

The implementation of a data management plan to uplift historical data: long-term change detection in the Belgian Continental Shelf

Ruth Lagring¹, Annelies Goffin², Yvan Stojanov¹, Francis Strobbe¹, Lennert Tyberghein², Thomas Vandenberghe¹

¹Royal Belgian Institute of Natural Sciences, Operational Directorate Natural Environment, Belgian Marine Data Centre (BMDC), Belgium (bmdc@naturalsciences.be)

²Flanders Marine Institute (VLIZ), Data Centre Division, Belgium

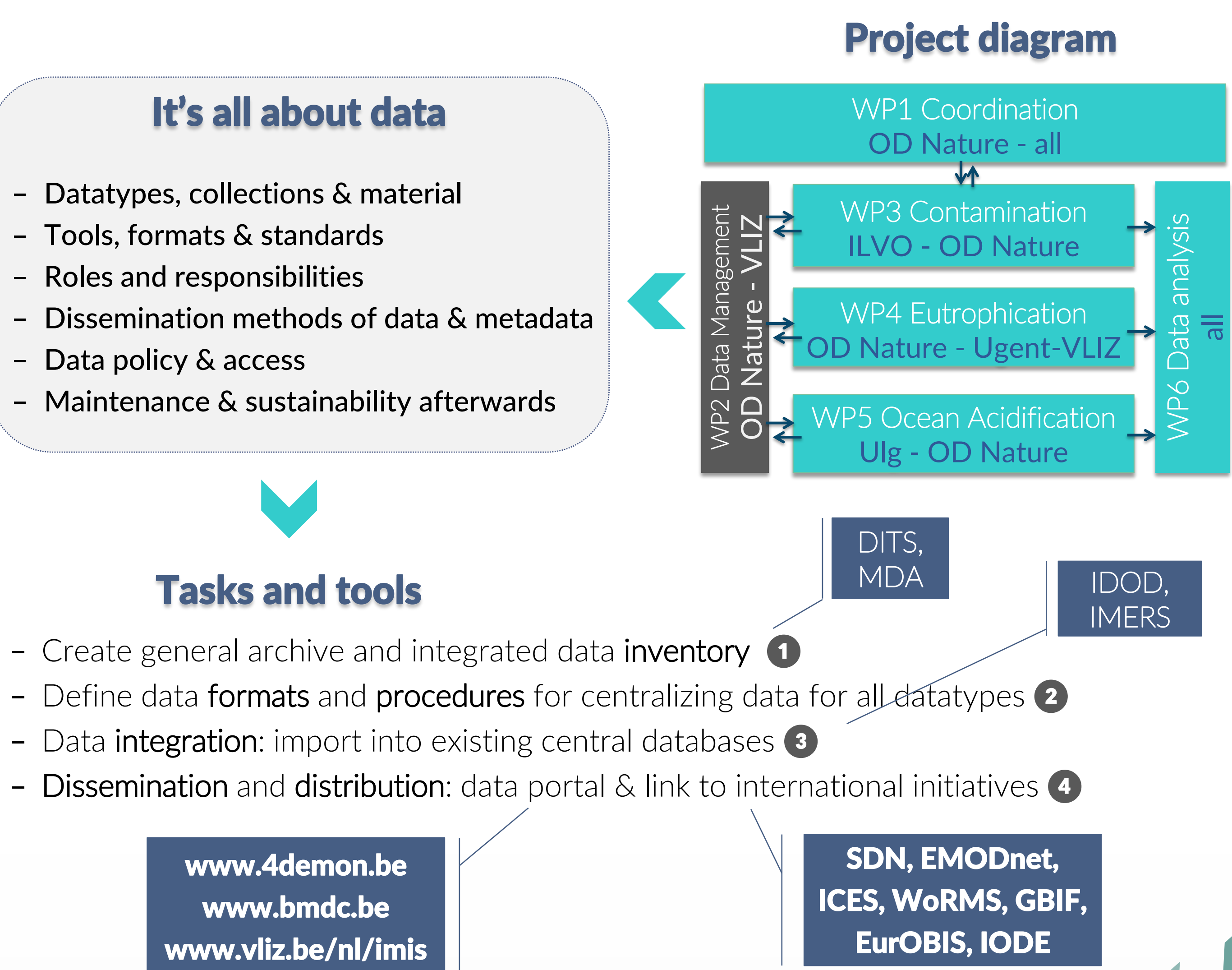
The amount of data collected during research and monitoring programs is increasing continuously. In the meanwhile know-how is constantly evolving. As data are very valuable it is important to ensure that they are managed efficiently during and after each project. More and more, funding agencies impose a **data management plan (DMP)** included in the proposal based on specific guidelines which are also used during the evaluation process. Such a DMP defines all aspects of data management, metadata generation, data preservation and analyses before the project begins. 4DEMON has the aim to **centralize, integrate and valorize data on contamination, eutrophication and ocean acidification** produced during expeditions in the Belgian Coastal Shelf (BCS) since 1970. It is a data-oriented project with two National Oceanographic Data Centres (NODC) as partners, **BMDC and VLIZ**. The data requirements of the funding agency (BELSPO) were implemented during the proposal by working out an **efficient data workflow**. As shown below, the intermediate results of the studies based on the resuscitated and valorized data are very promising.

Data guidelines

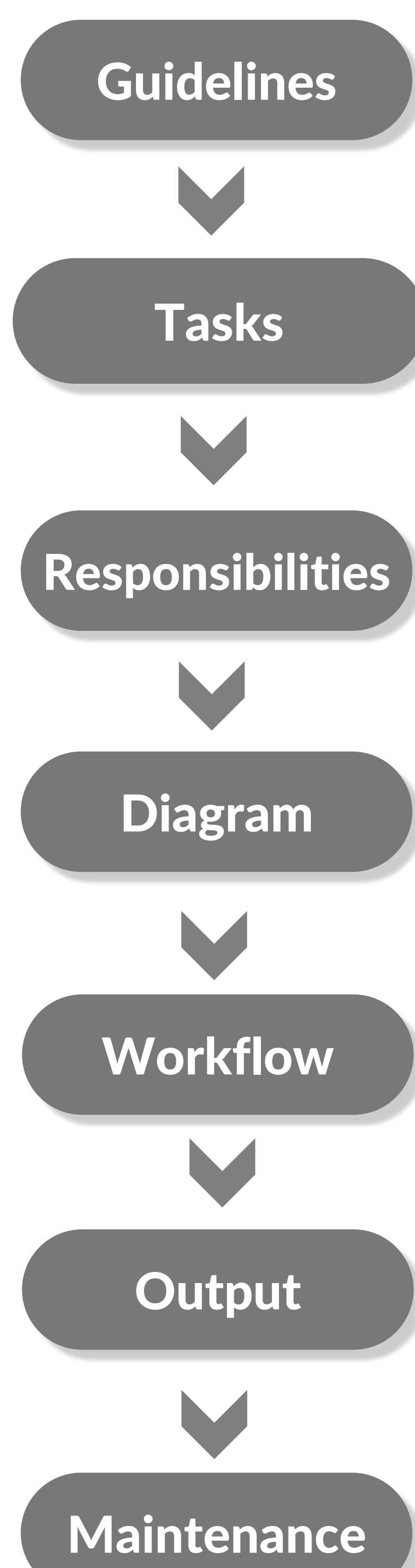
The project is funded by the 'Belgian Research Action through Interdisciplinary Networks' (BRAIN-BE), thematic axis 'Cultural, Historical and Scientific Heritage'. The **data guidelines** within the first BRAIN call were rather limited, but were fine-tuned in later calls:

- For obtaining the data, use existing databases if possible, ensure that the data is accessible and schedule the cost and time.
- If new data has to be produced, justify the added value and estimate the budget.
- Guarantee the sustainable availability of the data to other users for other purposes; define the users and accessibility methods.

Based on these guidelines a dedicated **Data Management Work Package** was included with well described **tasks**. The **responsibilities** of the partners (who does what) were defined and included in a project **diagram** supporting efficient planning.

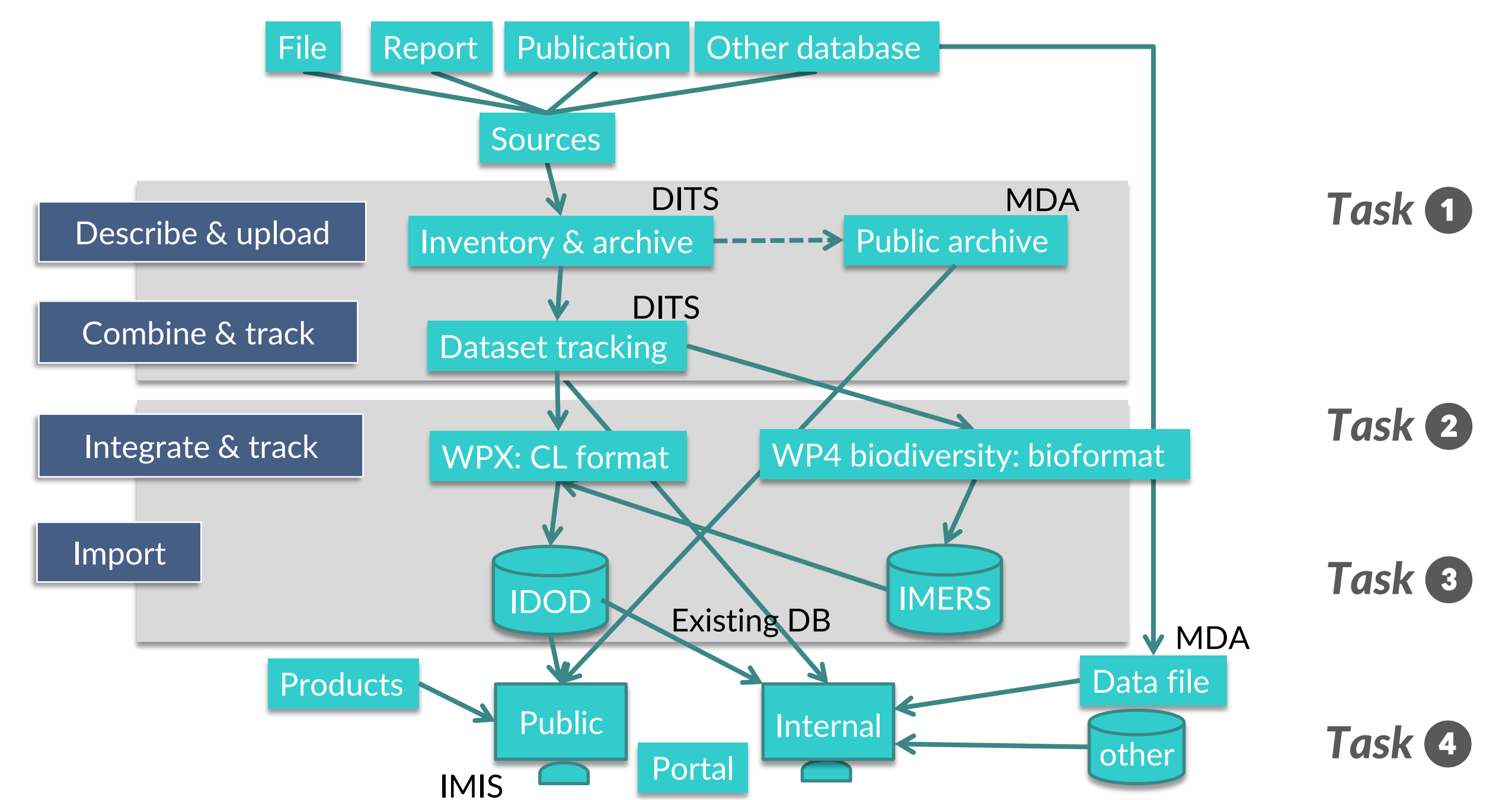


Data Management Plan



Data workflow

To ensure that all tasks are worked out efficiently, a **data workflow** was worked out, linking all the different processes, tools and responsibilities and taking into account all partners' needs.



ACTION, FEEDBACK & OUTPUT

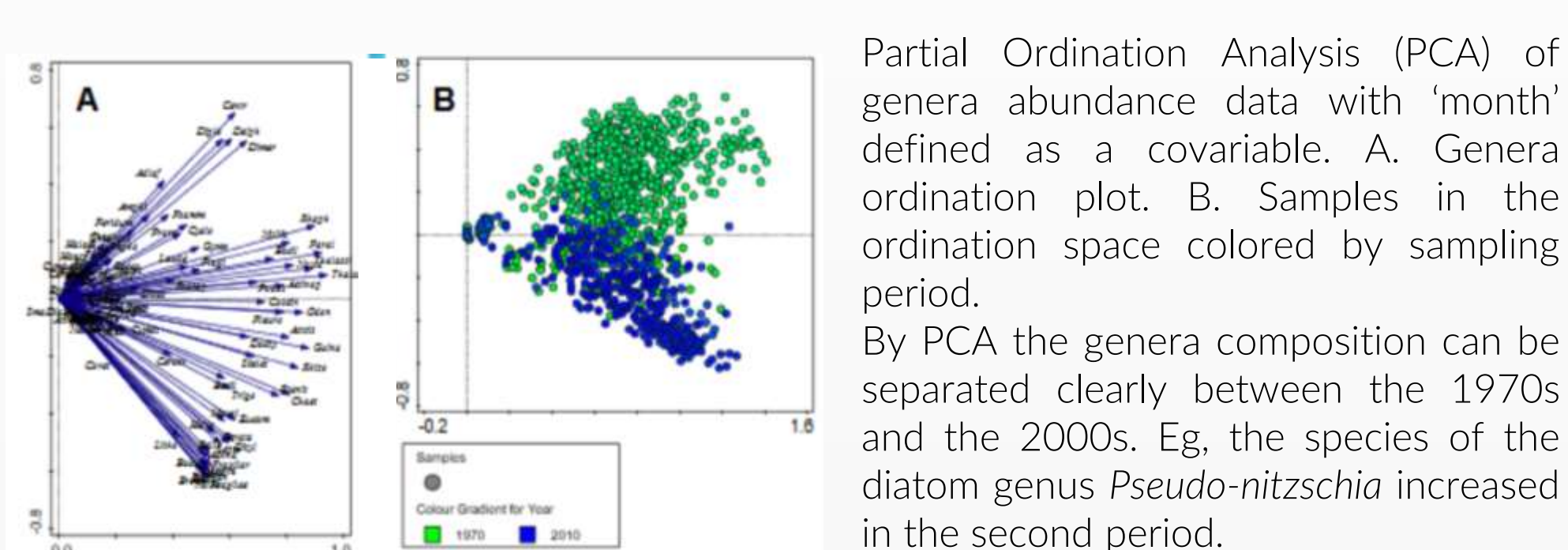
Once the projects started, the workflow was applied. Existing tools were adapted (MDA) and new tools developed (DITS), while formats for data exchange were fine-tuned. If partners' needs required adaptations, the datamanagers implemented their **feedback**. For example, for WP 3 and 4 intermediate databases were built to be able to centralise all original data before quality control and intercalibration was performed. Towards the end of the project, the **output** should be completely disseminated. The project website is being used for data products and a catalogue. Today, a data portal is being worked out.

MAINTENANCE

After the project ended all tools need to keep running and the data needs to remain accessible. As BMDC and VLIZ are both active NODCs with a long-term vision, the sustainability of the project results is ensured.

Shifts in species

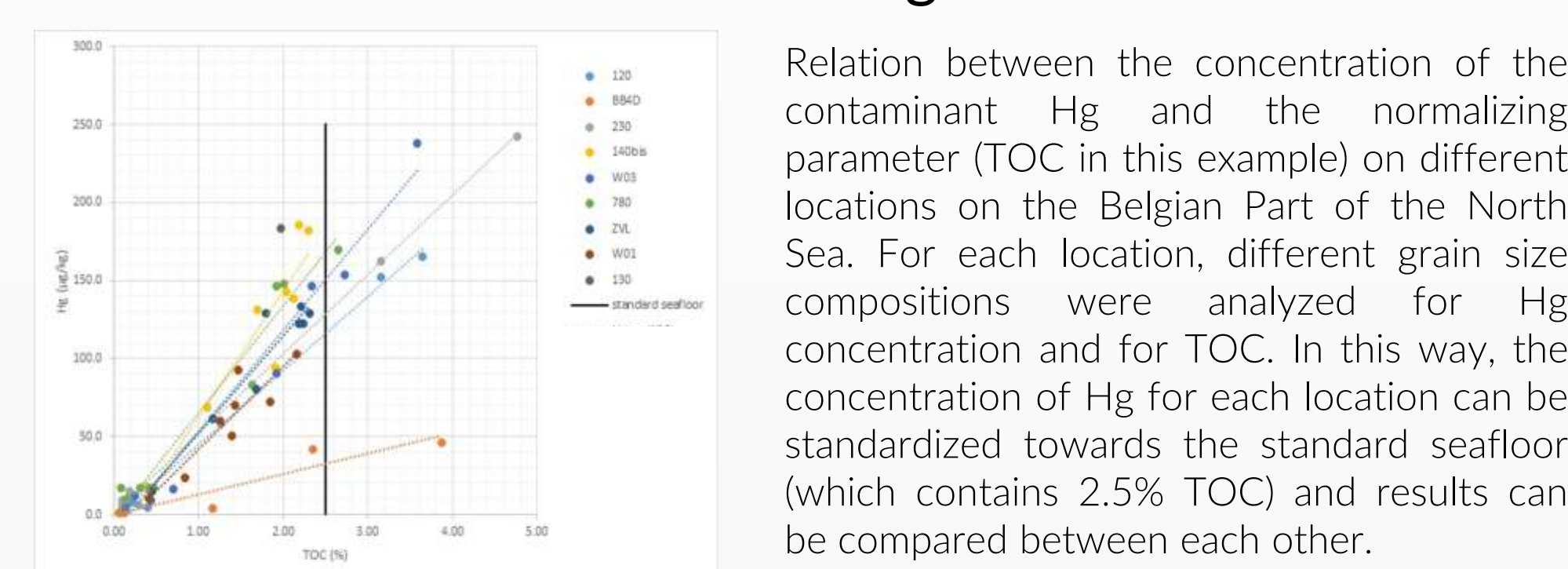
WP4: Shifts in phytoplankton community composition



Ref: Anja Nohe et al. (2016)

Standard methods

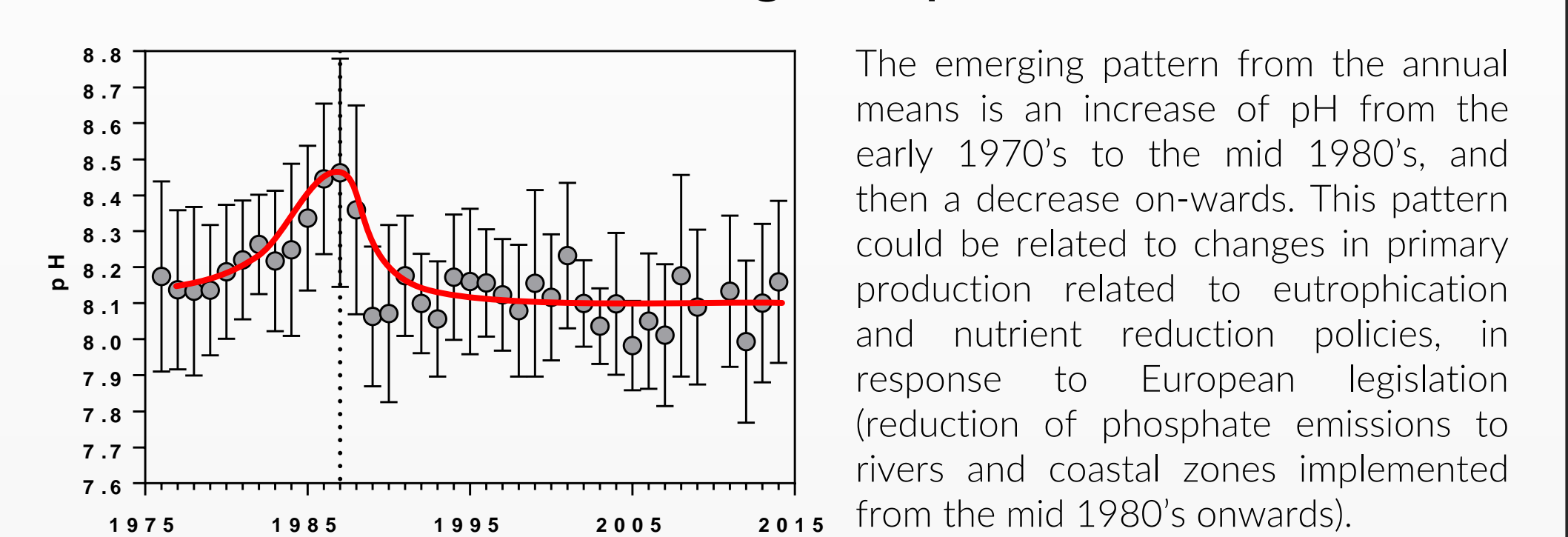
WP3: Correction for grain size effect



Ref: Karen Bekaert et al. (2016)

Policy impact

WP5: Annual averages of pH in the BCS



Ref: Alberto Borges et al. (2016)

Conclusions and Recommendations

- Clear **guidelines** and requirements on data should be provided by funding agencies to aid the project partners building an **efficient and unambiguous** data management plan.
- Including a **work package** on data management is an efficient way to support the dataflow throughout the project. The data management procedure of the 4DEMON project can be used as an example for other projects.
- Experienced **data centres** and data managers can provide adequate tools and databases, knowledge on data policy, standards, dissemination and ensure sustainability of the project outputs. It is therefore recommended to have them **actively involved** in each project.

References:

Karen Bekaert et al. (2016). Determination of the best normalizing parameter for heavy metals in sediments of the Belgian Part of the North Sea (BPNS).

Alberto Borges et al. (2016). Ocean acidification in the Belgian Coastal Zone.

Anja Nohe et al. (2016). Long-term phytoplankton monitoring data (1970-2010) from the Belgian North Sea reveal shifts in community composition and seasonal dynamics.

