



INSTITUTO
ESPAÑOL DE
OCEANOGRAFÍA

XXXIX Xornada Rede Estatal Autoridades Ambientais

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A incidencia dos Microplásticos no medio mariño

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Algunos datos

-4 Millones de toneladas de basura cada año acaban en el mar.

->300 millones de toneladas de plásticos producidos en 2016.

-268.940 toneladas de basura plástica flotando en los océanos.

-115 000 micropartículas/km² en el Mediterráneo.

Marine ecosystems subjected to a massive input of synthetic chemicals (many anthropogenic activities: agriculture, industry, transport, urban and domestic applications, etc).



Microplastics: fragments of bigger ones and actual uses in cosmetic, domestic products, etc...

Plastics (multiple applications: house, urban, industrial, agriculture, etc)



Microplastics



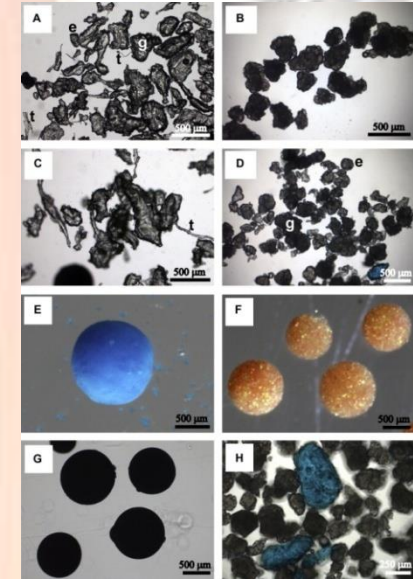
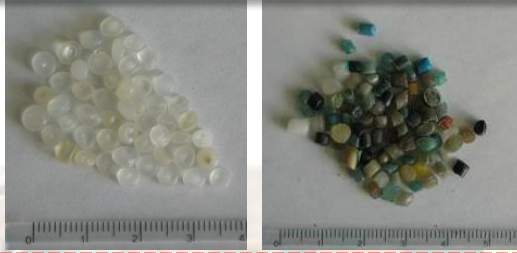
Microspheres (cosmetics, adhesives, personal care products, etc)

Origen de los microplasticos

● Microplasticos primarios

- Pre-produccion resin pellets
- Plastic scrubbers en cosmeticos
- Plastic abrasives en blasting
- Otros nano- y micro-polimeros

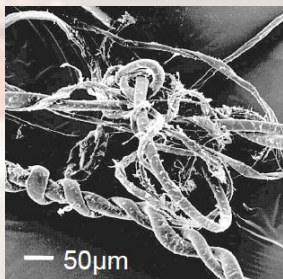
Resin pellets



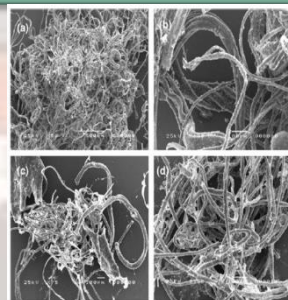
PE scrubs (Fendall and Sewell, 2009)

● Microplasticos secundarios

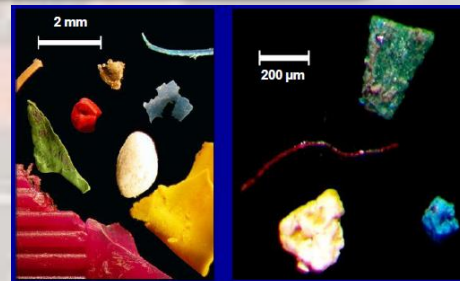
- Fragmentos, fibras, elastomeros y recubrimientos de polimeros grandes



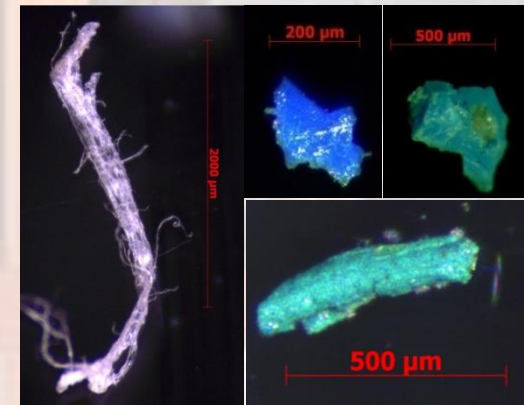
Fiber
(Thompson et al, 2004)



Fiber
(Murray and Cowie, 2011)



Sewage sludge
(Zubris & Richards, 2005)



Fragment



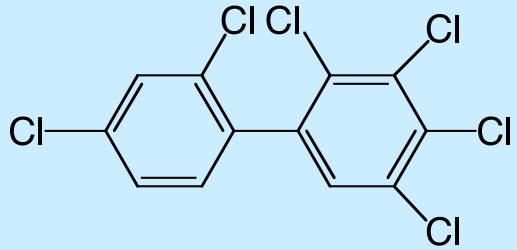
7,600,000
microplastics (2.5mm diameter)

7.6×10^{21}
nanoplastics (250nm diameter)

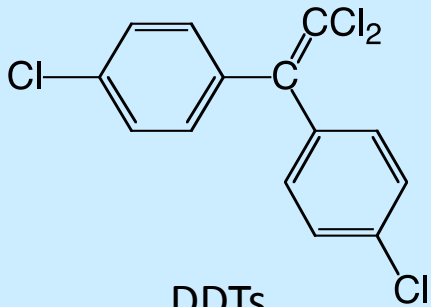
EPS buoys and floating debris © J.H. Lee, OSEAN;
EPS microplastics © Peter Kershaw

Los Plásticos transportan dos tipos de sustancias en el mar

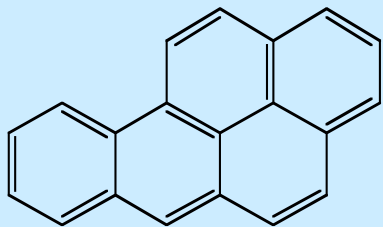
Sustancias adsorbidas del agua de mar



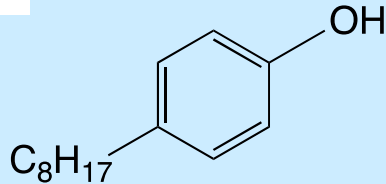
Polychlorinated biphenyl (PCBs)



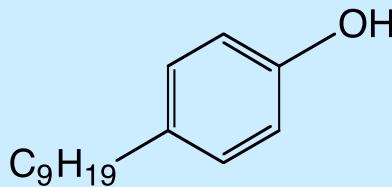
DDTs



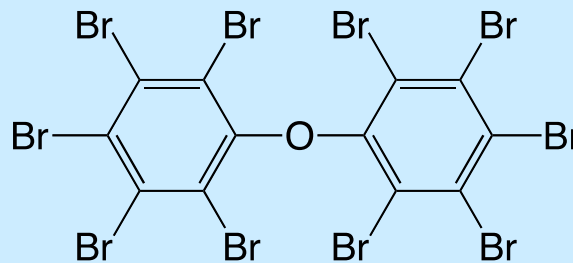
Polycyclic aromatic hydrocarbons (PAHs)



Octylphenol

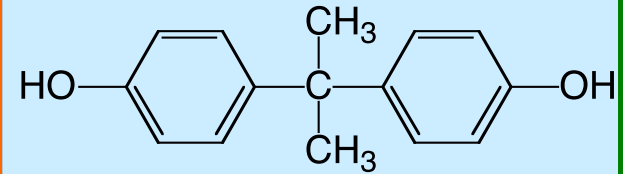


Nonylphenol



Polybrominated diphenyl ethers (PBDEs)

Aditivos químicos



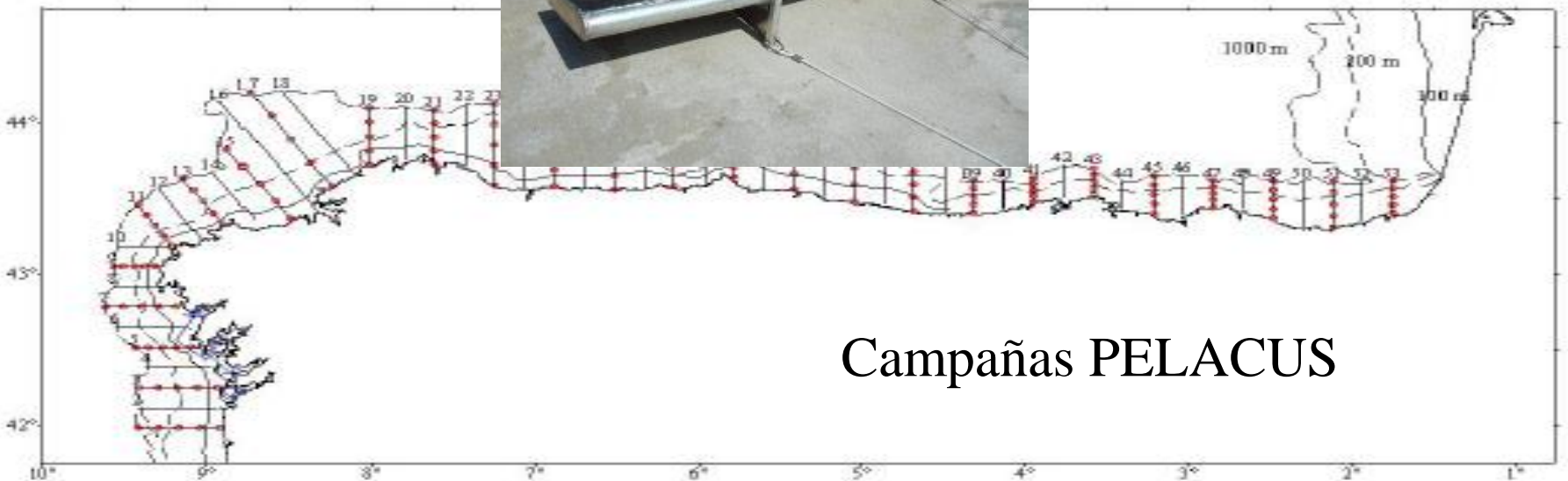
Bisphenol A

Red de muestreo

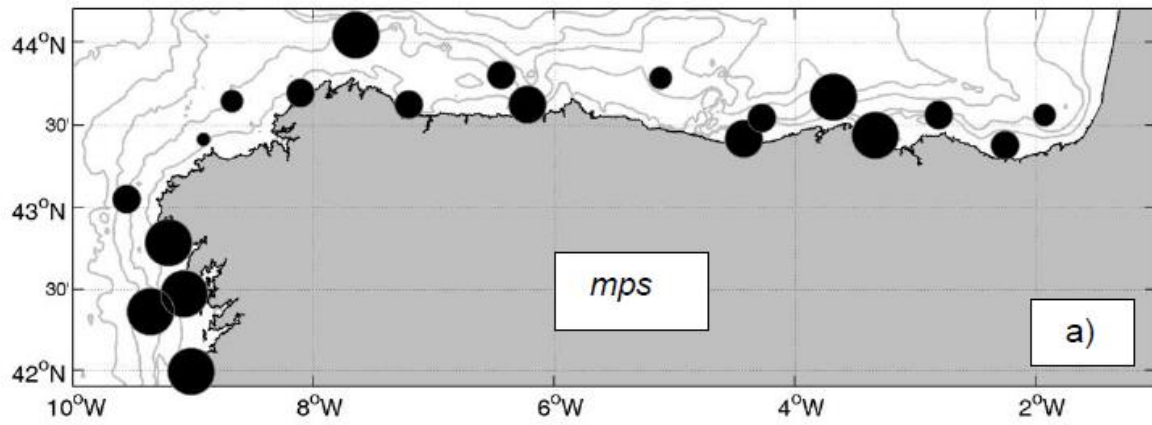
Microplásticos en los mares, algunos ejemplos



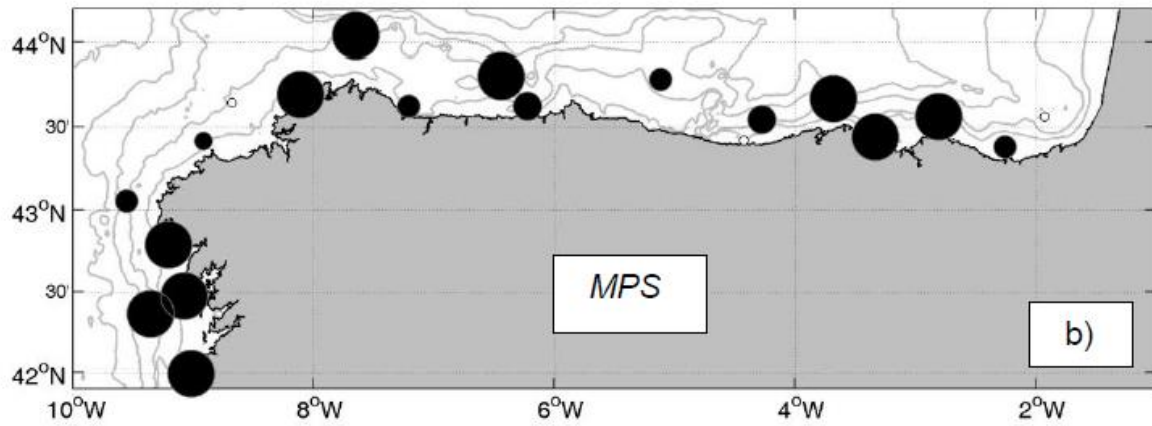
Figura 2: Estaciones de hidrolog



Campañas PELACUS

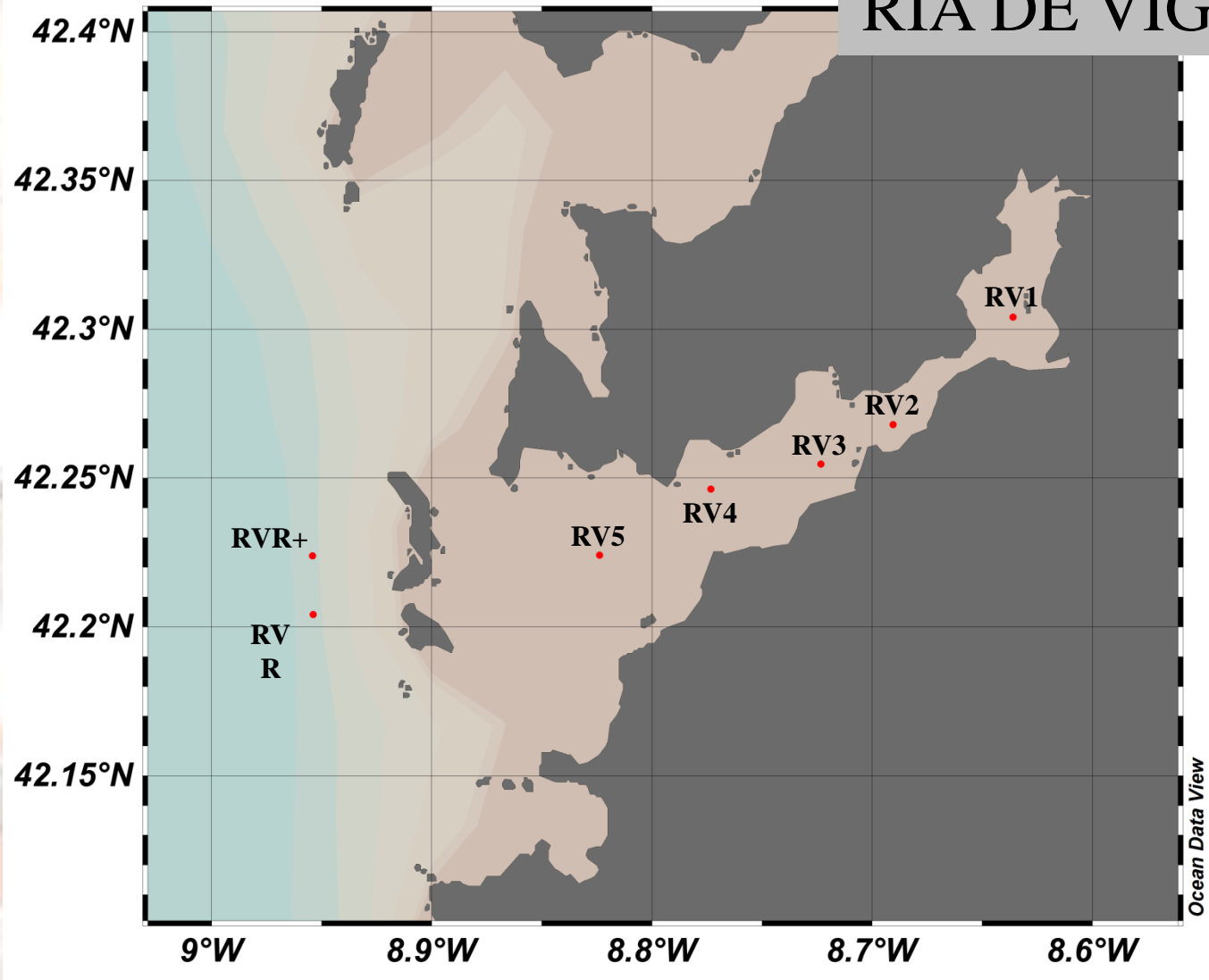


- > 750
- 501-750
- 251-500
- 101-250
- 51-100
- 26-50
- 1-25
- 0

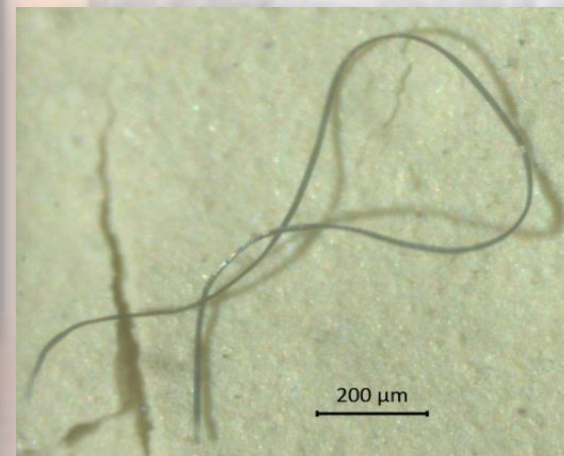
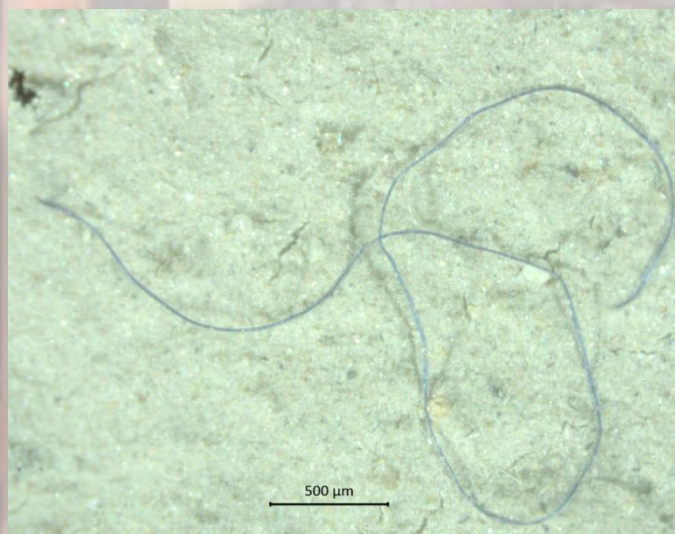
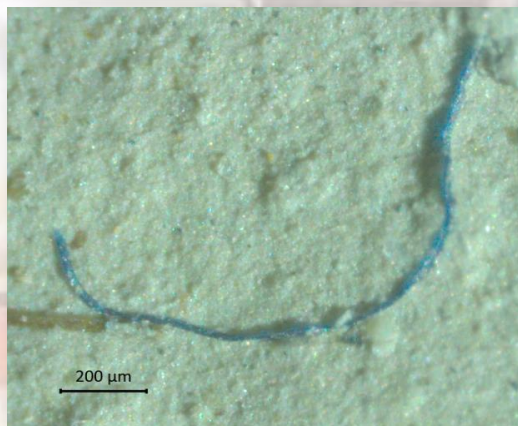
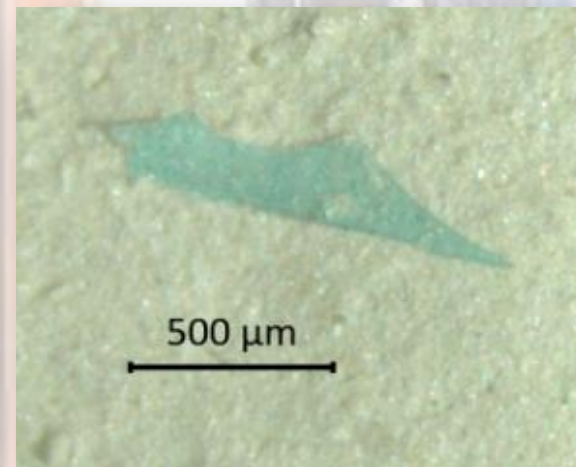
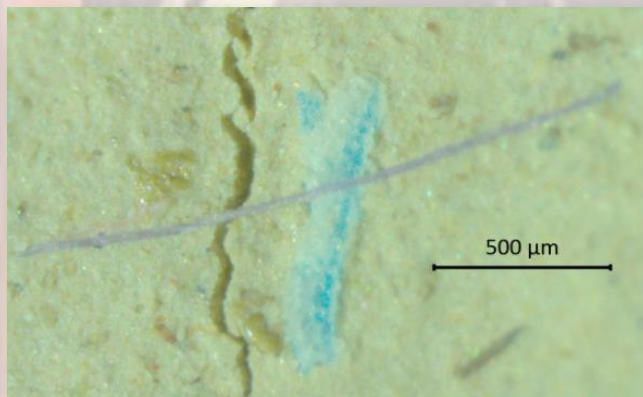
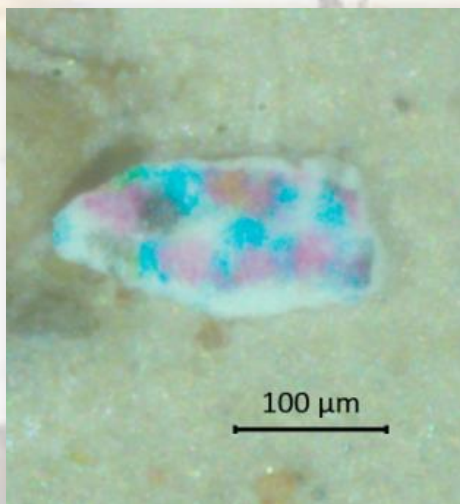


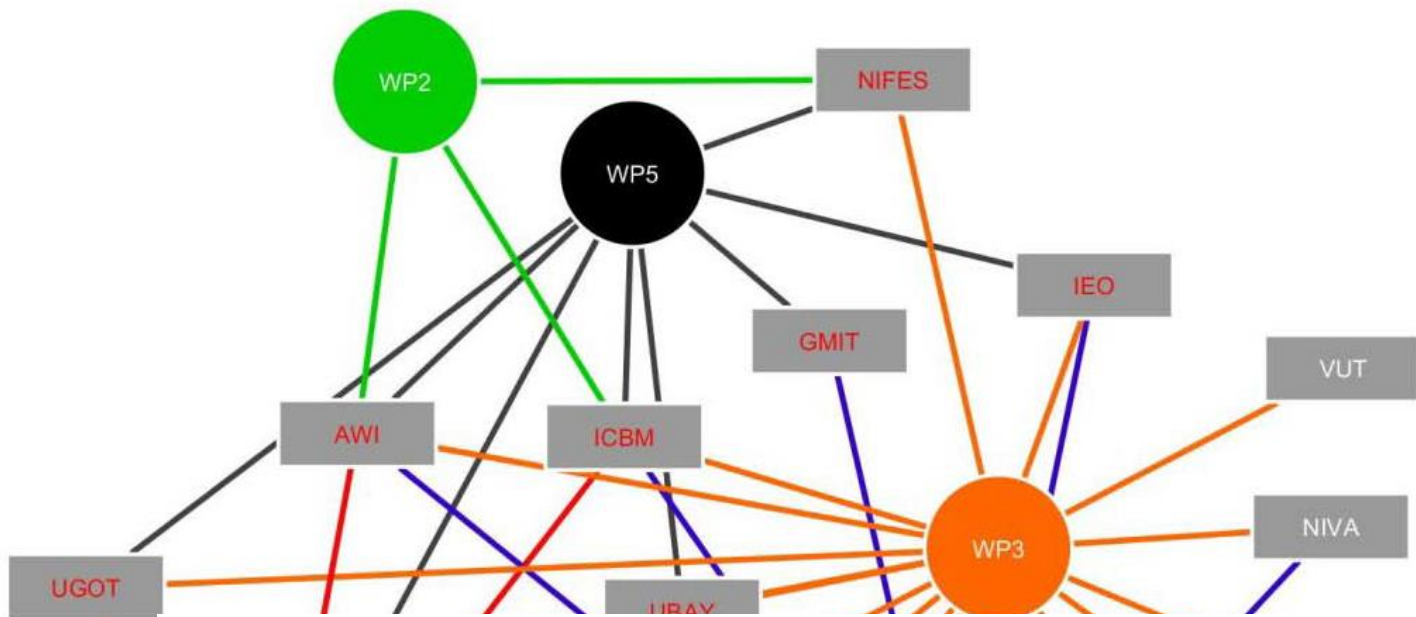
- > 100
- 81-100
- 41-80
- 21-40
- 16-20
- 11-15
- 1-10
- 0

RÍA DE VIGO

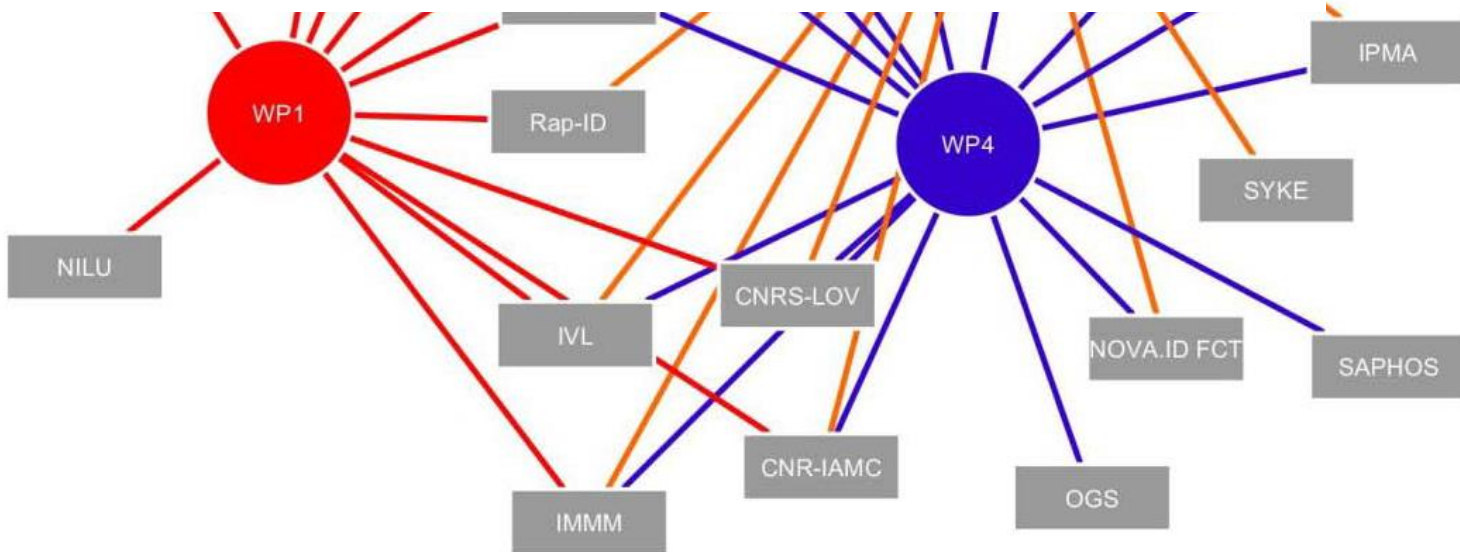


MPs ría de Vigo (proyecto IMPACTA)





Proyecto BASEMAN





Lineas prioritarias de investigación,

-Desarrollo y optimización de metodologías.

-Nanopartículas; cuantificación e impacto.

-Ecotoxicología.

Los microplásticos en el océano, un indicador de cambio global?

Mauna Loa Observatory, Hawaii Monthly Average Carbon Dioxide Concentration

Data from Scripps CO₂ Program Last updated February 2006

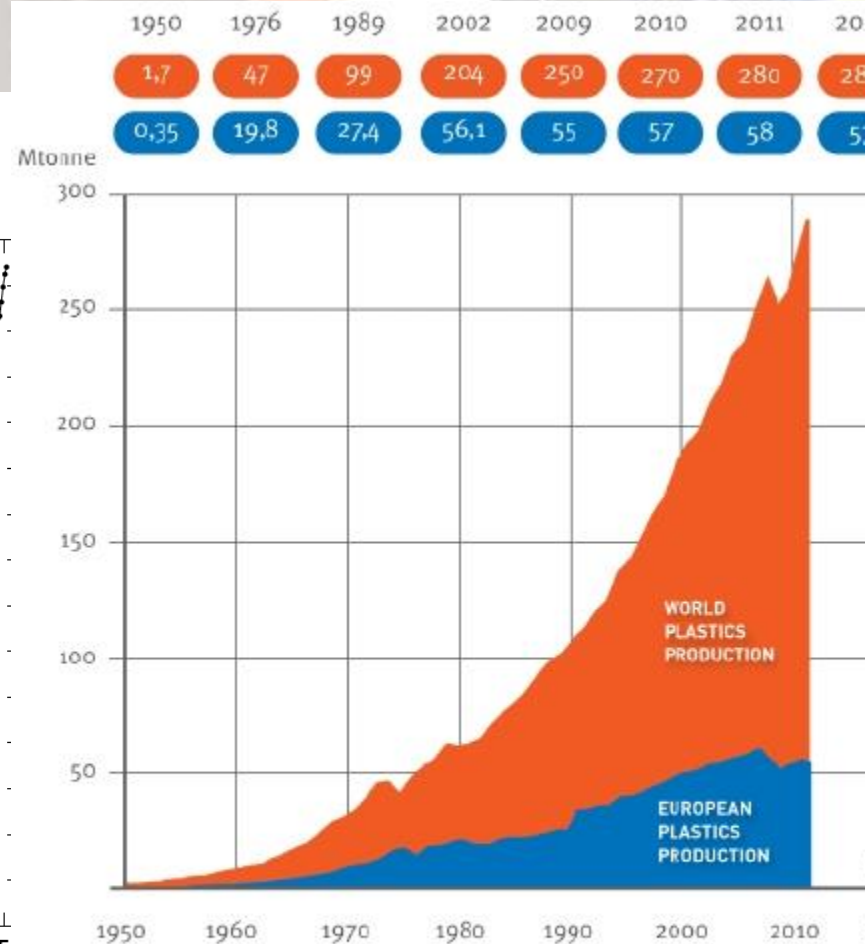
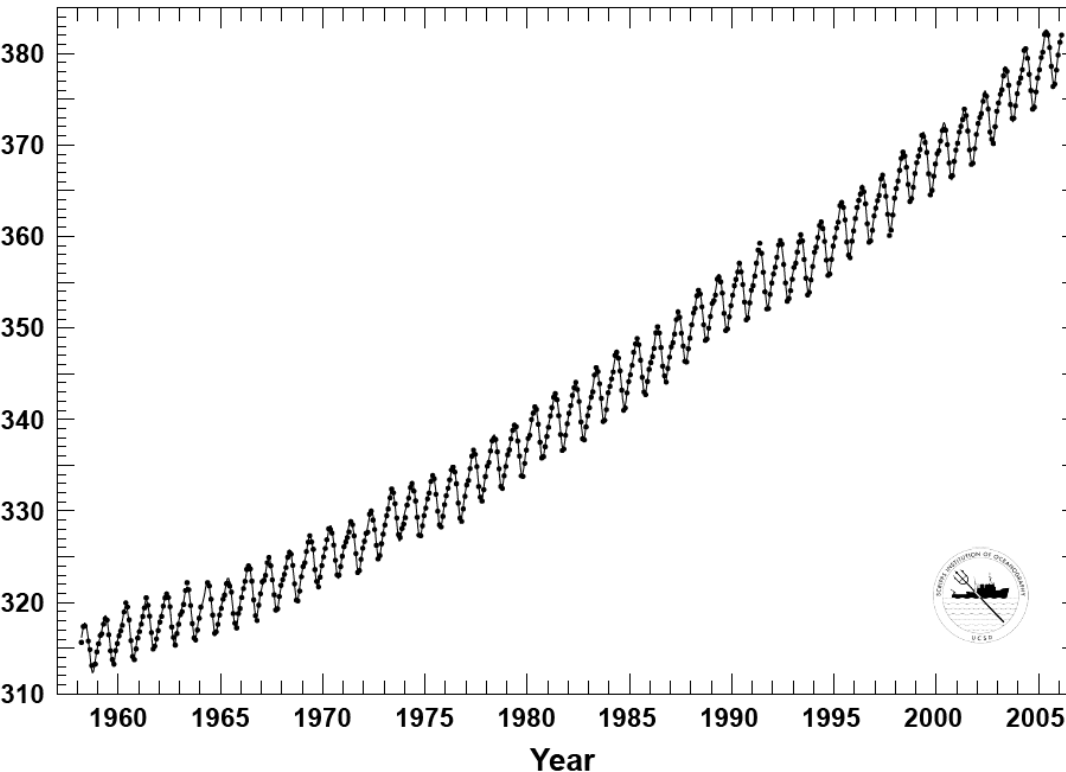


Figure 2: World plastics production 1950-2012

Includes thermoplastics, polyurethanes, thermosets, elastomers, adhesives, coatings and sealants and PP-fibers. Not included PET-, PA- and polyacryl-fibers

Source: PlasticsEurope (PEMRG) / Consultic

Un indicador de cambio global

Anthropoceno → Plastiesfera.



El problema de los Microplásticos en los océanos; ¿Soluciones?

1. Problema industrial: economía circular y legislación.
(Ej. Reciclaje redes, prohibición de MPs,)
2. Acciones de divulgación y educación ambiental.
(Ej. Acciones en limpieza de playas)
3. Del 3R al 5R (Rediseñar y Recuperar energéticamente).



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¡MUCHAS
GRACIAS!

