



## Exploration of Biodiversity in the Baltic Sea

The Baltic Sea is full of various kinds of organisms. Their occurrence and spread is likely influenced by how salty the water is. By analyzing water samples taken along the gradient from fresh water from the Warnow river to the brackish water of the Baltic Sea, this thesis sets out to explore the relation between biodiversity and salinity. However, one can choose from a wide variety of metrics to assess biodiversity within an ecosystem. Some metrics count how many different species occur without incorporating their distribution ("richness"). Others assess the impurity of the distribution of species ("entropy"). What if we could try out different biodiversity metrics to explore how this choice affects the patterns and relations we can discover in the water samples?

We, the [chair of Visual Analytics](#), research data visualizations that help ecologists explore the dynamics in aquatic ecosystems. We are seeking a curious and committed student to work with us at this exciting intersection. As biodiversity is not ultimately defined, your thesis will center around the following question: What is the effect of different metrics on the observed relation between biodiversity and salinity?

### Your job

- Get an overview of biodiversity metrics, their assumptions, and their implications
- Describe the goals, tasks, and needs of ecologists who analyze the water samples
- Design and implement a visualization tool to help them explore the influence of different metrics on the observable relations between biodiversity and salinity:
  - What patterns emerge from the data, depending on which diversity metric is used? What interpretations do these patterns suggest?
  - What metrics explain particular relations or phenomena better than others?
  - Which metric best reproduces the first documented relation between biodiversity and salinity in the Baltic Sea ("Remane curve")?
- Evaluate the practical usefulness of your proposed tool

### Your background

- Enrolled master student in the field of visual computing, computer science, or a comparable field of study
- Interest in data visualization, ecological applications, and interdisciplinary research
- Experience with web-based programming (e.g., TypeScript, React, D3.js)

**How to apply** If you are interested, please introduce yourself to Dr.-Ing. Lena Cibulski ([lena.cibulski@uni-rostock.de](mailto:lena.cibulski@uni-rostock.de)). We look forward to receiving your application!