Persistent organic pollutants (or POPs for short) are a group of chemicals with particularly harmful effects, because they are difficult to destroy, and tend to accumulate in animal bodies. An example of POP is DDT – a chemical widely known as an especially vicious toxin. No wonder, since it has been first produced to fight pests, e.g. unwanted insects. However, its effects exceeded by far what was intended, and nowadays, despite it has been banned across most of the world, we have plenty of DDT everywhere on the planet, including the remote Arctic.

In this project, I will study the behaviour of DDT and its kin: the long-lasting pollutants called PCBs and organochlorine pesticides. I aim to investigate whether those deposited once in the sea may be brought back to land again, to harm organisms up there, too. As it happens, there is a potential way for them to do that: through the falling snow. How should snow obtain pollutants from the sea? Firstly, it may simply absorb some of those which have "evaporated" into the atmosphere. With less and less sea ice this becomes more likely. But secondly, snowflakes may also form on small droplets of sea water, a spray formed in the air by wind and waves. This is a process which has a high potential to collect the organic pollutants from the sea surface, where they would naturally accumulate, being poorly dissolvable in water. Therefore, I plan to set out to study this process in the Arctic, to see how much effect it may have. And why should snow concern us, if whatever pollution it holds is "frozen" inside it? Because once it melts, it will release it again, and this melting happens when life flourishes on land. Therefore, the data I aim to collect will help protect the environment better, once we know how much toxins the animals on land have to handle.

The detailed plan for this project is to collect samples of snow and seawater, and determine the concentration of POPs in those. Then, mathematical models will be used to estimate how much sea water is actually sprayed into the air. Also, the concentrations of these pollutants in the air itself will be measured. From the relationships between these data, much and more will be possible to say about the processes of pollution exchange. To add some extra information, I will also look into the changes of these concentrations with height above sea level, distance from the sea, or between slopes facing the wind and sheltered from it. This will help to see how far inland may the influence of this extra source reach. Let's hope it is not much – then I'll have a good excuse to study what happens in the polar atmosphere, a fascinating study in its own right. Yet if it is a route pollutants take frequently, it is better to know that before the Arctic faces even more environmental stress. As if the warming we observe, melting glaciers and sea ice was not enough.