

# Causes and consequences of mercury levels in a long-lived seabird

*Starting date: April 2019 (the exact date is flexible)*

*Duration: 5 months (also flexible)*

One of the main consequences of anthropogenic disturbance is the release of a huge variety of pollutants, such as trace metals. These metals are able to accumulate in organisms, causing long-lived species and top predators, such as seabirds, to be particularly exposed. Trace metals, such as mercury, are known to affect life-history traits, such as survival and reproductive success, as well as the immune system and stress response. It is also now well-known that birds are able to reduce their pollution level by releasing metals in their feathers and eggs. As such, metals and their harmful consequences may be transferred to the next generation, but whether this indeed occurs remains an open question. Moreover, longitudinal data are scarce, but required to understand long-term consequences of pollution.



*Banter See colony*

We study common terns (*Sterna hirundo*) at a long-term study population located in the Banter See at Wilhelmshaven on the German North Sea coast. Since 1992, all locally hatched birds have been marked with a transponder shortly prior to fledging. We use antennae at resting places and around nests to identify both breeding and non-breeding individuals. Combined with 3-times-weekly checks of nests to record reproductive parameters and to mark offspring, our methods enable the systematic and remote documentation of individual presence and reproductive performance at the colony. Once birds have established themselves as Banter See breeders, their re-sighting probability is almost 100% and their return rate is 90%, such that we can collect data over long individual life cycles.

Since 2017, we collect blood samples and feathers from adults and their chicks, as well as eggshells, non-hatched eggs and dead chicks to assess mercury levels. Adult blood samples are obtained using a non-invasive technique, using blood-sucking bugs (*Dipetalogaster maximus*). At present, nearly 750 samples are available for further investigation.



*Blood-sucking bug*



*A common tern couple at the nest*

For the proposed project, we are searching for (a) dedicated student(s) who can start in April 2019, is/are enthusiastic about spending lots of time in a large colony of seabirds to continue collecting samples for mercury analyses, as well as to participate in all other research projects and the general monitoring of the breeding population. The aim of the project is to investigate whether the mercury level measured in adults correlates with life-history traits (age, sex, reproductive success...) and/or physiology (hormone levels, immune function...) and is transferred to the offspring (with potential consequences). Because the common terns in the breeding colony are

habituated to research, fieldwork will involve a lot of close interaction with the birds. No prior experience with birds or fieldwork is required. Knowledge about statistics and R, however, would be useful. The student(s) need(s) to enjoy working in an international team, happy to use English as the main working language and willing to wake up early to collect blood samples using bugs (which includes handling those bugs).

For more information, please contact **Dr. Coraline Bichet** ([coraline.bichet@ifv-vogelwarte.de](mailto:coraline.bichet@ifv-vogelwarte.de)) or **Dr. Sandra Bouwhuis** ([sandra.bouwhuis@ifv-vogelwarte.de](mailto:sandra.bouwhuis@ifv-vogelwarte.de)), Institute of Avian Research, Wilhelmshaven, Germany.