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## Team of the Biological Station Zingst

### Abstract

The Biological Station Zingst was founded in 1977 as a part of the Institute of Biological Sciences. Long-term monitoring in the Darß-Zingst Bodden Chain started in the late 1960ies with hydrological parameters and meteorology. Nutrients and plankton were added later to the long-term monitoring. Other tasks of the Biological Station are teaching of analytical methods, supporting sampling of water and sediments as well as hosting mesocosm experiments. This article presents the main contributors to the founding of the Biological Station, their research and teaching.

**Keywords:** Biological Station Zingst, Southern Baltic, Darß-Zingst lagoon, scientists

### 1 Introduction

A detailed description of biological research at the Rostock University was given in ARNDT (2006) covering predominantly the years before 1968, when the third university reform was applied. The foundation of the Biological Station Zingst took place later. All important documents upon estate's acquisition, construction treaties<sup>1</sup>, personnel assignment and interactions with the Institute of Biological Science (Sektion Biologie) in Rostock are not available yet in the university's archives. The missing times have to be reconstructed so far and preliminarily by witnesses as was done in SCHUMANN et al. (2019). This paper wants to honour all researchers having devoted time, ideas and effort in coastal ecosystems research at the Biological Station Zingst.

In the early 1970ies, the Institute of Biological Sciences decided to build a research and teaching station in Zingst. It is situated in at the Zingster Strom, a part of the eutrophic, brackish Darß-Zingst Bodden Chain (lagoon system). The vicinity to the Maritime Observatory of the Leipzig University, the facilities of the Water management directorate Coast-Warnow-Peene, the atmosphere measuring station Müggenburg (see below) and the possibility to use construction expertise from the Children's holiday camp in Pruchten (managed by the University of Rostock) supported this decision. Many of these neighbours added and some still contribute continuously to the value of the joint data sets.

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<sup>1</sup> Only a copy of the electrician's quote is in the station's documents.

This work focusses on scientists and colleagues conducting the monitoring, participating in the joint mesocosm experiments and sampling events. General research topics with important results valid for Baltic and other lagoon systems are outlined in this issue (SCHUMANN 2018). The long term data set has still to be compiled in respect to the respective starting points, frequency and sampling sites. However, technical information and metadata are given in the data repository of the LTER (long term ecological research) community in the DEIMS repository (<https://data.lter-europe.net/deims/>).

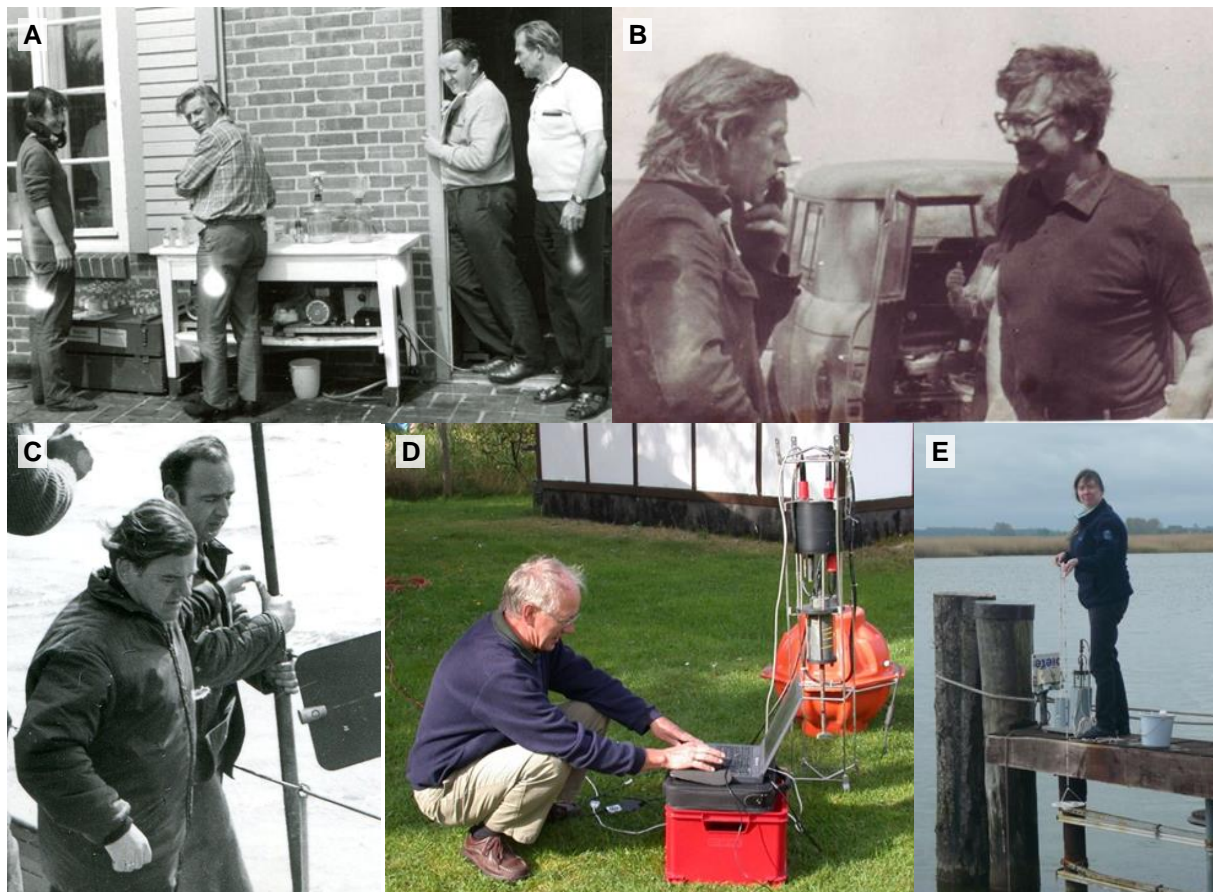
## 2 Directors of the Biological Station and working groups using it

The first director of the Biological Station Zingst was Günter Schlungbaum from 1977 on (Fig. 1 A). He was a senior scientific assistant from 1969 until 1980, became an associate professor in 1980 and full professor for applied ecology in 1993. He retired in 2000 (*cpr: catalogus professorum rostochiensum*). Especially in the 1980ies and 1990ies, research and teaching at the Biological Station was dominated by topics and requirements of the working group “Applied Ecology”. This is very interesting, since two other professors are always mentioned in relation to founding and establishing the station: Ernst-Albert Arndt (Marine Biology, Fig. 1 B) and Werner Schnese (Hydrobiology, Fig. 1 C). The working group of Werner Schnese was, however, called “Production Biology” as can be read in some protocols, when these papers will be accessible in the archives. These two groups investigated also intensively the Darß-Zingst Bodden Chain and used the station’s infrastructure.

Starting at the 1<sup>st</sup> of March 1978, Henning Baudler (Fig. 1 D) managed and led the station until his retirement at the 31<sup>st</sup> of July in 2012. He studied physics at the University of Rostock and graduated in oceanology at the Maritime Observatory of the University of Leipzig. Henning Baudler held seminars and practical courses in meteorology and oceanology also for biology students of the Rostock University as he still was a research assistant at the Maritime Observatory. This program for different students was expanded for distance learners of ecological environmental protection. He gave also practical courses for students from Russia (Immanuel Kant University Kaliningrad) and Lithuania (University of Klaipeda), which was embedded in respective bilateral exchange programs. Students of various disciplines participated annually in excursions visiting the areas of the Vistula and Curonian lagoons were taught in oceanology, geology, and ornithology. These partnerships allowed a tight cooperation with scientists from these Eastern Baltic countries resulting in several joint publications. Henning Baudler developed and installed together with colleagues of the University of Rostock working on electrical engineering and informatics an online measuring system logging physical parameters of the atmosphere, the water column and in the wind flat at the Eastern tip of the peninsula Zingst.

I am (Rhena Schumann Fig. 1 E), the third head of the Biological Station. As a pupil, I worked in a study group, which investigated phytoplankton in rivers of Berlin. This group was led by Lothar Täuscher (TÄUSCHER 2012). I enjoyed our excursions every spring to the Biological Station Boiensdorf. Consequently, I studied from 1984 to 1989 Marine Ecology at the University of Rostock and came to Zingst in 1986 for the first time. 1988, I joined one of the mesocosm experiments of the working group “Experimental Ecology” (Prof. Schiewer). As a PhD student, I worked in many enclosure and mesocosm experiments, as ROKI 1990, AGVER 1992 and CIROT 1993. The ecosystem research was fascinating, the housing within the station,

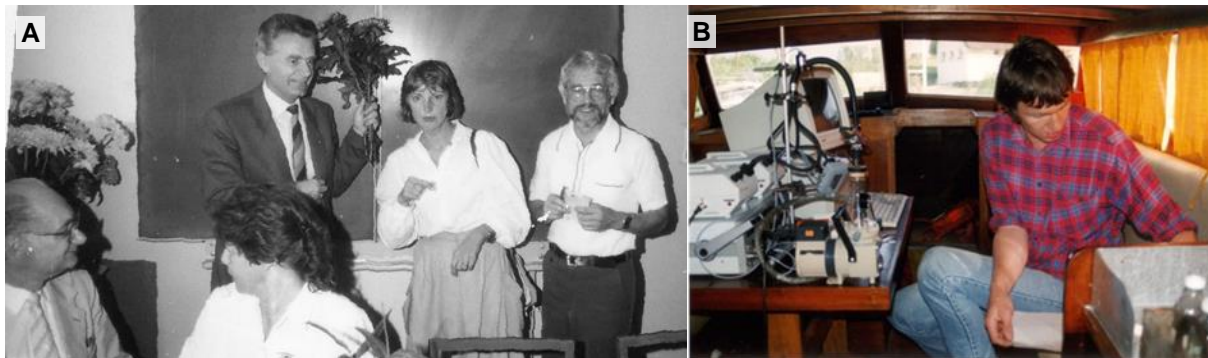
however, was very not hospitable. I further investigated phytoplankton and the microbial loop also in the Darß-Zingst Bodden also in the field and started my own long-term data series on phyto- and bacterioplankton in 1991 (SCHUMANN 1994). However, I investigated these field samples only as a hobby for many years after my graduation. Many years later in 2007, I got the opportunity returning to coastal systems research and matter cycling in brackish lagoons. Since 2002, I supervised practical courses in Zingst (aquatic system status evaluation for bachelor undergraduates in Biosciences, later also in water quality for master undergraduates of Aquaculture. Since 2012, I gave also on-site lectures for distance learners in water conservation.



**Fig. 1** **A:** Ferdinand Brzezinski (middle) is filtering water samples in front of the Maritime Observatory during the synoptic sampling campaign in 1972. Günter Schlungbaum is observing (3rd from left). Foto: H. Baudler. **B:** Ferdinand Brzezinski (left) and Ernst-Albert Arndt in the mid-1980ies at an excursion in front of the legendary Barkas. Foto: R. Heerkloß. **C:** Werner Schnese (front) and Peter Hupfer (back) expose a flow probe. Foto: P. Hupfer. **D:** Henning Baudler is initialising another flow probe, which was developed in cooperation with the working group of technical electronics and sensorics (2009). Foto: F. Schmacka. **E:** Me as a “pier”biologist upon sampling and measuring in our daily routine program. Foto: L. Felgentreu

Apart from the professors Werner Schnese (Fig. 1 C) and Ernst-Albert Arndt (Fig. 1 B), several other scientists contributed much to develop the research at the Biological Station. One of them was Ulrich Schiewer (Fig. 2 A), who planned and installed many enclosure experiments in the 1980ies and early 1990ies. He published several papers on these experiments and, thus, brought the station to international attention (e.g. SCHIEWER et al. 1984, SCHIEWER et al. 1991, SCHIEWER et al. 1993, SCHUMANN & SCHIEWER 1994). Hendrik Schubert (Fig. 2 B), who followed him as a full

professor of ecology, has a strong focus on ecology of inner coastal waters. Ulf Karsten became full professor in applied ecology (now applied ecology & phycology) and followed Günter Schlungbaum in 2000. He always supported the improvement of the station's infrastructure and the long-term monitoring in the Darß-Zingst Bodden Chain.



**Fig. 2** **A:** Ulrich Schiewer receiving congratulations upon his appointment as an extraordinary professor from Sibylle Abarzua and Norbert Erdmann in 1988. Sitting in front: Eike Libbert and Waltraut Schiewer. Foto: R. Heerkloß. **B:** Hendrik Schubert on board of the *Gammarus* in the mid 1990ies measuring primary production. Foto: R. M. Forster.

### 3 Staff and Guest Researchers

The first ship for sampling the lagoon system was built and put into service to sample water. Klaus Fütterer was the first ship's master of the *Gammarus* and Bernd Kriesten helped on board and worked as a house manager. Since 1989, Volker Reiff (Fig. 3 A) took over all these tasks, after he worked for a short time at the *Gadus*, the former research vessel stationed in Rostock (BAUDLER & HUPFER 2011). Nowadays, Volker Reiff is involved not only in sampling, but also in the maintenance of the measuring equipment, construction of mesocosms and participates fully in the daily measuring program. The technician does all analytical work in the lab, especially nutrient determination. The first technician at the station was Gerda Krüger (Fig. 3 B), who was followed by Rita Wulff (Fig. 3 C).

There were several senior scientists responsible also for chemical analytics and its quality management, the implementation of new methods and teaching: the first was Günther Nausch (nutrient analyses, Fig. 3 D), who worked later at the Leibniz Institute for Baltic Sea Research (IOW) and is now retired, followed by Uwe Selig (phosphorus cycle, now project execution office) and Christine Neumann (many years in various working groups of the University and at the IOW).

Especially in the late 1970ies and in the 1980ies, many other biologists of our university participated in mesocosm experiments and field campaigns: Monika Nausch (matter cycling, Fig. 3 D), Günter Jost (aquatic microbiology, Fig. 3 E), Norbert Wasmund (phytoplankton and microphytobenthos) (all senior scientists at the IOW now), Hartmut Arndt (protistology, was PhD candidate then, is now full professor of ecology at the university in Cologne, Fig. 3 E), Sabine Fulda (senior scientist in plant physiology, later plant genetics, now retired), Reinhard Heerkloß (zooplankton, Fig. 3 D), Peter Spittler (protistology) (all at our university, some are retired now) and Thomas Walter. Zoologists and marine biologists worked also at the Darß-Zingst Bodden Chain and used the ships, sampling devices and hands on help provided by the Biological Station: Helmut Winkler (fish biology), Günter Arlt (meiozoobenthos)

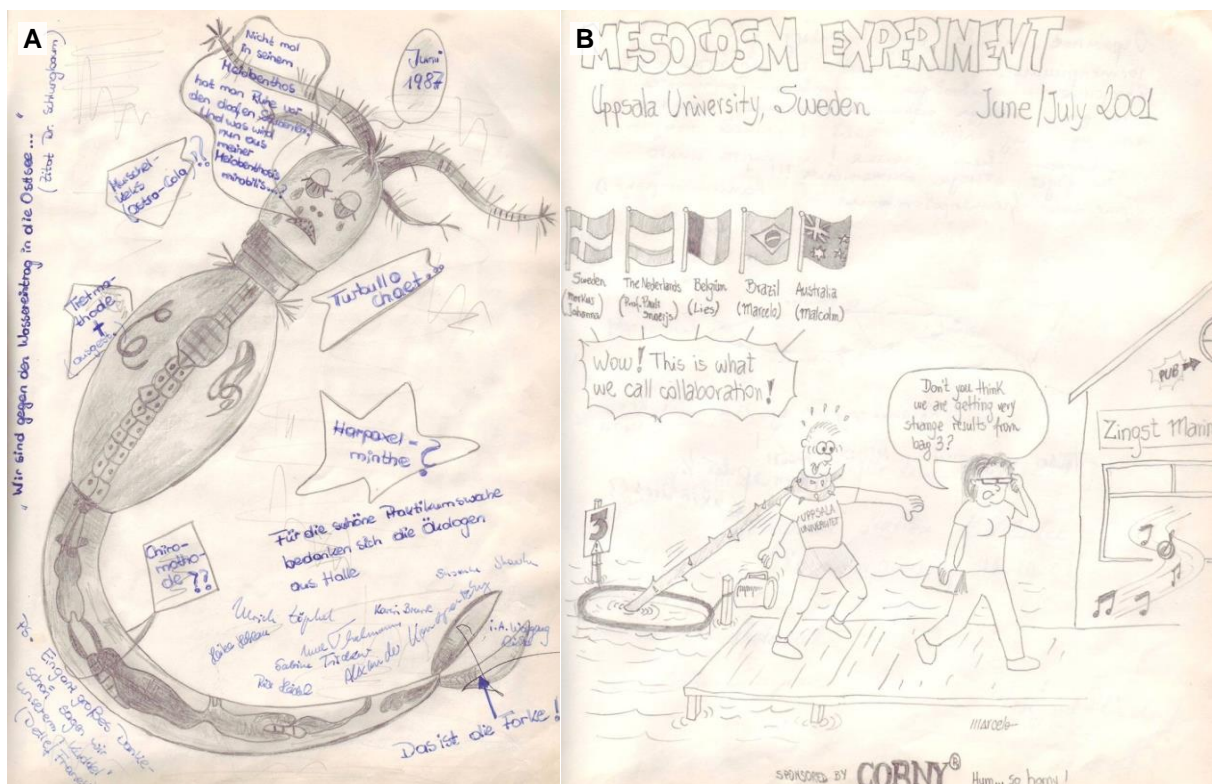
(senior scientist and professor at our university, retired), as well as the macrozoobenthologists Detlef Franek and Roger Burckhardt, Regine Bönsch (Institute for Applied Ecosystem Research, Broderstorf), Michael Zettler (IOW) and Ralf Bochert (State Agency for agriculture and fisheries Mecklenburg-Pomerania). Other working groups of the Institute of Biological Sciences, like biophysics, animal and plant physiology, dedicated also resources to the investigation of coastal ecosystems. Ulrich Vietinghoff and his senior scientist Marie-Luise Hubert promoted statistical methods and ecosystem modelling. However, these colleagues turned their focus to the Greifswalder Bodden in the 1980ies.

The working group of Hartmut Ewald provided much to the technology of measuring environmental parameters: Rainer Jaskulke and Bernd Himmel. They did not only construct probes, but also algae incubators and coupled our sensors to the computer network.



**Fig. 3** **A:** Volker Reiff as the shipmaster inspects his new research vessel, the *Nauplius*, at the Barther ships yard in summer 2011. We had just handed over the old ship, the *Gammarus*, to its new owners after having a last fare well trip. Petra Nowak was the first on board and served as a weight in a heeling test. **B:** Gerda Krüger at our first nutrient autoanalyser from mlw (Volkseigenes Kombinat Medizin-, Labor- und Wägetechnik Freital). Foto: H. Baudler. **C:** In 2011, we got our third autoanalyser. Rita Wulff observes carefully how the measuring manifolds are set up. **D:** Günther and Monika Nausch (sitting at the desk) as well as Reinhard Heerkloß (2<sup>nd</sup> row, right) at a scientific meeting. Foto: provided by R. Heerkloß. **E:** Hartmut Arndt (left) and Günter Jost taking samples at an enclosure construction. Foto: provided by H. Arndt.

Additionally, the Biological Station hosts many other guests, which use the infrastructure for workshops, field trips and their own experiments (Fig. 4 A and B). Ecological excursions are often combined with a trial day as a marine biologist. We gladly support such events by boat trips and sampling in the lagoons, microscopy or lab shows. The informal atmosphere turns all activities and scientific vocabulary into fun, which results in such creative and entertaining drawings as well to some remarkably comical quotes as “Blaukorn (mineral fertiliser) is blue and rain water also” following a famous tongue twister. This reflects that rain water is rich in phosphate, what turns blue upon the molybdenum blue reaction for measurement. The result was compared to one grain of fertiliser dissolved in one litre of water with a similar result. The students should get a visual impression of very small concentrations and could handle all samples on their own. Usually, this experience triggers long debates about fertilisation in gardens, flower pots, agriculture and environmental protection.



**Fig. 4** **A:** This is a very funny guest book entry of students from the University of Halle. The research object is clearly and lovingly painted: a benthic harpacticoid copepod. **B:** The Biological Station supported a Swedish enclosure experiment, in which a very international crew collaborated.

#### 4 Future plans

For some years now, we improved the connection between the working groups in Rostock and Zingst. Thus, more and more colleagues from Rostock share in the daily monitoring program and support practical courses. On the other hand, the personnel of Zingst helps analysing nutrient samples and teaches water chemistry for Research Training Groups or any individual scientist.

The university plans to build a new house for accommodating larger groups of students in the near future. This will improve especially the sleeping rooms, the kitchen and the lecture room.

## Acknowledgements

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