

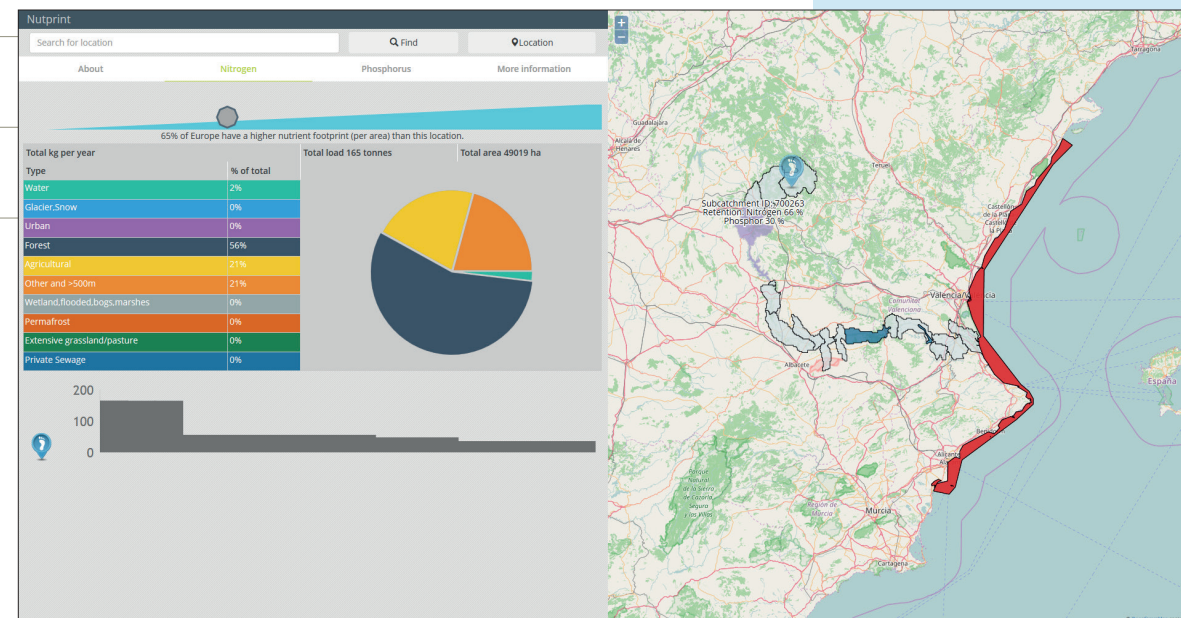
Nutrient footprint tool for coastal waters

Increased amounts of nutrients (nitrogen, phosphorus) are released into surface waters due to human activities on land. This has two negative effects. Firstly, higher levels of nutrients contribute to environmental problems due to the over-enrichment of water and sediments, especially in coastal zones. Secondly, nutrients leaching from arable land to surface water are no longer available as fertiliser for crops. Eutrophication is noticeable when it causes smells due to oxygen depletion or excessive algal blooms (of blue-green algae, for example). However, this is generally not noticed by the general public. The NUTPRINT project was established with the aim of visualising the impact of eutrophication in the European coastal zone in a simple way and of informing the public, water managers and stakeholders, creating support for mitigation measures.

NUTPRINT visualises the contribution of different sources of nutrients for any location in Europe. The most important sources contributing to eutrophication are diffuse loads associated with land use (agriculture, hard surfaces) and point sources such as industry, wastewater treatment and individual households.

The relative contributions of nutrient sources have been visualised for the region of interest and a comparison has been made with other regions in Europe. In addition, the project shows the retention of nutrients originating from a specific area on land in river systems and lakes. Generally, high levels of retention reduce the impact that an area has on eutrophication in coastal waters.

An example of a NUTPRINT visualisation covers an area in Spain. The nutrients in this example come mainly from agricultural land and to a lesser extent from forest and urban areas. The screen



dump from the portal shows that 65% of areas in Europe release more nutrients. On its way to the sea, some of the nitrogen is retained in the river system and lakes, as shown by the grey bar.

The visualisations in NUTPRINT are based on model calculations. The Swedish Meteorological and Hydrological Institute (SMHI) developed a Europe-wide hydrological and water quality model (EHYPE) that runs on open data only. Normal and background runs were used in NUTPRINT to calculate the anthropogenic component of nutrient flows leaching from land to water. All point sources were removed for background runs and land use was defined as grass land in order to visualise the contribution of alterations in land use and point sources.

NUTPRINT is one of fourteen products developed as part of the EU project SWITCH-ON (Sharing Water-related Information to Tackle Changes in the Hydrosphere - for Operational Needs). The SWITCH-ON project brought together a consortium of partners to convert open, hydrology-related, data into marketable products for the general public, water managers and other stakeholders.

Further reading:

<http://www.nutrientfootprint.eu>
<http://www.water-switch-on.eu/>