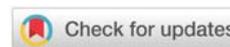


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**\*Corresponding author:** Dr. Vanessa Durán-Grados, Head of College of the Marine Engineering, University of Cádiz, Spain, E-mail: [vanesa.duran@gm.uca.es](mailto:vanesa.duran@gm.uca.es)

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## Opinion

# Why is it necessary to declare the Strait of Gibraltar an environmental control area?

**Vanessa Durán-Grados\***

Head of College of the Marine Engineering, University of Cádiz, Spain

Air pollution remains one of the most sensitive and harmful environmental concerns. According to a recent report 1 published by the World Health Organisation (WHO) [1] and the Organisation for Economic Co-operation and Development (OECD), in 2012, ambient air pollution was still responsible for about 500 000 premature deaths in Europe.

On the other hand [2] pointed out that in 2007 about 60 000 premature deaths occurring near coastlines in Europe, East Asia, and South Asia could be attributable to increase exposure to PM resulting from shipping air pollutants emissions.

This is because ships emitted pollutants such as nitrous oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), and Particulate Matter (PM). Because these emissions are known to be particularly closely associated with both mortality and morbidity, and respiratory infections and asthma in young children (WHO, 2012), pollutant-specific, location-specific, and source-specific models of health impacts must be taken into account in the design of control policies to minimize health-risk emissions [3].

In order to reduce air pollution from ships, the International Maritime Organization has officially designated certain zones as Emission Control Areas (ECAs); the Baltic Sea in 2006 and the North Sea in 2007. Finally, the east and west coasts of the United States and Canada, the Hawaiian Islands, and areas around the United States. Puerto Rico and Virgin Islands territories were also designated as ECAs by the IMO in 2012.

Based on other studies, Johansson, et al. report that, from 2009 to 2011, the emission limitations had a significant effect on reducing the emissions of SO<sub>x</sub> measured in the ECAs in northern Europe. In contrast [4], report that sulfur emissions in sea areas outside the SECAs, and emissions of other

species (especially NO<sub>x</sub>), in all sea areas around Europe have been increasing over the past few decades, while land-based emissions have been gradually decreasing.

Similarly, Volker Matthias, et al. 2010, reported that sulfur emissions (low sulfur) in the North and Baltic Seas were reduced by 45% after these areas were designated ECAs.

If ECAs were extended to all the EU's Exclusive Economic Zones, then health effects (from fine particles and ozone) would decrease by one-third; and the area of marine ecosystems affected by acidification and eutrophication would be reduced by about 45% [5].

The benefits of designating the U.S. and Canadian waters an ECA are expected to include the prevention of as many as 14,000 premature deaths and the relief of respiratory symptoms for nearly five million people each year [6]. In addition to the determination of total premature mortalities, health damage functions (estimated as premature mortalities per unit of emissions) can be calculated to provide insight into sources and locations in which emissions reductions may be more or less efficient from a public health perspective [7].

Set against the benefits, however, ECA regulations can harm port efficiency, as reflected in the concerns expressed by policy-makers and industrial managers: it has been estimated that the average efficiency loss from an ECA designation amounts to 0.058 - 0.066 on a scale of 0 - 1, accounting for a 15% - 18% loss from the ECA ports' average efficiency scores [8].

In the case of MT, such assessments are based on air quality dispersion models in which the amounts of primary pollutants (CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub>, CO and PM) that are emitted directly into the atmosphere are calculated by a bottom-up approach

(inventories compiled from ship activity records and activity-based emission factors for different ship types); these data serve as the main input for the models [9].

Spain has very intense maritime traffic along its Mediterranean coast, especially in the Strait of Gibraltar (the northwestern and Northern coasts are also subject to considerable traffic, including vessels on North Atlantic routes). The emission of NO<sub>x</sub>, SO<sub>x</sub>, and PM from international shipping close to the Spanish coast is 10 times higher than from national shipping and much higher than emissions from aviation.

In recent times, the idea of creating an emission control area for the Mediterranean Sea seems to have come back under the spotlight. The proposal was put forward by France, which, in the wake of the ECA models already seen in Northern Europe and in the United States, would deem it necessary to (re)try to introduce an area also in our seas. As the Strait of Gibraltar is a gateway to the Mediterranean, this would be another reason to declare it as an ECA área [10].

An epidemiological study from our own published research paper [10], applied to the Iberian Peninsula concluded that, in terms of premature mortality per 100,000 inhabitants, NO<sub>x</sub> air pollution contributed to 36.5 deaths, 48.8 deaths and 57.5 deaths in Barcelona, Valencia, and the Strait of Gibraltar, respectively. For all-cause mortality, PM<sub>2.5</sub> emissions from ships contributed to 12.5, 20.4, and 24.1 deaths per 100,000 inhabitants in Barcelona, Valencia, and the Strait of Gibraltar, respectively.

Taking into account the reduction of cardiopulmonary diseases in ACE areas since they were declared as such, it stands to reason that the Strait of Gibraltar should be also declared as an ECA area.

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