

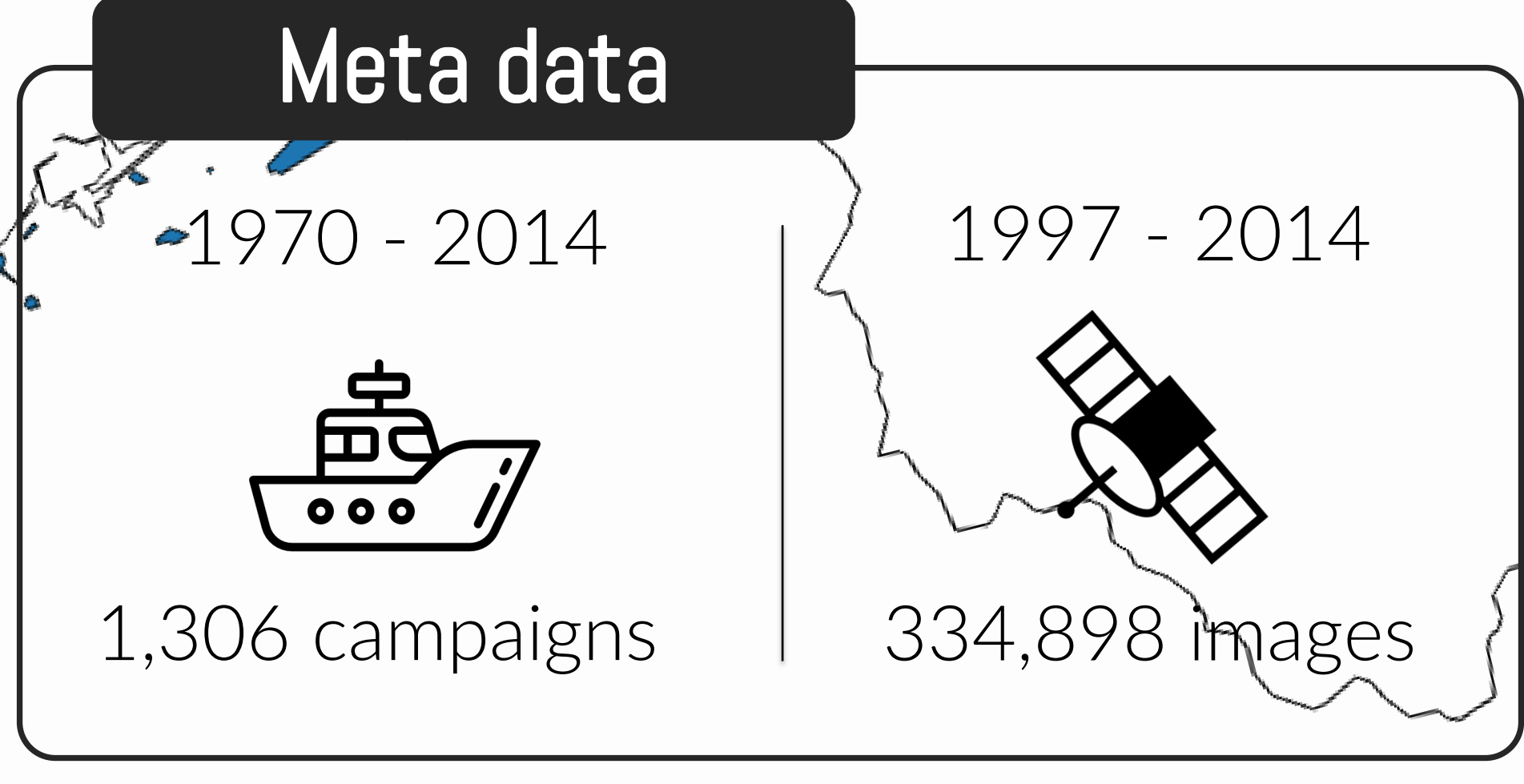
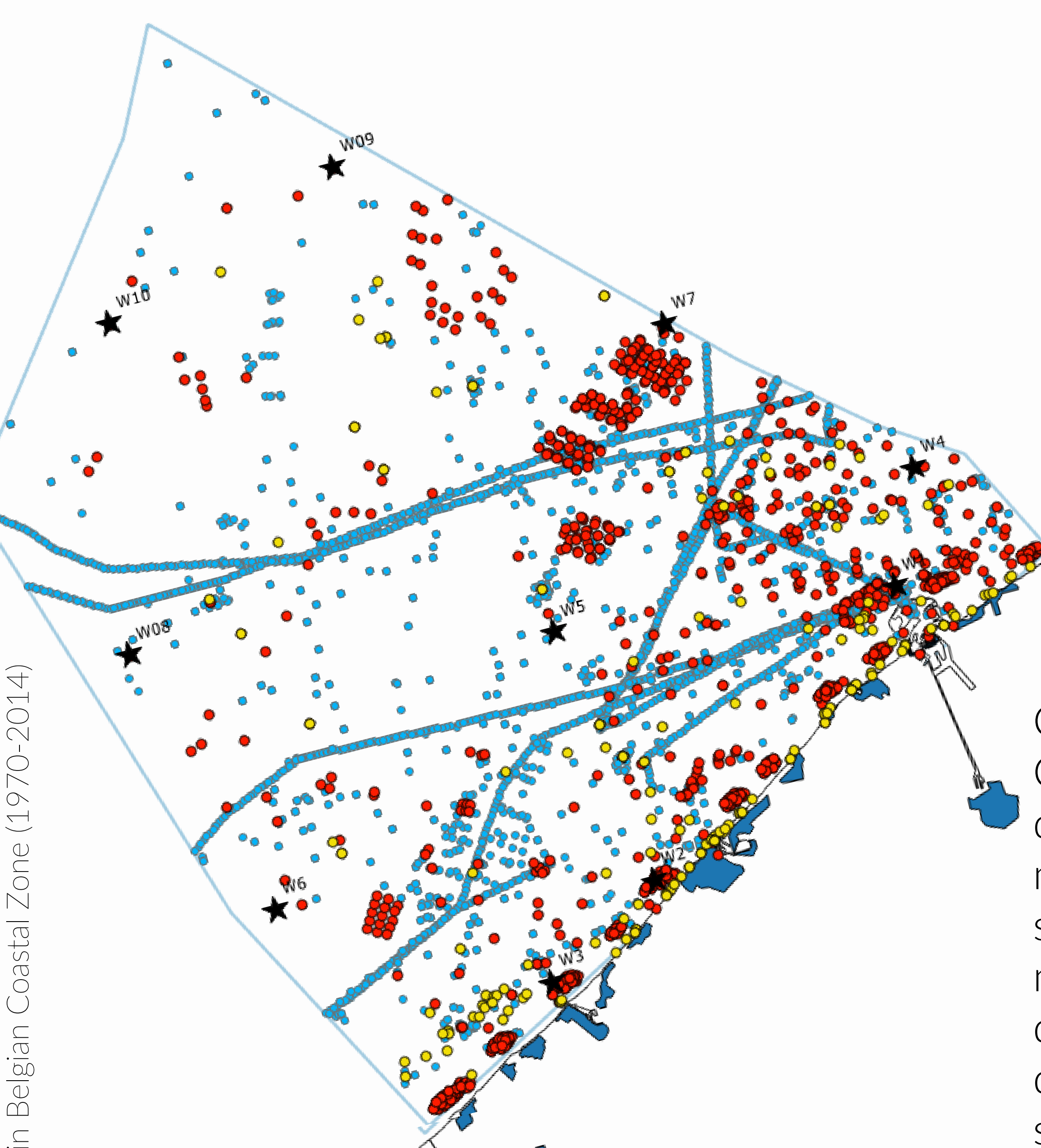
Belgian Marine Data Archaeology

R. Lagring¹, H.M. Le¹, A. Goffin², Y. Stojanov¹, F. Strobbe¹, L. Tyberghein², T. Vandenberghe¹, S. Scory¹
¹ Royal Belgian Institute of Natural Sciences, Operational Directorate Natural Environment, Belgium (bmdc@naturalsciences.be)
² Flanders Marine Institute (VLIZ), Data Centre Division, Belgium

4 Decades of Belgian Marine monitoring: Uplifting historical data to today's needs

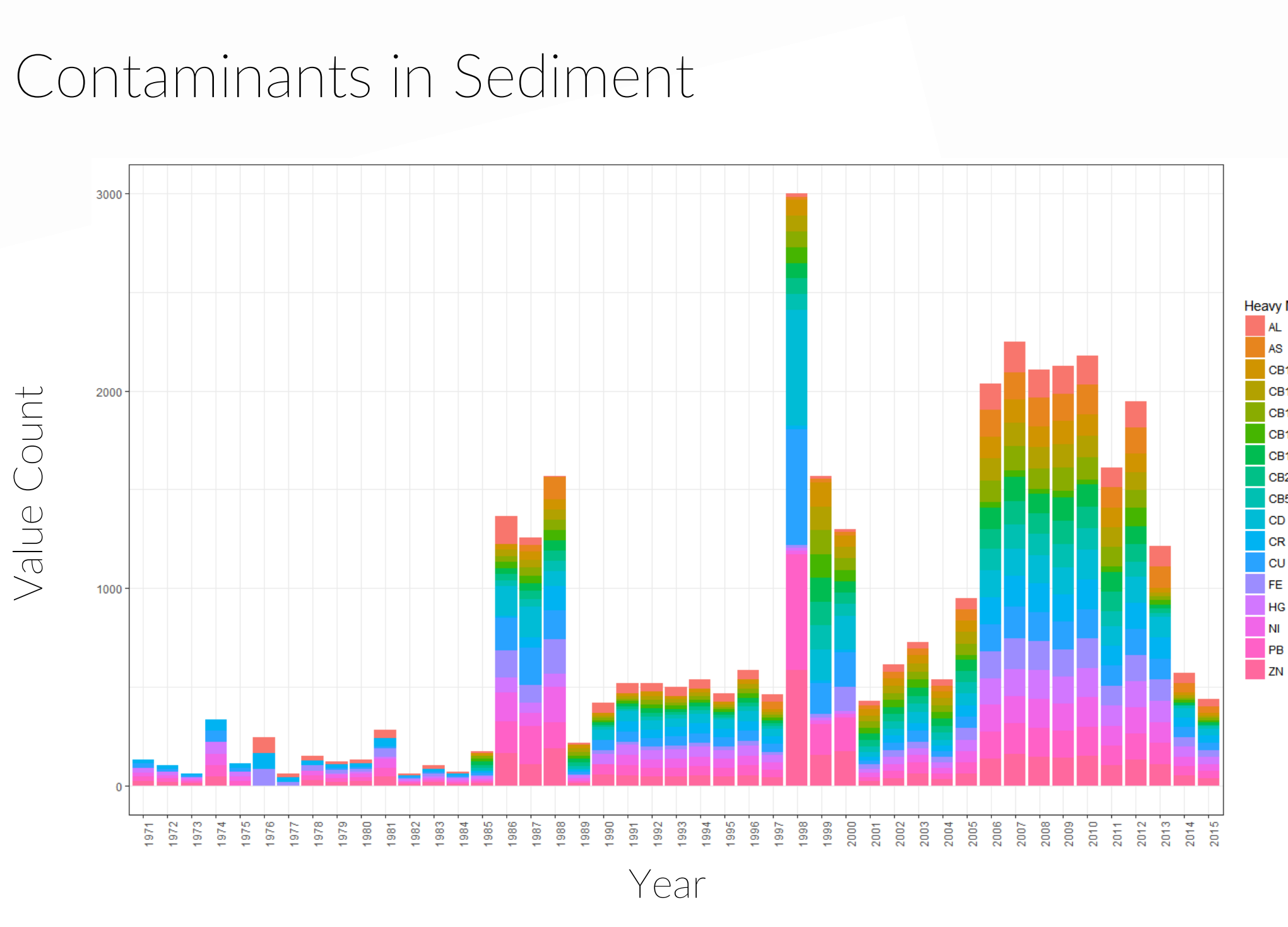
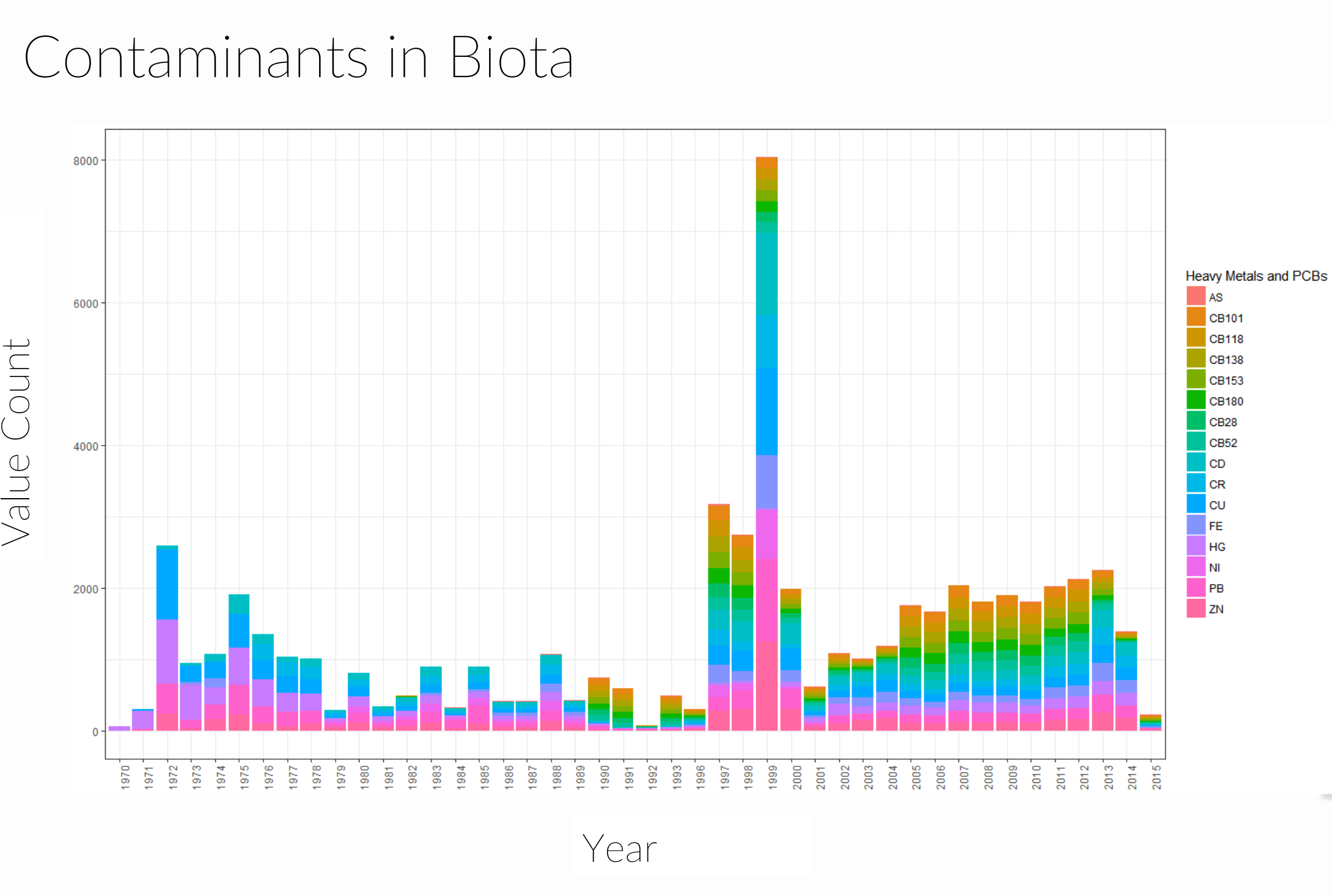
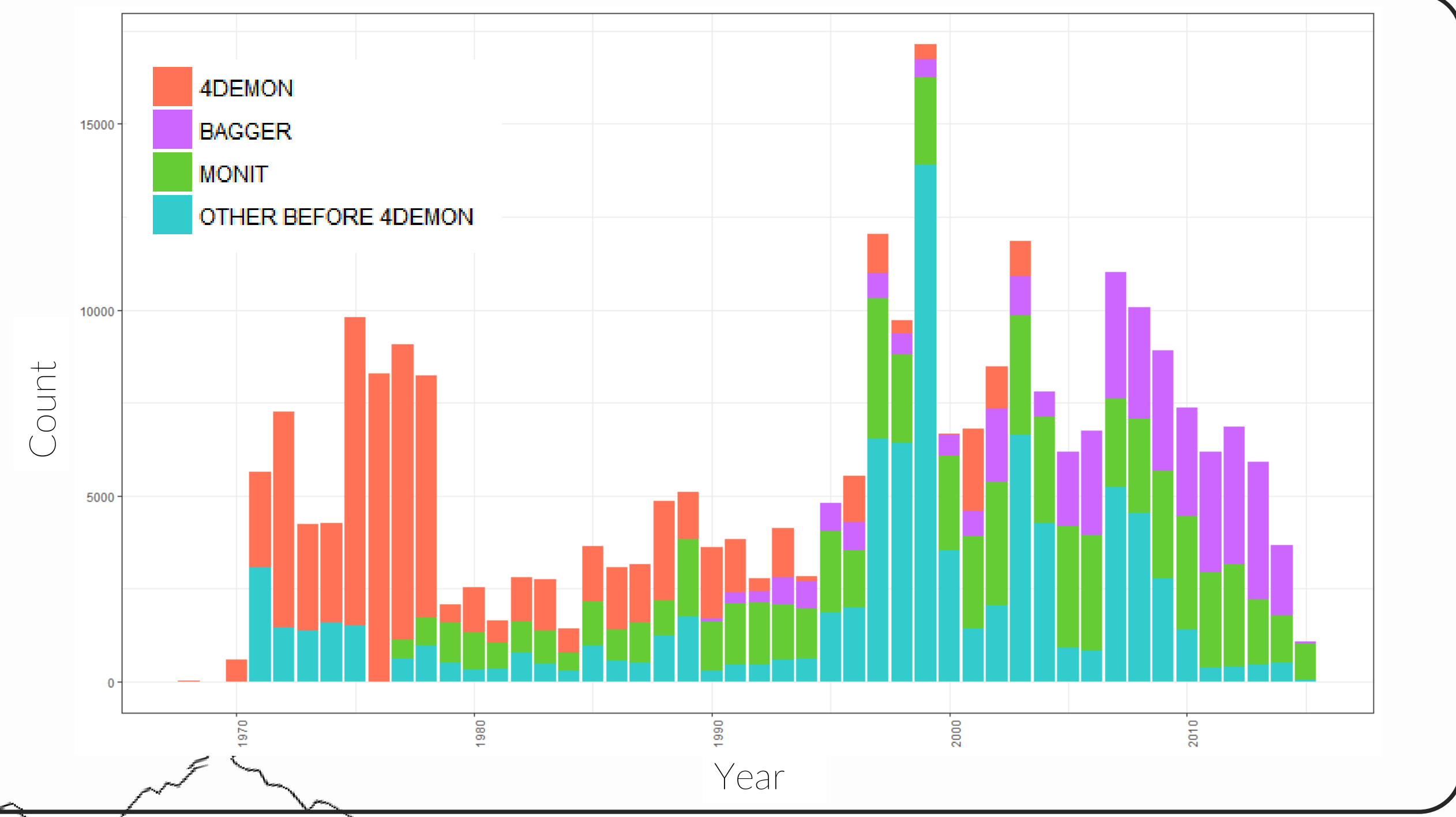
Contamination, eutrophication and acidification (MSFD descriptors) are intensely studied in the Belgian Coastal Zone (BCZ) since 1970. The use of historic data in long-term analyses has some major drawbacks: unavailability of the (meta)data and inconsistencies in spatial resolution, frequency, measurement techniques and storage. BMDC (RBINS) and VMDC (VLIZ), both NODCs, integrated all sources, its data and metadata in databases and updated the catalogues. The data are further uplifted by means of high tech methods for intense quality-check, intercalibration and valorisation of the integrated data sets and finally the assessment of environmental changes. A central data portal is under development, where the project data of the two NODCs will be made publically accessible. The case study on contaminants in sediment show the robustness of using Al and Fe as normalizers.

Sampling in Belgian Coastal Zone (1970-2014)

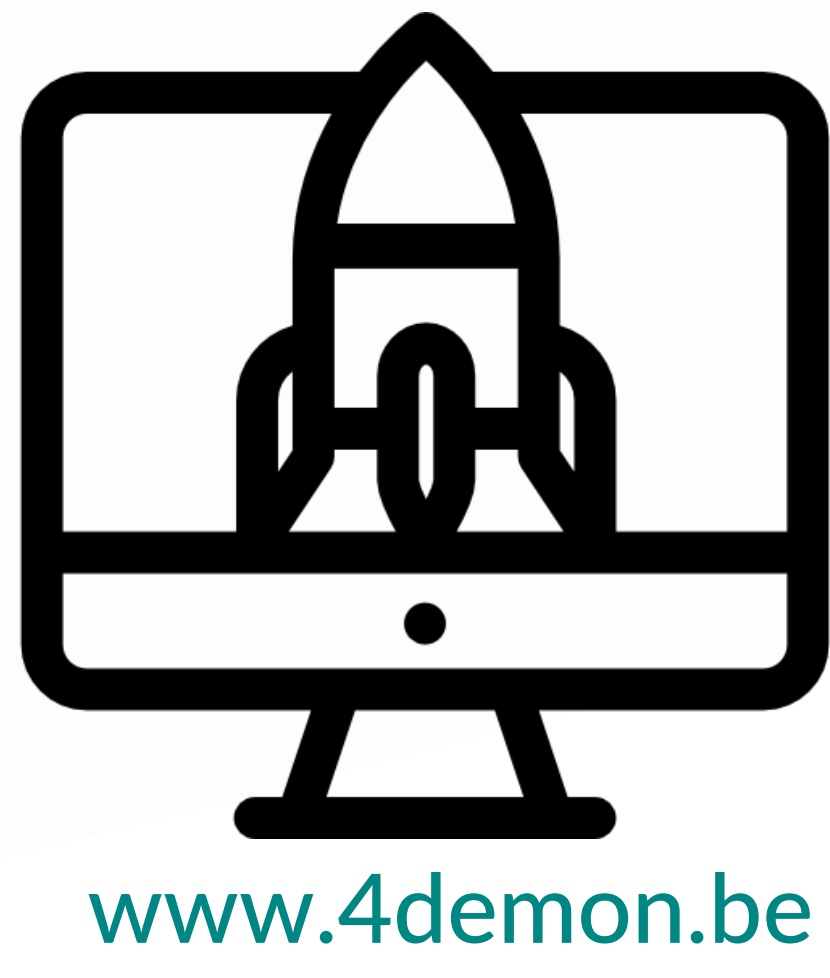


Data in the BCZ (1970-2014)

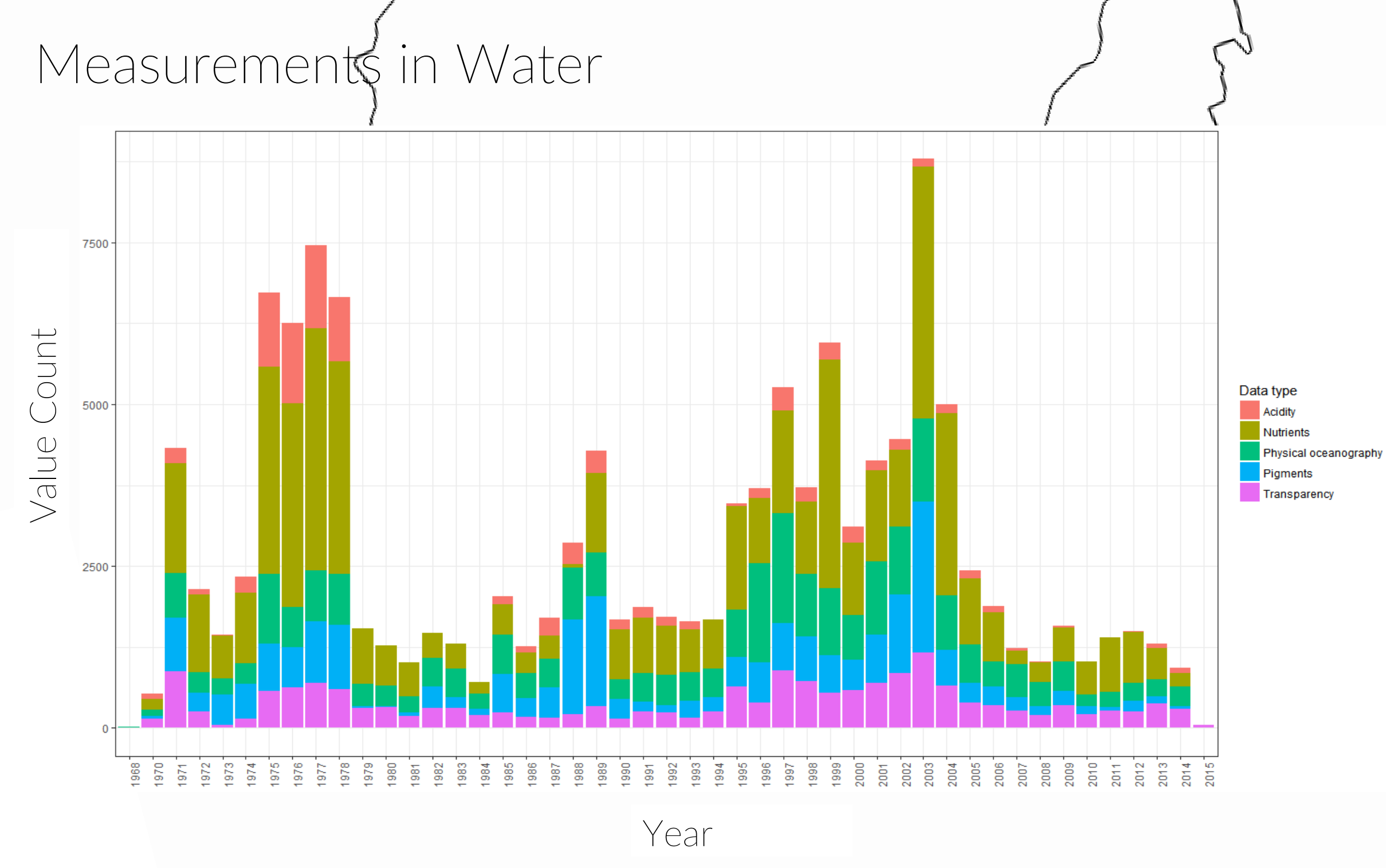
Count of values data (1970-2014) in the BCZ (biota-sediment-water).
 Bagger and Monit are long-term monitoring programs. 'Other' are data available via various research projects. 4DEMON are data resuscitated during this project.



Central Data Portal



www.4demon.be



Long-term datasets are compiled on:
 - Measurements in **Water**: Pigment concentrations (Chlorophyll a and Phaeophitin a), transparency variables (Secchi, Turbidity, TSM), Nutrient Concentrations (SiO₄, PO₄, NH₄, NO₃+NO), Sea Surface Temperature and Salinity, Ocean Acidification (pH and Alkalinity)
 - Contaminants in **Biota** (Heavy metals, PCBs and cofactors)
 - Contaminants in **Sediment** (Heavy metals, PCBs and cofactors)

The 4DEMON data, stored at the 2 NODCs, will be made publicly available via the **Central Data Portal**. Furthermore, the data will be made accessible via multiple international initiatives.

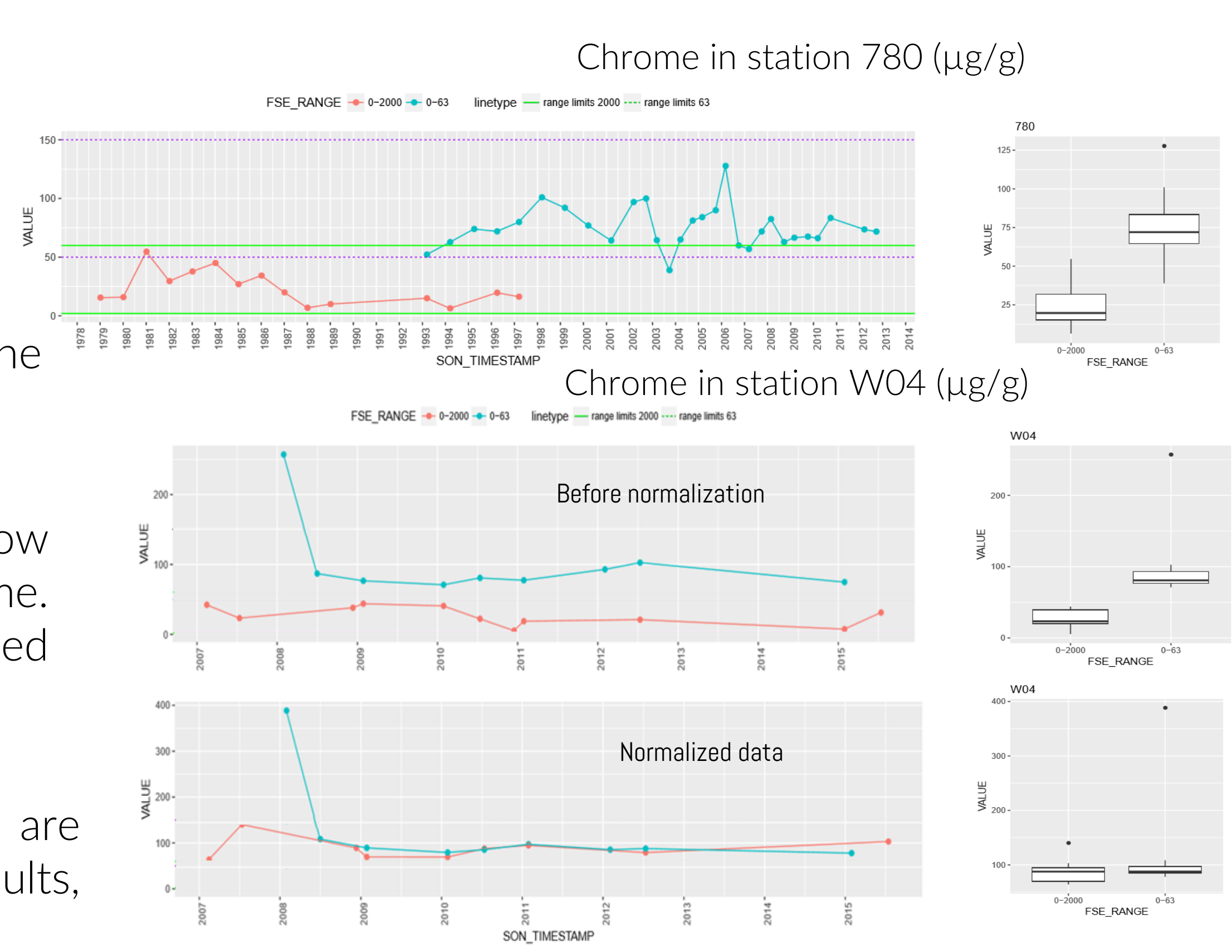
Study on Contaminants in Sediment

QC and Data cleaning
 Missing or unrealistic values, duplicates, outliers, extremes, outranged values, discrepancies (eg. unit errors).

Time trend assessment
 Long-term datasets are used to study the spatio-temporal evolution.

Normalization of granular fraction
 Correction for sediment composition to allow comparison of the pollution degree over time. Heavy metal concentrations are normalized with Iron and Aluminium.

Cluster analyses
 Stations with similar concentrations are clustered. According to cluster analyses results, a time-trend model will be built.



Project Outcomes

The tremendous amount of collected **data** will be made available on a central **data portal** open to public, scientists and stakeholders. Methods for long-term assessment, like models and the use of normalization **procedures**, are studied and data **products** developed.

The **Marine Data Archaeology** work performed in 4DEMON, including data collection, cleaning, validation and storage in consistent databases are time consuming but unavoidable steps to provide good quality data to support further scientific research and policy support