Map 5.1: Nitrate concentration and main cities and rivers and Map 5.2: Phosphate concentration and main cities and rivers

Data description:

These two maps are composed of five layers:

1. Data concerning "nutrient concentrations" have been provided by the CMENS and downloaded from the Copernicus platform (https://marine.copernicus.eu/). The "biogeochemical analysis and forecasts for the Mediterranean Sea at 1/24 degree" are produced by means of the MedBFM model system (i.e. the physical-biogeochemical OGSTM-BFM model coupled with the 3DVarBio assimilation scheme). MedBFM model is run by OGS and uses as physical forcing the outputs of the NEMO-OceanVar model system (Med-PHY managed by CMCC). Seven days of analysis are weekly produced on Tuesday, with the assimilation of surface chlorophyll concentration from satellite observations (provided by the CMEMS-OCTAC) and chlorophyll plus nitrate from Biogeochemical Argo floats (provided by CORIOLIS and LOV). One day of hindcast and ten days of forecast are produced daily.
2. "Population of main cities" is provided by the OpenDataSoft, the data provider is GeoName and the data is the result of an aggregation of over hundred different data sources. Data are monthly updated.
3. "Medpol pollution hotspots" is provided by the InfoMap node.
4. "Main river" is provided by the ESRI database and was designed in 2016.

Mapping method:

Concerning nutrient concentration, the ten-monthly modeled (from January to October 2020) data have been averaged to build the mean value of surface water (1 meter depth) nutrient concentration for 2020.

The layer "Main cities" shows only cities that have more or equal than 100'000 inhabitants. Proportional circles have been built following the Flannery method[1]. This method compensates the people worse judging of relative areas using a technic called *apparent magnitude* scaling which increase the circle applying an exponent on the scaling factor.

Analytical part:

The nitrate concentration at surface is the most problematic in three hotspots: in France (Rhone river mouth), Italy (Po river mouth) and Egypt (Nile river month).

The phosphate concentration at surface is the most problematic close to Gibraltar strait and concerns Morocco, Algeria and Spain.

[1] https://en.wikipedia.org/wiki/Proportional_symbol_map#Apparent_magnitude_(Flannery)_scaling