

HYDROGRAPHIC SURVEYS OF WISLOUJSCIE FORTRESS AREA

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ABSTRACT

In the close vicinity of the Westerplatte peninsula lies a unique fortification monument - the Wisłoujście Fortress. The name Wisłoujście (the mouth of the Vistula) dates back to the time when the Vistula had its estuary north of the Wisłoujście Fortress. The site was an area of strategic importance as it gave control of ships moving into and out of Gdańsk.

The Fortress is surrounded by shallow water. Hydrographic surveys are important because of navigation safety of small ships and yachts and they are difficult because of limited maneuverability of sounding vessel and limitations in positioning. Results of hydrographic surveys of Wisłoujście Fortress have been presented.

INTRODUCTION

Hydrographic surveys have been done in one of areas close to Wisłoujście Fortress using small sounding vessel equipped with:

- singlebeam hydrographic echosounder Simrad EA400 using 38 kHz and 200 kHz acoustic waves,**
- sidescan sonar Simrad EA400 with 200 kHz acoustic wave,**
- DGPS receiver CSI GBX.**

Sound speed in water has been determined on the basis of temperature measured in the echosounder's transducer. Water level was linked to water-level indicator located in Gdansk harbour master's office.

SOUNDING AREA

Sounding area, presented in Fig.1, is limited by fortress' walls. There is a part of waterway for yachts and small vessels mooring opposite to sounded area and at the end of northern wall of the fortress. Water is very shallow, so regular soundings are important because of navigation safety.

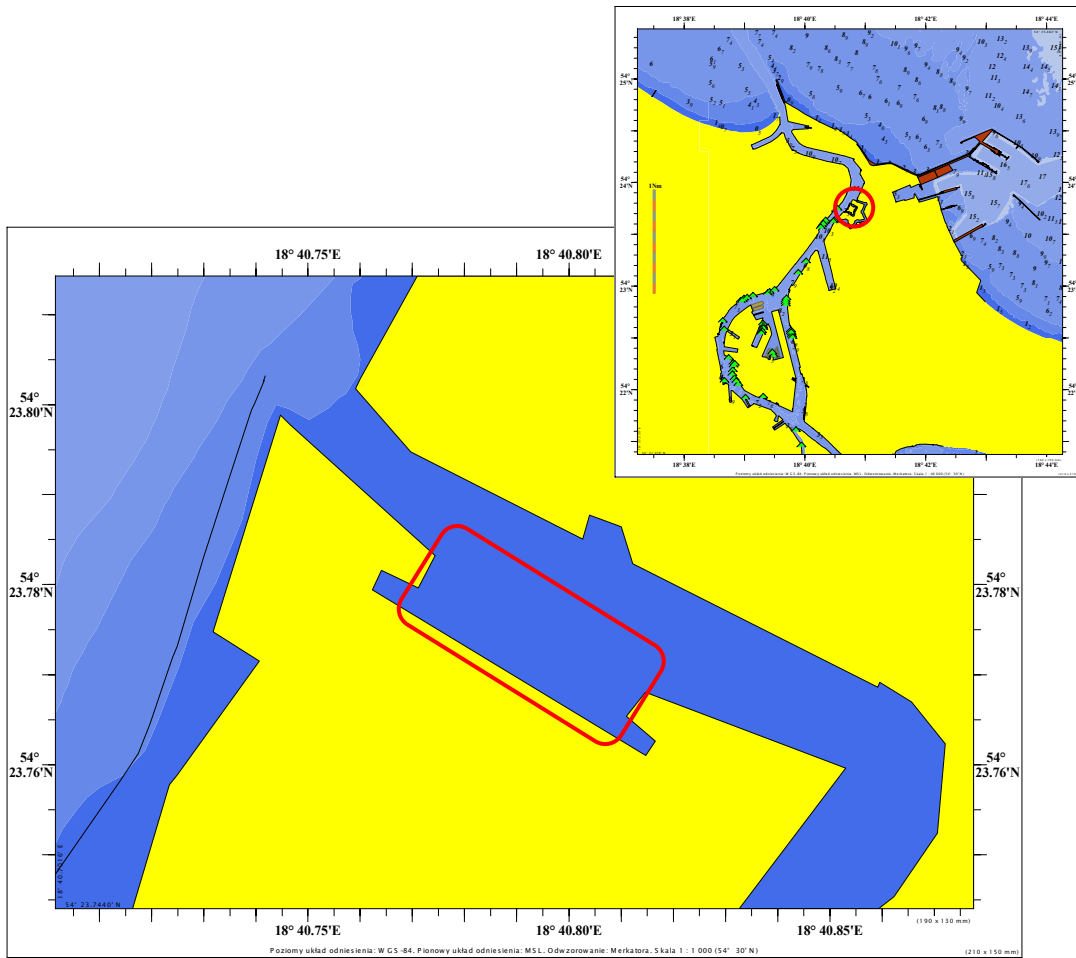


Fig. 1. Sounding area.



Fig. 2. Sounding area in Wisloujscie Fortress.



Fig. 3. Sounding area in Wisloujskie Fortress.

ACCURACY REQUIREMENTS

Minimum standards for hydrographic surveys of special order (areas where under-keel clearance is critical) according to S-44 [1]:

- accuracy of positioning – 2 m,
- accuracy of depth measurements – 25 cm,
- full sea floor search - required,
- feature detection – cubic features $> 1 \text{ m}^3$

have been met using above-mentioned equipment. Echogram of singlebeam echosounder and sonogram of sidescan sonar have been presented below.

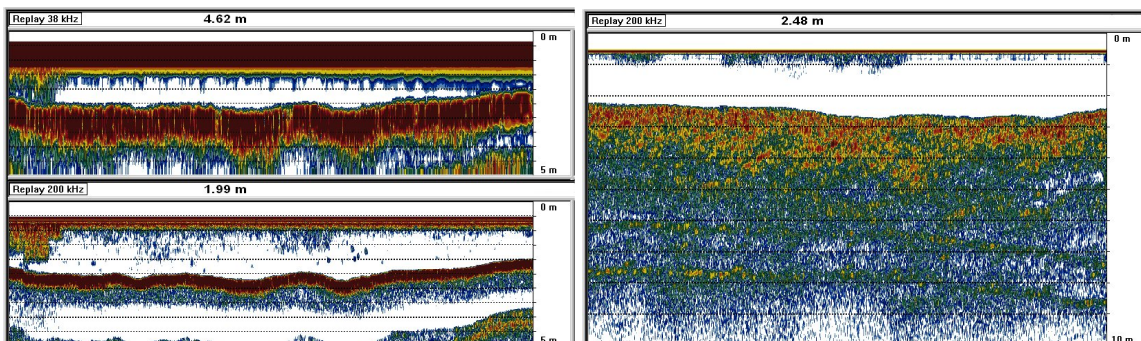


Fig. 4. Singlebeam echosounder's echogram (left) and sonogram (right).

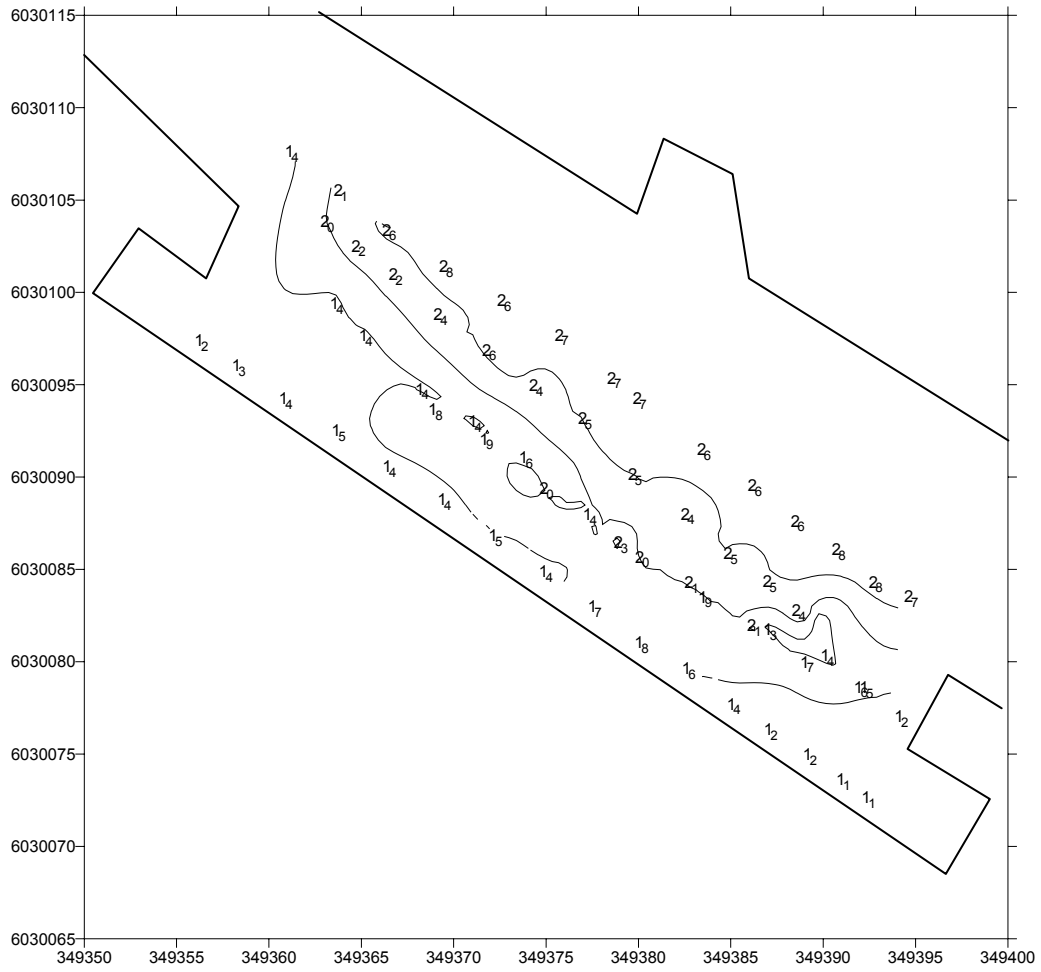


Fig. 5. Bathymetric sheet of Wisloujskie Fortress in UTM projection.

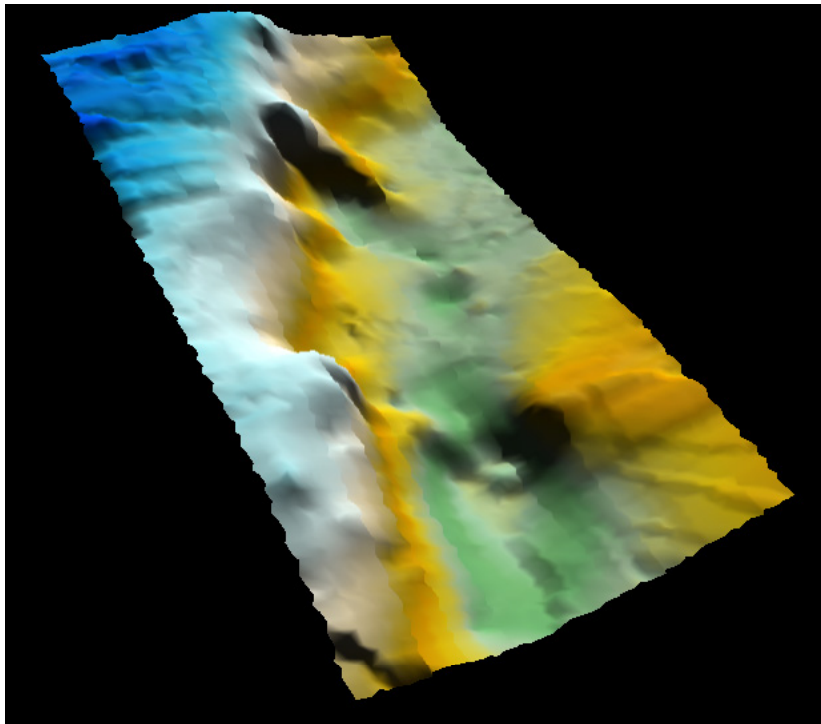


Fig. 6. Spatial presentation of sounded area.

CONCLUSIONS

Presented area is difficult in sounding and navigation. Soundings can be realized by small hydrographic vessel with 35 cm draught because of very shallow water and small area. Positioning is difficult because of high walls of the fortress. Co-ordinates of coast line can be obtained from the chart or ENC (Electronic Navigational Chart) cells encoded in S-57 standard.

Hydrographic surveys are realized periodically for ensuring the navigation safety. The area presented in this paper is one of many harbour areas in Gdansk and Gdynia harbours in S-44 Special Order with high accuracy measurements requirements.

REFERENCES

IHO Standards for Hydrographic Surveys, Special Publication No. 44, International Hydrographic Organization, Monaco 2008.

