartoszewska
Real Estate Market Analyst

AMRON CENTRE ANALYSIS

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When you want to buy a piece of land for building a new house, you should check not only the legal status of the property or infrastructure utilities for the plot, but also you should take account of surroundings. In that case, the sixty-four-dollar question should be: is my building plot located in a floodplain? Flood is a big problem that threatens people's lives and their property. But how to check it? This article aims to help you in search of an answer to this question.

THE HIGH-RISK FLOOD ZONE – WHAT IS IT?

According to a definition from Water Law Act adopted on July 20, 2017 (article 16, point 34), the high-risk flood zones are:

- areas, where the probability of flooding is average and amounts to 1% (it means that the probability of a flood would be once in 100 years),
- areas, where the probability of flooding is high and amounts to 10% (it means that the probability of a flood would be once in 10 years),
- areas between the shoreline and a flood embankment or a natural high bank, in which a flood embankment has been built, as well as islands and mudslides constituting registration plots,
- technical belt of the seashore constituting a zone of direct interaction of the sea and land.

It follows from the definition that the high-risk flood zone is a classified area located at the very proximity to the shoreline, as well as area, which can be found under water in the event of a flood based on forecasting models.

FLOOD HAZARD MAPS AND FLOOD RISK MAPS – BASIS OF ANTI-FLOOD ACTIVITIES

Flood hazard maps (MZP) and flood risk maps (MRP) are the main planning documents, which are prepared by the State Water Holding Polish Waters.

MZP and MRP are the basis for flood risk assessment and anti-flood activities, which aim to counter negatives results of a flood, civil protection and protection of business, environment and cultural heritage. They constitute a benchmark for analysis and decisions, which are necessary for activities of various administration bodies, mostly for crisis staff.

The obligation of maps development comes from legal acts, such as:

- Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks
- Water Law Act dated July 20, 2017
- Regulation of the Minister of Maritime Economy and Inland Navigation of 4 October 2018 on flood hazard maps and flood risk maps.

The boundaries of flood risk areas from MZP and MRP are the results of mathematical hydraulic modelling. It uses a digital elevation model and based on it calculates how water from the river will spread in a given



area during a flood (also in the variant, when there is no embankment, as well as after its possible rupture) - taking into account the range, depth, flow velocity and its duration. It should be noted that the flood hazard maps do not present the range of historical floods, but areas with a probability of flood.

On the maps, the presented area is divided into:

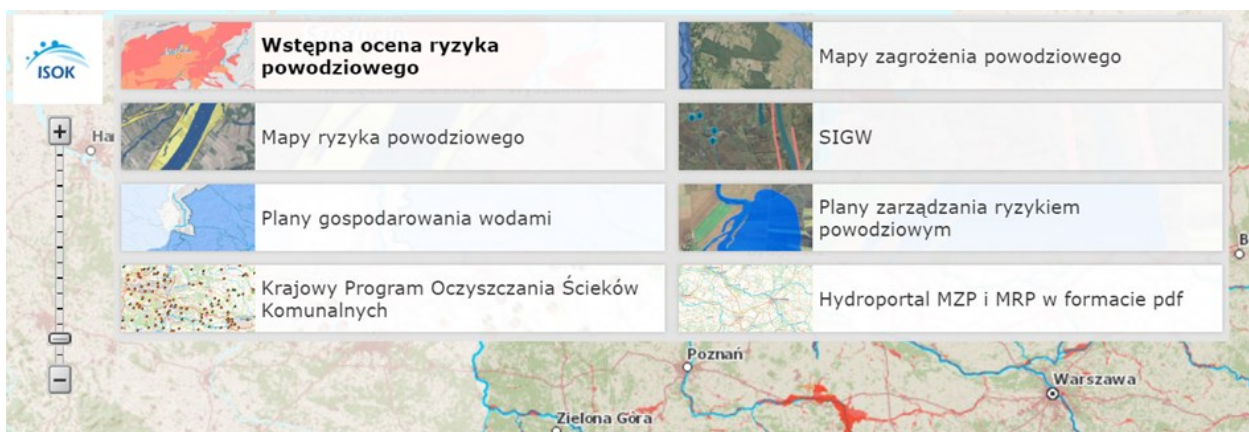
- areas, where the probability of flooding is low, amounting to 0.2% (once in 500 years) or where an extreme event is probable;
- areas, where the probability of flooding is medium and amounts to 1% (once in 100 years);
- areas, where the probability of flooding is high at 10% (once in 10 years);
- areas prone to flooding in the event of:
 - destruction or damage of the flood protection embankment,
 - destruction or damage of the anti-storm shaft,
 - destruction or damage to the damming structure.

In addition, the flood hazard maps show the depth and speed of water, as well as directions of water flow (for voivodeship capital cities and city with district rights, also other cities with the number of inhabitants higher than 100 000 people).

MZR AND MPR - WHERE TO FIND THEM?

The Hydroportal (<https://isok.gov.pl/hydroportal.html>) is a public portal run by the State Water Holding Polish Waters. It contains information about the waters in Poland. It enables to browse water management plans or data about flood and drought risk.

FIGURE 1. TYPES OF MAPS IN THE HYDROPORTAL



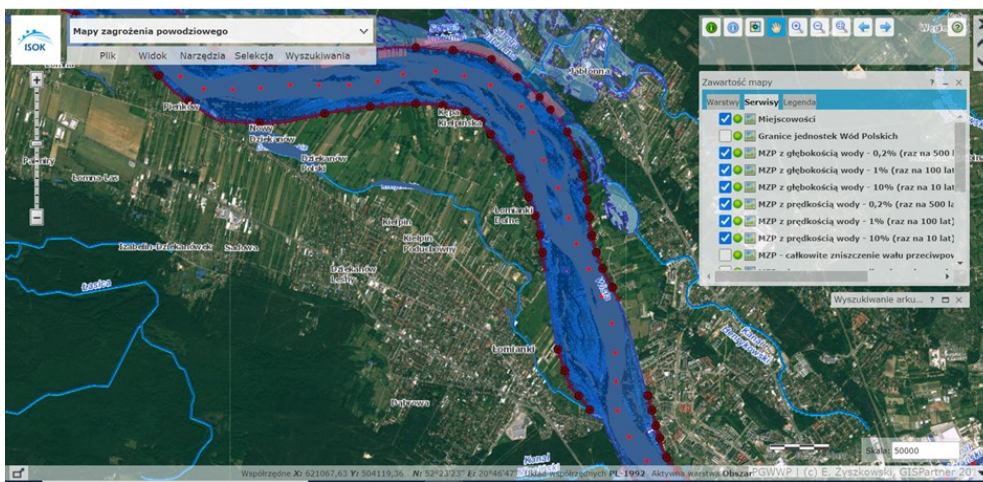
Source: Hydroportal - ISOK



The structure of the Hydroportal is similar to the national Geoportal. There are several types of maps to choose from. From the perspective of the flood risk, the flood hazard maps (MZP) and flood risk maps (MRP) will be the most interesting. If you know a number of a plot, you can use the search engine in the panel in the upper left corner and easily find the property that interests us.

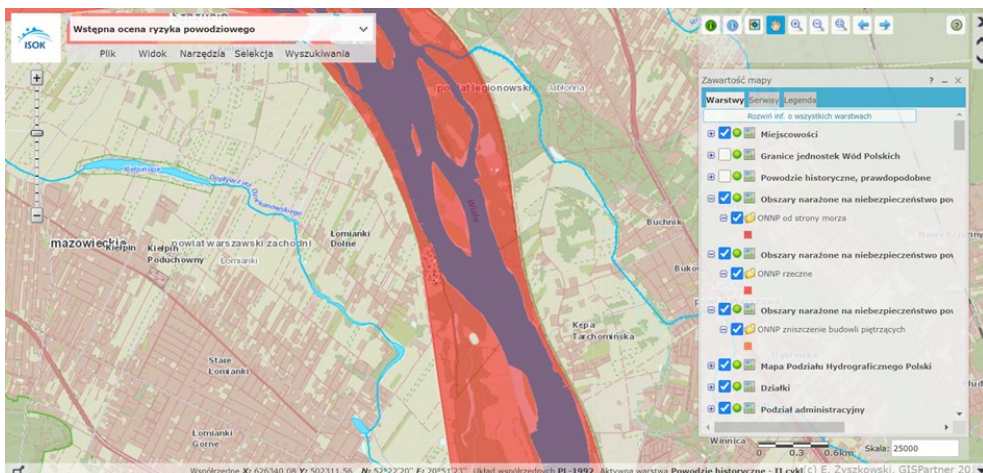
Using Hydroportal, we can interactively turn on and off the corresponding layers, which present appropriate degrees of a flooding probability. You can also check, which area can be flooded in the event of a breakage of flood embankments or the destruction of water structures.

FIGURE 2. SCREENSHOT FROM A FLOOD RISK MAP



Source: Hydroportal - ISOK

FIGURE 3. SCREENSHOT FROM A PRE-FLOOD RISK MAP

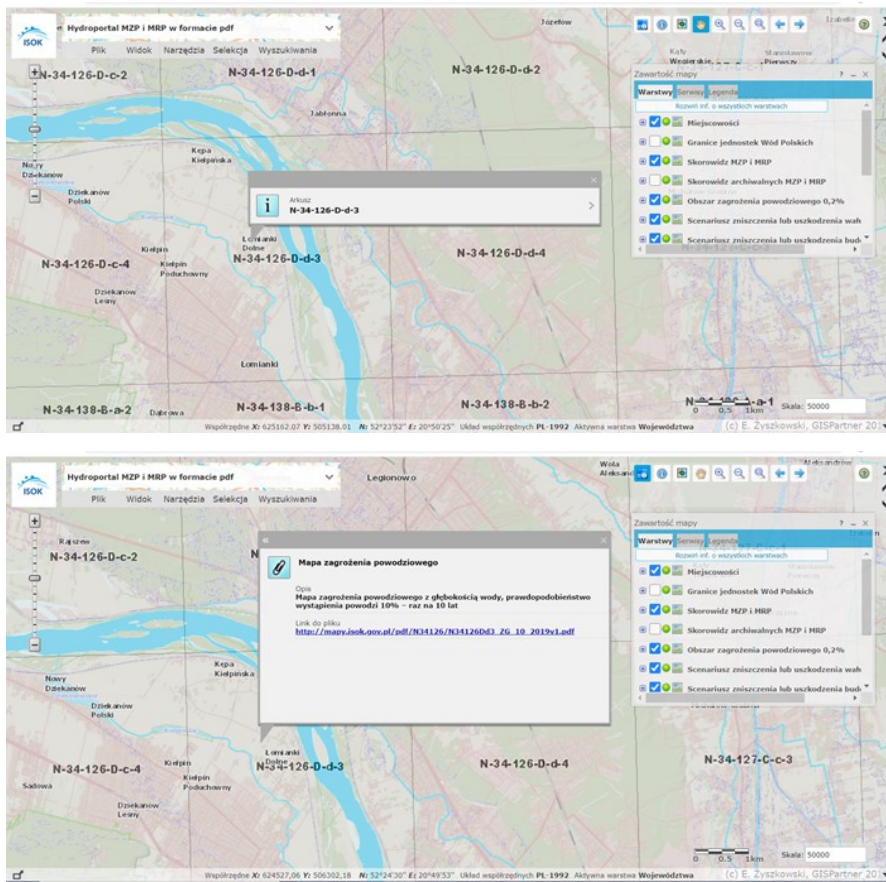


Source: Hydroportal - ISOK

The Hydroportal offers maps in cartographic form for download in pdf format, with a division on high and low-risk zones and flood risk zones. In the upper left corner in the bar with the map name, you just need to select 'Hydroportal MZP i MRP w formacie pdf'. If you press on the map, a window with the name of the map's sheet will appear on-screen. When you press on it, you can choose, which type of map you are interested in and then you will get a link to the appropriate map's sheet.

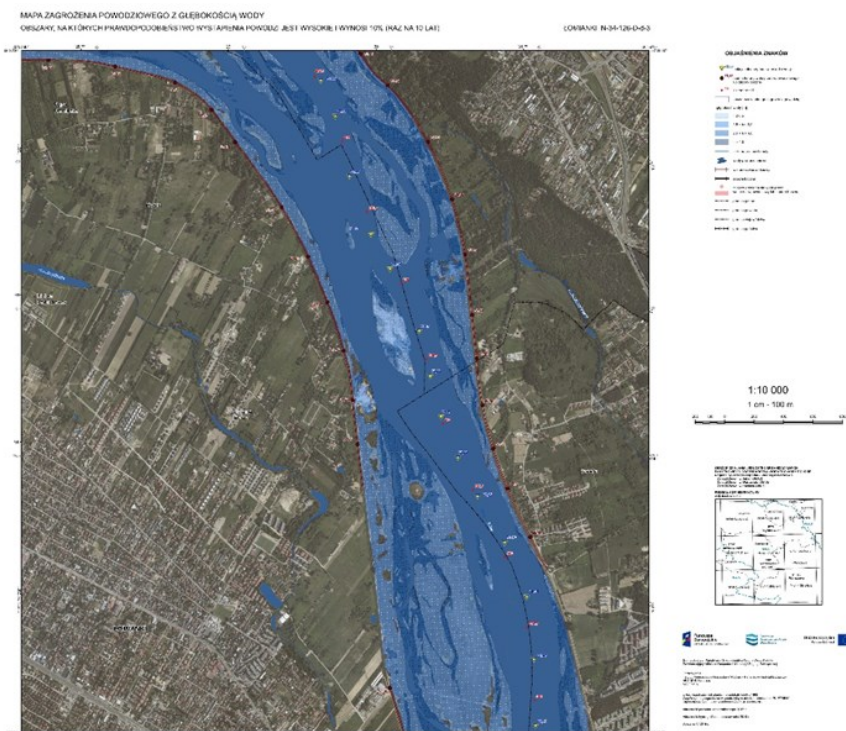


FIGURE 4. SCREENSHOT FROM A MAP INDEX OF MZP AND MRP IN PDF FORMAT



Source: Hydroportal - ISOK

FIGURE 5. SHEET OF A FLOOD RISK MAP



Source: Hydroportal - ISOK



STRATEGIC AND PLANNING DOCUMENTS - MANDATORY INFORMATION ABOUT FLOOD HAZARD

According to article 166 of the Water Law Act, for ensuring the protection of people and their property, boundaries of a flood risk area must be obligatorily included in planning and strategic documents, such as:

- voivodeship spatial development plan,
- voivodeship development strategy,
- municipal development strategy,
- supralocal development strategy,
- study of conditions and directions of spatial development,
- spatial development plan,
- municipal revitalization program,
- decision on location of a public purpose investment, as well as in a decision on the development conditions.

Moreover, the level of flood risk is included in a decision concerning the location of a public purpose investment and in planning permission related to properties located in part or in total at that area.

Due to the scale of the study, the most appropriate study for checking the information will be the local spatial development plan, because it covers only a fragment of a commune or town. In case of a lack of a spatial development plan, it is recommended to check other documents. Because of the generalization of supralocal studies and voivodeship studies, communal studies will be more suitable, e.g. the study of conditions and directions spatial development of the commune or the commune development strategy. Having a development strategy by local government is not obligatory, but most municipalities in Poland develop this strategic document.

Very often local spatial development plans and development strategies has been facilitated on websites and/ or in public information bulletins. Some communes provide their map portals, which are called Geoportals, where local plans are published. This tool allows you to check the plan for your plot by searching for its location on the map. However, plans on Geoportals are often not updated.

In each city or commune office, after submitting an appropriate application, you can obtain an abstract from the spatial development plan with the map for a particular plot. However, to get it, you need to pay the appropriate fee and wait for the receipt of such a document.



FIGURE 6. A SPATIAL DEVELOPMENT PLAN WITH AREAS WITH RISK OF FLOODS



Source: Commune office of Łomianki

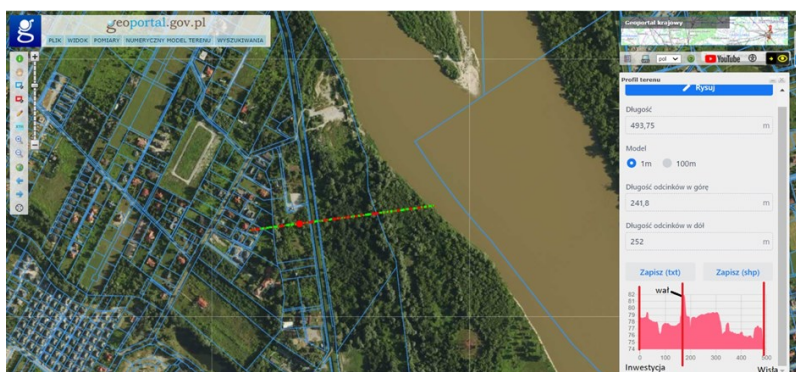
TERRAIN PROFILE TOOL

The terrain profile is a graph, which on the horizontal axis presents distances along a selected line through the terrain and on the vertical axis is an elevation of points. Drawing a line from the examined property to e.g. a riverbank allows to determine the differences of elevation between two points and determine the height of the barrier, e.g. flood embankments.

In the National Geoportal available at <https://geoportal.gov.pl/> in a section 'Numeryczny Model Terenu' in the main menu there is a tool 'Terrain Profile', which is based on the Digital Terrain Model (DTM) and allow to draw a cross-section along a user-defined line.

When you select the option 'Terrain profile', you will see a panel, in which you need to select the DTM resolution. The next step is to press a button 'Draw a profile line', which is in the upper left corner. Another step is to draw a line on a selected area of the map by clicking at selected points. Drawing can be ended by double-clicking on the left mouse button. Results are presented in a graph.

FIGURE 7. TERRAIN PROFILE TOOL



Source: own elaboration with using terrain profile tool in geoportal.gov.pl



BACKGROUND SURVEY

Conversations with neighbours are always a good source of information. It is worth asking them if in surroundings have ever been floods or are there any retention reservoirs or levees. In addition, it can be asked whether there has been any flooding of the river in the last few decades and how long after this event the water was on the surface. Senior neighbours certainly know how fast water flows down to the drains and when the drains get overfilled. They will also tell you if they have ever had their cellars flooded.

If there are no buildings in the area, you can take a look at the surrounding plants. Wetland territories are dominated by willows and alders. Meadows are full of field horsetails, woolly and rushes. The occurrence of these kinds of plants on the plot means that in this place, there is a high level of groundwater and therefore, the flood risk is higher.

SUMMARY

There is a lot of ways to obtain information about flood risk on a plot that interests you. Such information is a publicly available source of information, but you need to know how to get them. Information about floodplains is extremely valuable and they may preserve people's lives and possessions.



AGNIESZKA BARTOSZEWSKA

Real Estate Market Analyst

e-mail: agnieszka.bartoszevska@amron.pl

AMRON Centre

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