Internship offers

Erasmus+

UNIVERSITY OF ZIELONA GÓRA

INSTITUTE OF ENVIRONMENTAL ENGINEERING
University of Zielona Góra

Institute of Environmental Engineering
University of Zielona Gora

INSTITUTE
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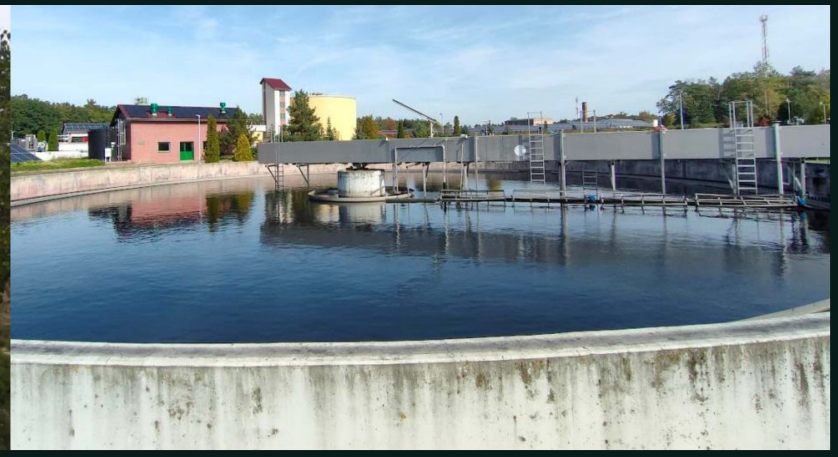
ENGINEERING
University
of Zielona Góra

1. Pipes, networks, energy efficiency
2. Environmental design and land reclamation
3. Water, wastewater and waste technology





The **Institute of Environmental Engineering** at the **University of Zielona Góra** has been actively involved in national and international projects for many years. We are one of the oldest and most experienced institutes of the University.

Various specialised research teams deal with analytical, research and design dilemmas. We teach and research, in the field, at the computer and in the laboratory.

Please proceed to the next slides to discover the possibilities of a internship in the Erasmus+ programme.

Pipes, networks, energy efficiency

Marzena Jasiewicz, PhD Eng.

DISCIPLINE:

- Environmental Engineering

SCIENTIFIC INTERESTS:

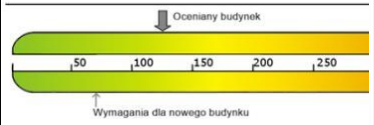
- alternative energy sources,
- interior installations,
- physics of buildings.

Reduced carbon emissions and improved environmental sustainability

The aim of the project is to develop a comprehensive approach to balancing renewable energy sources and estimating their potential for heating applications. This will involve selecting, calculating, and designing appropriate technological systems that utilize renewable energy sources (RES) effectively.

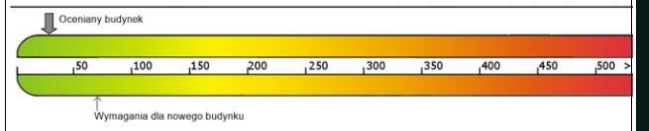
Ocena charakterystyki energety	
Wskaźniki charakterystyki energetycznej	**Oceniany bu**
Wskaźnik rocznego zapotrzebowania na energię użytkową	EU= 226,0 kWh
Wskaźnik rocznego zapotrzebowania na energię końcową [11]	EK= 579,5 kWh
Wskaźnik rocznego zapotrzebowania na nieodnawialną energię pierwotną [11]	EP= 125,1 kWh
Jednostkowa wielkość emisji CO_2	E_{CO_2}= 0,001 $CO_2/(m^2 \cdot r$
Udział odnawialnych źródeł energii w rocznym zapotrzebowaniu na energię końcową	U_{OZE}= 99,4

Wskaźnik rocznego zapotrzebowania na nieodna



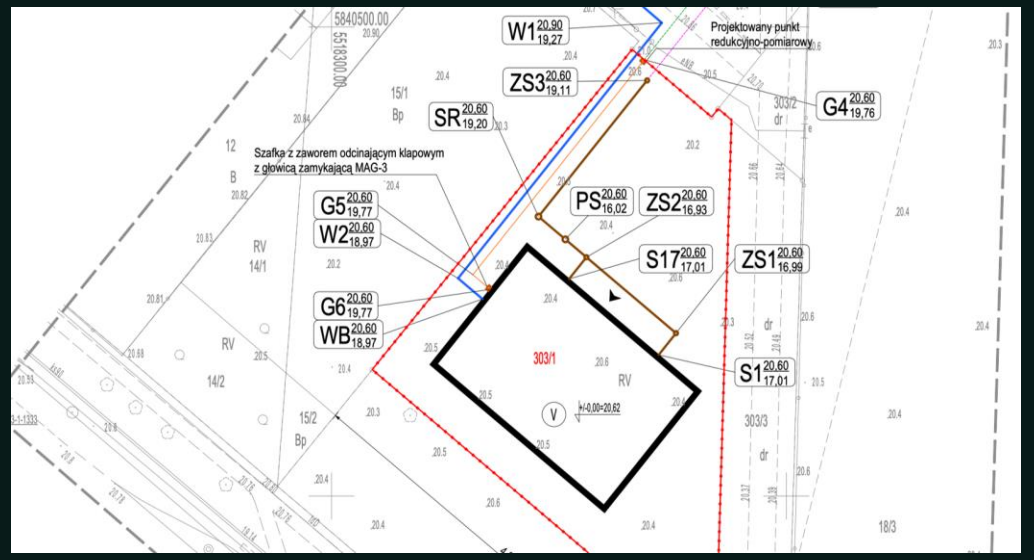
Ocena charakterystyki energetycznej budynku [10]		
Wskaźniki charakterystyki energetycznej	**Oceniany budynek**	**Wymagania dla nowego budynku według przepisów techniczno-budowlanych**
Wskaźnik rocznego zapotrzebowania na energię użytkową	EU= 58,7 kWh/(m^2·rok)	
Wskaźnik rocznego zapotrzebowania na energię końcową [11]	EK= 129,2 kWh/(m^2·rok)	
Wskaźnik rocznego zapotrzebowania na nieodnawialną energię pierwotną [11]	EP= 28,9 kWh/(m^2·rok)	EP= 70,0 kWh/(m^2·rok)
Jednostkowa wielkość emisji CO_2	E_{CO_2}= 0,00037 t $CO_2/(m^2$·rok)	
Udział odnawialnych źródeł energii w rocznym zapotrzebowaniu na energię końcową	U_{OZE}= 99,50%	

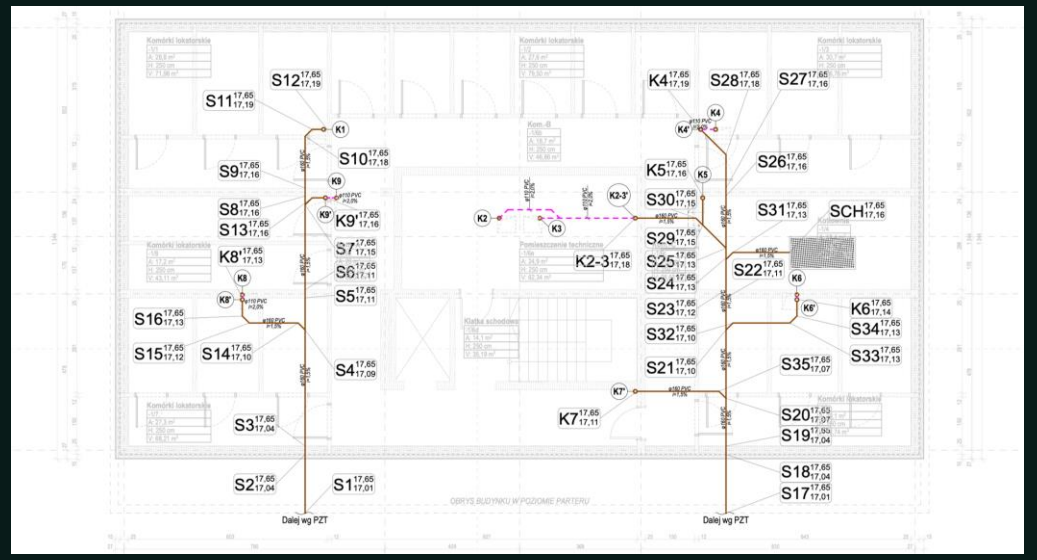
Wskaźnik rocznego zapotrzebowania na nieodnawialną energię pierwotną EP [kWh/(m^2·rok)]



The functionality of interior installations

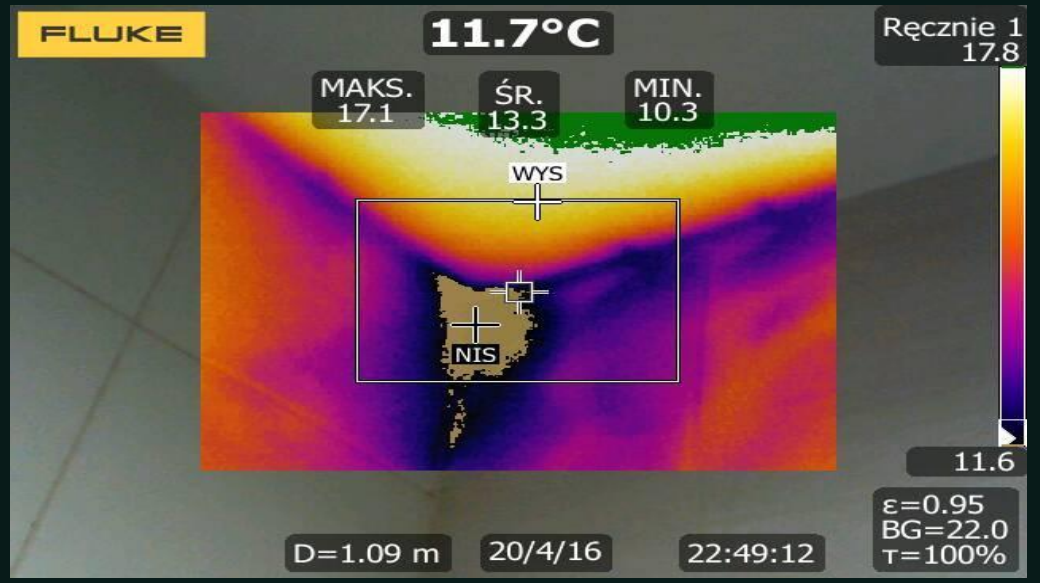
The aim of the project is to design a comprehensive water and sewerage system for a multi-family building. This system will encompass the following key components

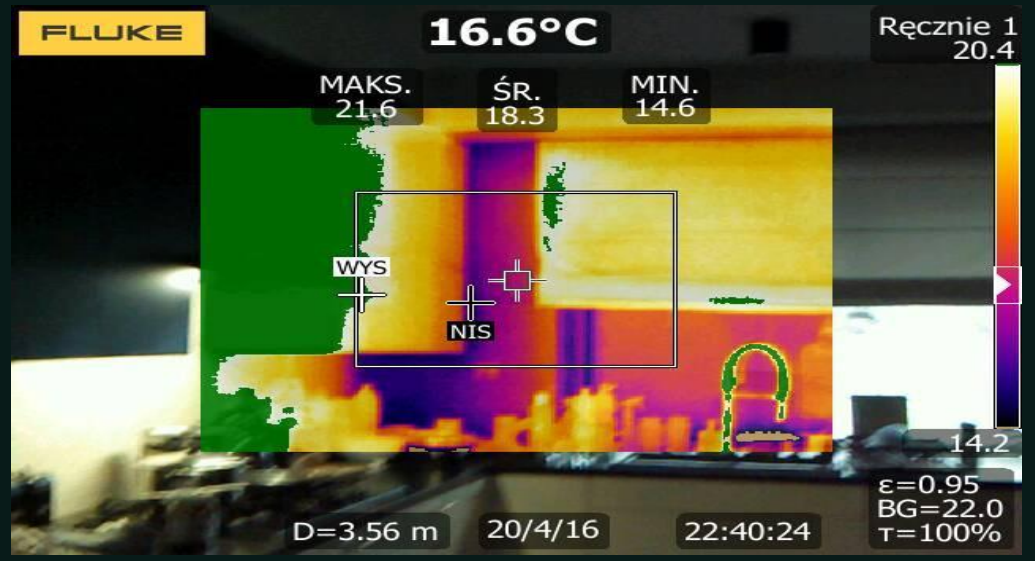




The severity of air infiltration and heat loss

The aim of the project is to identify and locate thermal bridges and installation leaks in buildings using a thermal camera. Thermal bridges are areas in a building envelope where heat can escape more easily than in surrounding areas, leading to energy loss and potential condensation problems. Installation leaks, such as those around windows, doors, and pipes, can also cause significant energy loss and moisture intrusion.





Ewa Ogiołda, PhD Eng.

DISCIPLINE:

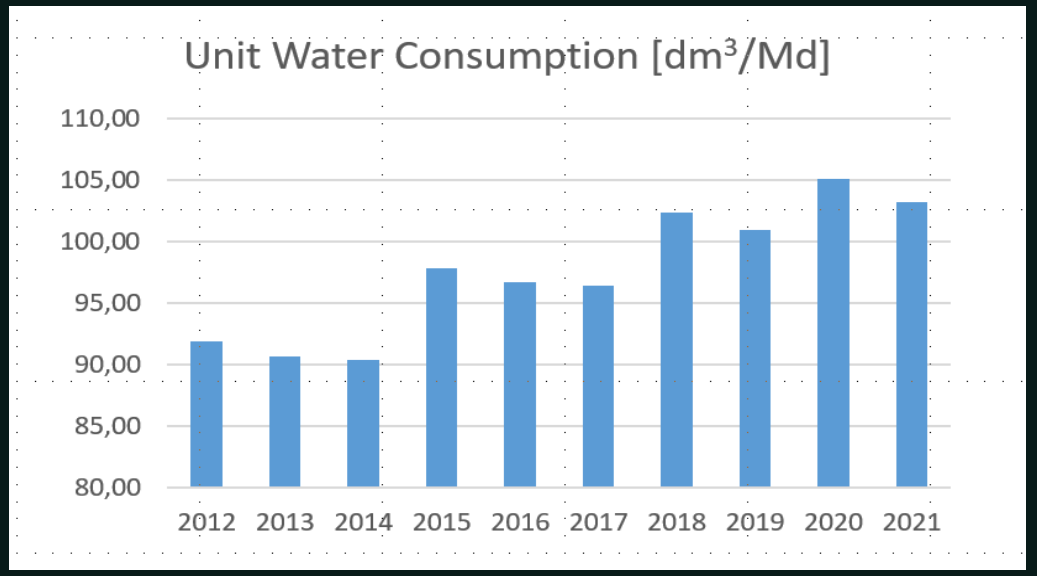
- Environmental Engineering

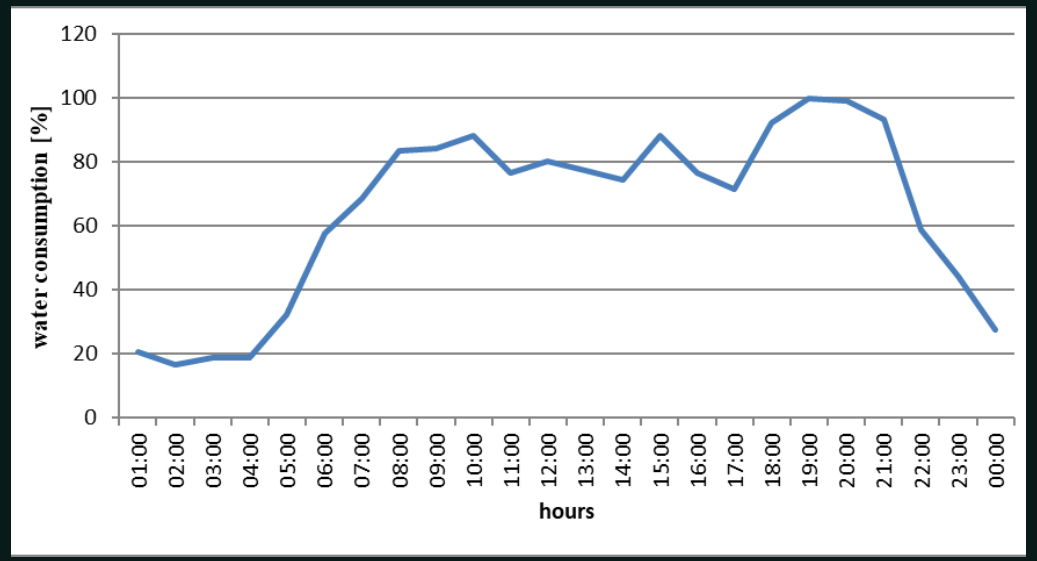
SCIENTIFIC INTERESTS:

- water supply,
- trenchless technologies.

Water consumption characteristic (volume and irregularity)

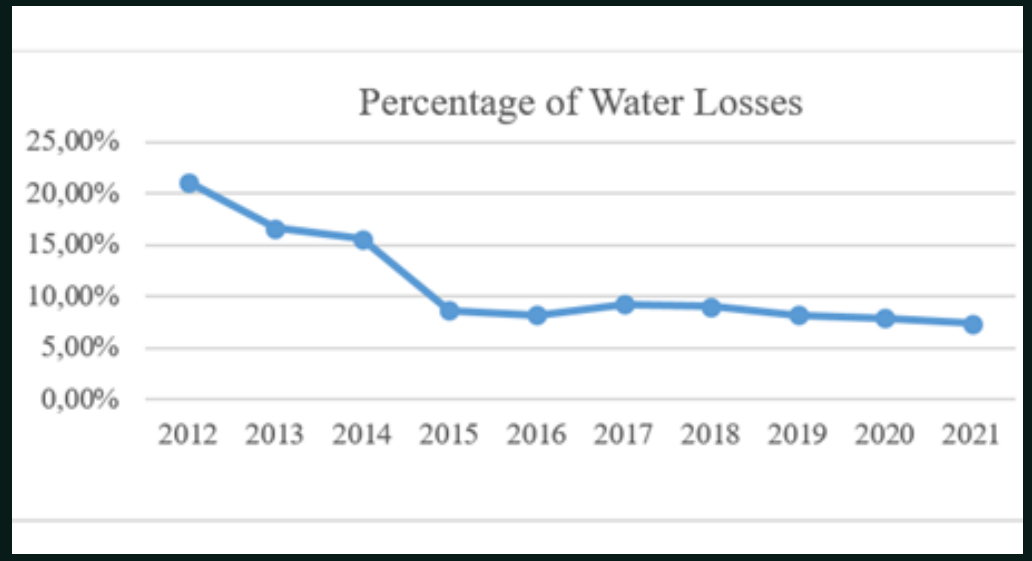
The aim of the study is to determine unit water consumption rates and irregularity coefficients for different time intervals. The calculations are based on a selected settlement unit.





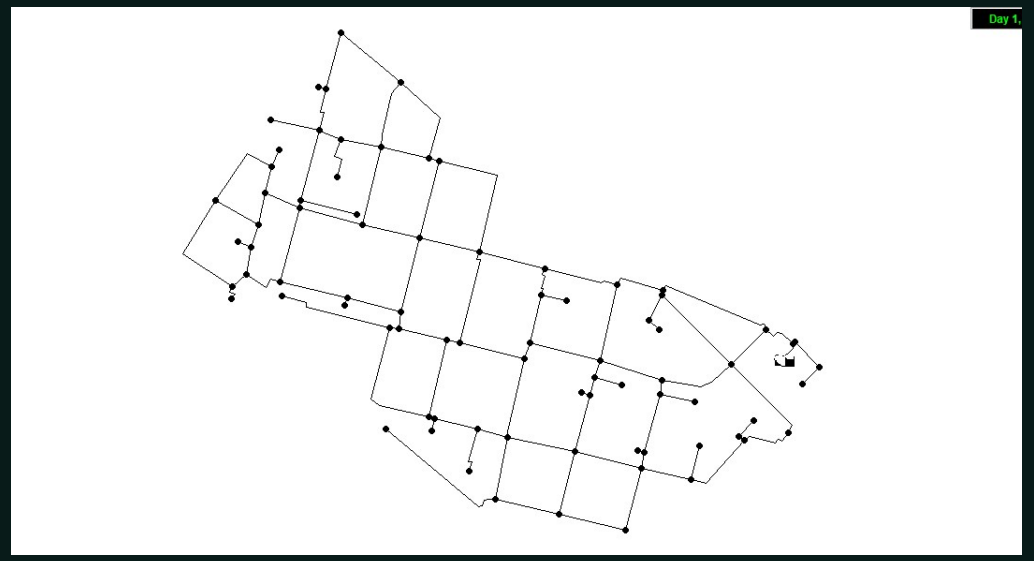
Causes and magnitude of water losses

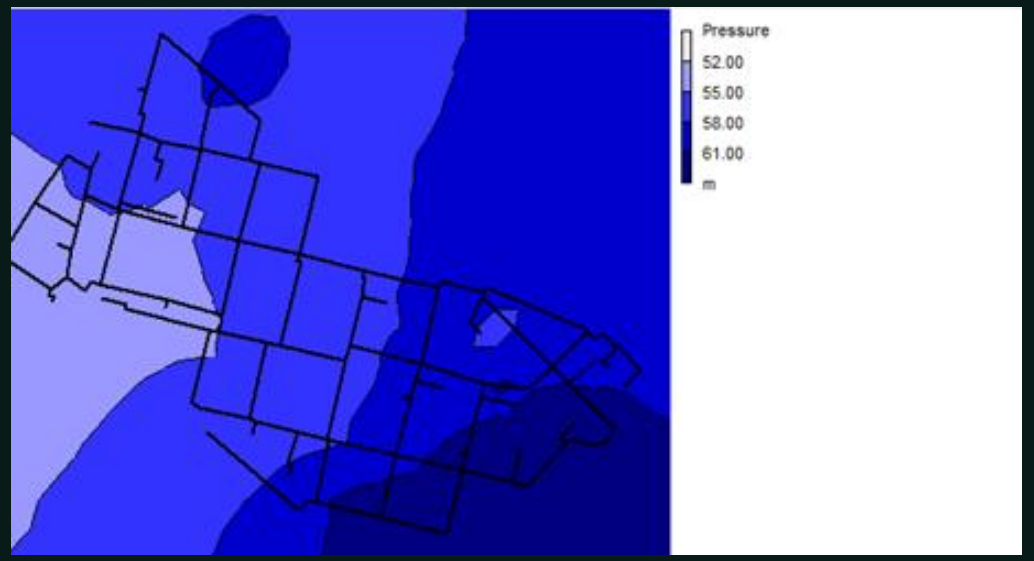
The study aims to identify why water is being lost in a chosen settlement's water supply network, how much water is being lost, and ways to reduce this loss. Another task is to perform an economic analysis of the project.



Calculation of water supply systems parameters

The goal of this research is to figure out the details of the water supply system for a community by using a simulation model created in the EPA-NET software. Creating the model is the first step in determining the parameters of the current condition, and also allows for simulation calculations for various network load options.





Ireneusz Nowogoński, PhD Eng.

DISCIPLINE:

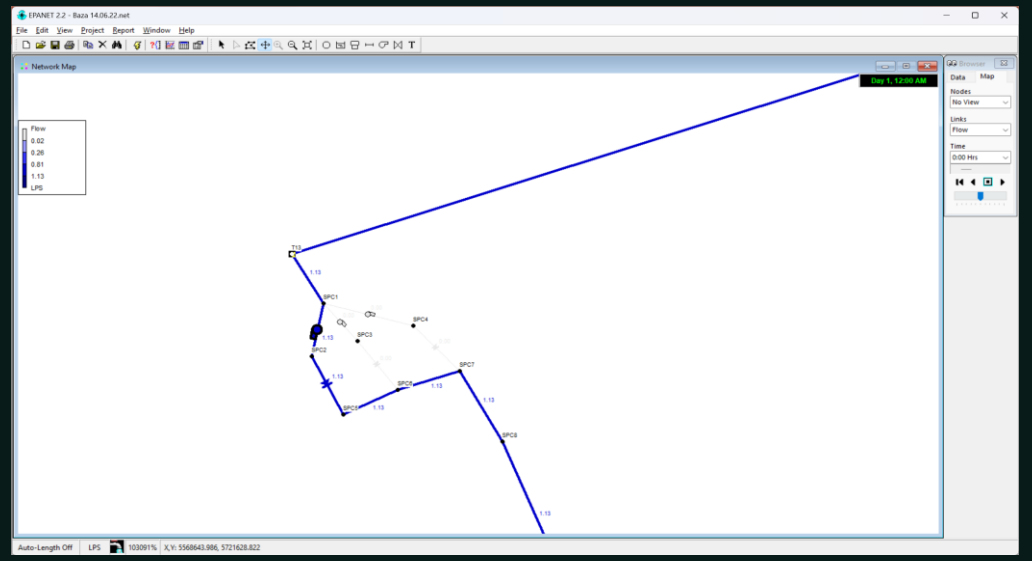
- Environmental Engineering

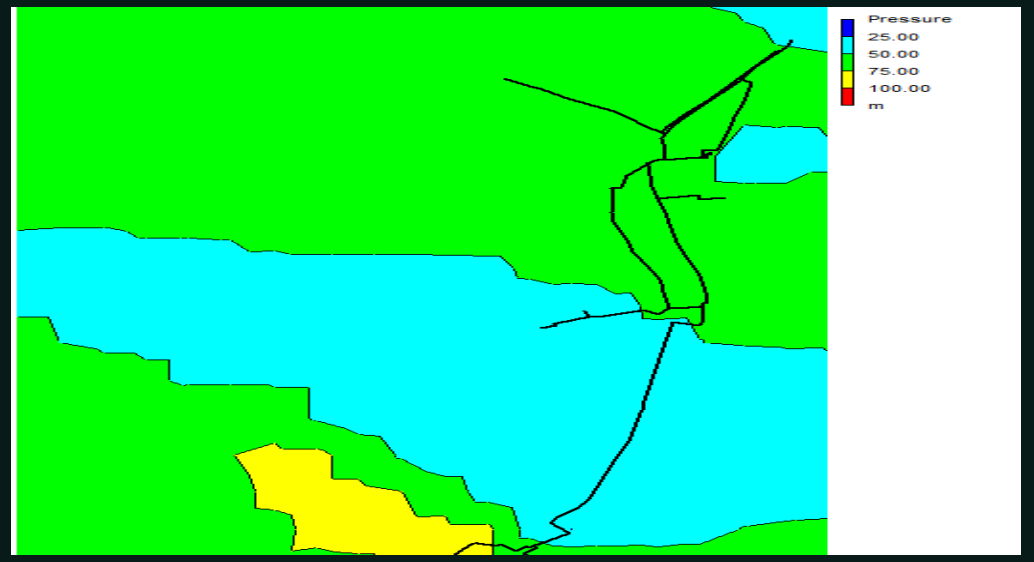
SCIENTIFIC INTERESTS:

- water supply,
- urban hydrology.

Modern simulation methods for water supply systems including inventory results, nodal distribution estimation methods

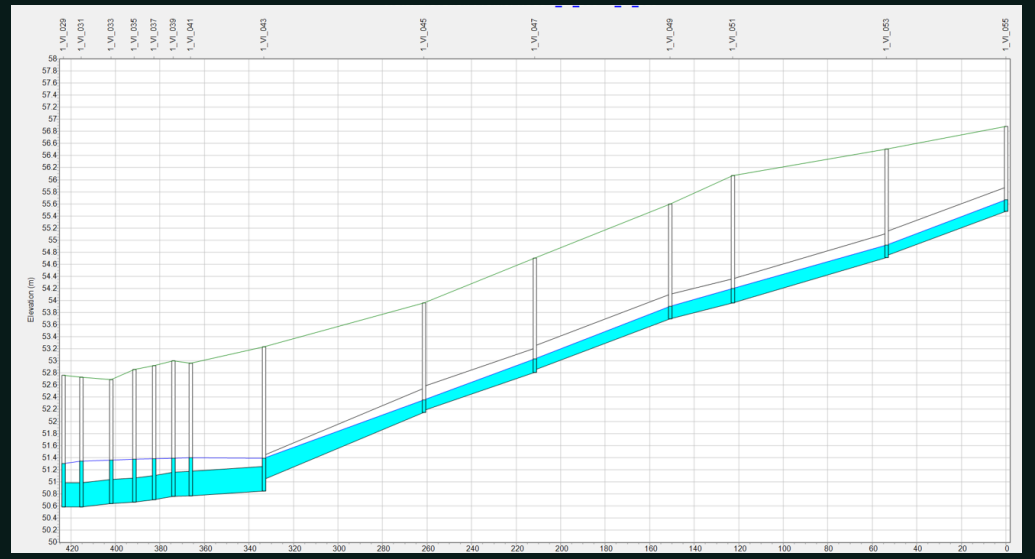
The scope of the work includes the development or upgrade of a simulation model of water supply system. The model will be tested against other models or field measurement results.





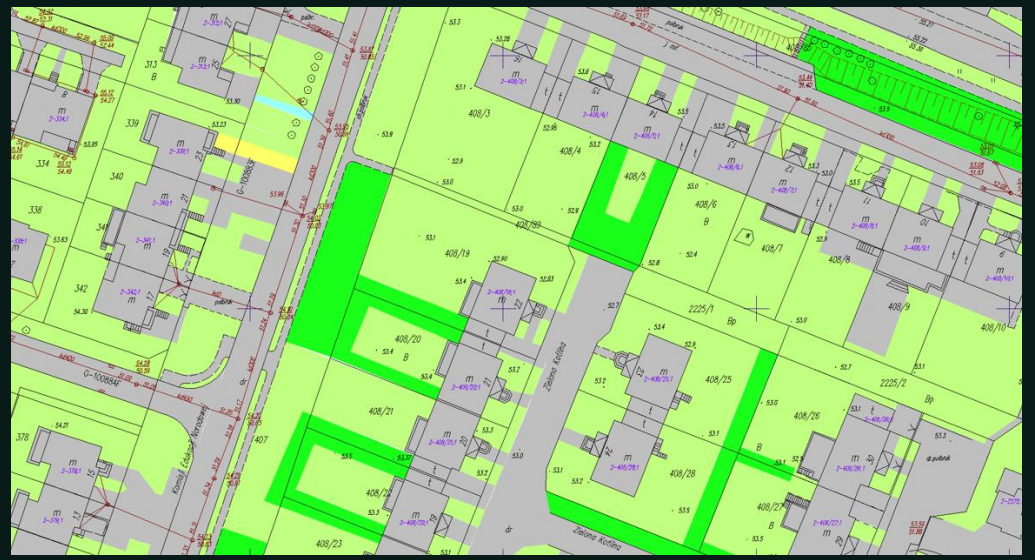
Modern simulation methods for sewerage systems including analysis of rainwater catchments and typical sewerage network facilities

The scope of the work includes the development or upgrade of a simulation model of a selected rainwater catchment with a stormwater drainage system. The model will be tested against other models or field measurement results. The scope of work may also include analysis of rain gauge data.



Preparation of simulation models of a selected urbanised area

The scope of the work includes the development of a simulation model of a selected rainwater catchment with a stormwater drainage system. The model will be based on a detailed inventory based on maps and local inspections of the analyzed areas.



Katarzyna Kubiszyn, MSc Eng.,

DISCIPLINE:

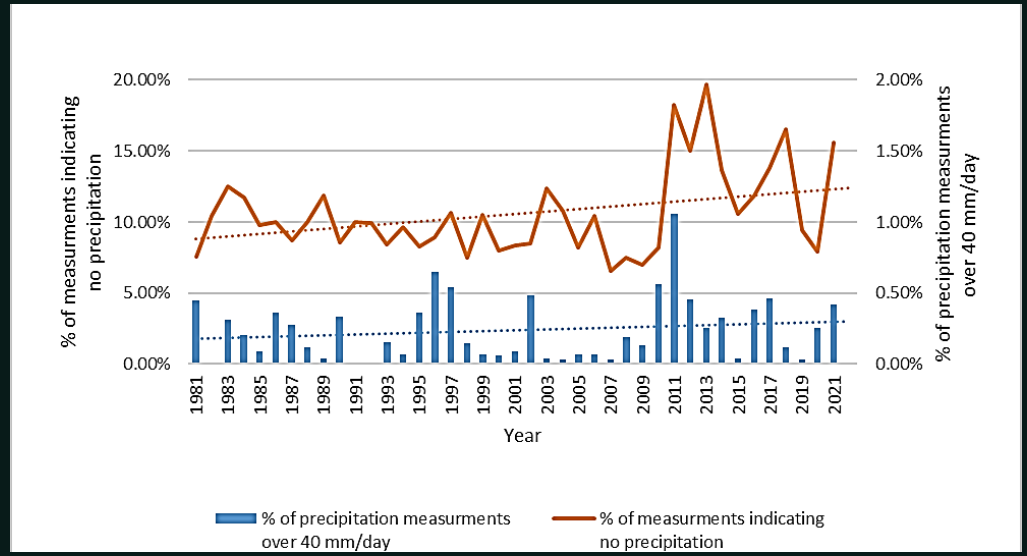
- Environmental Engineering

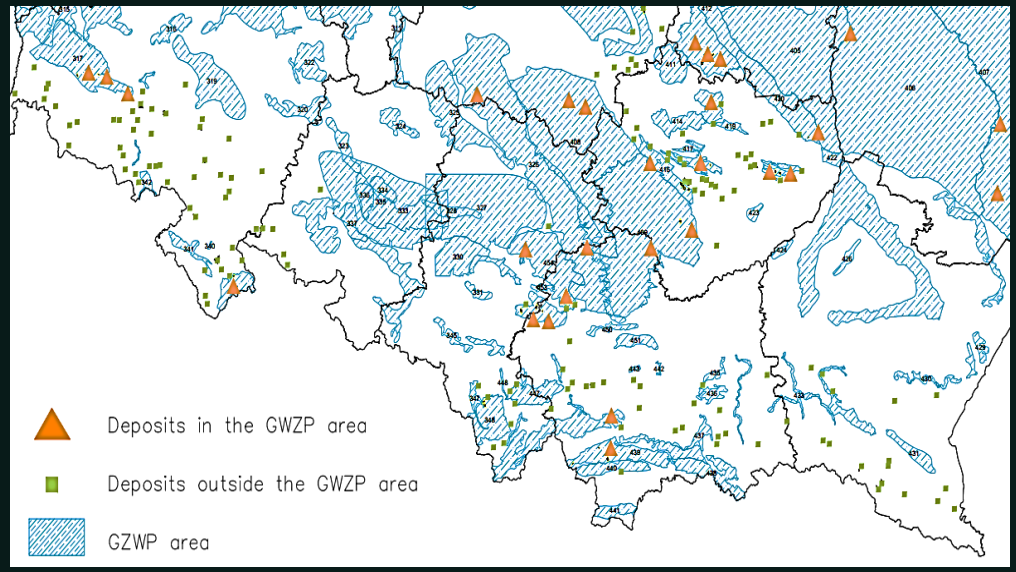
SCIENTIFIC INTERESTS:

- hydrogeology,
- mining and land reclamation,
- computer simulation of environmental processes
- natural resource management,
- sustainable development.

Environmental data analysis tools

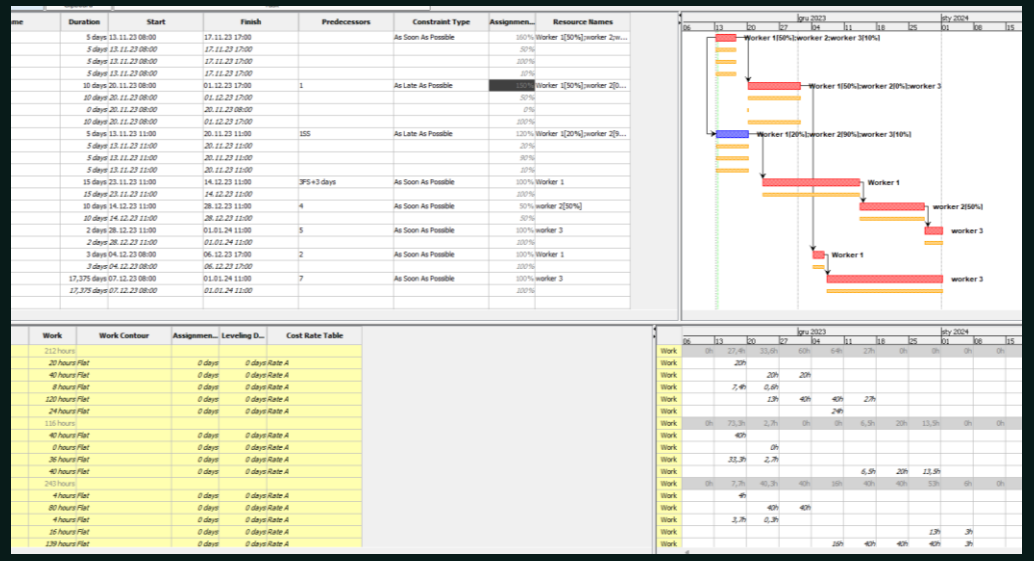
Data analysis from external databases using tools such as Civil 3D, Excel, and GIS systems. Preparing Final Reports and Visualizing Data.

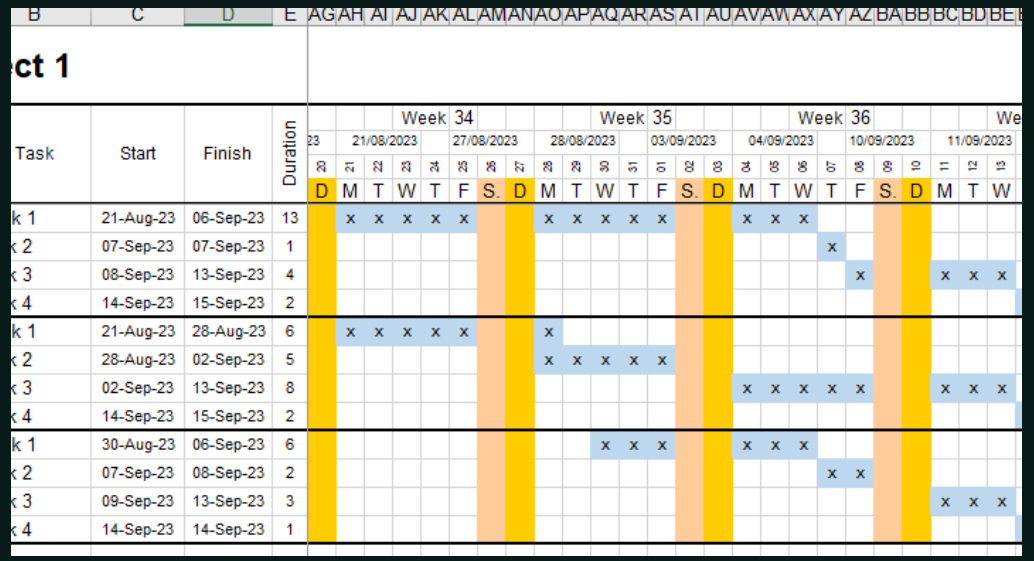




Project management in environmental engineering

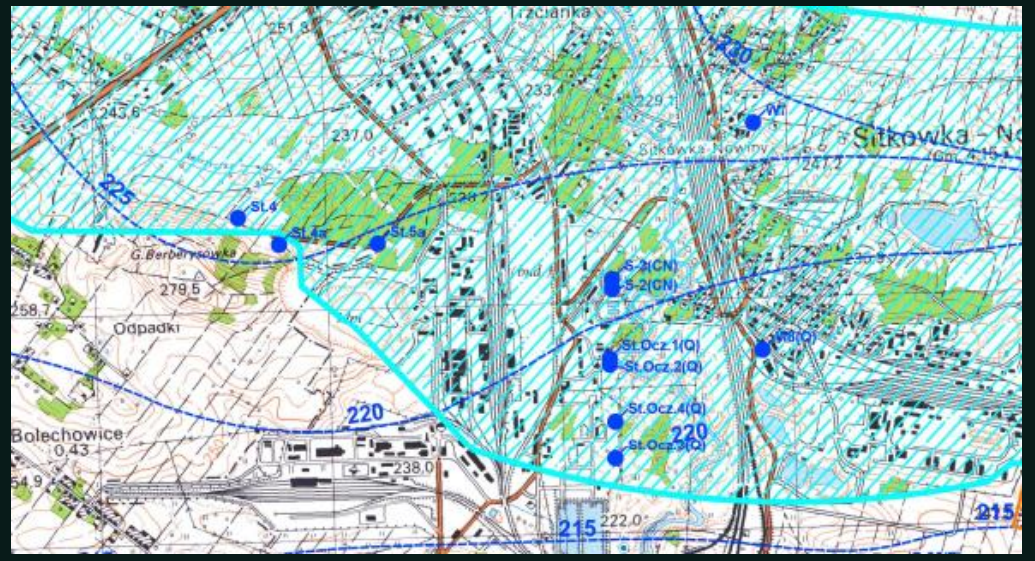
Introduction to Project Management for International Projects, including team building and basic project management tools. Practical exercises using Excel and ProjectLibre for schedule preparation.

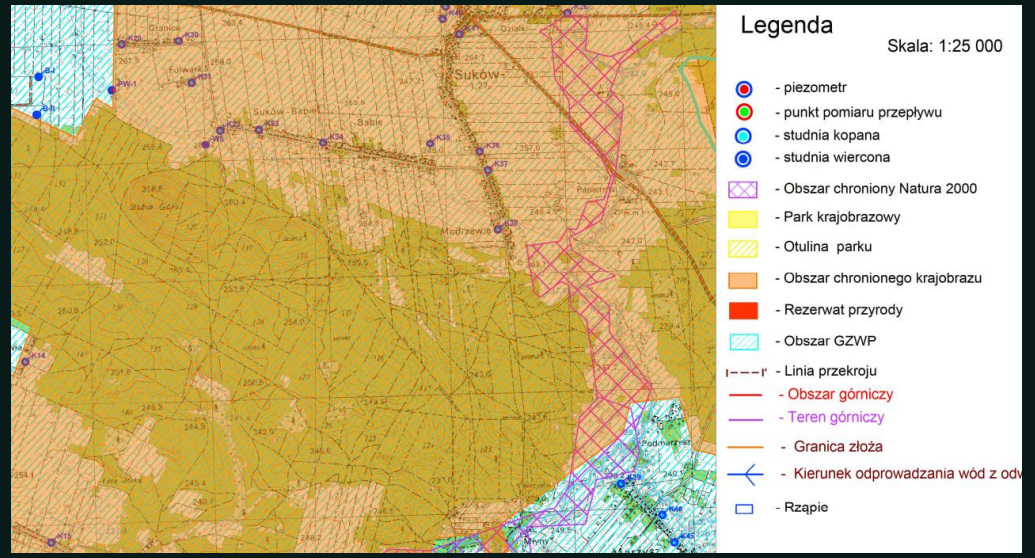




Groundwater flow and aquifer hydraulics basics - flow mapping

Introduction to groundwater flow issues. Collection of field data and preparation of documentation and hydrogeological maps.





Piotr Ziembicki, PhD Eng.

DISCIPLINE:

- Environmental Engineering

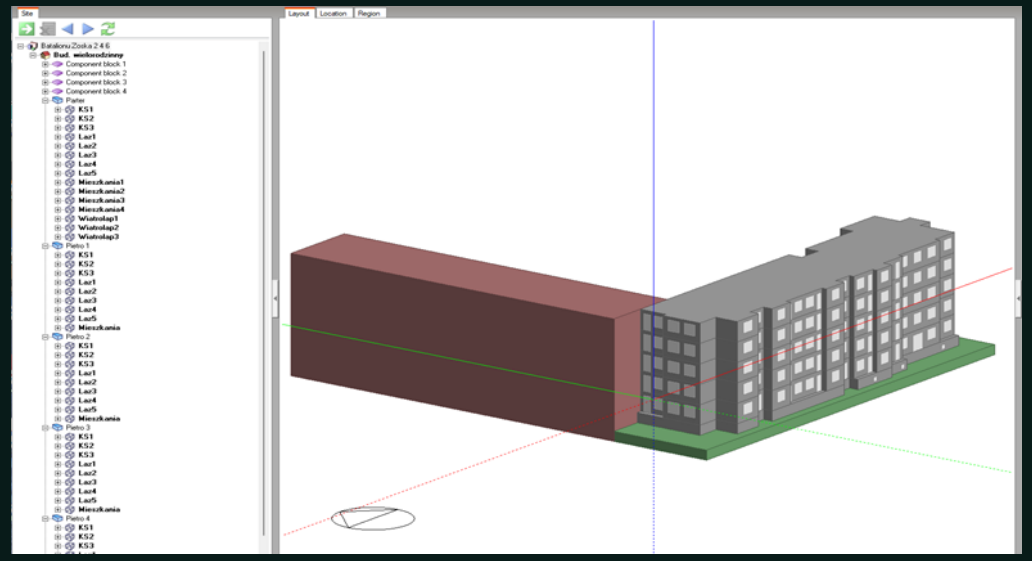
SCIENTIFIC INTERESTS:

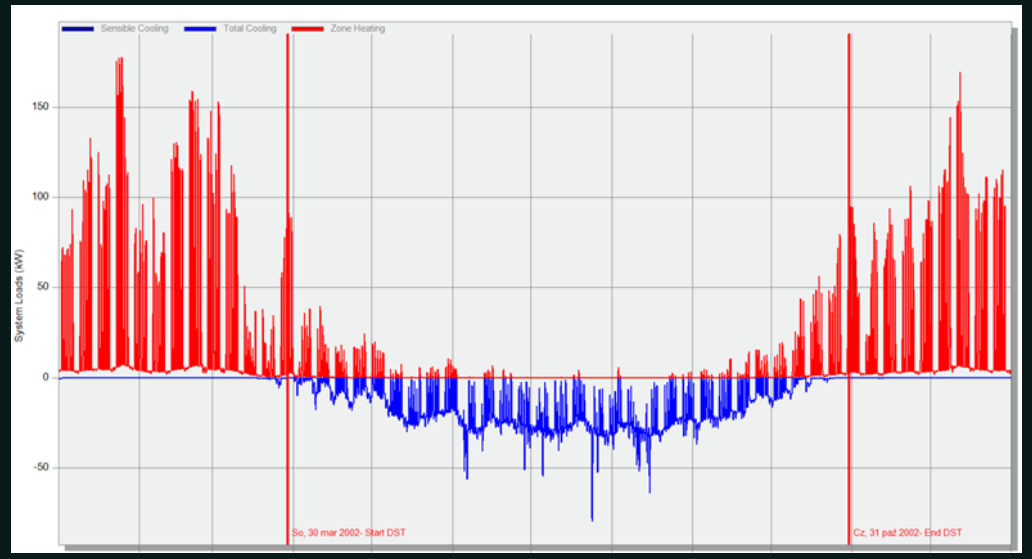
- thermal energy,
- heating,
- ventilation and air condition,
- computer simulation and AI,
- district heating systems,
- energy analysis of buildings,
- energy efficiency,
- hybrid energy sources.

Buildings energy analysis using computer simulation methods

Optimization of energy use in the buildings considers all aspects of its technology, including HVAC installations.

Software used: DesignBuilder, EnergyPlus, OpenStudio, SketchUp, Python, R.

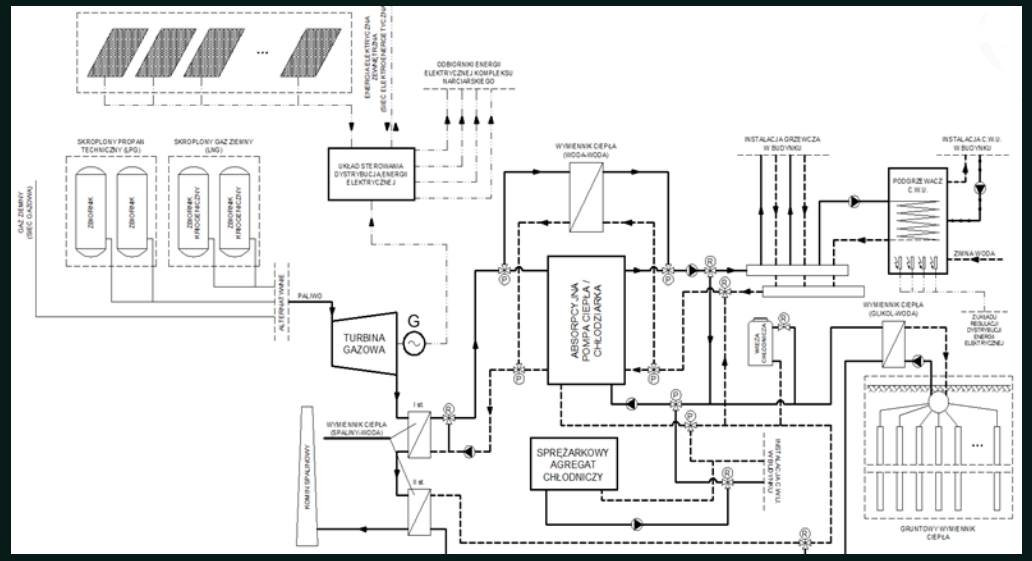


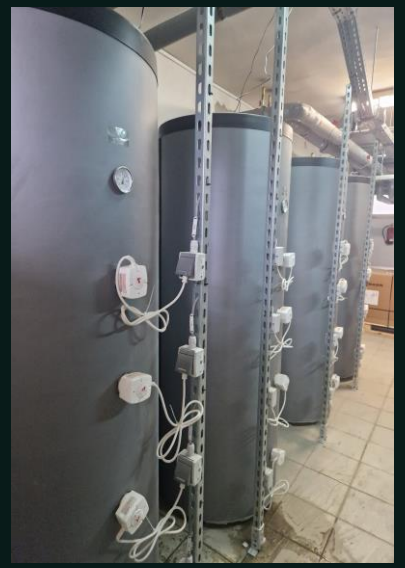


HVAC systems energy efficiency analysis

Designing, analyzing, and optimizing hybrid heat, cold, and energy sources for single and group buildings.

Using advanced simulation software and self-created algorithms implemented with Python and R programming languages.



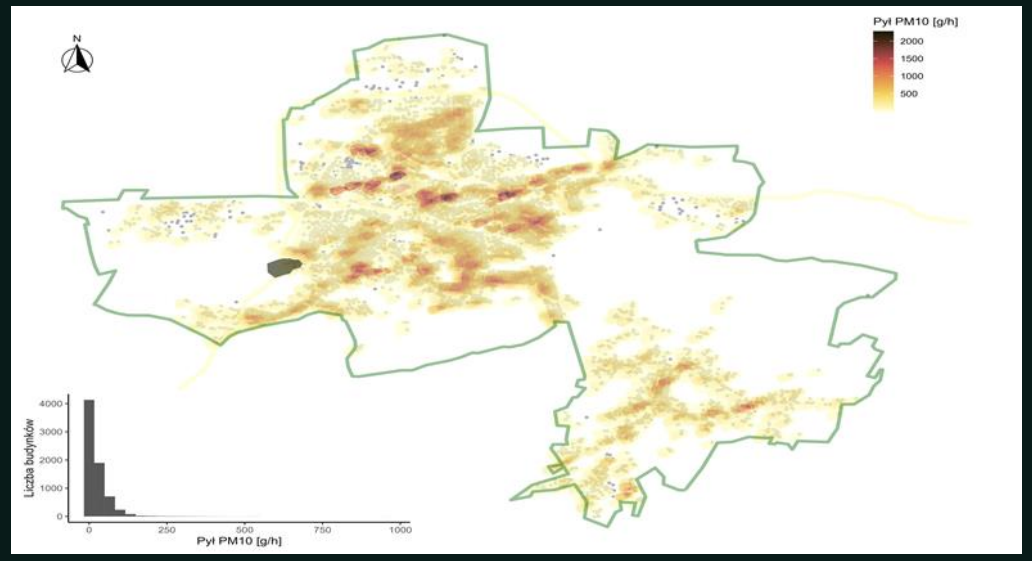


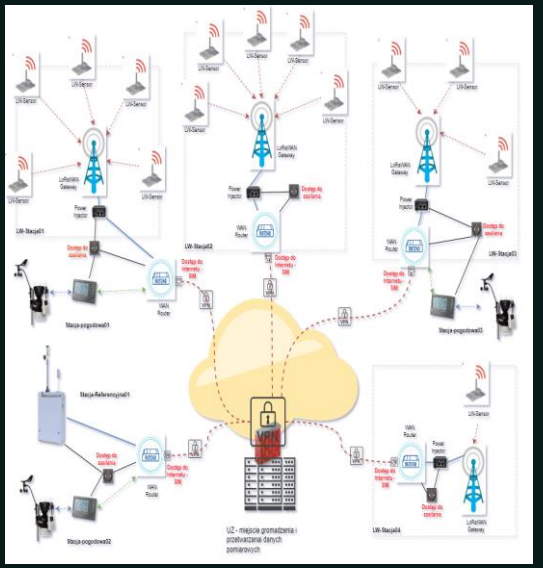
Air pollution emissions analysis for buildings based on databases and facility inventory

Methods of reduction of air pollution based on deep analysis of its dissipation.

Analysis of the relation between heat and energy demand and air pollution dissipation in urban areas.

Required skills: basics of relational databases, basic programming skills in python and R languages. Basics of big data analysis.





Environmental design and land reclamation

Andrzej Greinert, PhD, hab. Eng.,
Prof. at University of Zielona Gora

DISCIPLINE:

- Environmental Engineering

SCIENTIFIC INTERESTS:

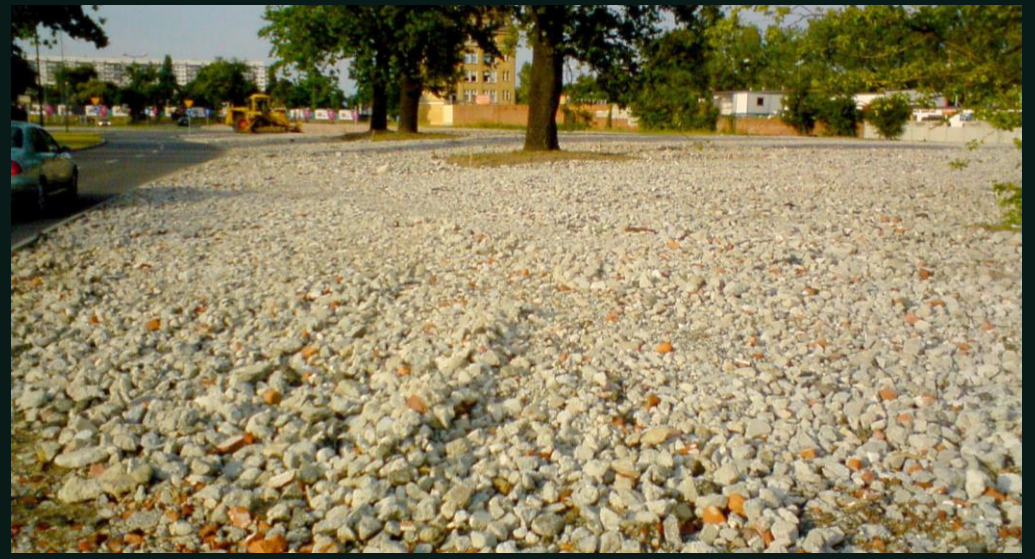
- SUITMA (Soils of Urban, Industrial, Traffic, Mining and Military Areas)
- soil degradation and reclamation,
- urban areas development,
- municipal green areas.

Historical and contemporary soil forming factors and effects of their activity

The aim of this project is to investigate the historical and contemporary soil forming factors and their effects on soil formation. The trainee will participate in field and laboratory work aimed at identifying urban anthropogenic soils. The goal is to learn about the relationship between local soil-forming factors with special attention to human activities (historical and recent).

Construction and demolition waste in soil – diversity, effects

The aim of this project is to assess the long-term persistence and impact of human-induced alterations on urban soils. The trainee will be involved in the collection of environmental samples, their preparation and laboratory analysis - both macroscopic and assessment of their physical and chemical properties. They will then attempt to assess their potential impact on the soil environment.



Durability of anthropogenic transformations of urban soils

The aim of this project is to investigate the long-term effects of human-induced alterations on urban soils. This involves understanding how human activities have changed the properties of urban soils over time. Additionally, the project aims to assess the resilience and durability of these transformed soils under various environmental conditions and human pressures.

Urban soils characteristics as a factor limiting possibilities of a land use

The aim of this project is to evaluate the impact of urban soil characteristics on land use suitability and potential limitations for various development projects. The main goal is to characterize the diverse physical, chemical properties of urban soils, and then assess the suitability of urban soils for various land use applications including treshold values designed for various land use.

Urban green areas development as a factor of sustainable development of the city

The aim of this project is to investigate the role of urban green spaces in promoting sustainable urban development. This involves understanding how the presence and quality of green spaces contribute to environmental, social, and economic sustainability in cities.

Jakub Kostecki, PhD Eng.,

DISCIPLINE:

- Environmental Engineering

SCIENTIFIC INTERESTS:

- SUITMA (Soils of Urban, Industrial, Traffic, Mining and Military Areas),
- heavy metal/trace elements in environment,
- environmental impact assessment,
- nature based solutions,
- waste management.

Bio-waste in circular economy

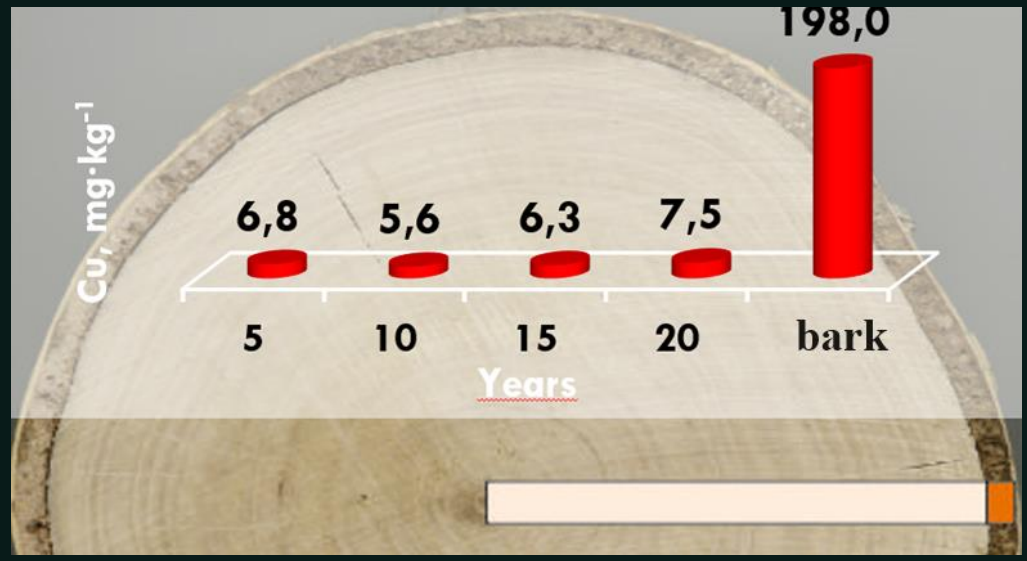
Organic waste is one of the larger waste groups. It can be landfilled or treated. The paper evaluates the potential of selected bio-wastes (e.g. brewery waste, wine waste, sewage sludge) for natural use, including their suitability for fertiliser purposes.

Soils sealing & soil compacting in urbanised areas

In urban areas, soil sealing and compaction is one of the most important problems of soil degradation. The study will analyse soil sealing in the selected area in current and archive view (orthophotomap), assess the degree of soil compaction and its basic properties.

Environmental impact assessment of industrial facilities

The aim of this study is to analyse the environmental impact of a selected industrial facility. The analysis starts with a matrix study and ends with an analysis of selected parameters of the soil and water environment and the vegetation cover in the vicinity of the facility.



Marta Gortych, PhD Eng.,

DISCIPLINE:

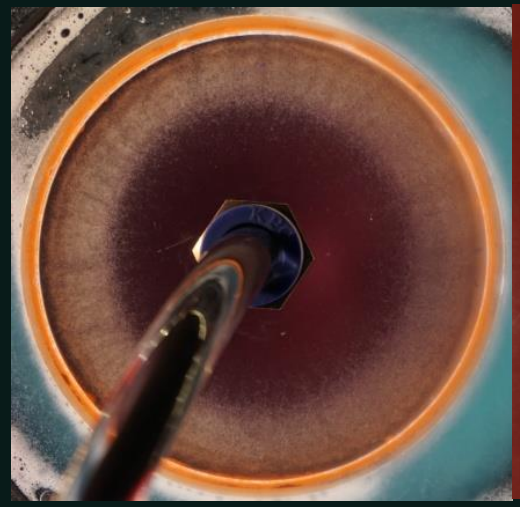
- Environmental Engineering

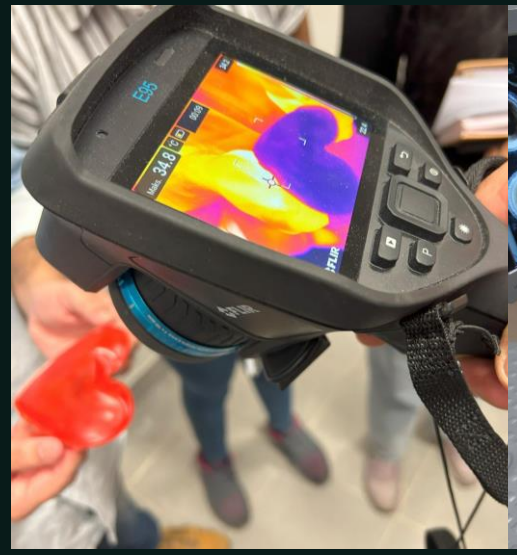
SCIENTIFIC INTERESTS:

- energy storage,
- phase-change materials,
- heat and mass transfer,
- hydrology.

Modern methods of energy storage

The goal of this work is to investigate contemporary approaches to heat-based energy storage. We will carry out experiments using diverse phase change materials and search for appropriate materials to use in construction. We will apply and measure mass and heat flow in various types of materials.





Determination of watercourse balances

The goal of the internship is to identify the features of a chosen river basin. Identify the limits of the river basin, divide it into smaller sub-basins and ascertain their sizes, measure the length of the primary river and its branches. Create proper profiles, analyze catchment geometry and terrain features. Compute the catchment balance.

Katarzyna Łuszczyńska, PhD Eng.,

DISCIPLINE:

- Environmental Engineering

SCIENTIFIC INTERESTS:

- indoor air quality (IAQ),
- moulds in buildings,
- technical microbiology.

Bioindication methods for the determination of the toxicity of moulds in buildings

The purpose of this research is to assess the danger of mycotoxins produced by moulds on building exteriors to people occupying the rooms.

Microbiological quality of indoor air

The study aims to examine the air quality (by calculating the amount of microorganisms present) to assess its impact on the wellbeing of those using and living in the room.

Roza Wasylewicz, PhD Eng.,

DISCIPLINE:

- Environmental Engineering

SCIENTIFIC INTERESTS:

- heavy metal and trace elements in environment;
- soil degradation;
- adaptation to climate change of an urban areas.

Adaptation to climate change in a selected urban area

The aim of the project is to assess adaptation measures to climate change in a selected urban area and to develop an adaptation concept in terms of reducing surface impacts and improving local retention.

The state of the environment in an urban or industrial area

The aim is to study and assess the impact of urbanisation on the state of the environment (soil, plants) in an urban or industrial area.

Soil contamination in the city or selected industrial plant

The aim of the assignment is to investigate soil contamination in a selected area and determine the potential impact of these contaminants on the environment and people.

Water, wastewater and waste technology

Sylwia Myszograj, PhD, hab. Eng.,
Prof. at University of Zielona Gora

DISCIPLINE:

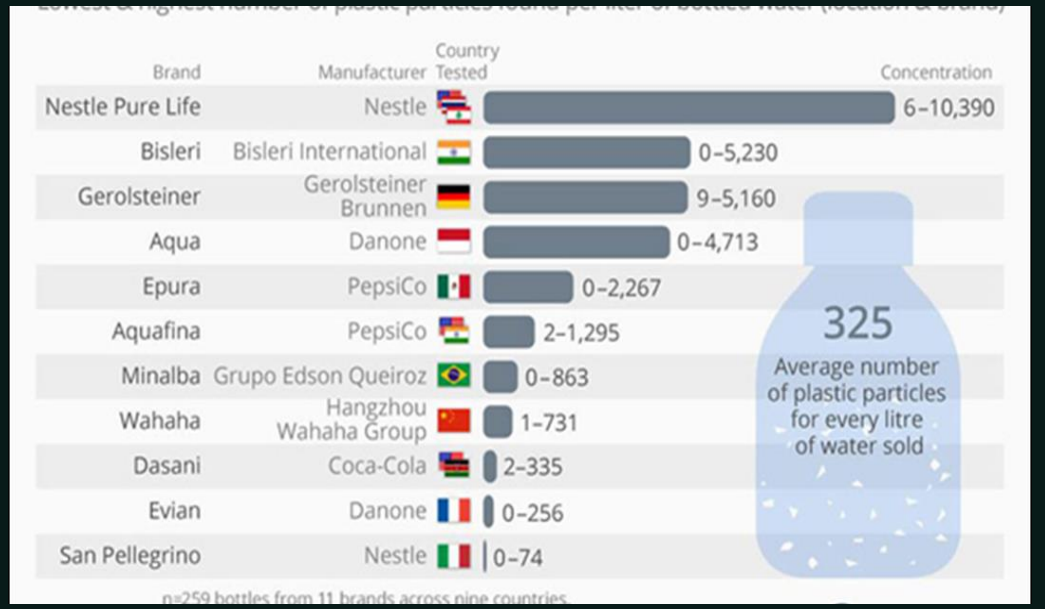
- Environmental Engineering

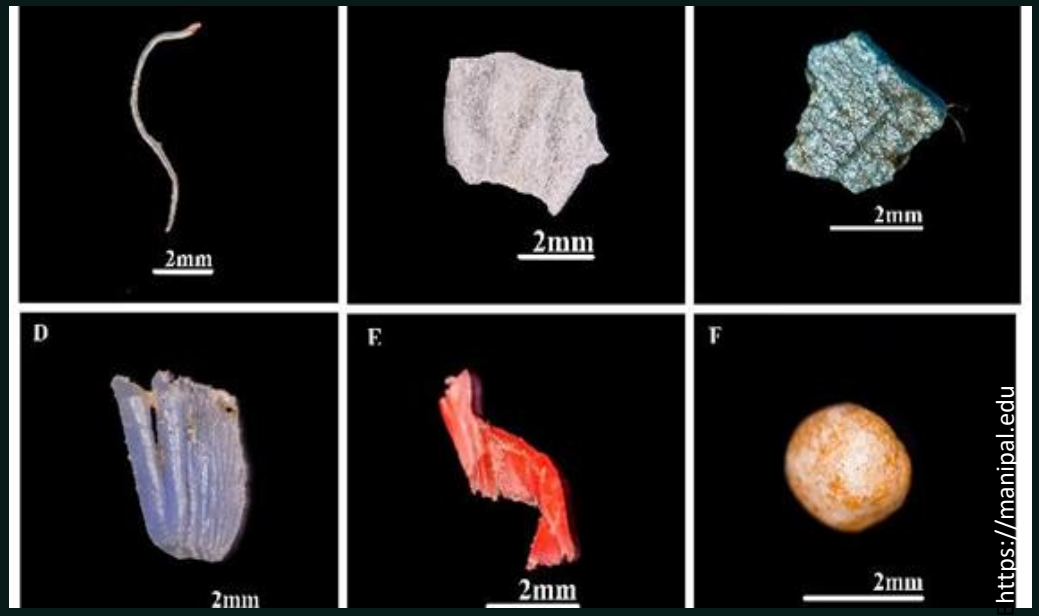
SCIENTIFIC INTERESTS:

- wastewater treatment technology,
- sewage sludge management,
- energy from waste,
- microplastic in the environment.

Microplastics in water and wastewater - determination and removal technologies

Regardless of the implementation of the program to reduce landfill of plastic waste at the global level, attention is still drawn to the problem of microplastics. The research will focus on searching for methods for identifying microplastics in water and wastewater, as well as methods for their removal and monitoring in the environment.





Intensification of sewage sludge and bio-waste anaerobic digestion

The research will focus on optimizing methods of disintegration of sewage sludge and bio-waste using thermal and chemical methods. Co-fermentation will also be used as a method of intensifying methane fermentation.

Trace elements in methane fermentation

The aim of the research is to determine the impact of selected trace elements on the anaerobic digestion of food waste and to determine whether the source of additional trace elements affects their bioavailability for microorganisms and determines the effectiveness of anaerobic digestion. Sources of compared trace elements include pure chemicals, compost and ash from biomass combustion.

Izabela Krupińska, PhD, hab. Eng.,
Prof. at University of Zielona Gora

DISCIPLINE:

- Environmental Engineering

SCIENTIFIC INTERESTS:

- coagulation processes,
- groundwater purification,
- iron removal.

Removal of chlorinated organic precursors from water by coagulation

The aim of this study is to determine the removal efficiency of organic pollutants as potential precursors of chlorinated organic substances in the coagulation process. The subject of the study will be surface water from the Obrzyca River before and after the micro-ceding process captured at the Zawada Water Treatment Station.

Application of Zeta potential to evaluate the efficiency of the coagulation process

The aim of this study is to evaluate the efficiency of the coagulation process in the treatment of surface water from the Obrzyca River with Al and Fe coagulants by measuring the zeta potential. The measurement of TOC, DOC, UV254, UV272, colour, pH and turbidity will also be performed in the raw water and after the coagulation process.

Ewelina Płuciennik-Koropczuk, PhD, Eng.,

DISCIPLINE:

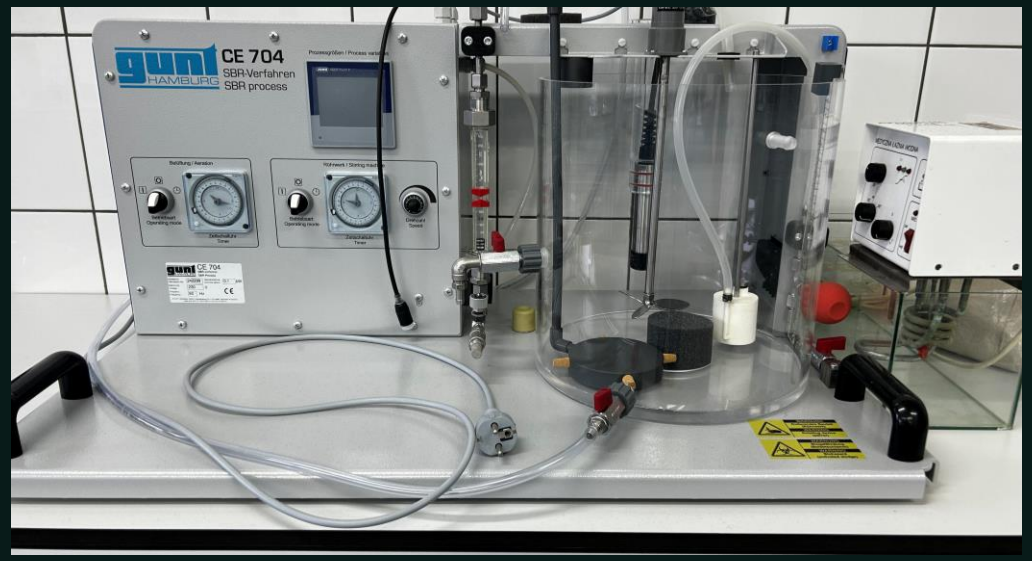
- Environmental Engineering

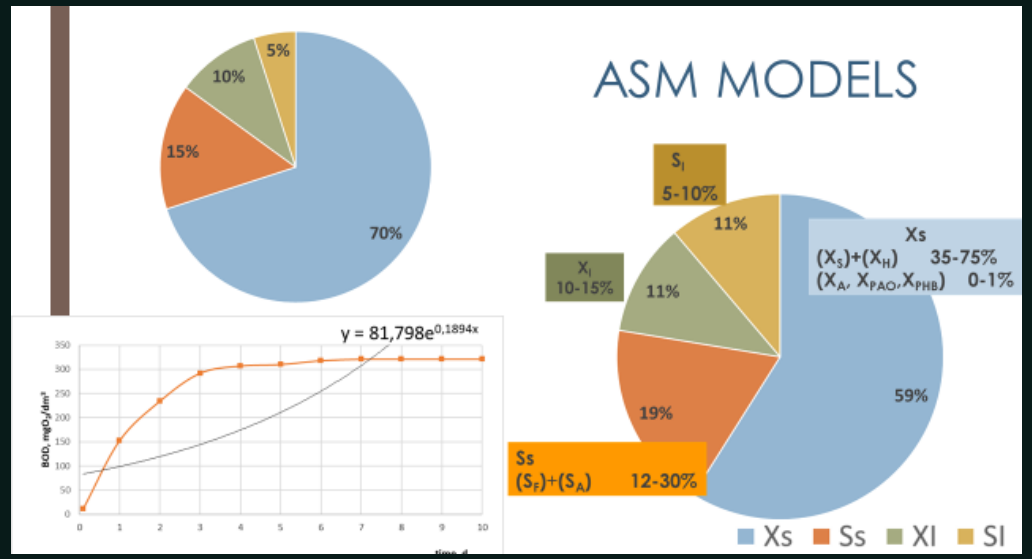
SCIENTIFIC INTERESTS:

- wastewater treatment.

Technologies for the treatment of municipal and industrial wastewater

The aim of the research is to assess the susceptibility of industrial wastewater to biochemical decomposition. Tests will be conducted in an sequencing batch reactor and using an effluent toxicity test. The degree of decomposition of pollutants will be assessed on the basis of COD fractions.





Use of renewable energy sources in municipal facilities

The aim of the research is an energy analysis of a municipal wastewater treatment plant. The object of the research will be a WWTP. The research will determine the energy demand of the facility, energy consumption in technological processes and indicators of energy demand for removing pollutants from wastewater, depending on the season.

Anita Jakubaszek, PhD, Eng.,

DISCIPLINE:

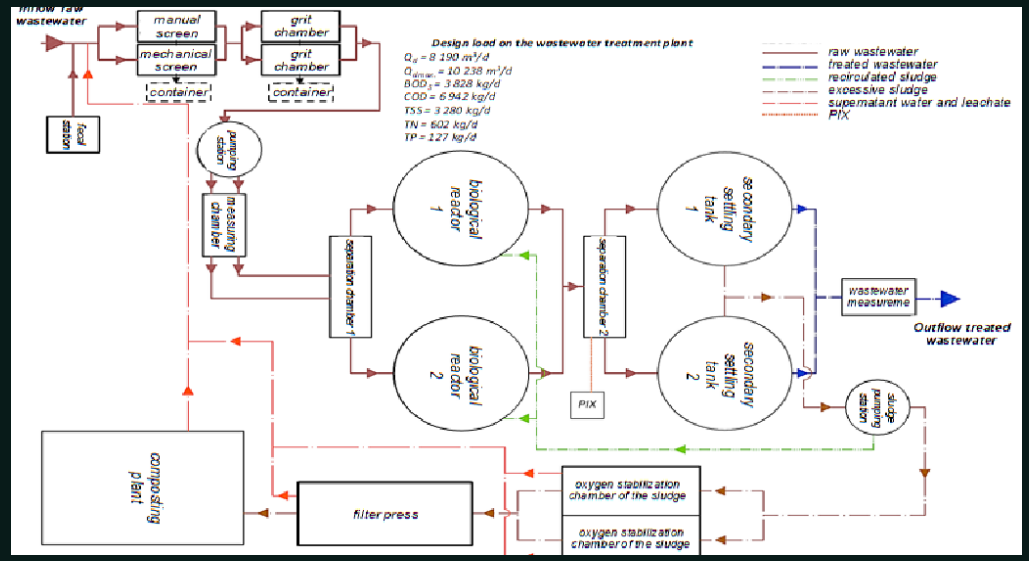
- Environmental Engineering

SCIENTIFIC INTERESTS:

- Municipal and industrial wastewater treatment,
- Wastewater management in areas without sewerage system.

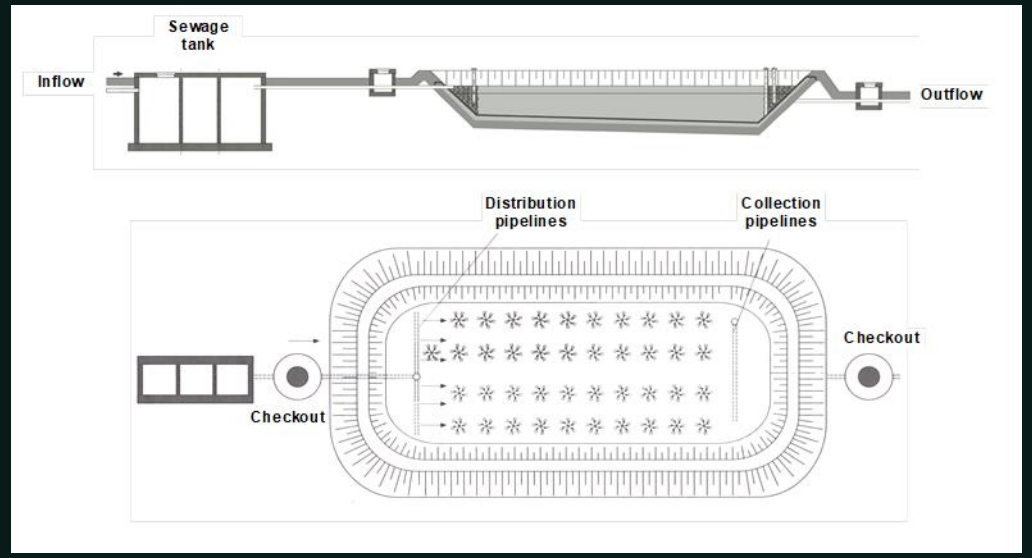
Municipal and industrial wastewater treatment

The aim of the project is to analyse the effectiveness of pollutant removal from municipal wastewater in the subsequent stages of its treatment. The work includes optimisation of wastewater treatment systems and design of technological systems for municipal wastewater treatment.



Wastewater management in areas without sewerage

The aim of the project is to develop and implement sustainable wastewater treatment solutions for areas without access to conventional sewerage systems. The project will focus on: selection, calculation and design of individual wastewater treatment systems.



Monika Suchowska-Kisielewicz, PhD Eng.,

DISCIPLINE:

- Environmental Engineering

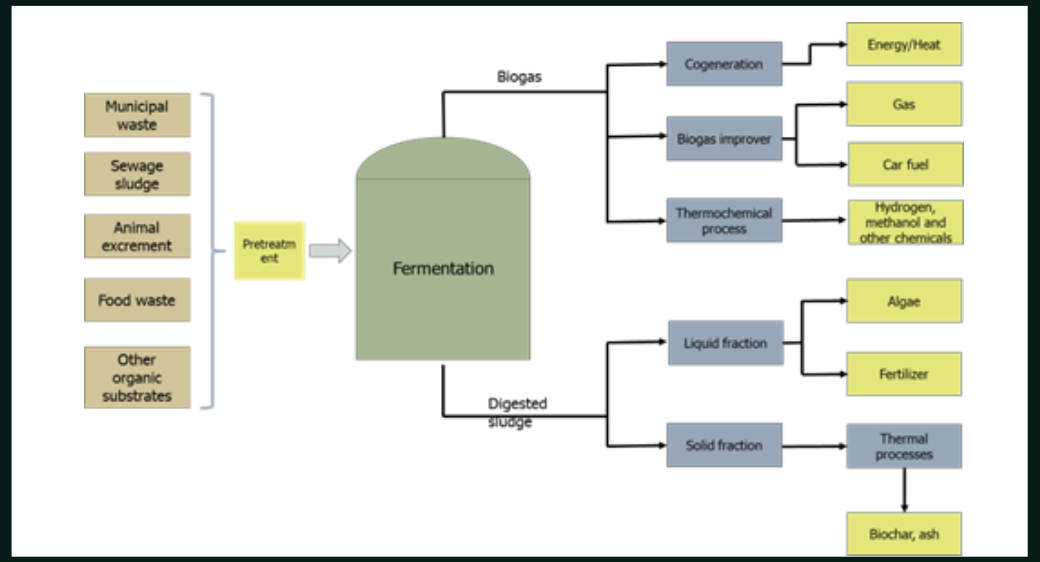
SCIENTIFIC INTERESTS:

- energy from waste,
- biorefineries in the circular economy,
- urban and national nitrogen budgets,
- optimization of wastewater and sewage treatment sludge processing,
- circular economy in waste management.

The role of biorefineries in the circular economy

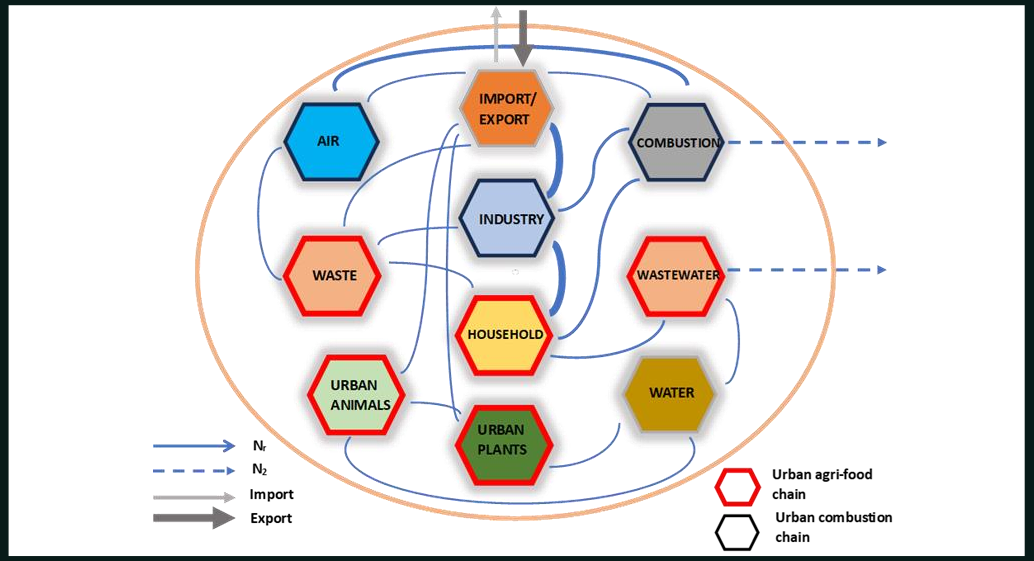
The increase in world population is correlated with the increase in waste production that must be processed. Taking into account current legal regulations, introducing the principles of circular economy into waste management is an essential element in modern society.

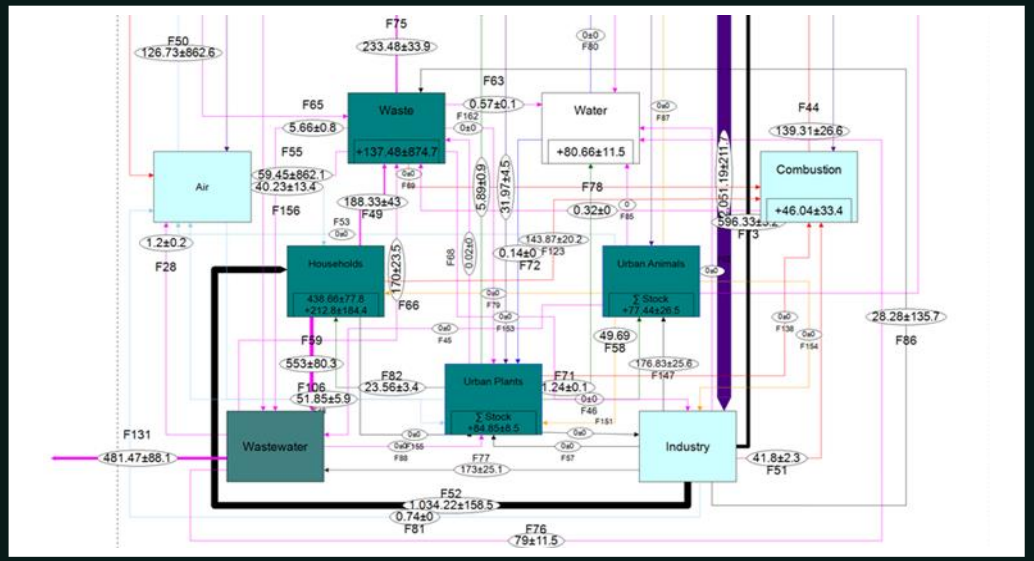
Research on various technological paths using anaerobic decomposition processes to recover economically attractive products and byproducts from waste is an important and current issue worth exploring.



Urban nitrogen budgets

In urban areas, main sources of reactive nitrogen (Nr) are linked to combustion in power and heating, industry, and transport, as well as waste and sewage treatment. Municipal nitrogen budgets allow for the identification of N emission sources, calculation of emission volumes and identification of critical places for which reduction strategies should be created.





These are just examples…

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If you have an idea for something else - write to us!

We will work something out!

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For more information email:
j.kostecki@iis.uz.zgora.pl

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