

Citizen Science in Baltic Sea – Experience from the Beach

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Many people believe that the Europeans are less and less interested in science which makes it difficult to base decisions on scientific knowledge and results in confusion between science, junk science and pseudoscience, a confusion dangerous for the modern society. There are fields which are evidently underrepresented in the school curriculum. This is the case of marine sciences in Poland. Poland is a relatively large country but its coastline is comparatively short. Sandy beaches are typical for the southern Baltic but many regard them as biological deserts, highly valued only for recreation and tourism. In order to demonstrate that healthy recreational waters and clean beaches are linked to the well being of the natural ecosystems, we have formulated different educational programs in close cooperation with several high schools. Students supported by their teachers and marine scientists performed relatively simple but time-consuming environmental observations. We prepared three different educational programs: one was targeted at gifted students, the other two engaged groups of students. In the first program it was the students themselves who had to plan an experiment or a field study, and we helped the students to design a methodologically easy study addressing a bona fide scientific question. The goal of the second program was to engage students in time-demanding measurements of various biological and physical data. The measurements were performed by 2 to 5 students with simple equipment available at every school. The third program was perhaps the most interesting because it allowed to obtain publishable data. With the help of students we obtained multiyear, fine scale data on the distribution of sandhopper *Talitrus saltator*, a crustacean that might be used as an indicator of the beach naturalness. After giving a short introductory lecture, we took the students to the beach for a practical demonstration how to dig holes of the specified size and depth, remove the upper sand layer and count the jumping-out sandhoppers. The program continued for 6 years and covered the whole Polish coastline. The experience gathered in all three programs was shared with the participants of the 2009 Spring School on Coastal Monitoring in Porto (Portugal) and allowed to create a proposal for a European Education Marine Monitoring Network. All three programs received positive feedback from the participants. Importantly, they gave the students the opportunity to learn how scientific knowledge may inform environmental decision making and the opportunity to experience the continuity of science: marine sciences integrate disciplines that are separate in the Polish school curriculum.

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