KIMO RESOLUTION 3/09 (revised October 2016)

Microplastics

Plastics have brought many benefits to society and are hugely important in modern life. As a consequence annual production has increased from 5 million tonnes in the 1950s to over 311 million tonnes today and it is estimated that it could increase to nearly 2000 million tonnes by 2050. One of plastic's greatest properties, its durability, is also the main reason that plastics present a threat to the marine environment. Discarded plastic items accumulate and persist in the marine environment, slowly breaking down into increasingly smaller pieces. Microplastics (tiny plastic particles, commonly <1mm) are distributed throughout the ocean, occurring on shorelines, in surface waters and seabed sediments from the Arctic to the Antarctic. Plastic debris is an increasing environmental concern and has been identified as one of the most important global pollution-related issues by the United Nations Environment Programme.

Since most plastics are buoyant, the problems associated with plastic debris are particularly evident in marine habitats where over 265 species of mammals, birds, fish and invertebrates, including endangered and threatened species, are known to ingest plastic. The incidence of ingestion can be extremely high. For example, in the North Sea over 95% of dead Fulmars (*Fulmarus glacialis*) were found to have plastic in their guts. Microplastics have been found in the bodies of a wide variety of marine organisms including invertebrates, crustaceans, fish, birds and mammals.

Research by the University of Plymouth has shown that microscopic pieces of common polymers including polyethylene, polyvinyl chloride and polypropylene are now on shorelines and in the water column throughout the North East Atlantic. Pieces as small as 2µm (micrometres) have been identified and their abundance has increased over the past 50 years. Some samples of shoreline material now contain more than 10% plastic and because conventional polymers will not biodegrade it seems inevitable that the abundance of these fragments will continue to increase.

Microplastics may be manufactured for particular industrial or domestic applications, such as cosmetics, detergents, cleaning products, blasting agents, inks and paints, food coatings, medicine and a range of technical applications. These are termed 'primary' and can be released unintentionally into the sea. Secondary microplastics occur as the result of degradation and fragmentation of larger plastic pieces. Other sources of microplastics in our environment include

man-made fibres which are washed out of clothing and other textiles, tyre abrasion in road traffic and pellet loss during the manufacture and processing of plastics.

The larger surface to volume ratio of microplastics makes them more chemically reactive than larger pieces of plastic, increasing their potential harmfulness. Small marine organisms ingest microplastics and are then eaten by larger creatures, transferring microplastics up the food chain. This trophic transfer has been witnessed in separate studies of crabs, shrimps and fish. A study of marine mussels has shown that once ingested, microplastic particles can transfer from the gut to body tissues, cells and organelles, affecting the physiology of the host organism and potentially compromising its ability to reproduce.

The risks to living organisms of microplastic ingestion are amplified by the common industry practice of adding chemical compounds such as flame-retardants and plasticisers to plastics at the point of manufacture. Many of these additives have been demonstrated to be toxic to both humans and the environment. For example, the commonly used additives BPA, brominated flame retardant and phthalate have all been shown to cause endocrine disruption in humans. Fragments of plastic have also been shown to concentrate pollutants that have arisen in the environment from other sources, such as pesticides from the surrounding seawater. This effect can be substantial with persistent organic pollutants such as PCBs, DDE, nonylphenols and phenanthrene becoming 5 to 6 orders of magnitude more concentrated on plastic debris than in the surrounding seawater. Pathogenic bacteria (*Vibrio* sp.) which can cause septicaemia and serious gastrointestinal disorders are also commonly found attached to microplastics.

Although more research is required, there is sufficient cause for concern regarding the potential of microplastic pollution to harm marine biota, the environment and human health.

Therefore KIMO believes that it is essential to establish the full health and environmental impact of microplastic debris in the transport of pollutants to marine life and in line with the precautionary principle to reduce inputs of plastics and microplastics to the marine environment.

KIMO

Recognising the need to protect the marine environment from the increasing burden of pollution from plastics and microplastics

Urges all European Governments to:

1) **Fund research to assess the environmental effects of microplastics in the marine environment and the impact of transfer of toxic chemicals to the food chain.**

2) **Undertake monitoring programmes to establish the extent of contamination of the seabed and water column by microplastics.**

3) **Ban the use of microplastics in domestic and industrial products where there is any risk that they will be transported into the marine environment and promote cooperation with industry to find alternatives.**

4) **Tighten controls on discharges from point sources such as plastic production facilities and waste water facilities and from domestic sources such as washing machines to prevent microplastics and microfibres from entering the marine environment.**

5) **Implement and promote schemes to prevent runoff containing microplastics entering the marine environment from surfaces such as roads and plastic turf.**

6) **Promote a circular economy by implementing legislation to increase the percentage of plastic waste that is reused and recycled.**

7) **Promote greater awareness of the impacts of plastics and microplastics in the marine environment.**

KIMO members:

Agree to submit this Resolution to all National Governments, the European Commission and other relevant organisations.