Groundwater monitoring in Poland and cross-border areas

Tomasz GIDZIŃSKI tomasz.gidzinski@pgi.gov.pl

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Polish Hydrogeological Survey - structure  www.psh.gov.pl

DIRECTOR, Polish Geological Institute

PGI Director for the PHS

WORKING TEAMS

Groundwater monitoring
Hydrogeological Data Bases
Groundwater Reserves
Prognosis, Analyses and Threats
Research Methods

Regional PHS Units in the PGI Regional Branches
IMPLEMENTATION OF THE EU DIRECTIVES
(Groundwater Bodies)

Groundwater Bodies Delineation

Groundwater Bodies Quality Status (2005)
GROUNDWATER MONITORING (830 observation wells, piezometers and springs)
Groundwater monitoring observations and surveys in the national network include measurements of the groundwater level and hydrogeochemical analyses.
Monitoring network design methodology

One of the hydrogeological stations in Poland - Granica near Warsaw

There are three observation wells in the station area:
- Oligocene aquifer - 1 well
- Quaternary aquifer - 2 wells
Wyposażenie otworu obserwacyjnego na stacji hydrogeologicznej w Zawoj

- szczelna obudowa studni z tworzywa sztucznego
- kabel zasilający pompę głębinową
- wodometr
- otwór rurki piezometrycznej
- kran do pobierania próbek wody
- kran na przewodzie odprowadzającym wodę z pompowania oczyszczającego
- wodowaz

Wyposażenie otworu obserwacyjnego

- studnia techniczna
- otwór 828 - I
- otwór 828 - II
- otwór 828 - III

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In about 150 selected observation wells the groundwater level and temperature have been automatically measured. Results of automatic measurements are registered and transmitted. Automatic measurements enable the selection of any frequency of the registration.
Development of automatic groundwater level measurements
Source of power - solar batteries
GPRS / GSM

Punkt pomiarowy

LAN Państwowego Instytutu Geologicznego

Aplikacja monitoringu
Sensors of groundwater level measurements
Groundwater monitoring networks in the boundary area of Poland
The organizing of groundwater monitoring network in the Polish boundary zone with Lithuania has been realized in the framework of the Polish Hydrogeological Survey activities and was launched in 2003.

The aforementioned task was set up in several stages. In the first stage, a group of existing drilled wells was selected with a view to incorporating them into the cross-border groundwater observation network. Further phases of groundwater monitoring network development within the boundary area provide for installation of the new observation wells.
Design of the groundwater transboundary monitoring network in the Polish-Lithuanian border area:

- Implementation of Water Framework Directive & State Water Law requirements regarding groundwater
- Design of representative groundwater monitoring network on regional (international) scale
- Conducting groundwater quality and quantity monitoring investigations
- Distinguishing and characterization of transboundary aquifers
- Recognizing of trends in groundwater chemical composition changes and groundwater level fluctuations resulting from human activities
### Groundwater observation wells in the border zone with Lithuania

<table>
<thead>
<tr>
<th>Observation well number</th>
<th>Locality</th>
<th>District/community</th>
<th>Statigraphy</th>
<th>Well depth [m]</th>
<th>Aquifer depth (top-bottom) [m]</th>
<th>GPS B</th>
<th>GPS L</th>
<th>River basin</th>
</tr>
</thead>
<tbody>
<tr>
<td>II/1239</td>
<td>Maszutkinie</td>
<td>Wiżajny/Suwalski</td>
<td>Quaternary</td>
<td>52.0</td>
<td>47.0 - &gt;52.0</td>
<td>542242.3</td>
<td>225719.7</td>
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<td>II/1240</td>
<td>Smolniki</td>
<td>Wiżajny/Suwalski</td>
<td>Quaternary</td>
<td>95.5</td>
<td>65.0 - 94.5</td>
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<td>Okliny</td>
<td>Wiżajny/Suwalski</td>
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<td>75.5 - &gt;90.0</td>
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<td>224908.0</td>
<td>Czarna Hańcza</td>
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<td>II/1245</td>
<td>Kukle</td>
<td>Giby/Sejny</td>
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<td>2.7 - &gt;31.0</td>
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<td>II/1248</td>
<td>Wigrańce</td>
<td>Sejny/Sejny</td>
<td>Quaternary</td>
<td>36.6</td>
<td>13.6 - &gt;36.6</td>
<td>540311.5</td>
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<td>II/1249</td>
<td>Stare Boksze</td>
<td>Puńsk/Sejny</td>
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<td>13.0 - &gt;36.0</td>
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<td>II/1255</td>
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<td>Sejny/Sejny</td>
<td>Quaternary</td>
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<td>6.0 - 62.0</td>
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<td>232401.8</td>
<td>Marycha</td>
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<td>II/1455</td>
<td>Poluńce</td>
<td>Puńsk/Sejny</td>
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<td>49.0 - &gt;78.0</td>
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<td>II/1456</td>
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<td>2.0 - 17.0</td>
<td>542059.5</td>
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Groundwater qualitative status
Groundwater monitoring network in the border zone with Ukraine
Groundwater monitoring network in the Polish-Belorussian border zone

Legend
- Hydrogeological boreholes
- River
- Country border
- Village
- City
- Forest
- Lake
NATO Pilot Study Project

Sustainable Use and Protection
of Groundwater Resources
Transboundary Water Management
The main goal of the project is to prepare an expert platform for discussion about rational groundwater management and the efficient way of protection of transboundary resources.
Thank you for your attention