



Instytut Meteorologii i Gospodarki Wodnej
Państwowy Instytut Badawczy

Warning systems for specific hazards in the IT System of the Country's Protection against extreme hazards

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Instytut Meteorologii i Gospodarki Wodnej

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IT System of the Country's Protection against extreme hazards—
acronym ISOK

The ISOK project is co-financed by the European Regional Development
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Priority Axis 7 - Information Society

Project is carried out by Consortium:



Main Office for Geodesy and Cartography



National Water Management Authority - Leader of Consortium



**The National Institute of Telecommunications- National
Research Institute**



Government Centre for Security



**Institute of Meteorology and Water Management - National
Research Institute**



Introduction

The main use of the system is then supporting the protection of the society, economy and environment against extreme hazards; another is to aid decision making, if the extremes occur.

Besides, the ISOK will possess tools (applications) allowing to support routine and incidental tasks required for managing, updating and processing data (for example giving information on the status of a given threat; carrying out analyses using geospatial information; generating reports).



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IT SYSTEM

Georeferential Database of Topographic Objects (GBDOT)

Relief and land cover numerical model (DTM and DSM)

Digital ortophotomap

Flood hazard maps

Flood risk maps

Meteorological hazard maps

Maps of other hazards

- Map of surface water and groundwater intakes for the areas threatened with flood occurrences
- Map of air contamination connected with meteorological threats
- The risk map of major industrial accidents connected with meteorological threats
- The risk map of disruption in Polish Power System connected with meteorological threats
- Map of threat for health and life of population connected with meteorological threats and the social vulnerability

Place of maps of other hazards with respect to the ISOK project architecture



Short characteristic of maps of other hazards

Maps of other hazards	Forecast map	Historical maps (static maps)	Popular and scientific material	Availability
Map of surface water and groundwater intakes for the areas threatened with flood occurrences	Yes	No	Yes	<i>restricted access</i>
Map of air contamination connected with meteorological threats	Yes (Prediction of hazard for the next 24, 48 and 72 hours)	No	Yes	openly available
The risk map of major industrial accidents connected with meteorological threats	Yes (Prediction of hazard for the next 6, 12 and 24 hours)	Yes	Yes	<i>restricted access</i>
The risk map of disruption in Polish Power System connected with meteorological threats	Yes (Prediction of hazard for the next 6, 12 and 24 hours)	No	Yes	openly available
Map of threat for health and life of population connected with meteorological threats and the social vulnerability	Yes (Prediction of hazard for the 12 UTC (today and tomorrow))	Yes	Yes	openly available

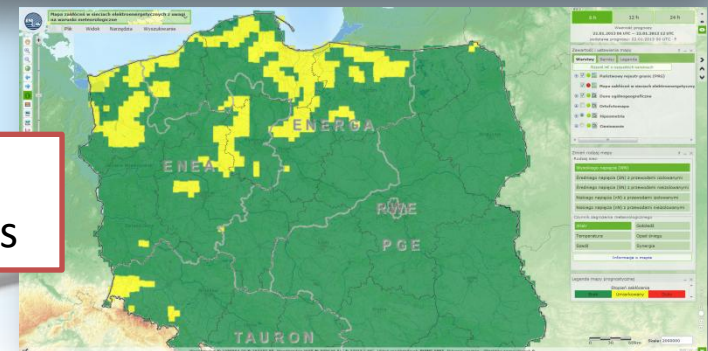
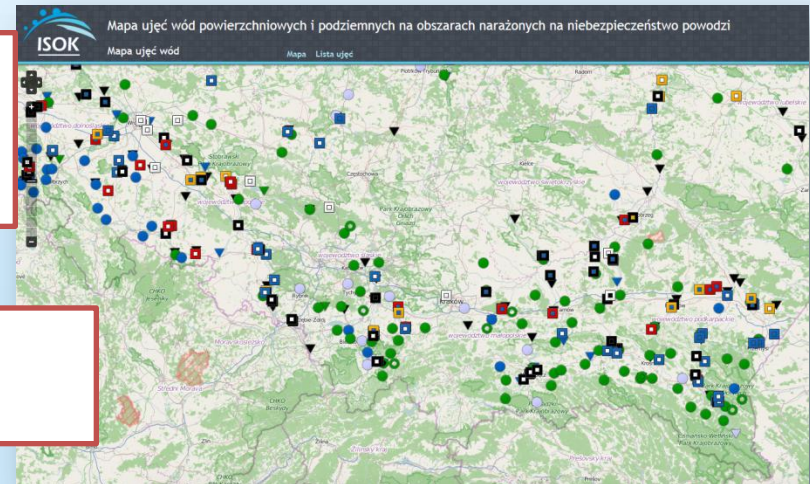
Maps of other hazards

Each map of other hazards is a forecast map informing about a possible threat. Maps which are indirect related with a protection of critical infrastructure are:

Map of surface water and groundwater intakes for the areas threatened with flood occurrences

The risk map of major industrial accidents connected with meteorological threats

The risk map of disruption in Polish Power System connected with meteorological threats

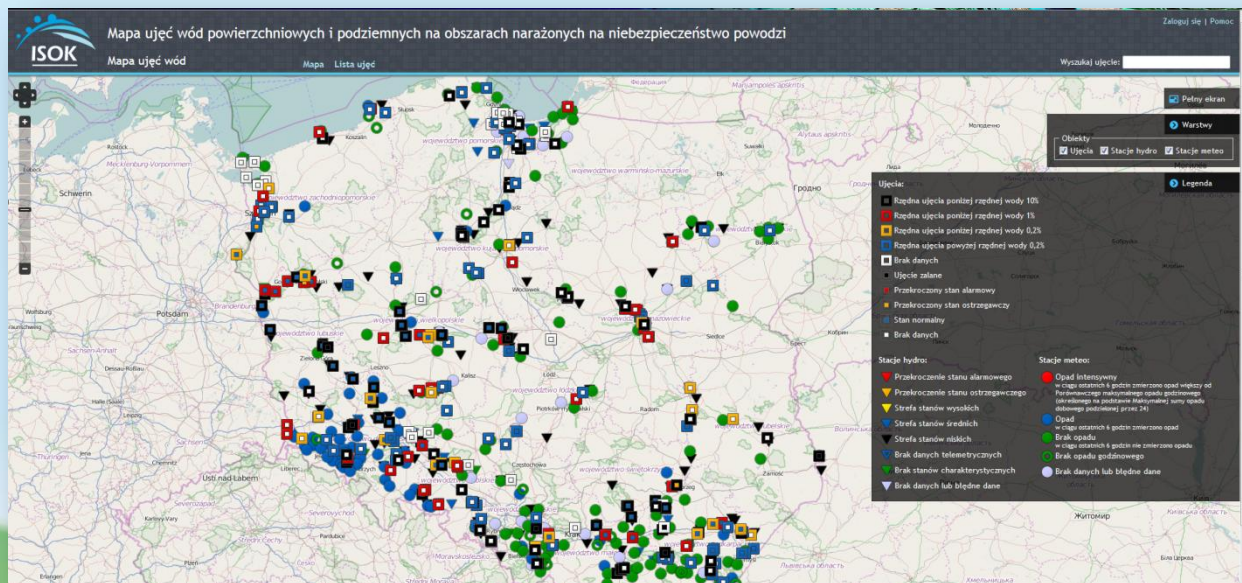


Map of surface water and groundwater intakes for the areas threatened with flood occurrences - short characteristic

Water intakes map, in accordance to previously accepted guidelines, is the expansion of flood hazard maps developed under Directive 2007/60/EC.

Chosen surface water and groundwater intakes threatened with flood are particularized with the information on the consequences of their possible shutdown.

The map possesses an operational nature: depicts intakes with background information on current and forecasted hydrometeorological situation, and links it with the information provided by flood risk maps.





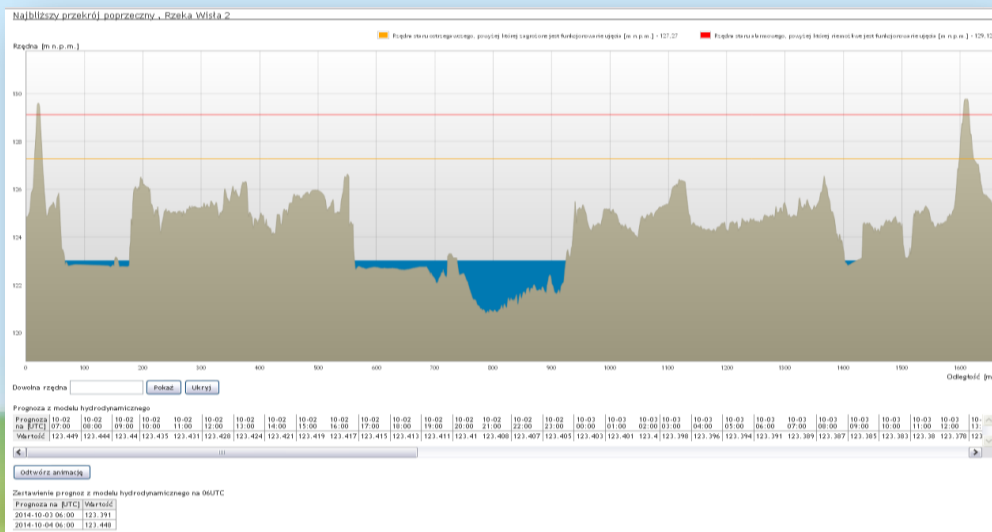
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Water intakes shown on the map include both the intakes defined as facilities, with buildings required for water yielding, as well as other facilities of water supply, including water treatment plants.

Water intakes map is displayed by the Water Intakes Monitor, an application developed during the ISOK project. Hydrological data and forecasts are obtained from the IMGW-PIB Monitor.

The data comes from the IMGW-PIB automated measurement network as well as from weather observers.



Legend

Water intakes:

- ☒ Ordinate of intake below water level ordinate of 10%
- ☒ Ordinate of intake below water level ordinate of 1%
- ☒ Ordinate of intake below water level ordinate of 0.2%
- ☒ Ordinate of intake above water level ordinate of 0.2%
- ☐ Unknown status
- ☒ Intake inundated
- ☒ Alarm level
- ☒ Warning level
- ☒ Normal level
- ☐ Unknown level

The risk map of major industrial accidents connected with meteorological threats

The map will show the probability of failure in industrial plants (lower-tier establishment, upper-tier establishment and other establishment which are not include in Directive Seveso III)

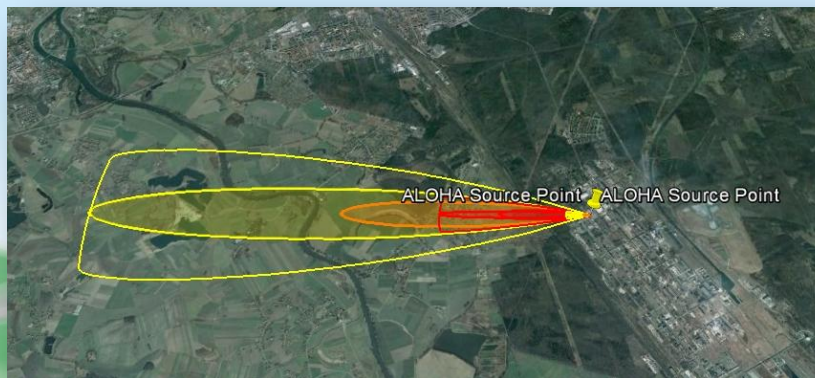
Factors of meteorological hazards:

- wind,
- precipitation,
- snowfall,
- thunderstorm,
- rime,
- glaze,
- synergy (meteorological factors).

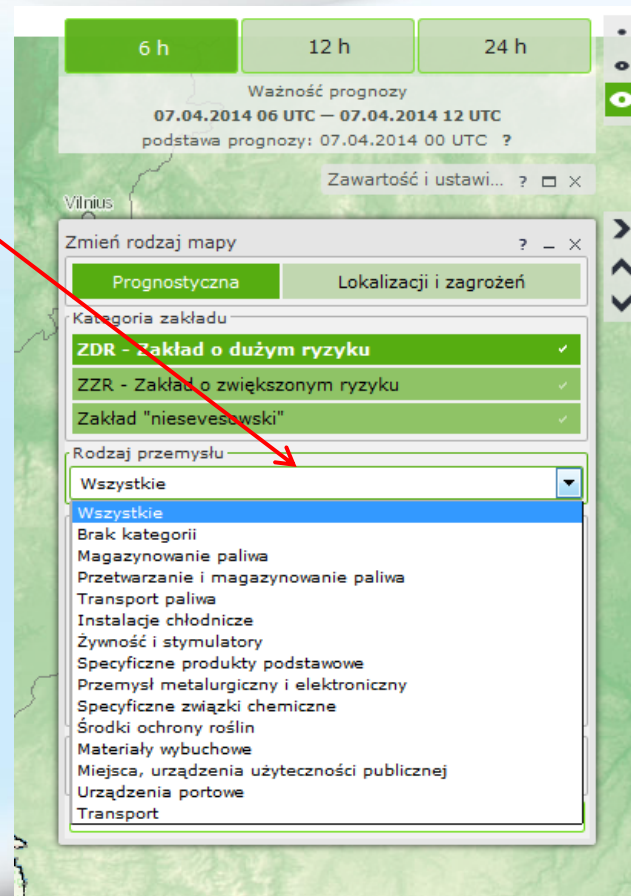
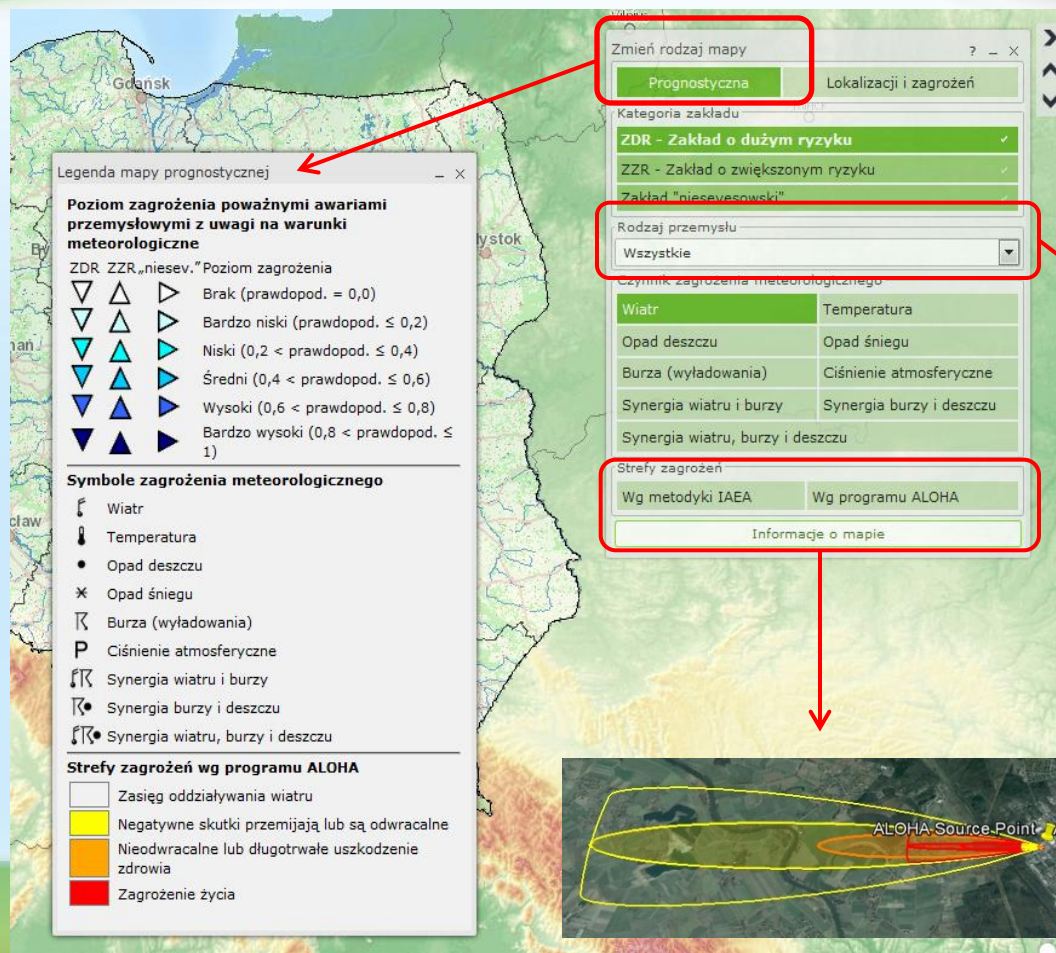
Hazard zones

Depending on the detail of the data obtained it was assumed that the hazard zone will be determined on the basis of:

- IAEA methodology - a simplified model (*International Atomic Energy Agency*),
- ALOHA software - accurate model.



Forecast map – example of Web - Portal



Historical maps (static maps) – example of Web-Portal

Zmień rodzaj mapy ? - X

Prognostyczna Lokalizacji i zagrożeń

Kategoria zakładu

- ZDR - Zakład o dużym ryzyku ✓
- ZZR - Zakład o zwiększonym ryzyku ✓
- Zakład "niebezpieczny" ✓

Rodzaj przemysłu

Wszystkie

Rodzaj mapy

Lokalizacja ZDR, ZZR i zakładów „niebezpiecznych”

Rodzaj zagrożenia

Poważne awarie przemysłowe

Poważne awarie przemysłowe z przyczyn meteorologicznych

Prawdopodobieństwo wystąpienia poważnej awarii przemysłowej z przyczyn meteorologicznych

Szczegóły

Wybierz zagrożenie

Wybierz zagrożenie

- Wybuch
- Pożar
- Chemiczne zatrucie środowiska
- Wyciek substancji chemicznych

Zmień rodzaj mapy ? - X

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Kategoria zakładu

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Rodzaj przemysłu

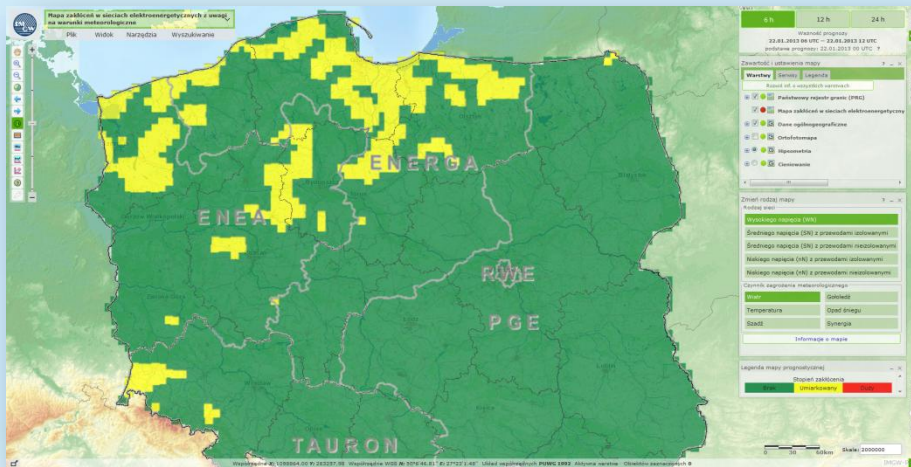
Wszystkie

Wszystkie

- Brak kategorii
- Magazynowanie paliwa
- Przetwarzanie i magazynowanie paliwa
- Transport paliwa
- Instalacje chłodnicze
- Żywność i stymulatory
- Specyficzne produkty podstawowe
- Przemysł metalurgiczny i elektroniczny
- Specyficzne związki chemiczne
- Środki ochrony roślin
- Materiały wybuchowe
- Miejsca, urządzenia użyteczności publicznej
- Urządzenia portowe
- Transport

The risk map of disruption in Polish Power System connected with meteorological threats - short characteristic

The risk map of disruption in Polish Power System connected with meteorological threats is to reflect a level of risk so probability of occurrence of undesired events – interferences in industrial and distribution power electric networks which may occur as a result of extreme meteorological phenomena which may cause breaks in transfer and delivery of electric energy to recipients and/or losses in technical infrastructure.



Selected power lines:

- high-voltage lines,
- distribution networks.

Factors of meteorological hazards:

- wind,
- temperature,
- snowfall,
- rime,
- glaze,
- synergy (meteorological factors).



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Thank you for your attention!

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