B5. Pressure from pollution

b. Marine pollution

Type: Pressure indicator

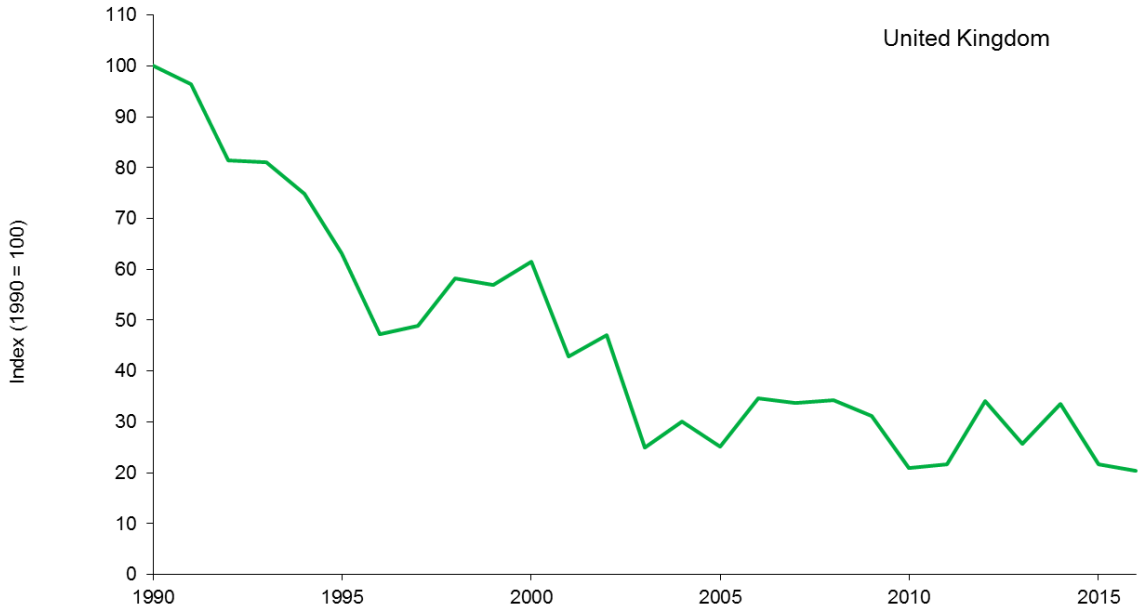
Summary

The combined inputs of all six hazardous materials into marine environments have shown a long term decrease of 80% since 1990. Inputs of five of these substances show decreases since 2011, however the input of copper has increased by 1% in the short term.

Indicator Description

The indicator shows the combined input of six of the most hazardous substances to the UK marine environment. The indicator is based on levels of five heavy metals (cadmium, mercury, copper, lead and zinc) and one organic compound (lindane). Pollution in the marine environment from these six substances should decrease to levels that are non-detrimental by 2020.

Figure B5bi. Combined input of hazardous substances to the UK marine environment, as an index of estimated weight of substances per year, 1990 to 2016



Source: Defra Marine Strategy and Evidence Division, using data provided by: Environment Agency, Northern Ireland Environment Agency, Scottish Environmental Protection Agency.

Levels of all six substances declined over the period 1990 to 2016: mercury and lindane each by 90%; cadmium by 87%; lead by 66%; zinc by 63% and copper by 57%.

In the short term, inputs of hazardous substances decreased by 20% from 2011 to 2016 (using a 3 year average for 2011). Inputs of five of these hazardous substances declined in the short term: lindane had the highest percentage decrease (-56%), followed by lead which decreased by 40%, and then zinc (-7%), and both cadmium and mercury decreased by -1%. The input of copper has increased by 1% since 2011.

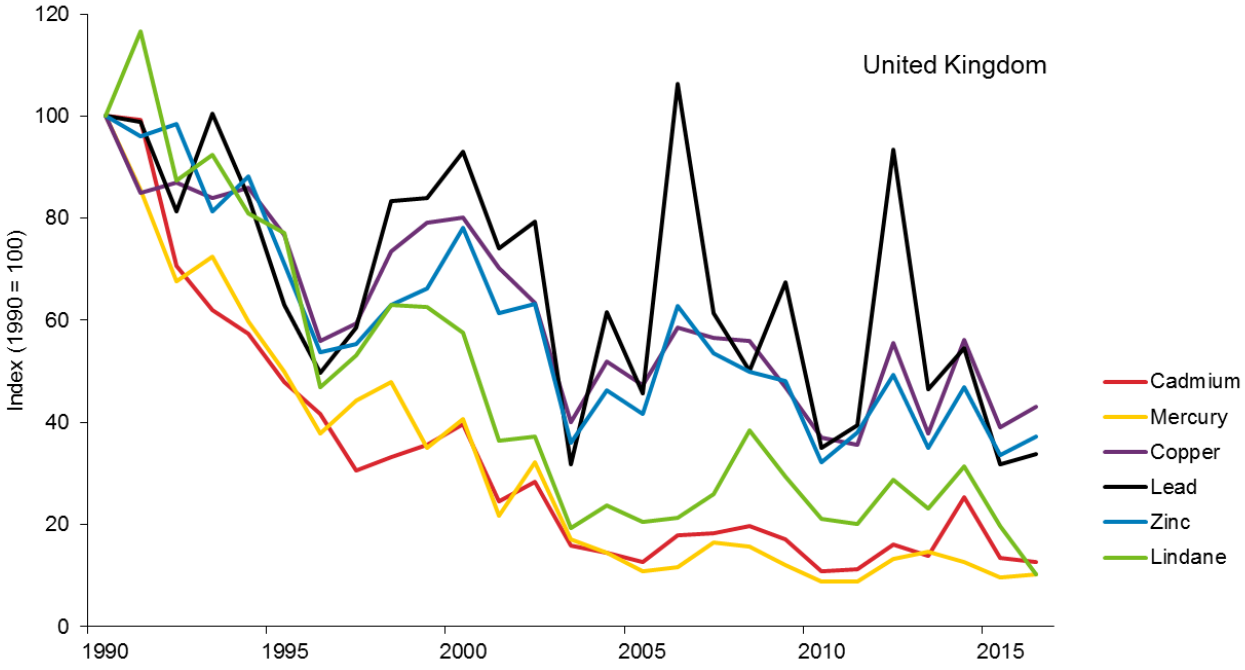
Inputs into the marine environment are estimated from concentrations and flow rates in rivers entering the sea and those from estuarine and coastal point sources. Riverine inputs

reflect both point and diffuse sources upstream of the sampling point and tend to be strongly influenced by flow rates. Flow rates are heavily affected by rainfall patterns so year to year fluctuations in pollutant loads are likely.

Assessment of change in input of hazardous substances			
	Long term	Short term	Latest year
Combined input of hazardous substances	1990–2016	2011–2016	Decreased (2016)

A detailed illustration of changing levels of each input is seen in Figure B5bii. The low point in 2003 is thought to be a consequence of reduced river flows during an exceptionally dry year. Conversely, levels increased in 2012 and again in 2014 corresponding with years of heavy rainfall. In 2012, England had the wettest year since records began in 1910; the summer was the wettest since 1912 increased rainfall in November and December contributed to extensive flooding. In 2014, the winter (Jan – Feb) was the wettest since records began.

Figure B5bii. Inputs of hazardous substances to the UK marine environment, as an index of weight of substance per year, 1990 to 2016



Source: Defra Marine Strategy and Evidence Division, using data provided by: Environment Agency, Scottish Environmental Protection Agency, and Northern Ireland Environment Agency.

Relevance

Pollution by hazardous heavy metals and pesticides can have adverse effects on the marine environment and biodiversity. Pollutants enter coastal waters either directly from point sources on UK coasts and estuaries or are carried via rivers.

One of the goals of the Convention for the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention) is to implement the Hazardous Substances Strategy by making progressive endeavours, through appropriate actions and measures, to move towards the targets of the cessation of discharges, emissions and losses of hazardous substances by the year 2020.

While many measures have already been put in place to prevent these persistent contaminants from entering the environment (e.g. bans on lead in petrol, marketing restrictions on the use of cadmium and mercury, a ban on the use of lindane), there are still reservoirs of these contaminants from legacy use in soils and sediments which are mobilised by various weather events.

Background

The assessment of change for the indicator was made by applying a 3% rule of thumb. The arithmetic mean of the first three years of the data series was compared with the last point to determine the assessment for the long-term trend, and an arithmetic mean of the year five years back in the time series and the year either side calculated to compare with the last point to assess the short-term trend.

Although data for total UK (direct plus riverine) inputs to the marine environment are available as lower and upper estimates, for ease of interpretation only upper (i.e. maximum) values have been used in this assessment, rather than presentation of the data range for each substance. The values for each pollutant are converted to an index scaled to 100 at the start year of 1990, and then combined with a geometric mean.

Goals and targets

Aichi Targets for which this is a primary indicator

Strategic Goal B. Reduce the direct pressures on biodiversity and promote sustainable use.

Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Aichi Target for which this is a relevant indicator

Strategic Goal B. Reduce the direct pressures on biodiversity and promote sustainable use.

Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Web links for further information

Reference	Title	Website
Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)	Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)	http://ospar.org/
Defra Clean Seas	CP2 index of hazardous substances	http://chartingprogress.defra.gov.uk/clean-seas-hazardous-substances

Full details of this indicator, including a datasheet are available at:
http://jncc.defra.gov.uk/page-6183**.**

Last updated: July 2018

Latest data available: 2016