

# SMART SURVEYORS FOR LAND AND WATER MANAGEMENT CHALLENGES IN A NEW REALITY

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Profession of land surveyors in the age of the technological revolution

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## Different definitions

### Geodesy

- Internationally is the science of measuring Earth as a planet, its geometric shape, size, movement, and orientation in space among other celestial bodies,

### surveying

- is the measuring activities to determine the positions, size, shape, and **legal status** of real estates





## The present of surveyors and geodesy

**surveying** - correct operation of the geodetic equipment, or even a correct activation of the equipment, while the measurements are taken without any active involvement of an operator

**surveying of the borders** of real estate properties or registered parcels of land:

not only what to survey, but also where to survey

**it is a huge experience, huge knowledge**



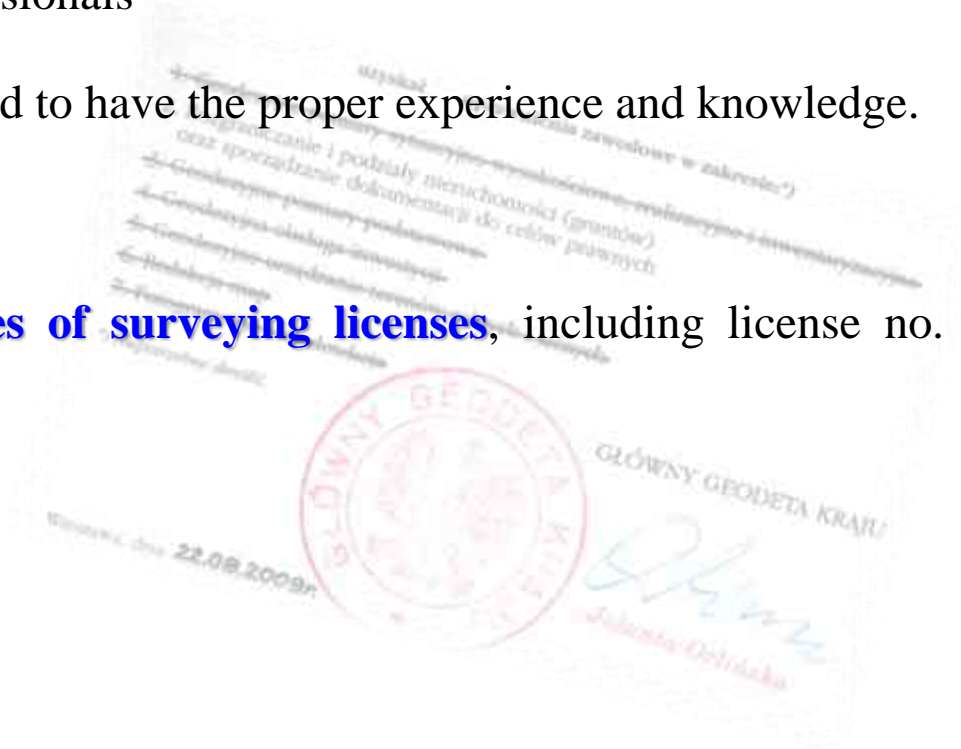


## Surveying Licenses

In many countries across the world, including Poland, geodetic surveys can only be performed by licensed professionals

who are confirmed to have the proper experience and knowledge.

In Poland, there are **7 types of surveying licenses**, including license no. 2 – one referring to border surveys





## Internet „highway” – portals, portals, portals..... race for a new geoportal

- local,
- regional,
- National

One of the most popular GEOPORTAL - established and maintained by the Surveyor General of Poland

**With a lot of data released**



The screenshot shows the homepage of the Geoportal Krajowy. The main navigation bar includes: O Geoportalu, Dane, Usługi, Aplikacje, Rejestry, Pomoc, Współpraca, Służba geodezyjna - Kontakt, Newsletter, and YouTube. The 'Aktualności' (News) section features three articles:

- 14.06.2021 Prawdziwa ortofotomapa („true ortho”) dla Gdyni i Sopotu.**  
Do państwowego zasobu geodezyjnego i kartograficznego przyjęliśmy prawdziwą ortofotomapę (tzw. „true ortho”) dla obszaru miast Gdynia oraz Sopot (ponad 200 km<sup>2</sup>). Prawdziwa ortofotomapa została opracowana ze zdjęć lotniczych z 2020 roku na zlecenie Urzędów Miast Gdyni oraz Sopotu. Prawdziwa... [Zobacz >](#)
- 11.06.2021 Ostatnia sesja szkoleniowa w projekcie POWER zakończona**  
W odbywającej się w dniach 7-11 czerwca 2021 r. sesji szkoleniowej z cyklu „Podnoszenie kompetencji cyfrowych e-administracji – działania edukacyjno-szkoleniowe dla użytkowników infrastruktury informacji przestrzennej – etap II” realizowanego w ramach Programu Operacyjnego Wiedza Edukacja... [Zobacz >](#)
- 10.06.2021 Posiedzenie Państwowej Rady Geodezyjnej i Kartograficznej**  
W formie wideokonferencji 10 czerwca 2021 r. odbyło się drugie w tym roku posiedzenie Państwowej Rady Geodezyjnej i Kartograficznej. Tematem wiodącym posiedzenia było: Funkcjonowaniem branży geodezyjnej w warunkach stanu zagrożenia epidemicznego – działalność gospodarcza, realizacja... [Zobacz >](#)

On the right side of the page, there are several promotional tiles for: Geoportal Krajowy, Geoportal 3D, Geoportal INSPIRE, Zasoby CAPAP, and Portal PZGiK (zakup danych on-line). At the bottom right, there is a banner for [www.LiczaSieKonkretly.gov.pl](http://www.LiczaSieKonkretly.gov.pl) and the logo for the Ministry of Infrastructure.



Statystyki odwiedzin - Widok

https://widok.gov.pl/statystyki/

widok.gov.pl **beta**

ENGLISH

## Statystyki odwiedzin

76 stron

6 295 użytkowników na naszych stronach

Liczba obieków na stronie: 10 25 50 100

Wyszyc

Popzednia 1 2 3 4 5 6 7 8 Nastepna

Koronawirus		2021		2020	
Uruchomiono:	b.d.	Liczba odwiedzin	20,32 mln	Liczba odwiedzin	39,32 mln
Instytucja:	Ministerstwo Cyfryzacji	Popularność	↑ 810%	Popularność	↑ 1434%
		Najpopularniejszy miesiąc:	Maj	Najpopularniejszy miesiąc:	Grudzień

biznes.gov.pl		2021		2020	
Uruchomiono:	b.d.	Liczba odwiedzin	5,67 mln	Liczba odwiedzin	10,19 mln
Instytucja:	Ministerstwo Rozwoju	Popularność	↑ 35%	Popularność	↑ 25%

CEIDG		2021		2020	
Uruchomiono:	b.d.	Liczba odwiedzin	5,56 mln	Liczba odwiedzin	10,94 mln
Instytucja:	Ministerstwo Rozwoju	Popularność	↑ 8%	Popularność	↑ 29%
		Najpopularniejszy miesiąc:	Czerwiec	Najpopularniejszy miesiąc:	Grudzień

Geoportal Krajowy		2021		2020	
Uruchomiono:	b.d.	Liczba odwiedzin	3,63 mln	Liczba odwiedzin	5,48 mln
Instytucja:	Główny Urząd Geodezji i Kartografii	Popularność	↑ 25%	Popularność	↑ 26%
		Najpopularniejszy miesiąc:	Czerwiec	Najpopularniejszy miesiąc:	Grudzień

obywatel.gov.pl		2021		2020	
Uruchomiono:	b.d.	Liczba odwiedzin	2,32 mln	Liczba odwiedzin	4,89 mln

Historia Pojazdu		2021		2020	
Uruchomiono:	b.d.	Liczba odwiedzin	2 mln	Liczba odwiedzin	3,75 mln

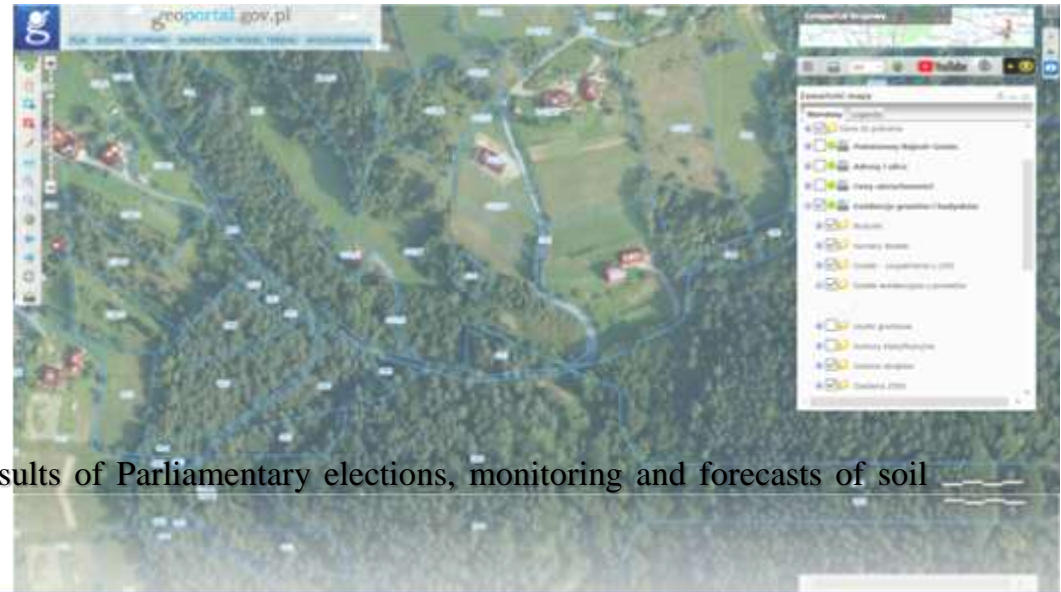


## The National GEOPORTAL

set up via WMS (Web Map Service) in Poland, features data included in other public portals.

### Included:

- land and building register, the infrastructural
- network register,
- the database of topographical objects (BDOT500 and BDOT10k),
- address points,
- geodetic matrices,
- State Border Register,
- State Register of Geographical Names,
- digital terrain model,
- digital surface model,
- orthophotomap,
- 3D models of buildings,
- planning concepts,
- prices and values register for real estates,
- enclosed areas,
- data from other public registers, as well as the results of Parliamentary elections, monitoring and forecasts of soil conditions, and many many more.....







**large amounts of data, as well as data redundancy,  
which should be avoided**

**The amount of data available on public web portals is enormous.**

**All web portals are available for all of us :**

**to the public, including surveyors,**

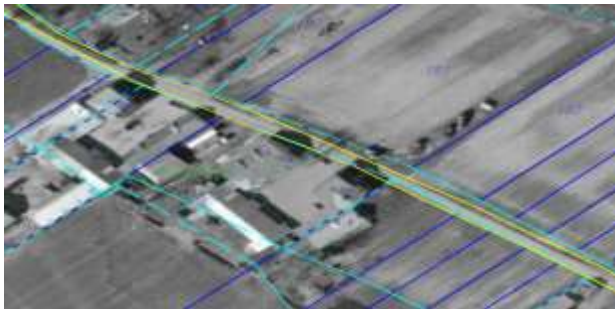
**for many sectors of the economy (builders, surveyors,  
architects, designers, etc.),**



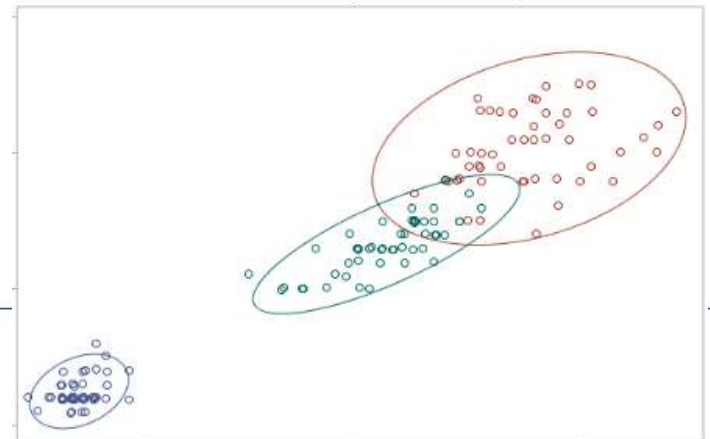


## the availability of portals creates other problems

- landowners can check the borders of any relevant real property, buildings, utilized area, and contours of soil quality class via public portals.
- often the data do not comply with accuracy / quality requirements.
- some borders can originate from the vectorization of cadastral maps, whose purpose is to establish spatial databases or to help transfer funds of direct agricultural support.
- they do not originate from source materials on which the register is based;



95% Prediction Ellipses for Each Group





## the availability of portals creates other problems

When cooperating with a land surveyor, a land owner expects that the borders found on the GEOPORTAL are reflected in real life.

While performing his work, however, a surveyor is bound by the source documents, which he tries to explain to the real property owner.

This is one of the reasons for conflicts not only at the interface between a surveyor and a landowner, but also between land owners.





## education

- At the same time, due to unlimited access to higher education, both private and public, there are too many surveyors on the market.
- There are above 20 000 licensed surveyors in Poland.
- This situation translates into low prices of geodesic services owing to limited number of contracts and too many providers.



## New generation of equipment

- General accessibility of increasingly accurate surveying methods is another factor which prompts **a future redefinition of the profession of a surveyor.**
- An accuracy range of several dozen centimeters can be obtained with a plain smartphone with which measurements can be performed using GPS, Glonass, Galileo or BeiDou satellites,
- increasing the accuracy range to up to a few centimeters.



such as R1 Trimble or PPM 10 XX, increases the accuracy range to up to a few centimeters



## 1. Summary

- The profession of a surveyor, and especially a cadaster surveyor, requires extensive technical and legal expertise. However, due to the technological progress, the expectations towards surveyors have been changing.
- Increasingly, surveyors are no longer seen as professionals who are able not only to perform measurements of spatial objects, but also to obtain, analyze, and process archival data, or data originating from various sources. Owing to the general availability of geoportals which feature enormous amounts of spatial data, and a broad access to increasingly accurate measurement data, surveyors are more and more often expected to interpret the available spatial data.
- Surveying activities are increasingly often performed by individuals who are not educated surveyors, while surveyors are only engaged when a problem emerges and needs to be clarified, or whenever their involvement is legally required.
- It can be expected that, in the near future, surveyors will be marginalized and eliminated from assignments in some market sectors, such as construction, measurements of soil masses, or agricultural surveying. It is no longer required to master complex technologies in order to perform an accurate measurement, as measurements are taken automatically by contractors. Legal regulations can delay this process, but it cannot be entirely eliminated.
- The role of a surveyor dealing with a real estate cadaster appears to be slightly different. Here, archival data needs to be analyzed in the context of legal provisions or technologies which are a thing of the past, and therefore automatization or artificial intelligence can be of no use in some cases.



- Thank you for your attention

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