


**Leading international biologging research to elucidate the impacts of anthropogenic stressors on marine ecosystems**

	Principal Investigator	National Institute of Polar Research, Associate Professor <b>WATANABE Yuuki</b> Researcher Number : 60531043
	Project Information	Project Number : 22K21355 Project Period (FY) : 2022-2028 Keywords : marine megafauna, animal movement, anthropogenic stressor

**Purpose and Significance of the Research**

Ever increasing human activities are altering marine ecosystems globally. However, assessing how anthropogenic stressors affect marine megafauna, the sentinels of marine environments, remains a challenge. Recently, biologging technology emerged, in which miniaturized sensors are attached to free-living animals to acquire information on their behavior, internal states, and the environment. With this technology, this project investigates the effects of the following five major stressors on marine ecosystems and their interactions: (1) ocean warming, (2) decreasing sea-ice extent, (3) decreasing dissolved oxygen concentration, (4) pollution, and (5) underwater noise. The team will attach biologging devices to a range of marine megafauna (i.e., marine mammals, seabirds, sea turtles, and large-bodied fishes) that are expected to be particularly sensitive to these stressors. This project will aim at providing a broad understanding of how anthropogenic stressors impact marine megafauna and ecosystems.

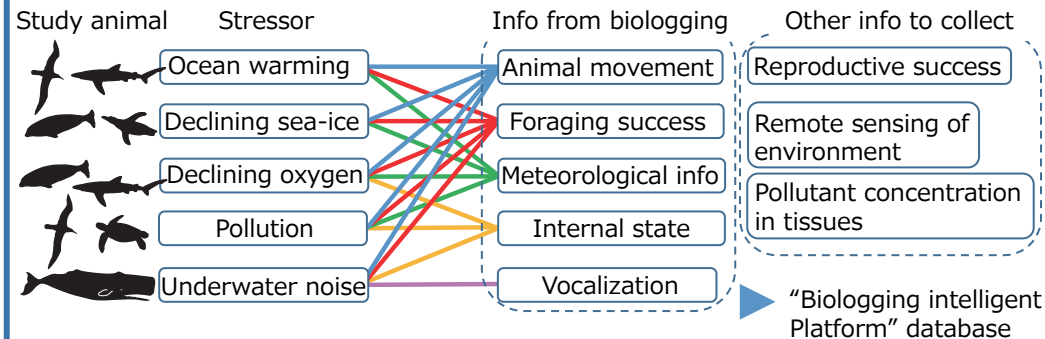
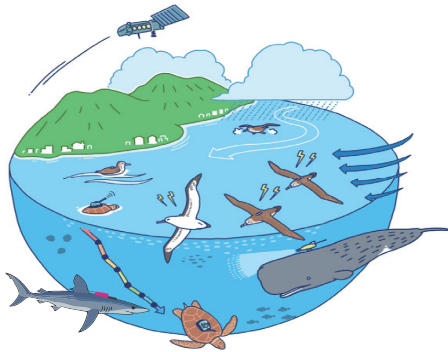
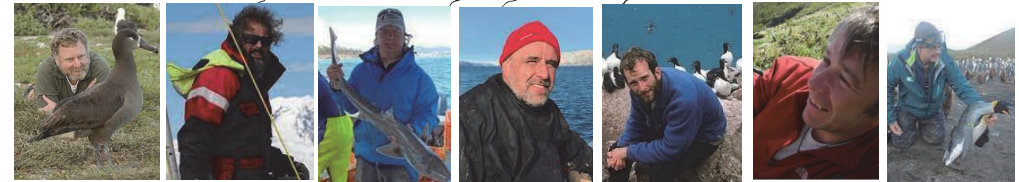
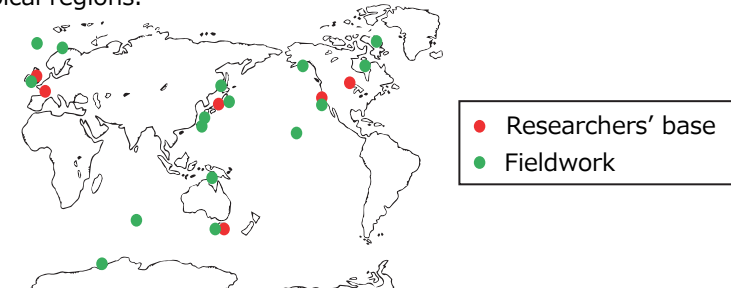


Fig.1 Biologging reveals the effects of stressors on marine megafauna

**Organization of the Project Team**

PI is Yuuki Watanabe (National Institute of Polar Research, NIPR), a leading researcher in the field of biologging. Co-Is include Akinori Takahashi (NIPR), Katsufumi Sato (Atmosphere and Ocean Research Institute, Univ. of Tokyo, AORI), Kentaro Sakamoto (AORI), Kagari Aoki (AORI), and Akiko Shoji (Univ. of Tsukuba). These Co-Is have extensive knowledge and experience of marine megafauna research using biologging technology. Co-Is also include Hidetoshi Takahashi (Keio Univ.), an engineer capable of designing and developing new biologging devices. This project has seven oversea collaborators, who are distinguished researchers in the field of marine megafauna ecology and physiology. This international collaborative team has unique research environments, allowing fieldwork to be conducted at many sites across the globe, including the Arctic, Antarctic coasts, subantarctic islands, and many coasts and islands in temperate and tropical regions.



D. Costa (USA) P. Miller (UK) J. Semmens (Australia) N. Hussey (Canada) K. Elliott (Canada) T. Guilford (UK) C. Bost (France)

Fig.2 International network of this project

**Plan for Fostering Early-career Researchers**

This project will employ 15 postdocs in total for up to three years. The postdocs will visit the laboratories of oversea collaborators (red in Fig. 2) and conduct fieldwork (green in Fig. 2). Doctoral students will also be dispatched to oversea institutions and fieldwork sites. Collaborating with the top oversea researchers, postdocs and students will conduct their own studies on marine megafauna using biologging technology. With an extensive international network of the team, this project helps early-career researchers to advance scientific skill and knowledge, build research careers, and eventually obtain tenure research positions.

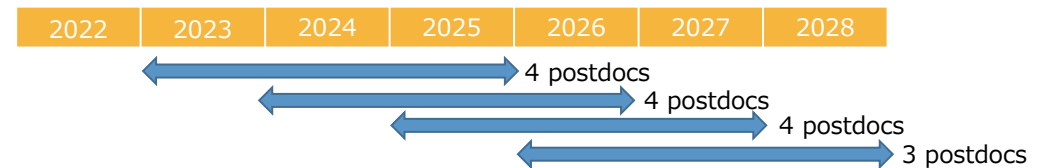


Fig.3 Plan for postdoc employment