

1. Research group heading/name & full address/affiliation

Faculty of Civil and Environmental Engineering and Architecture
Ecoengineering and Environmental Physicochemistry Department
85-796 Bydgoszcz, ul. Sucha 7

2. Name of the group's leader with a short BIO

Prof. DSc Jerzy Garbacz

Position:

- Full professor at the University of Science and Technology, Ecoengineering and Environmental Physicochemistry Cathedral
- Head of the Ecoengineering and Environmental Physicochemistry Department

Degrees:

1975 – PhD in chemistry, Nicolaus Copernicus University in Toruń, "Badanie oddziaływań międzycząsteczkowych w niezlokalizowanej warstwie adsorpcyjnej na powierzchniach jednorodnych",

1982 – DSc in chemistry, Nicolaus Copernicus University in Toruń, "Opis asocjacji adsorbowanych molekuł składnika gazowego na powierzchni adsorbentów stałych",

1999 – Chemistry Professor in Environmental Engineering

Positions and functions (the most important ones)

1972-1973 – assistant, Faculty of Chemistry at Nicolaus Copernicus University in Toruń

1973-1975 – senior assistant, Faculty of Chemistry at Nicolaus Copernicus University in Toruń

1975-1983 – adjunct, Faculty of Chemistry at Nicolaus Copernicus University in Toruń

1983-1990 – associate professor, Faculty of Chemical Technology and engineering at University of Technology and Agriculture in Bydgoszcz

1991-2000 – associate professor, Faculty of Chemical Technology and Engineering at University of Technology and Agriculture in Bydgoszcz

2001 – still – full professor, Faculty of Civil and Environmental Engineering and Architecture at University of Science and Technology in Bydgoszcz

1983-2000 – head of the Surface Physicochemistry Department, University of Science and Technology in Bydgoszcz

2001-2008 – head of the Physicochemistry and Numeric Environment Analysis Department at University of Science and Technology in Bydgoszcz

2008 – still – head of Head of the Ecoengineering and Environmental Physicochemistry Department

Scientific achievements:

89 publications mainly in English journals, over 30 papers and lectures during national and international conferences, and 5 monographs.

Staff training:

5 Promoted PhDs, 5 doctoral dissertation reviews and PhD thesis review

Associations and committees:

Polish National Pure and Applied Chemistry Committee and The Polish Society of Calorimetry and Thermal Analysis member

3. Names of the group's members and their research areas/ interests

Prof. DSc Jerzy Garbacz – environment condition diagnosis, environmental protection design, physicochemistry of interfacial and surface equilibrium, phenomenological thermodynamic and statistics, adsorption of gases and liquids on solid matters

PhD Jacek Cieściński – physical limnology, reclamation of water reservoirs, monitoring studies of lake ecosystems and dam reservoirs

PhD Marzena Wiśniewska – hydrobiology with phycology specialty, biomonitoring of aquatic environments, biological methods of sewage purification

MSc Jerzy Ciechalski - monitoring studies of lake ecosystems and dam reservoirs

MSc Ryszard Dąbkowski - monitoring studies of lake ecosystems and dam reservoirs

MSc Alfred Kozłowski - monitoring studies of lake ecosystems and dam reservoirs

4. Leading research topic of the group

Lake ecosystems studies;

- Physicochemical properties of sediment and lake waters

- Thermal and oxygen conditions of lake waters

- Specific hydrobiological elements with phycology and biomonitoring specialties

Lowland dam reservoirs studies;

- Physicochemical properties of sediment and lake waters
- Specific hydrobiological elements
- Quantitative evaluation of bottom sediment

5. Best realizations of the main research topic

- Żurski Reservoir bottom sediment research for evaluation of its time of shallowing – research co-financed by Marshal's Office of Kuyavian – Pomeranian Voivodship as a result of offer contest no. 8/2008
- Phytoplankton dynamics of Charzykowskie Lake during a 14 year period of sewage treatment plant functioning in Chojnice
- Use of deterministic models to bottom sediment evaluation in lowland dam reservoirs
- Participation in the international project (2009-2013) EULAKES – European Lakes Under Environmental Stressors. Expertise topic: *Opracowanie charakterystyki zmian struktury ilościowej i jakościowej fitoplanktonu, charakterystyki ilościowej pojawienia się zakwitów oraz oceny tendencji zmian i kierunków przeobrażeń wody Jeziora Charzykowskiego*
- Surface waters diagnosis for environment management optimization in Bory Tucholskie with special consideration of Wda Landscape Park
- Wiśniewska M. 2013, "Plan zadań ochronnych dla obszarów Natura 2000, Dolina Osy".

6. General description of scientific interests

Scientific interests of the group concentrate mainly on research considering indicators useful in evaluation of results of anthropogenic lake and lowland dam reservoirs changes, alteration prognosis in lake ecosystems in the context of toxic cyanosis hazard, and monitoring research in terms of biological parameters (chlorophyll – a, species structure, numerical amount and biomass of phytoplankton, state/ecological potential of aquatic ecosystems).

7. Specific interests and additional topics of extended interests.

Specific interests of the group consider water reservoir research (lakes and dam reservoirs) in the area of spatial protection forms in Bory Tucholskie. It's a unique forest compound of Central European lowland of over 261 thousand hectares of space where 5 landscape parks, Bory Tucholskie National Park, and a Biosphere Reserve created in 2010 are placed. It's a key area for

balanced development strategy not only for Kuyavian-Pomeranian voivodship.

8. Other important characteristics of the group

Besides the specialized laboratories of Ecoengineering and Environmental Physicochemistry Department the group has two research stations in Bory Tucholskie at their disposal. Territorial Monitoring Station in Drzewicz is placed in Zaborski Landscape Park near the border of Bory Tucholskie National Park several metres from Łackie and Dybrzk lakes. The second station is near Tleń next to Żur Dam Reservoir in Wda Landscape Park. Equipment in both stations enables teams to conduct terrain research and stay there for as long as it is required.

9. Main achievements of the group

The group has a data bank that enables the evaluation of trophic system, quality of waters, anthropogenic lake and lowland dam reservoirs in Bory Tucholskie.

Results of the quantitative bottom sediment Żur dam reservoir research lay out the basis for more complex research that can explain the diversity of thickness in different areas of the reservoir, and enables to form an algorithm useful to define the sediment and the rate of shallowing considering specific basin.

Taking into account the similarity of other dam reservoirs in Bory Tucholskie, we can assume that the issue of stiling up is the basic cause of the degradation of not only the Żur Reservoir but also others. The verification of this hypothesis seems to be an attractive research opportunity.

10. 5 best selected publications and/ or other relevant accomplishments.

- Garbacz J,K., Cieściński J., Ciechalski J. Cieścińska B., 2015. "Specyfika zbiorników zaporowych w Borach Tucholskich. Stan poznania środowiska przyrodniczego Tucholskiego Parku Krajobrazowego i Rezerwatu Biosfery Bory Tucholskie. Monografia." Redakcja naukowa Mieczysław Kunz. Nicolaus Copernicus University in Toruń. Toruń.

- Garbacz J.K., Cieściński J., Ciechalski J., Dąbkowski R., Kozłowski A., 2015. "Zróżnicowanie miąższości osadów dennych w reprezentatywnych profilach pomiarowych dla zbiornika zaporowego Żur. Diagnostowanie stanu środowiska metody badawcze – prognozy. Kompleksowe badania i ochrona środowiska naturalnego. Zbiór rozpraw pod redakcją Jerzego Garbacza." Bydgoszcz Scientific Society. Bydgoszcz.
- Garbacz J.K., Cieściński J., Dąbkowski R., Kozłowski A., 2014. "Reprezentatywność wyników pomiarów miąższości w wybranych punktach zbiornika zaporowego Żur dla potrzeb oceny ilości osadów dennych. Diagnostowanie stanu środowiska metody badawcze – prognozy. Kompleksowe badania i ochrona środowiska naturalnego. Zbiór rozpraw pod redakcją Jerzego Garbacza." Bydgoszcz Scientific Society. Bydgoszcz.
- Wiśniewska M., Luścińska M., 2012, *Long-term changes of phytoplankton in lake Charzykowskie. Oceanological and Hydrobiological Studies*. Institute of Oceanography University of Gdańsk. Volume 41, Issue 3, 90-98:
- Wiśniewska M., Paczuska B., 2015, *Long-term changes in the dynamics and structure of cyanobacteria in Koronowo Reservoir. Oceanological and Hydrobiological Studies*. Institute of Oceanography University of Gdańsk. Volume 44, Issue 1, 127-138: DOI:10.1515/ohs-2015-0013