

# Biodiversity Warehouse atlas software enables user-friendly fish distribution maps for the whole Trilateral Wadden Sea Area



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## Fish Atlas of Germany and Austria

So far, there is no official presentation of the distribution of all fish species all over Germany, where the responsibility for fisheries lies with the federal states. Thus, important basics for biogeographical and ecological questions as well as for protection and management concepts are missing.



Get started! In German, English or Portuguese version:  
[www.fischfauna-online.de](http://www.fischfauna-online.de)

To fill this gap, in a joint initiative of the *City University of Applied Sciences Bremen* and the *German Ichthyological Society*, a German-wide and, together with Austria, cross-national database of all available distribution data was created early on and made available on the internet as a "Fish Atlas of Germany and Austria". [*Fischartenatlas von Deutschland und Österreich - Fischfauna-Online*]

## What information does the Atlas provide?

- Species fact sheets for all German and Austrian fish species (marine and fresh water)
- Distribution maps
- Species description, diagnosis, current information (e.g. new articles), standard information (e.g. red list status, ecological guilds)
- Photo gallery
- Numerous search and evaluation options

## Biodiversity Warehouse

Under the name "Biodiversity Warehouse" an open access, modular software architecture for the administration and presentation of faunistic distribution data was developed. The technical implementation is carried out as a distributed system using

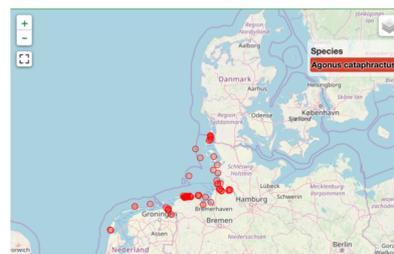
- PostGIS as spatial database system,
- OSM as the source of the basic maps,
- GeoServer for the publication of map overlays,
- java and node.js for the implementation of backend-services and
- javascript-APIs like Angular, Leaflet, D3.js for the implementation of the frontend.

## German Ichthyological Society

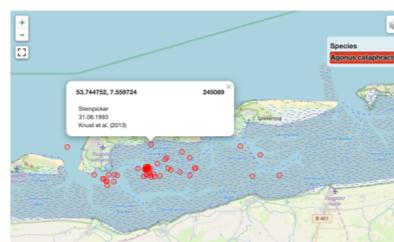
<http://www.ichthyologie.de>

## Trilateral Wadden Sea Area included

- For the first time, fish distribution maps for the entire Trilateral Wadden Sea area also were included.
- The data mainly originate from a first ad-hoc literature search and do not claim to be complete.
- However, the first online distribution maps show that the atlas offers a user-friendly web-based system for the coordination, evaluation and communication of distribution data.
- We see potential users in the scientific field as well as in official nature and species conservation and environmental education.
- Citizen Science data can also be integrated via simple interfaces.



View at different zoom levels. Maps based on Open Street Maps.



Distribution maps (pinpoint, exact specification of the data sources).



Combined representation of several species.

## Gallery



We are still urgently looking for photos for free distribution! Who can help?

## Where does the data come from?

The distribution data within the Atlas comes from

- literature searches and
- database queries with the responsible authorities (currently two German federal states and Austria as a whole) as well as from
- individual reports which registered users (Citizen Scientists) can transmit online or via smartphone application directly to the system.

The Citizen Science data are checked for plausibility by a specialist editorial team before publication in the system for the purpose of quality control.

## You would like to contribute?

Fish distribution data and literature wanted!

Please feel free to contact German Ichthyological Society.

## Who we are?

Both the fish atlas database and the underlying software Biodiversity Warehouse were developed at the University of Applied Sciences Bremen in the International Study Course of Technical and Applied Biology (ISTAB):

- In cooperation with German Ichthyological Society
- Developed exclusively within the framework of student projects
- Working group Biodiversity between Biology (Prof. Dr. Heiko Brunken) and Computer Science (Prof. Dr.-Ing. Heide-Rose Vatterrott)
- All data Open Access, freely available for non-commercial use (environmental education, science)
- Distribution and species information is currently being updated - support is welcome



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