



Port of Cartagena

Cartagena Port Authority

**IAPH 2025**

## **Sustainability Awards**

### **WPSP theme 4. Community Building**

#### **Focus area**

**Societal integration of ports: aligning and integrating port and community objectives for the betterment of both.**

Leadership of port authorities in adhering to principles of good corporate governance and promoting them in the wider port community.

#### **Potential topics**

- Port information and training centres - Open port initiatives - **Community and social engagement programmes - Education and employment initiatives** - Transparency and reporting - Equal rights and opportunities - Gender equality - Business ethics and sustainable port governance - Fair trade / responsible supply chains - Anti-corruption - Sustainable cruise tourism initiatives

#### **Project**



**Inter-University Chair in Environment Port Authority of Cartagena-Campus Mare Nostrum (APC - CMN Chair in Environment)**

## Inter-University Chair in Environment Port Authority of Cartagena-Campus Mare Nostrum (APC - CMN Chair in Environment)



In 2015 the Port of Cartagena created the Inter-University Chair of Environment Port Authority of Cartagena-Campus Mare Nostrum (Chair of Environment APC - CMN). In July of that year, a collaboration agreement was signed between the Port Authority of Cartagena, the Polytechnic University of Cartagena and the University of Murcia for the creation of this Chair, which was renewed on June 19, 2023.

This year marks the tenth anniversary 10 years of this Chair, which allows permanent collaboration between the Port Authority of Cartagena and public universities in the Region of Murcia (Spain), developing research activities, transfer, technical assistance and training in environmental matters.

Its purpose is to establish a permanent structure of collaboration between the three institutions that includes research, transfer, technical assistance and training activities in environmental matters to be developed by the research groups of both Universities, including other Research Centres, professionals or collaborating entities, in order to provide the Chair with a multidisciplinary and specialized team to carry out its activities in a framework of close collaboration and cooperation.

Priority areas of action of the Chair are those determined by the Permanent Commission that governs its operation, and particularly those related to biodiversity and the responsible management of species and habitats, mainly in the port environment.

The promotion of environmental concepts and tools such as Nature Conservation Banks, the environmental custody of the territory, the management of natural resources, the integration of environmental assessment in the planning and management of companies, as well as the design of measures aimed at the conservation, sustainable use, improvement, restoration and compensation of the natural heritage and biodiversity are of interest.

Likewise, the Port of Cartagena has extended this commitment to the companies that are part of the port community to contribute to their involvement, awareness, collaboration and participation in this objective that has to be common to all of us of conservation and improvement of our environment.

The Chair of the Environment carries out studies and research on environmental matters, training and academic activities to improve the quality and consolidation of knowledge in this field, and the organization of activities aimed at raising awareness, dissemination and reflection on its priority areas of action.

The Port Authority of Cartagena directs, coordinates and collaborates with both universities in carrying out advisory, research and training activities. It also places at their disposal its own facilities that may be necessary for the development of the Chair; promotes dissemination, diffusion, communication and promotion activities of the actions carried out; and collaborates in the search for European and research funds destined to the realization of activities related to the protection, conservation and improvement of the environment.



Throughout these 10 years, through the Chair, the Port Authority of Cartagena and researchers from both universities have developed more than 25 research projects that represent an important advance in scientific knowledge and quality research.

#### In 2016

"Underwater noise monitoring using Autonomous Underwater Vehicles. Integration of an intelligent hydrophone in an AUV IVER2\_Ecomapper", by Javier Gilabert Cervera.

"Environmental diagnosis, risk analysis and definition of corrective measures in abandoned sludge deposits in the Rambla del Avenque (Cartagena)", by Ángel Faz Cano.

"Evaluation of pollination and seed dispersal networks as key factors for the conservation of the 5220\* habitat on the coast of Cartagena", by M<sup>a</sup> Pilar de la Rúa Tarín.

"Analysis of the population structure and captive breeding of the long-snouted seahorse *Hippocampus guttulatus*", by José Galián Albaladejo.

#### In 2017

"Diatom community as indicators of water quality and sentinels of environmental changes", by Marina Aboal.

"Underwater robotics for the acoustic characterization of impulsive underwater noise present in port facilities according to the methodological criteria for the implementation of Marine Strategies. Case study of the Port of Cartagena", by Antonio Guerrero González.

#### In 2018

"Análisis, Distribución, Fuentes y Destino de Polímeros Microplásticos en las Dársenas de Cartagena, Escombreras y Cala Cortina", by Francisco Javier Bayo Bernal.

"Role of the docks and dikes of the port of Cartagena for the recruitment of juveniles and as habitat for adults of rocky bottom fish", by Víctor Orenes Salazar

"Assessment of the impact of atmospheric emissions from cruise ships in the dock of Cartagena: pilot study of marine pollution", by J. María Moreno Grau.

#### In 2019

"Development of a system of natural environment indicators integrated in the strategy of the port of Cartagena: terrestrial and coastal fauna", by José Francisco Calvo Sendín.

"Development of a GIS application as a support tool for the environmental digitalization of the Port of Cartagena and case study of application using underwater robotics", by Antonio Guerrero González. "*Monitorización de ruido submarino mediante Vehículos Autónomos Submarinos. Integración de un hidrófono inteligente en un AUV IVER2\_Ecomapper*", por Javier Gilabert Cervera.

### **In 2020**

- ☀️ *"Waste reuse and corrective measures in the sea, through the design of new materials, reefs and floating islands. FLOATER", by Carlos J. Parra Costa.*
- ☀️ *"Protocol implementation and design of a geographic information system on biodiversity in the Natura Network. Pilot example: Avifauna of the protected areas of the Mar Menor and the Mediterranean Coastal Strip of the region of Murcia", by José Antonio Palazón Ferrando.*
- ☀️ *"Geocondensers: Application of shallow geothermal energy as a passive means to condense atmospheric humidity", by María del Mar García Alcaraz.*

### **In 2021**

- ☀️ *"Underwater Robotics for Obtaining Bionomic Cartography of UGAP2 areas", by Antonio Guerrero González.*
- ☀️ *"Study of fish stocking in mesophotic rocky bottoms in the environment of the Port of Cartagena" - MESOFOTICT", by José Antonio García Charton.*
- ☀️ *"Modeling of the dynamics of Arsenic and Mercury contamination in the maritime-terrestrial zone of influence of the port area of Cartagena", by Salvadora Martínez López.*

### **In 2022**

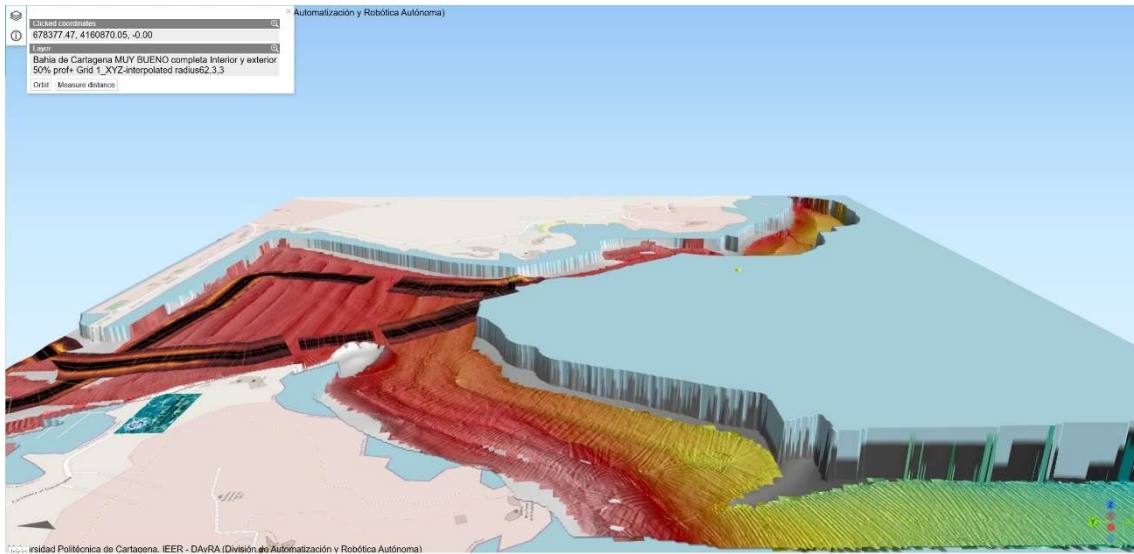
- ☀️ *"Technology based on artificial intelligence for the dissemination and communication of environmental actions", by Rodrigo Martínez Béjar.*
- ☀️ *"Landscape impact study of the Barlomar Port Terminal. An analysis using visual impact indicators based on the intrinsic values of the protected areas of the NATURA 2000" Network, by Salvador García Ayllón-Veintimilla.*
- ☀️ *"Monitoring of sustainable artificial reef colonization", by Carlos J. Parra Acosta.*

### **In 2023**

- ☀️ *"Radiological map of the Port of Cartagena", by Rodrigo Martínez Béjar.*
- ☀️ *"Detection of emerging contaminants in port water quality control, pharmacological residues", by Pedro Marín Carrillo.*
- ☀️ *"Coral conservation study in the coast of Cartagena - CONCORALCT. Red gorgonian and orange coral", by José Antonio García Charton.*

In 2024

- ☀️ “Environmental adaptation of plots of land next to the old Peñarroya foundry in Santa Lucía”, by Ángel Faz Cano.
- ☀️ “Atlas of the flora and fauna species of the city of Cartagena”, by María Luisa Suárez Alonso.
- ☀️ “Purpurin in the sea, analysis of its presence, biodegradation and toxicity of shiny microplastics in marine ecosystems”, by Marta Doval Miñarro.



Also included in the content of the APC - CMN Environmental Chair are the annual End of Grade and End of Master's Grade Awards, which are aimed at engineers, graduates and master's grade holders. Each year these awards are presented with proposals as diverse as research related to the Natura 2000 Network, biodiversity and responsible management of species and habitats, underwater noise, marine pollution and contaminated soils, as well as technological developments related to the dissemination, communication or management of environmental actions.



2023 TFG and TFM Awards Ceremony



2020 TFG and TFM Awards Ceremony



2019 TFG and TFM Awards Ceremony



2022 TFG and TFM Awards Ceremony

The following works have been awarded until the current edition:

End of GRANDE:

In **2016**; “Micronuclei and other nuclear abnormalities in hemolymph of wild mussels (*Mytilus galloprovincialis*) in 10 sampling stations of the Mediterranean coast”, by María Virtudes García Pérez.

In **2017**; “Investigation of the Effect of Air Lubrication on Friction Resistance”, by Antonio Gallardo Martínez.

In **2018**; “Distribution patterns of wintering raptors in Campo de Cartagena”, by Mario Álvarez Martínez.

In **2019**; “Ecological functions of intermittent rivers for vertebrate terrestrial fauna”, by Juan Carlos Vivancos Pérez.

In **2020**; “Garden analysis using environmental criteria and proposal for adaptation to climate change”, by Lázaro Rosillo Muñoz.

In **2021**; "Analysis of turbidity and nitrate concentration in samples from the Mar Menor. Development of a new method for the absorption of nitrates in aqueous samples using magnetic nanoparticles", by Miguel Ángel Martín Pepeira.

In **2022**; “Simulation of a container terminal using a computational tool”, by Jesús Cabezo Olmedo.

In **2023**; “Application of hydrophobic coatings on asphalt pavements”, by Ana Moreno Viguerras.

As for the **FINAL MASTER'S THESIS**, the following were awarded:

In **2016**; “Conservation status of Dendropoma lebeche reefs in the Regional Park of Cabo de Cope and Puntas de Calnegre (Region of Murcia)”, by María Alcaraz Marín.

In **2017**; “Study and sizing of an installation for supplying electrical energy to ships from shore based on Onshore Power Supply technology”, by Natalia García Esquivá.

In **2018**; “Larval dispersal patterns in grouper (*Epinephelus marginatus* Lowe 1834) among marine protected areas of the Iberian southeast”, by Víctor Orenes Salazar.

In **2019**; "Study of the impact of cruise ship traffic in the Cartagena Dock and the concentration of particulate matter in the atmosphere. Behavior and influence of other factors on atmospheric aerosol", by Annalisa Di Martino.

In **2020**; “Lighting improvement strategy for public lighting in parks and gardens in Cartagena”, by Lara Álvarez Mascheroni.

In **2021**; “Surface functionalization of low-cost lignocellulosic wastes for use in nitrate removal in water”, by Anelisse Pol Zenteno.

In **2022**; “Comparison of fish video-census methods for future application in Mediterranean mesophotic population studies”, by Antonio Ortolano Muñoz.

In **2023**; “Combination of innovative technologies for water reuse”, by Cristián Pérez Hernández.

**PROYECTO INVESTIGACIÓN: Reutilización de residuos y medidas correctoras en el mar, a través del diseño de nuevos materiales, arrecifes e islas flotantes.**  
 << FLOATER >>



**PROYECTO PUREHABITAT**

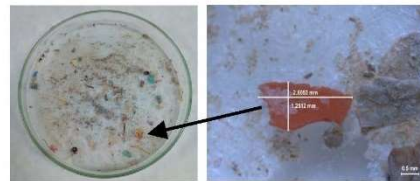
**ALGUNAS ESPECIES DE JUVENILES DE PECES OBSERVADAS**



De izquierda a derecha y de arriba abajo: *Sarpa sarpa*, *Diplodus annularis*, *Symphodus ocellatus*, *Chromis chromis*, *Epinephelus marginatus* [Fotos: Víctor Orenes Salazar]

**CMC** Centro de Materiales \*ANÁLISIS, Caracterización, Fomento y Diseño de Polímeros Microestructurados en las Islas de Cartago, Escondido y Los Corales  
 MEMORIA DE RESULTADOS DEL CONTRATO PARA ACTIVIDADES DE INVESTIGACIÓN Y DESARROLLO  
 REF: 9615-1924

A continuación, cada una de estas micropartículas fotografiadas se aislaba en placa Petri de 40 mm y se analizaba de forma individual mediante espectroscopia de infrarrojo con transformada de Fourier (FTIR) (Thermo Nicolet 5700, Madison, WI, USA), con resolución de 16  $\text{cm}^{-1}$  y un intervalo de longitud de onda de entre 400 y 4000  $\text{cm}^{-1}$ , para conocer así su composición por medio de la comparación de los espectros obtenidos con bibliotecas de referencia del propio equipo. Las bibliotecas de referencia empleadas para este estudio fueron: Hummel Polymer and Additives (2011 espectros de infrarrojo), Polymer Additives and Plasticizers (1799 espectros de infrarrojo), Sprouse Scientific Systems Polymers by ATR Library (500 espectros de infrarrojo) y Rubber Compounding Materials (350 espectros de infrarrojo) (Figura 3.11).



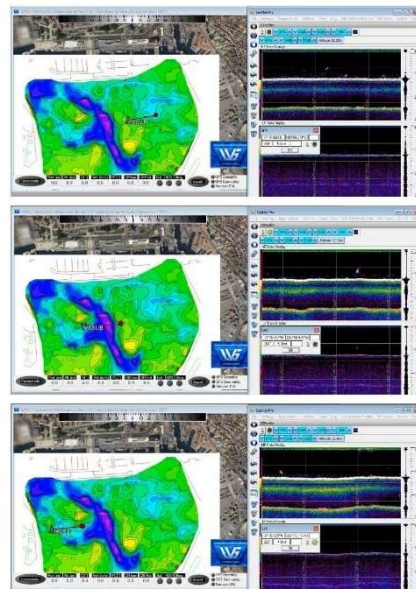
**Figura 3.10.** Imagen obtenida al estereomicroscopio de una micropartícula aislada en una de las muestras analizadas



**Figura 3.11.** Espectrofotómetro de infrarrojo con transformada de Fourier (FTIR)



Robótica submarina para la caracterización de ruidos impulsivos en instalaciones portuarias. Caso práctico del Puerto de Cartagena



Universidad Politécnica de Cartagena **CTN**

The Cartagena Port Authority Interuniversity Chair of the Environment – Mare Nostrum Campus is responsible, among other things, for promoting and conducting multidisciplinary studies and research on environmental issues surrounding the Port of Cartagena, which can be used and leveraged by the Port Authority for the benefit of its proper development and management. For this reason, the Cartagena Port Authority will continue to support this Chair, which, after 10 years, continues to achieve its goal of creating and reproducing the knowledge needed by the port and society as a whole.

With this initiative, the Port of Cartagena is leading the way in synergies between universities and seeks to attract the talent of its students and researchers to contribute to the goals of sustainability, innovation, transformation, and improvement in environmental management and our natural environment.

### **Links**

<https://observatorio.apc.es/catedra-de-medio-ambiente-apc-cmn/>

<https://www.apc.es/webapc/compromiso/medioambiente/catedramedioambiente>

<https://www.campusmarenostrum.es/web/cmn/docencia/catedra-autoridad-portuaria>

