

# Marine pollution lessons in a city without sea

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Learning something from an environment that you rarely see it's indeed a hard exercise of imagination. Moreover, if the thing you have to learn is related with empirical science, is even a nearly dreadful work. However, the fascination that places like the Southern Sea surrounding Antarctica or the tropical Open Ocean may help to enhance the attention of your public in a city like Madrid, located in the geographical centre of the Iberian Peninsula.

On different experiences directed to a wide typology of people (from kids, youngsters and non-expert adults, to specialised public like teachers or other Scientifics), our research group has tried to maximize the outreaching of our studies' results. Those are focused on persistent organic pollutants (POPs) occurrence, fate and effects in marine ecosystems and biota. For instance, we have experienced with mock bird samplings imitating the real protocol to obtain blood for contaminants and isotopes analysis (Roscales, González-Solís et al. 2016, Roscales, Vicente et al. 2016). Likewise, we have used graphical resources (big format information panels)(Expedition 2009, Expedition 2015) to illustrate talks about POPs distribution in the open ocean atmosphere (Gonzalez-Gaya, Zuniga-Rival et al. 2014, González-Gaya, Fernández-Pinos et al. 2016), waters (González-Gaya, Dachs et al. 2014) and marine plankton (Morales, Dachs et al. 2015).

The methodologies for the divulgation process include talks, debates and participatory workshops in schools and in our working laboratory, but also the participation in television documentaries or in newspapers' blogs. Each methodology is intended to a certain target public. However, are those methodologies working appropriately for the effective transmission of information? Do kids learn better during a traditional school class than playing a game on a computer? Do adults prefer serious conferences than sampling simulation workshops? Several experiences will be presented and evaluated.

"Connected learning", that coordinates formal and non-formal situations, may be an answer to the appropriate scientific outreach. That way linking school subjects to attractive and informative sessions about oceanic persistent pollution or workers industrial responsibility to practical experiences in the sea (or simulations in our case in Madrid), could be the perfect format for targeting our audience. In the "connected learning" sphere, academia, administration, educators and even private companies work together in order to facilitate the assimilation and use of apparent "distant" information in our daily live. Our final objective is not only to explain that POPs like organochlorinated pesticides, perfluorinated water repellents or polybrominated flame retardants found in Antarctic birds or in the middle of the Pacific Ocean come from our activities. But to make people assume their responsibility and therefore, make a societal change in order to preserve our oceans healthy and pristine. And it is not only a matter of scientific research, but an educational issue.

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