



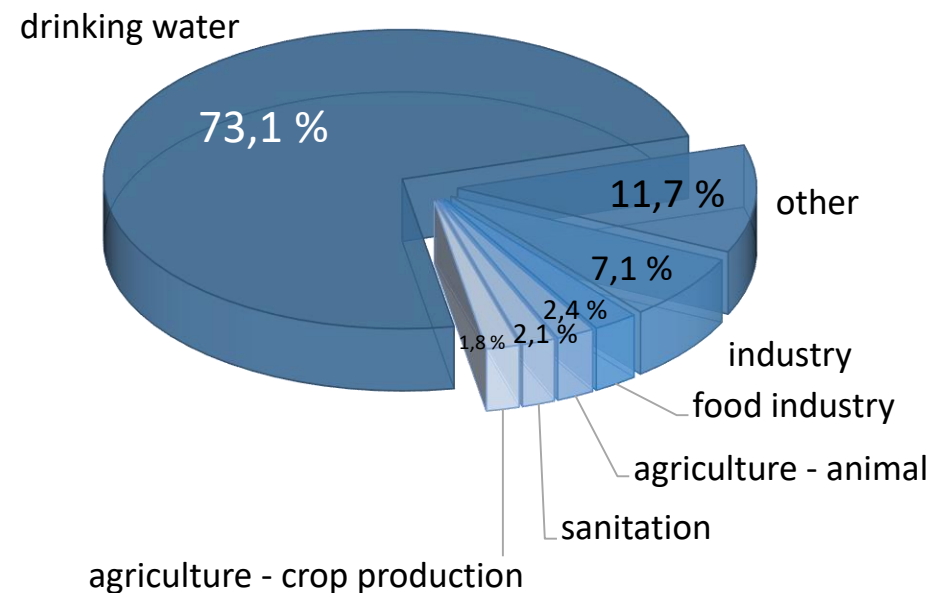
SAFEGUARDING GROUNDWATER INTENDED FOR HUMAN CONSUMPTION IN SLOVAKIA

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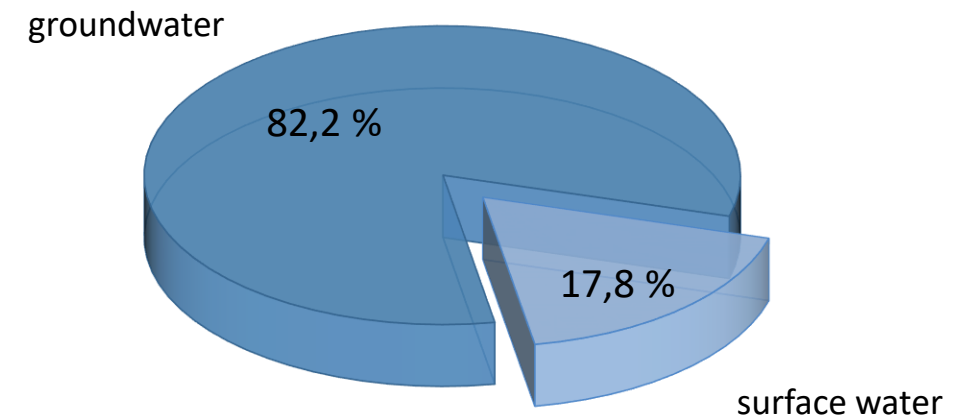
Groundwater in Slovakia

Groundwater is the main source of drinking water in Slovakia:

- 73,13 % of groundwater is used for drinking water supply
- 82,2 % of drinking water is from groundwater sources



GROUNDWATER ABSTRACTION PURPOSES



SOURCES OF DRINKING WATER

Data source: SHMI

Definitions

§ 7 of Act No. 364/2004 Coll. on Water and on the Amendment of Act No. 372/1990 Coll. of the Slovak National Council on Misdemeanors as amended by later regulations (Water Act)

‘ water source for abstraction of water intended for human consumption’

is defined as an abstraction point in surface water body or in groundwater body, from where water is abstracted in its original state or after treatment used as drinking water supply, or possibly be used for this purpose, which average daily yield is at least 10 m³ of water calculated average per calendar year or supply more than 50 people.

§ 2 of Act No. 364/2004 Coll. on Water and on the Amendment of Act No. 372/1990 Coll. of the Slovak National Council on Misdemeanors as amended by later regulations (Water Act)

‘ catchment area for abstraction points of water intended for human consumption’

is defined for the groundwater as part of the groundwater body corresponding to the area of the generation and accumulation of groundwater source and for the surface water it is area above the abstraction point defined by hydrological characteristics (river sub-basin)

Number of drinking water sources

1 051 drinking water sources

(Public water supply development plan 2021 - 2027)

- 997 groundwater sources
- 55 surface water sources

„ZberVaK“ database (WRI)

- 1068 groundwater sources and its localities operating by water companies and 399 by municipalities (2018)
- 1622 parameters about objects and facilities of public water supply and public sewerage (Regulation No. 605/2005)
- water companies own or operate 90,5 % of yield of groundwater sources
- municipalities own or operate 9,5 % of yield of groundwater sources

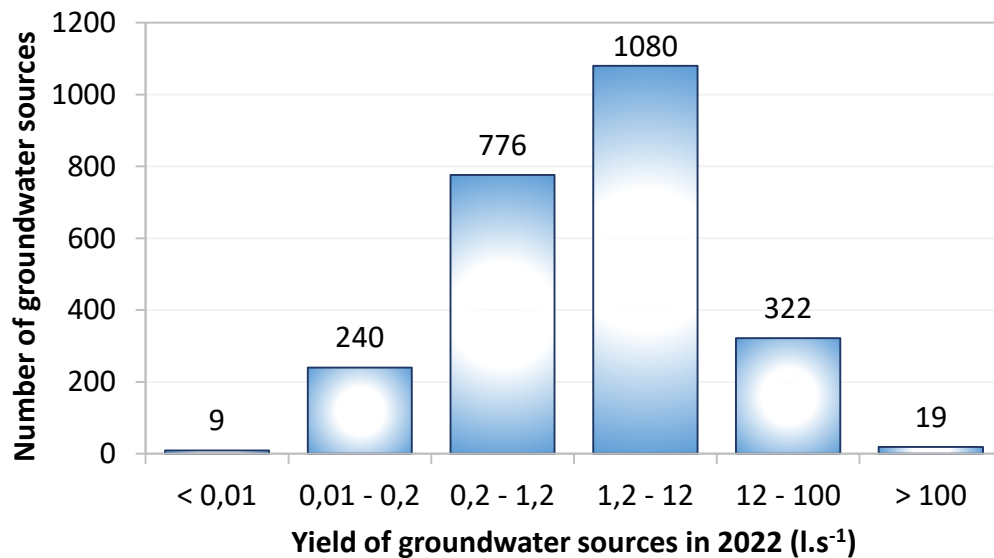
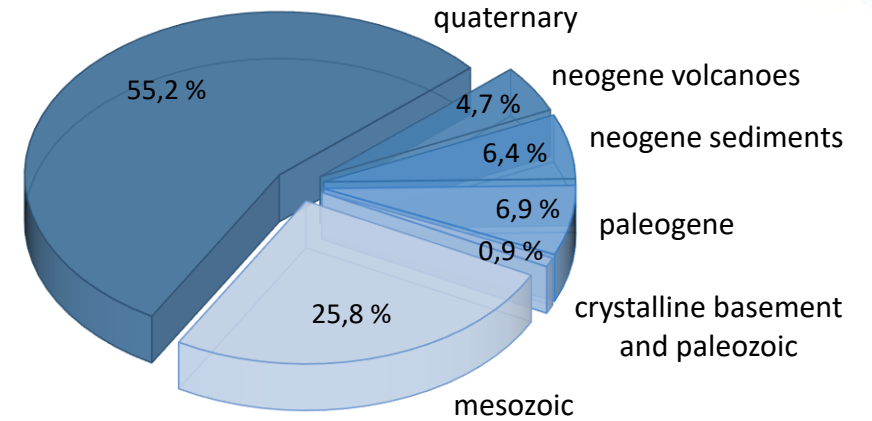
Central Water Register (SHMI)

- obligation to report exploitations of water
- 3148 drinking groundwater sources
- 979 sources with zero abstraction during years 2018 - 2022

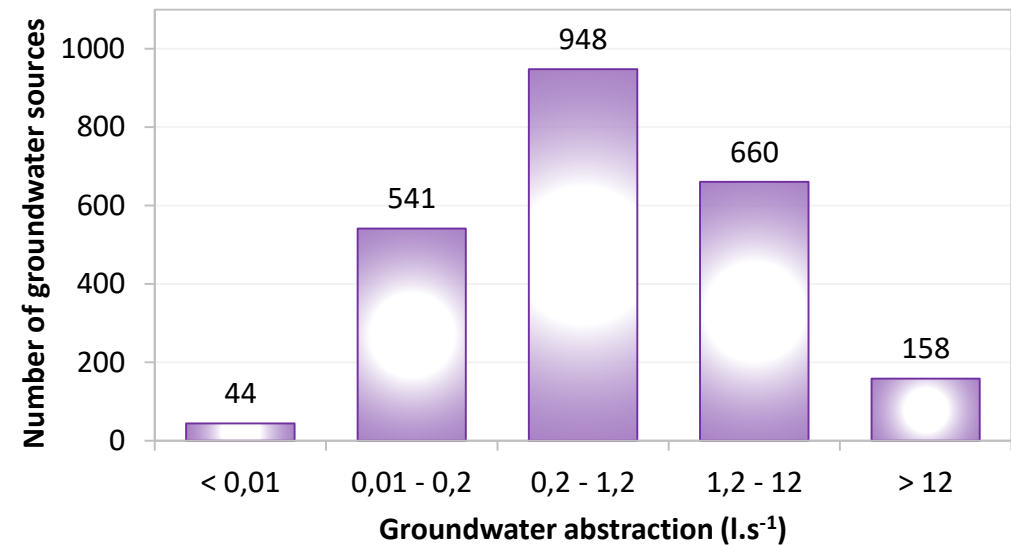


Characterization of drinking water sources

- the highest exploitable amount of groundwater is in quaternary aquifers
- maximal yield of groundwater source ~ 460 l.s⁻¹
- maximal abstraction from groundwater source ~ 121,25 l.s⁻¹



Exploitable amount of groundwater in hydrogeological structures



Safeguarding drinking water sources

Safeguard zones of drinking water sources

- (Regulation No. 29/2005 Coll.; § 32 Act No. 364/2004 Coll.)
- I., II., III. level
- intended to protect the territory of water abstraction point against imminent threat
- technical area modifications depending on aquifer type
- obligation to request the review of safeguard zones (by the end of 2027)

Drinking water protected areas

- Act No. 305/2018 Coll.
- area defined by national law, that naturally accumulates and regenerates water sources
- restriction of activities, protection measures , water quality monitoring, informing the public, fines
- 10 DWPA – 14 % of the country area

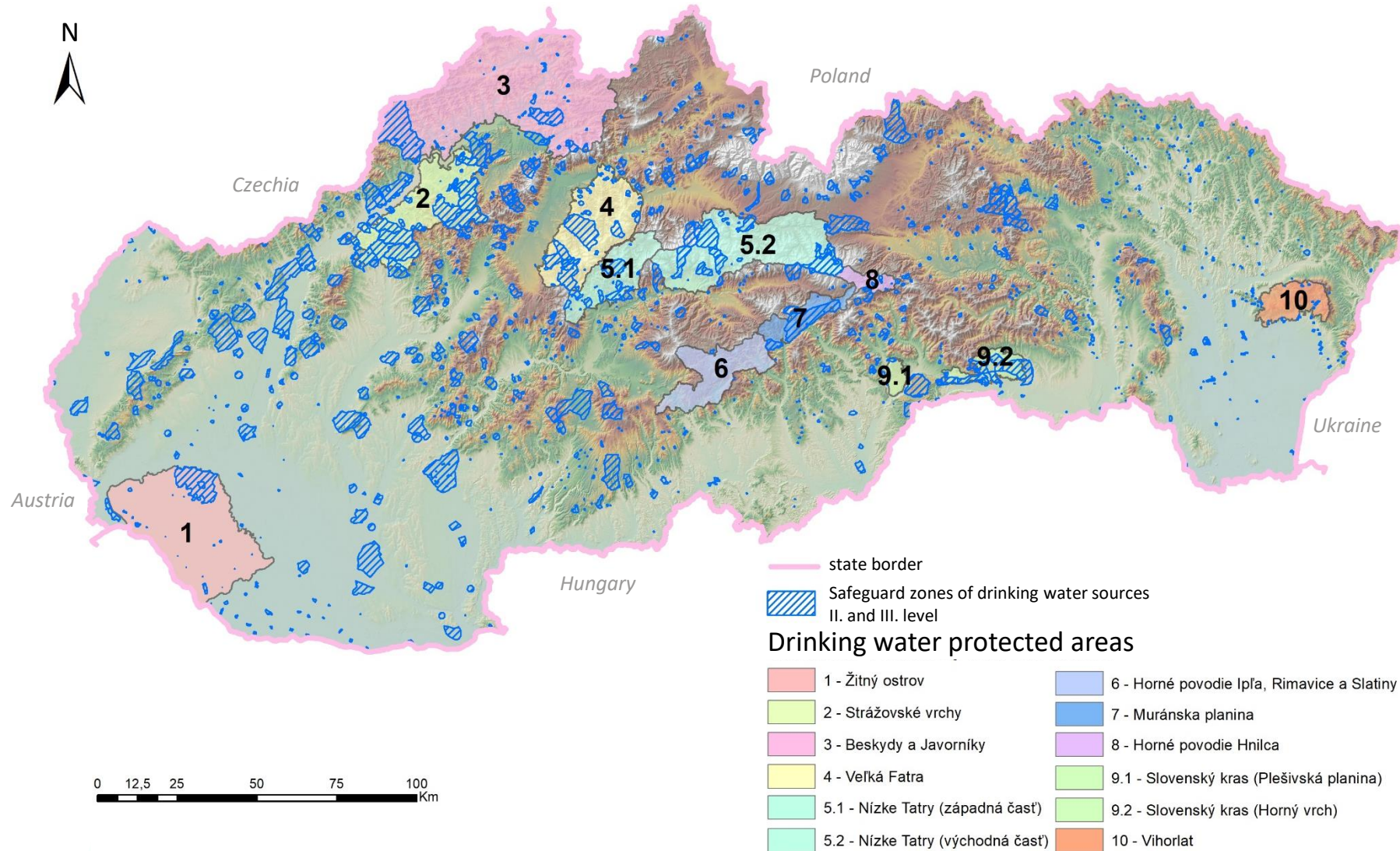


VODNÝ ZDROJ!

**PÁSMO HYGIENICKEJ OCHRANY
I. STUPŇA**

**VSTUP NEPOVOLANÝM OSOBÁM
A ZNEČIŠŤOVANIE ZAKÁZANÉ!**

Drinking water protected areas and safeguard zones



Regulation adopting Article 8 of DWD

Regulation of the Ministry of Environment of the Slovak republic adopting Article 8 of Directive (EU) 2020/2184

Details about risk management of the catchment areas for abstraction points of water intended for human consumption

§ 1 Risk analysis, which identifies the likelihood of occurrence and the severity of undesirable consequences of hazardous events

Description of the catchment area

a) characterisation of the catchment area

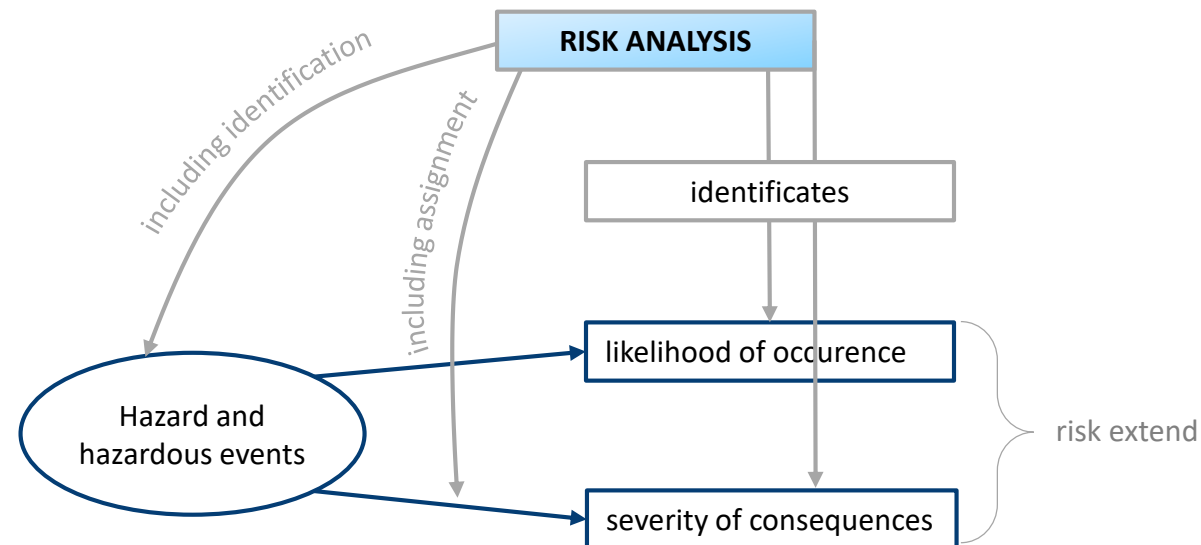
b) appropriate monitoring of relevant parameters

§ 2 Risk assessment and evaluation, which determines the level of risks and develops measures to mitigate or eliminate unacceptable risk

§ 3 Risk management, which adopt, implement and control measures to mitigate or eliminate unacceptable risks or to prevent emergence of identified risks

Risk analysis

- (1) Risk analysis, which identifies the likelihood of occurrence and the severity of undesirable consequences of dangerous events including:
- identification of hazard and hazardous events in the catchment areas for abstraction points, using all available information about its characterisation (description),
 - assigning the likelihood of occurrence and the severity of undesirable consequences to the identified hazardous events.



Risk assessment and evaluation

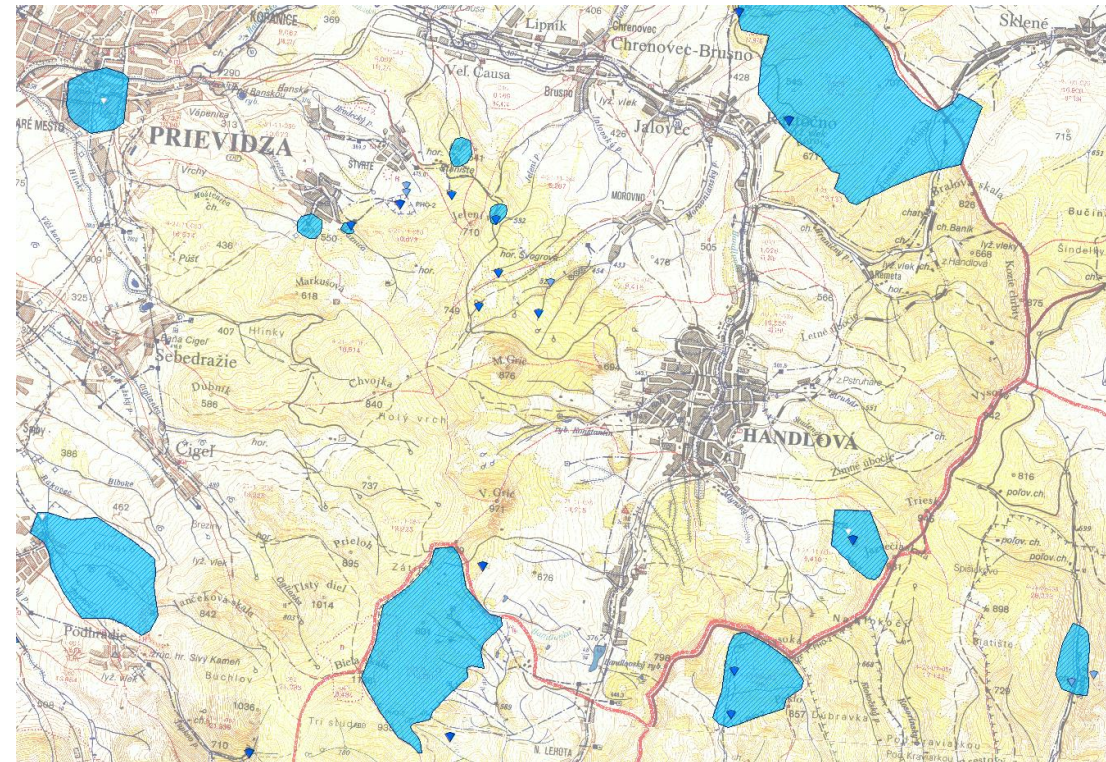
Matrix for determining the risk and priority of risk

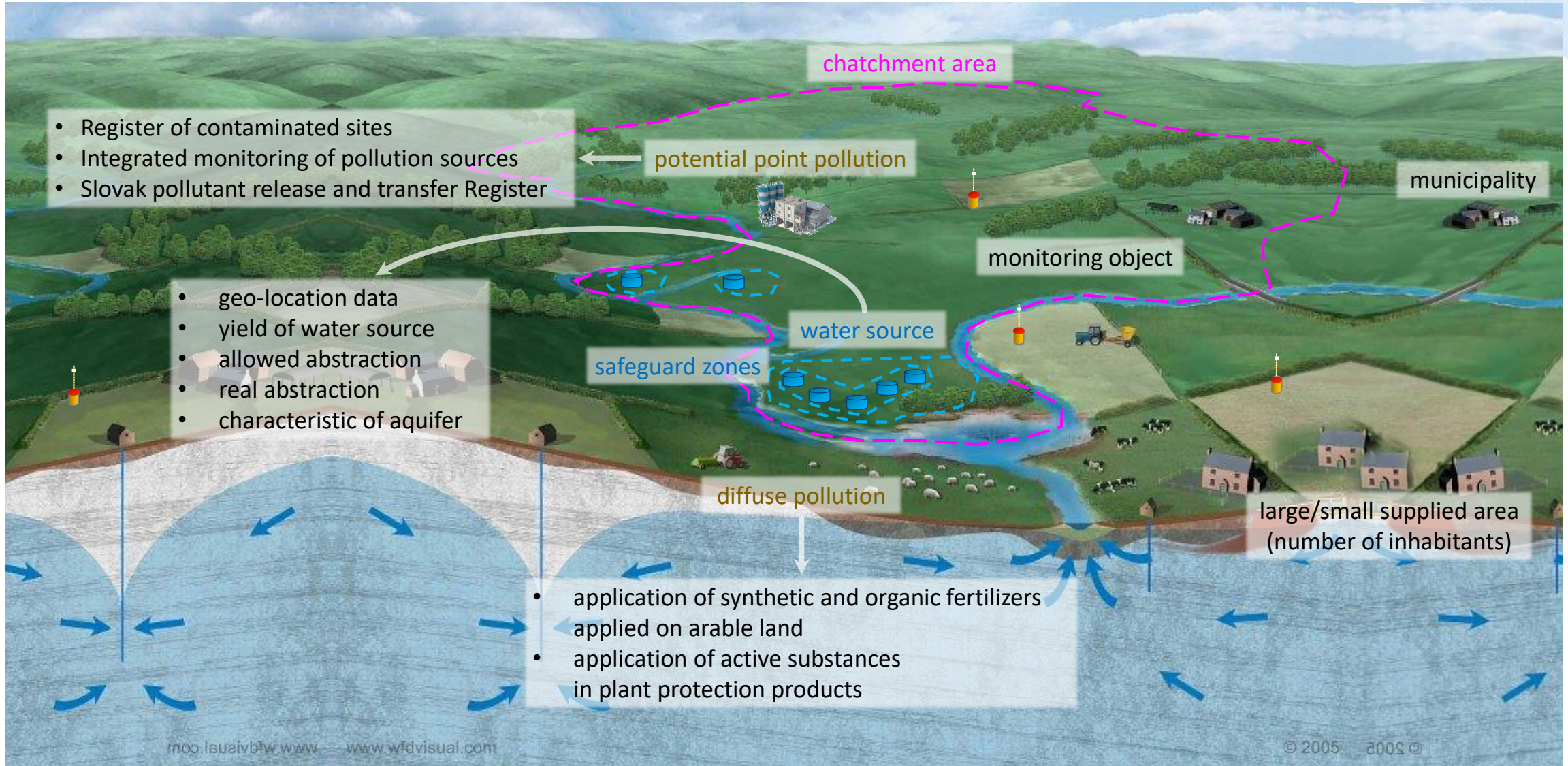
| Likelihood of occurrence of hazardous event | Severity of consequences | | | | |
|---------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| | 1 insignificant <i>(no or nondetectable repercussions)</i> | 2 low <i>(potential health damage of small part of population)</i> | 3 moderate <i>(potential health damage of large part of population)</i> | 4 high <i>(possible lethal effect to small part of population)</i> | 5 catastrophic <i>(possible lethal effect to large part of population)</i> |
| 1 rare <i>(once in 5 years)</i> | 1x1 low risk | 1x2 low risk | 1x3 medium risk | 1x4 high risk | 1x5 high risk |
| 2 improbable <i>(once in a year)</i> | 2x1 low risk | 2x2 low risk | 2x3 medium risk | 2x4 high risk | 2x5 very high risk |
| 3 moderate <i>(once in month)</i> | 3x1 low risk | 3x2 medium risk | 3x3 high risk | 3x4 very high risk | 3x5 very high risk |
| 4 probable <i>(once in week)</i> | 4x1 medium risk | 4x2 high risk | 4x3 high risk | 4x4 very high risk | 4x5 very high risk |
| 5 almost certain <i>(once in a day)</i> | 5x1 high risk | 5x2 high risk | 5x3 very high risk | 5x4 very high risk | 5x5 very high risk |

This approach allow to evaluate the level of risk and determine priorities in terms of measures to reduce or eliminate identified hazards and hazardous events.

Characterization of the catchment area

- identification and delineation of the catchment area
- mapping of the safeguard zones (water management map – 1997)
- geo-references for all abstraction points (databases WRI, SHMI)
- basic and technical data of the abstraction point (databases WRI)
- land and landscape utilization (RBMP, CORINE land cover)
- anthropogenic impact (RBMP)
- hydrological runoff and water flow direction
- hydrological balance
- processes of recharging and storage of water sources
- water quality - monitoring network (SHMI, SGIDŠ, WRI)





Summary and challenges

- Creation of methodology for delineation of catchment areas depending on groundwater source yield, hydrogeological characteristic and size of supplied area.
- Making a list of groundwater sources/localities for which catchment area need to be delineated.
- Elimination of discrepancies and completing information about drinking water sources.
- Preparation of data, that were obtained in accordance with water framework directive.
- Need of actualisation of safeguard zones map.

