



# XXVII FIG CONGRESS

11-15 SEPTEMBER 2022  
Warsaw, Poland

Volunteering  
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Geospatial excellence  
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## Hydrography education in Geodesy courses – case study in Maritime University of Szczecin

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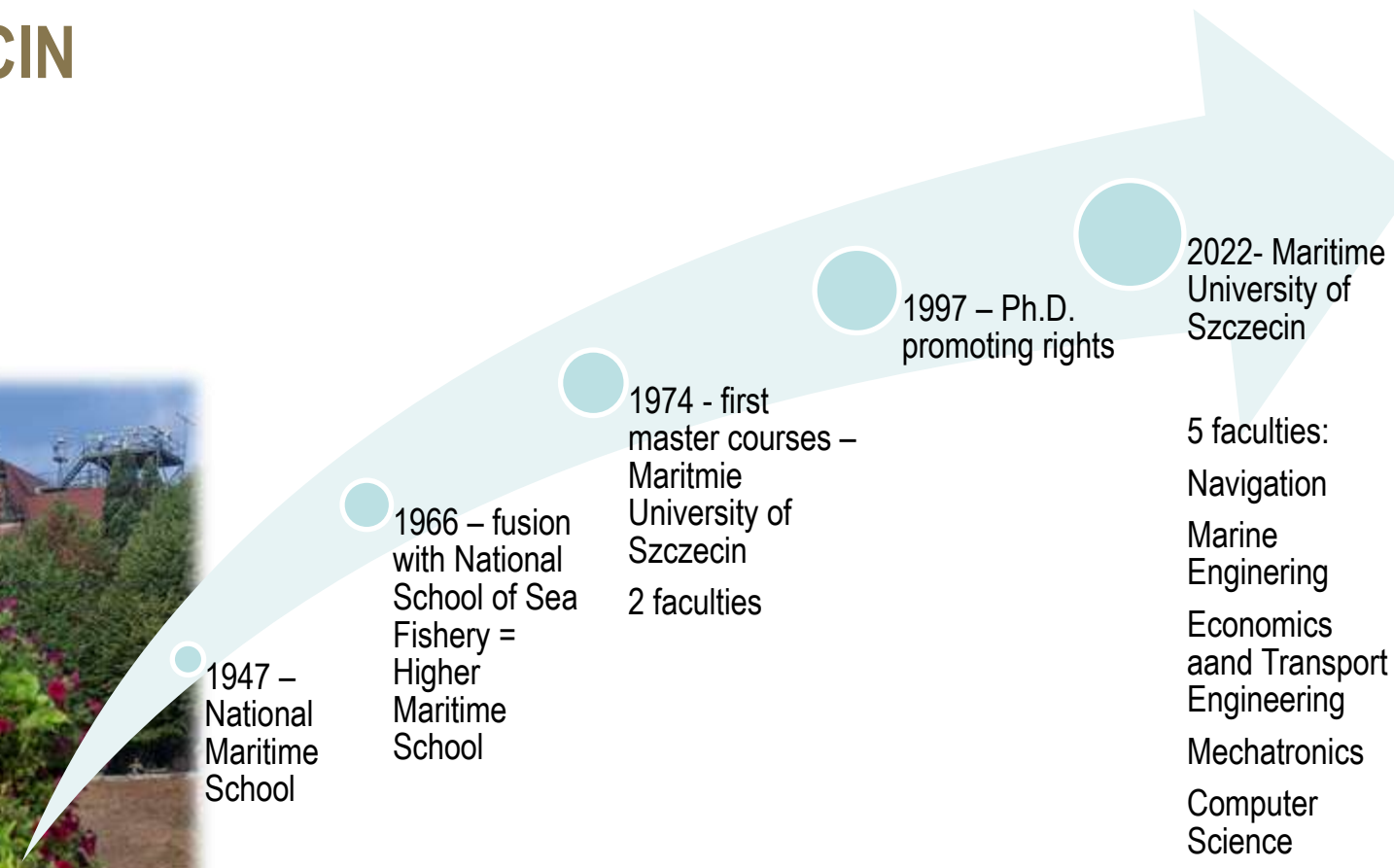
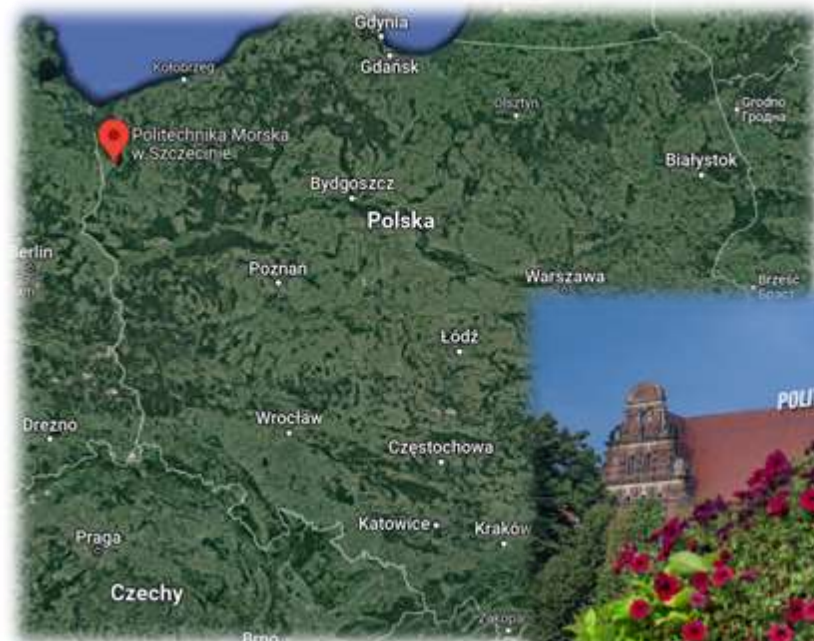
## INTRODUCTION - THE STORY

- The school that became the University
- The enthusiasts that wanted to teach Hydrography
- The greed for knowledge
- The equipment
- The standards
- The passion for providing hydrography to the new generation

## HYDROGRAPHY AND GEODESY

- The relationship between geodesy and hydrography is ambiguous as the views on these terms and their definitions have been changed over time and within organizations
- NOAA: Geodesy - “the science of accurately measuring and understanding the Earth's geometric shape, orientation in space, and gravity field”
- NOAA: Hydrography – „the science that measures and describes the physical features of the navigable portion of the Earth's surface and adjoining coastal areas”
- Summing up it can be said that hydrographic surveying can be treated as a kind of specialized geodetic surveying
- Therefore, it seems that hydrographic education can be treated as a specialized case of subject of Geodesy

## MARITIME UNIVERSITY OF SZCZECIN



5 faculties:  
Navigation  
Marine Engineering  
Economics and Transport Engineering  
Mechatronics  
Computer Science

## HYDROGRAPHY EDUCATION IN MUS

2000

specialty of Hydrographic  
Survey and Navigational  
Aids in

degree course of  
Navigation (STCW  
standard)

2008

new degree course of  
Geodesy and Cartography  
with module  
Hydrography

2018

Specialty of Hydrography  
in  
Degree course of Geodesy  
and Cartography

2019

HOPN Certification  
that the program fulfills  
requirements for teaching  
at “A” category level

## REQUIREMENTS FOR TRAINING OF HYDROGRAPHIC SURVEYORS

- IMO does not make any requirements due to hydrographic surveyors training processes or getting diploma, only calls on the members to conduct hydrographic surveying in the most modern and accurate way and to keep nautical charts and other aids to navigation up-to-date
- IHO - education and training of hydrographic surveyors is treated as one of the key issues
- IHO, together with FIG and ICA have established International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC)
- However the requirements for training programs for hydrographic surveyors and their categories are elaborated solely by IHO itself
- Theoretical and practical scope related to the training of both A and B category hydrographers is strictly defined by the S-5 Standards of Competence for Category "A" (or "B")

## REQUIREMENTS FOR TRAINING OF HYDROGRAPHIC SURVEYORS

- a person with category "A" qualification can work as a specialist in government, industrial or academic institutions and is able to supervise and approve the hydrographic measurements
- a person with "B" category is a person who is specializing in providing products and services in accordance with the required specifications, and whose work is supervised and approved by "A" category hydrographer
- Poland's representative in IHO and its committees and groups is the Hydrographic Office of the Polish Navy (HOPN)
- Chief of HOPN issues A and B category certificates for surveyors
- Chief of HOPN can grant the Institution with the certificate of compliance with "A" or "B" category education requirements

## SUMMARY OF TEACHING PROGRAMME FOR CERTIFICATION

- Graduates receives the degree of Bachelor of Science (Engineer) in Geodesy and Cartography with the specialty of Hydrography
- 2 605 teaching hours within 7 semesters (3,5 year)
- 1 050 hours are lectures, while 1 300 hours are laboratories and exercises in which student learns how to solve practical problems and how to carry out practical tasks, on top of it there are 255 hours of projects in various courses focusing mostly on practical work
- Specialty subjects cover more than 500 hours, including 330 hours of laboratories and projects
- Proposed degree course is a complex and multidisciplinary approach to educate universal hydrographic surveyor, who is able not only to maintain hydrographic surveys, but also to perform land surveys and understand basic navigational constraints



## CHALLENGING REQUIREMENT – FIELD PROJECT

- Programmes must include a supervised and evaluated Complex Multidisciplinary Field Project with a minimum aggregate period of at least four weeks
- different aspects of hydrography in a complex environment with varying sea-floor and oceanographic conditions
- does not include the practical exercises that form a part of the course modules syllabi and are designed to complement the theory component
- The measurement part is covered during one-week stay on board of research ship Navigator XXI and other surveys are gathered during projects on the boat Hydrograf XXI
- Data processing is then performed during other projects
- In such way each student performs a unique complex and multidisciplinary project during teaching process in which he/she is performing typical works of hydrographer starting from campaign planning through the surveying up to post-processing and final products preparation

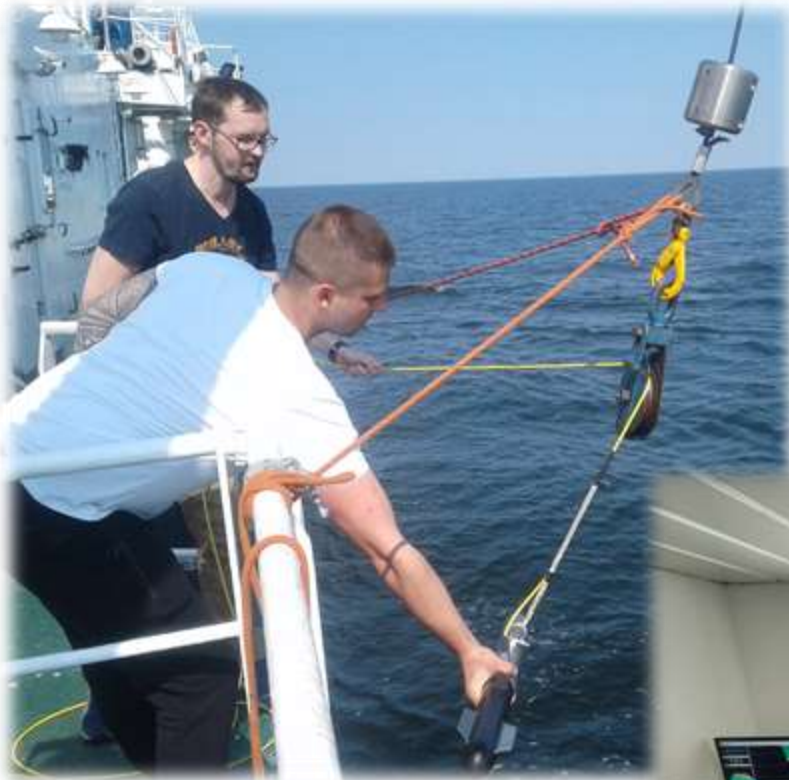
## THE EQUIPMENT



- **Multibeam echosounder** EM 710
- **Sidescan/tow sonar** Edgetech 272-TD
- **Sub-bottom profiler** Edgetech SB-216S
- **Magnetometer** SeaSpy Marine
- **ROV** Offshore Hyball
- **CTD sounder** HMS 1820
- **Software** Qinsy Survey, Hypack

- **Multibeam echosounder** GeoSwath Plus
- **Singlebeam echosounder** EA400
- **Sidescan/tow sonar** Edgetech 4125
- **Scanning sonar**MS1000
- **ROV** VideoRay Explorer
- **Sonda SVP** Valeport
- **GPS/RTK Receiver** Trimble
- **Software** Caris HIPS&SIPS, Caris BDB, S-57 Composer

## STUDENTS AT WORK



## STUDENTS AT WORK



## DISCUSSION AND CONCLUSIONS

- Teaching hydrography is an important task of education systems nowadays – we need high quality hydrographer's products
- We have been teaching hydrography for more than 20 years already in Maritime University of Szczecin and during this time we have tested various models and methods for this education
- Many IHO requirements are reflected in geodesy subjects and as so there is more time for teaching specialized hydrographic issues in dedicated courses
- Plans:
  - IHO Certification
  - Master course on hydrography or/and offshore



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