

Best Poster Presentation at Environ 2021

**Winner: Adrián Delgado
Ollero; Dublin City University**

Biofouling studies on marine
rated materials and coatings



Materials immersed in water undergo a series of biological and chemical processes, resulting in the formation of complex layers with attached organisms, known as biofouling. Biofouling in the aquatic environment shortens the life-time of immersed structures affecting the functioning and data quality of water instrumentation. For a large percentage of deployed instrumentation, biofouling is the single biggest factor affecting the operation, maintenance, and data quality and responsible for high ownership costs to the point where it becomes prohibitively expensive to maintain operational networks and infrastructure.

The selection of materials, and coatings with anti-fouling properties has become an increasingly difficult challenge but one that must be constantly reviewed and updated to advance the development of materials, composites and coatings that can be widely used in aquatic ecosystems and allow devices and structures submerged or in contact with water to last longer and reduce maintenance costs.

Adrian's PhD research focuses on overcoming the problem of biofouling, specifically on the study of the antifouling properties of textured surfaces inspired by marine organisms, their artificial replication and their application in antifouling technology in laboratory and real marine environments. His research also focuses on the development of integrated UV-C radiation systems for the maintenance of optics in water quality monitoring sensors and research into materials for more durable sensor-housings against biofouling.



Adrian's work at Environ 2021 aimed to present a scoping study, a range of materials commonly used in the construction of marine sensors and 2 antifouling paints were deployed over 1 year to test their robustness and antifouling performance in the brackish water ecosystem of the Dublin Estuary to be subsequently employed in the construction of a sensor in collaboration with the DCU Water Institute and its partner TechWorks Marine. Adrián's PhD research is funded through Project Ireland 2040's Disruptive Technologies Innovation Fund (DTIF), by the European Union's Horizon 2020 research and Innovation programme (Next Evolution in Materials and Models for Ocean Energy NEMMO project and DCU Water Institute under the supervision of Prof. Fiona Regan.