

Explanation

Cumulative richness is calculated by adding only newly observed unique species each year to a cumulative sum. For maps, the value is calculated as a snapshot for each spatial cell. For time-series analyses, the value is calculated as a running cumulative sum for each sequential time step over the complete data cube.

-  **Steep increase of the cumulative curve:** Each timestep, new species are still being discovered for the first time in that region.
-  **Shallow increase or flat cumulative curve:** Almost no new species are being added to the historical list anymore.

Applicability for policy

-  **Data completeness check:** If the cumulative richness line is steep, it indicates that the data is still incomplete and not all species are represented in the dataset.
-  **Tracking new arrivals:** In highly monitored regions where data is already complete, a sudden increase in cumulative richness can serve as a leading indicator for the arrival of invasive alien species or climate-driven species shifts.

Limitations

This metric is poorly suited to measuring rapid, negative biodiversity changes or current habitat degradation. Since it is a cumulative sum, the value never decreases. If a local extinction occurs or if common species crash in numbers, cumulative richness will completely ignore it and remain at its maximum.

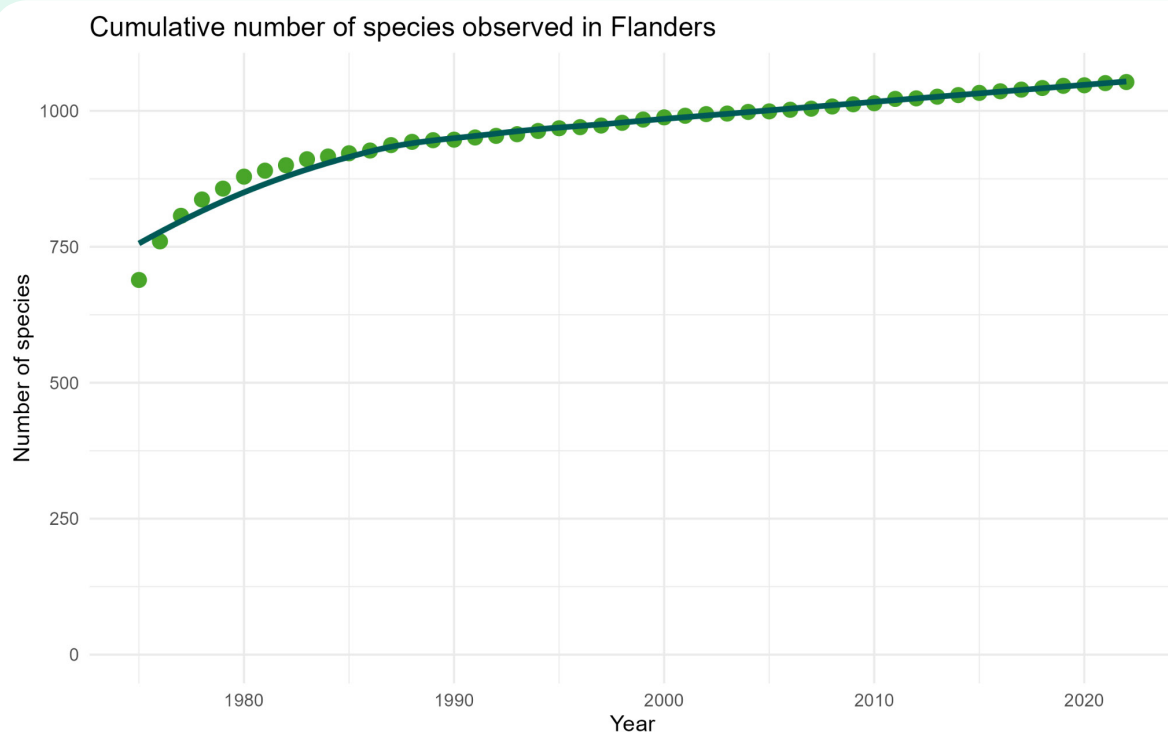
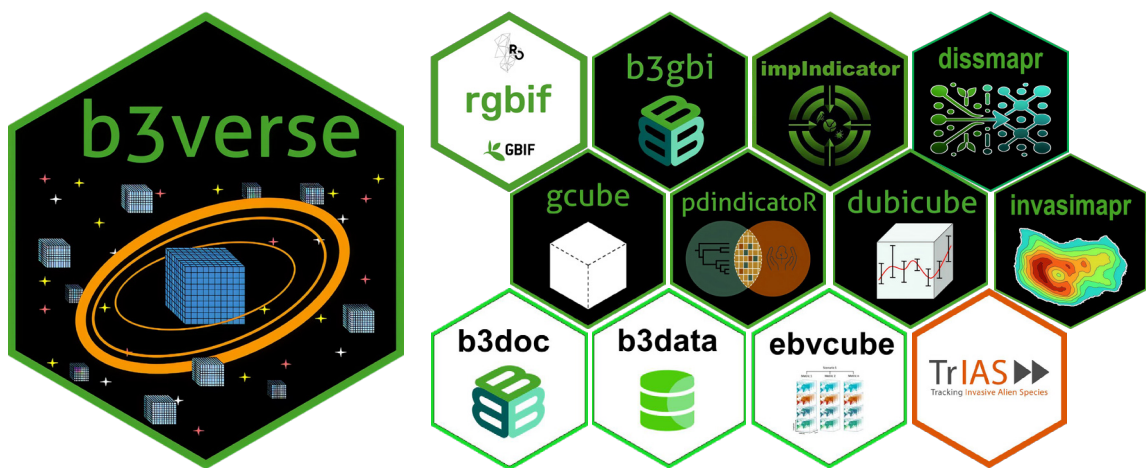
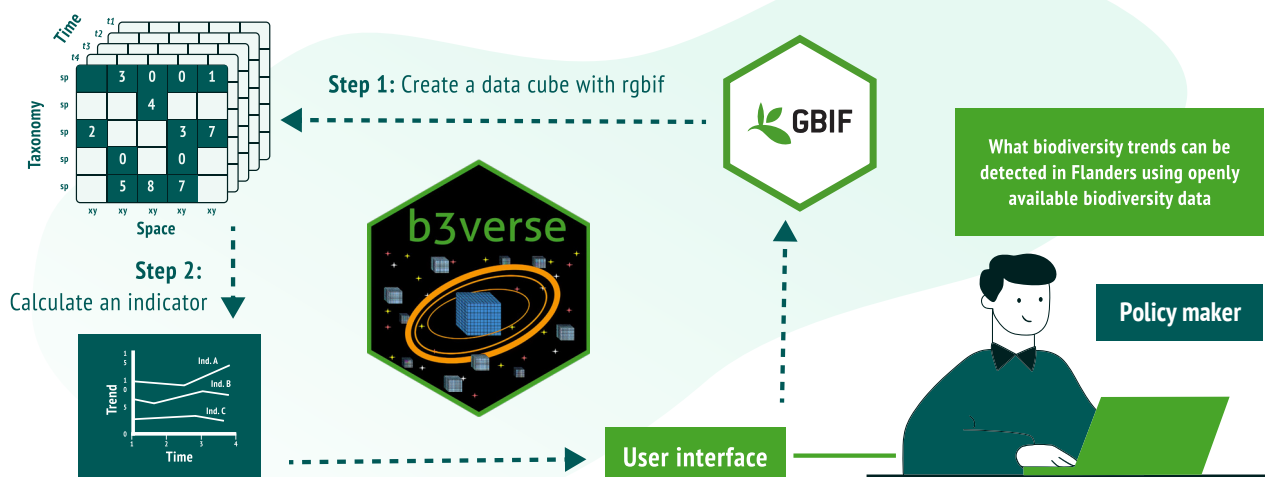


Figure 1: This figure shows the temporal trend in cumulative species richness of native flowering plants in Flanders since 1975, based on the Florabank dataset. GBIF Occurrence Download <https://doi.org/10.15468/dl.jep66n> Accessed from R via rgbif (<https://github.com/ropensci/rgbif>) on 2026-03-20.

The B-Cubed workflow supports the creation and analysis of a data cube based on GBIF data. Further documentation is available at <https://docs.b-cubed.eu/>. Overview of all available packages at <https://b-cubed-eu.r-universe.dev/builds>.



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b-cubed.eu

B-Cubed aimed to standardise access to biodiversity data, helping transform fragmented biodiversity records into timely, policy-relevant indicators. This was achieved by developing a service to create “species occurrence cubes”, which then served as the basis for models and indicator of past, current and future biodiversity. To ensure its results can be reused, the project created exemplary workflows for modelling and indicator calculation, as well as a suite of guides, tutorials and hands-on training sessions. The application and usefulness of B-Cubed’s algorithms and software are demonstrated through the project’s four case studies.

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