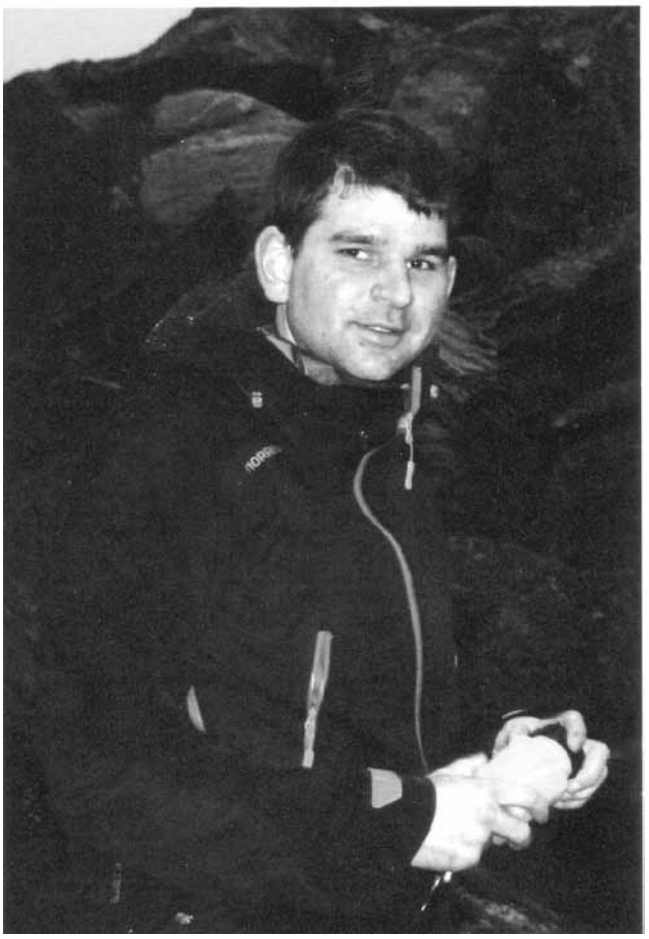
# Manton Prize Winner

## Responses of the macroalgal key species *Fucus serratus:* Driving the impact of climate change on North Atlantic rocky shores



Interestingly, a unifying characteristic of the previous Irene Manton Price winners is their profound interest in and fascination for nature. This complies well with my own background. I have always been interested in the marine environment. After finishing high-school in 2002, I chose to do ornithological field work during my one-year civilian service on the island Spiekeroog in Northern Germany. Subsequent to this remarkable experience, I got in first touch with marine biological research during three-month internships at the biological institute for polar and marine research on Helgoland (AWI: Alfred Wegener Institut, Germany) and at a seal station in Friedrichskoog (Germany).

With the aim to specialize in the field of marine science, I started studying biology in 2004 at the University of Oldenburg (Germany), where I wrote my Diploma thesis in the research group of Gabriele Gerlach "Biodiversity and Evolution of Animals". The aim of my investigation was to uncover the role of spatial geographic distance, hydrodynamics and behavior for the connectivity between populations of the marine intertidal snail *Littorina litorea*. During these investigations, I developed a strong interest for programming and compiled the statistical package 'DEMEtics' for the software R within the group of Gabriele Gerlach. It allows to measure genetic differentiation between populations, based on two measurement indices, of which one was suggested to overestimate population connectivity.

After graduating in 2010, I started a Ph.D. position at the University of Nordland (UiN) in Northern Norway. Affiliated with the "Marine Ecology Research Group", I now investigate responses of the marine brown alga *Fucus serratus* to climate change under supervision of Galice Hoarau (UiN), Jorge Fernandes (UiN) and Jeanine L. Olsen (University of Groningen, The Netherlands). Early results of these investigations were the topic of my presentation at the BPS winter meeting in Newcastle. Specifically, I aim to predict distributional changes of *F. serratus* under simulated climate change with an Ecological Niche Model and to uncover genetic changes (at microsatellite loci) that have occurred over the past decade. The niche model is based on collaboration with the Phycology Research group of the University of Ghent (Belgium) and predicts a drastic northward shift of the southern distribution limit of *F. serratus* until 2200. Our finding of a significant decrease in genetic diversity at its southern edge of distribution in northern Spain, suggests that it might soon be too warm for this species. Due to its key role for the intertidal ecosystem, disappearance of *F. serratus* can have far reaching consequences for the entire North Atlantic intertidal ecosystem with unforeseen impact on human society and economy being linked to this coast.

Thanks to the investigations in my Diploma and PhD thesis, I learned a variety of investigative approaches in marine evolutionary biology, ranging from molecular genetic analyses in the lab, to in vivo experiments, bioinformatics programming and computer modelling of larval dispersal and of species distribution. Based on these previous scientific experiences, I am keen on further investigating evolutionary implications of environmental changes on marine ecosystems. Species' responses to such changes are driving adaptation, extinction and speciation and ultimately set the level of biodiversity.

I would like to thank all the persons that are involved in and contribute to my PhD investigations, those who helped and guided me through the early stages of my biological career, especially the supervisors of my Diploma and PhD thesis, and finally the BPS for awarding me the Irene Manton prize. The winter meeting in Newcastle was a very interesting and inspiring conference.

**Alexander Jüterbock**