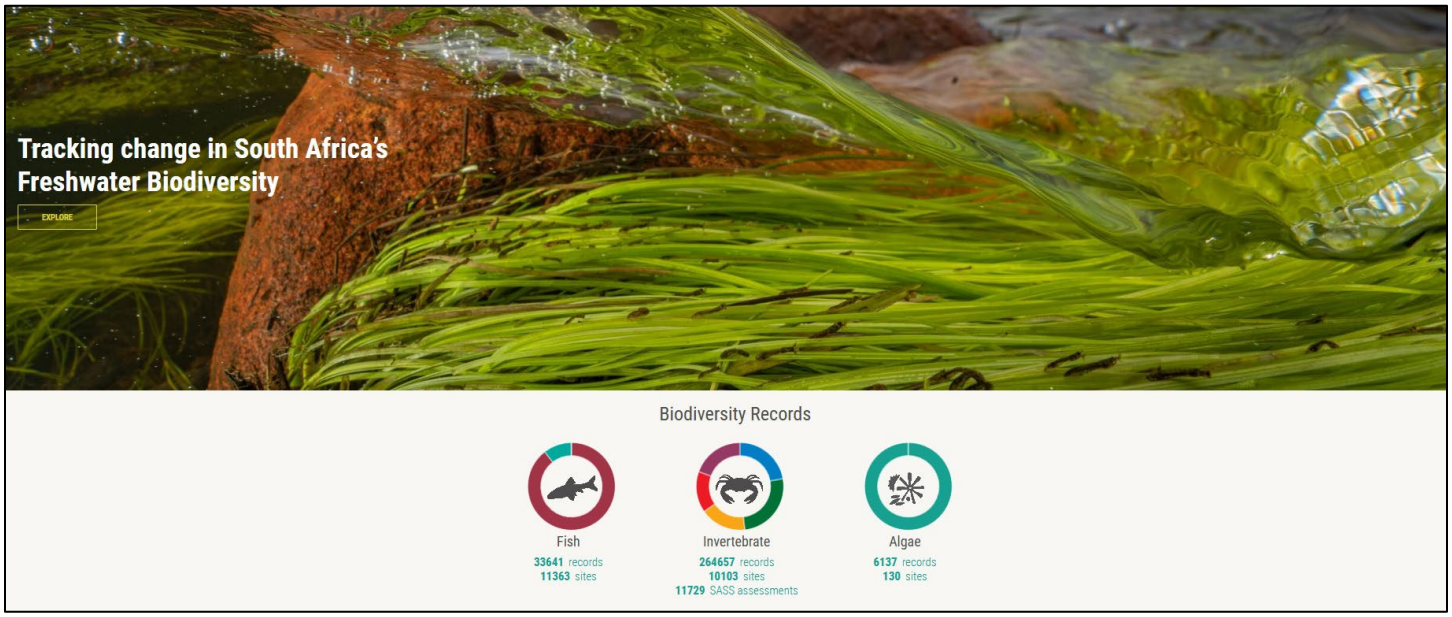
FBIS Freshwater Biodiversity Information System

USER MANUAL



September 2022

Citation guidelines

Data accessed through the FBIS are free for all—but not free of obligations. Under the terms of the FBIS data users agreement, users who download individual datasets or search results and use them in research or policy agree to cite them using the referencing information provided in the metadata for each data record.

Good citation practices ensure scientific transparency and reproducibility by guiding other researchers to the original sources of information. They also reward data-publishing institutions and individuals by reinforcing the value of sharing open data and demonstrating its impact to their stakeholders and funders.

Users are strongly encouraged to cite data retrieved from the FBIS network according to the recommended citation:

Freshwater Biodiversity Information System (FBIS). 2022. Downloaded from https://freshwaterbiodiversity.org on <current date>

Note: Users also need to cite the individual source references that they have used, which are available in the metadata table provided on the detailed dashboards.

To cite the scientific article published in the African Journal of Aquatic Science.

Dallas HF, Shelton JM, Sutton T, Tri Ciputra D, Kajee M and Job N. 2021. Development of a freshwater biodiversity information system for evaluating long-term change in rivers in South Africa. African Journal of Aquatic Science. doi.org/10.2989/16085914.2021.1982672

To cite the User Manual:

Freshwater Biodiversity Information System (FBIS). 2022. FBIS User Manual. Prepared by the Freshwater Research Centre and Kartoza.

Website:

freshwaterbiodiversity.org


FRC
FRESHWATER
RESEARCH CENTRE


KARTOZA
OPEN SOURCE GEOSPATIAL SOLUTIONS


JRS Biodiversity
Foundation

Table of Contents

1 Introduction

Freshwater Biodiversity Information System (FBIS) is an open-access, online platform for serving, hosting, analysing, visualising and sharing freshwater biodiversity data in South Africa. The overall purpose of the platform is to support data-driven freshwater decision-making and management in South Africa.

The system currently accepts and serves data on species occurrence, abundance and associated habitat and abiotic parameters, for anurans, fish, invertebrates, algae, odonate adults and wetland plants. It also accepts and serves water temperature time series data and physico-chemical data.

System design and functionality was strongly informed by data and reporting needs of key end-user groups, including water resource managers, biodiversity and conservation managers and planners, scientific researchers, and environmental consultants. Future expansion of FBIS aims to increase the diversity of data accessed, data flow, geographic coverage and strategically embed FBIS into South Africa's main freshwater decision-making pipelines.

Platform development was funded by the JRS Biodiversity Foundation through two grants: 2017-2020 (Phase 1) and 2021-2024 (Phase 2). The platform was developed by the Freshwater Research Centre in partnership with Kartoza and the South African National Biodiversity Institute.

A scientific article has been published in the African Journal of Aquatic Science and is available here. The citation for the article is:

Dallas HF, Shelton JM, Sutton T, Tri Ciputra D, Kajee M and Job N. 2021. Development of a freshwater biodiversity information system for evaluating long-term change in rivers in South Africa. African Journal of Aquatic Science. doi.org/10.2989/16085914.2021.1982672

The link to the FBIS site: https://freshwaterbiodiversity.org/

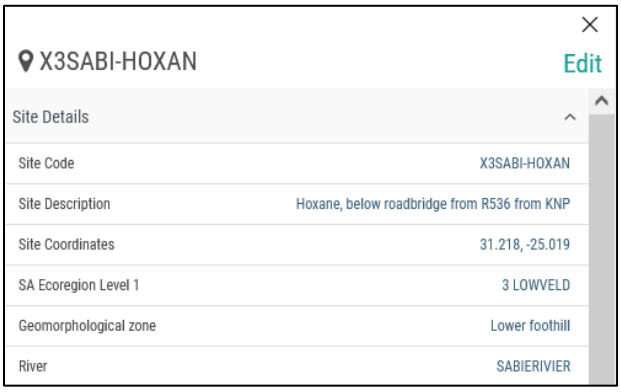
This manual aims to provide details on key aspects of FBIS and expand on its functionality. It is accompanied by a series of video clips that demonstrate various workflows that users are likely to need (a short video tutorial series is available (**here**).

2 Key concepts

Site: A specific location along a river course where sampling or assessments take place.

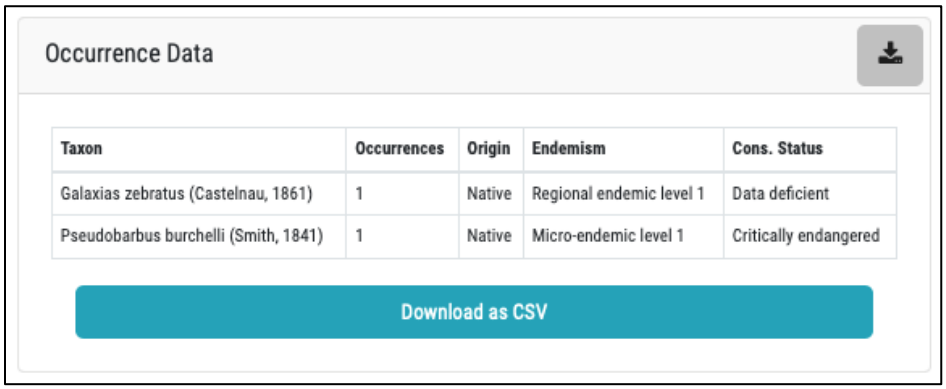
FBIS Site-code: A unique name given to each site made up of:

- Two characters representing the secondary catchment code e.g. G1
- Four characters representing the river name e.g. JONK. This is currently derived from the 1:500 000 DWS rivers layer. If the river does not have a name on this layer, then the nearest river name is taken. For this reason it is important for a user to add the Original river name on the Site form if the river is unnamed (e.g. a small tributary).
- A hyphen i.e. –
- Five characters representing the nearest place name e.g. SIMONS. In many cases these five characters are replaced by a numeric value where a place name has not been identified. The Original Site Code and Original River Name from the original study are also provided.
- The site code is generated automatically unless the user as a standard name.

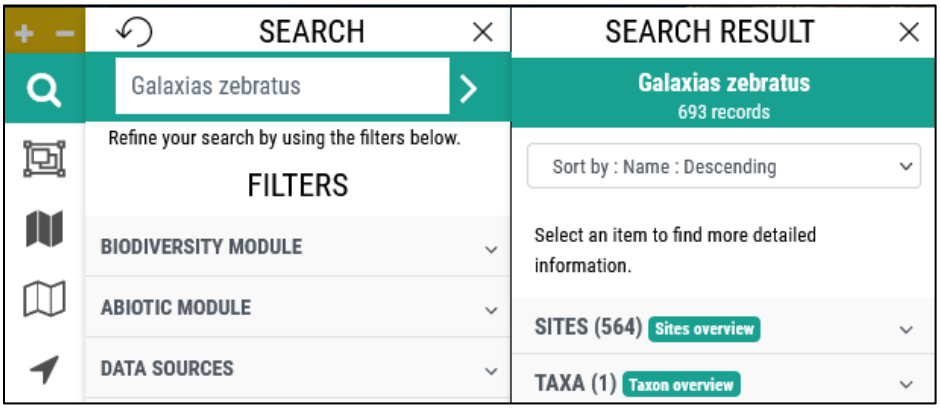


River: This is currently derived from the 1:500 000 DWS rivers layer. If the river does not have a name on this layer, then the nearest river name is taken. For this reason it is important for a user to add the Original river name on the Site form if the river is unnamed (e.g. a small tributary). (See section 11.1 Create a site).

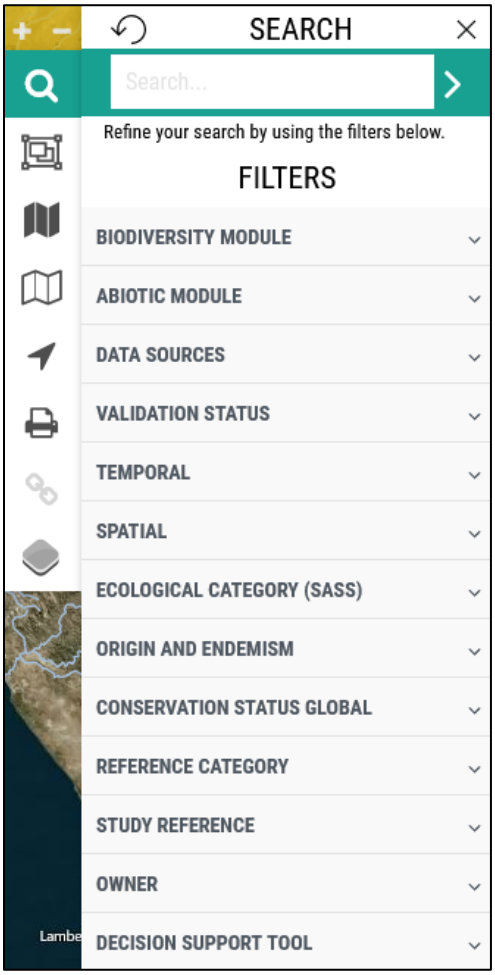
Occurrence record: One collection record for a taxon at a given site. This record may optionally include abundance data.



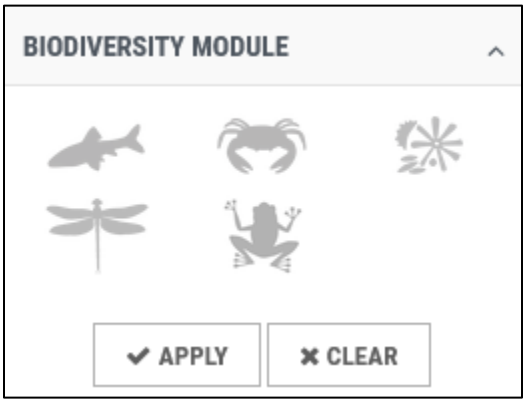
Search: The process whereby freeform text is entered into the search box and the matching records are shown on the map.



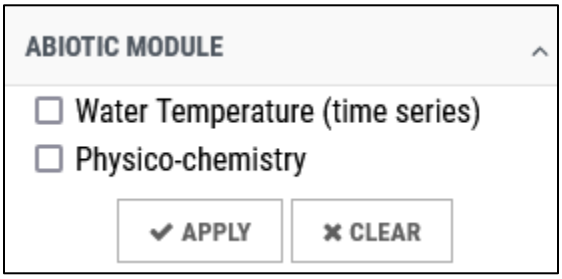
Filters: Often used in conjunction with search, filtering allows you to narrow down the result set based on predefined spatial, temporal and biological criteria, such as province, date, species, etc.



Biodiversity Module: A higher taxonomic grouping of taxa (and thus their related collection records). Modules can have their own dashboard implementations and data capture forms to capture information specific to the kind of taxa in the module grouping.

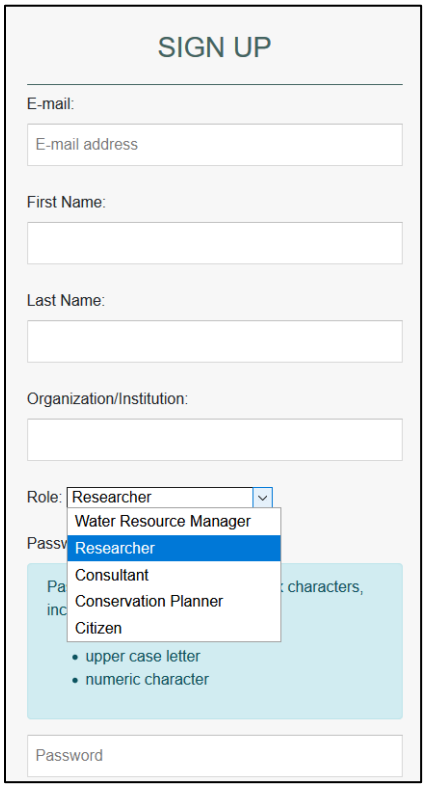


Abiotic Module: A module serving abiotic data including water temperature time series data and physico-chemical data.



3 Signing up and logging in

Visit freshwaterbiodiversity.org to login, sign up and explore. Complete the **Sign Up** to register to use FBIS, including details of your organisation and role in the freshwater community.

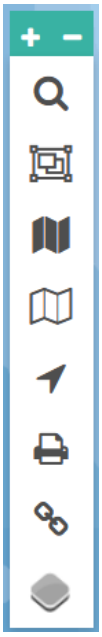


4 Overview of the map interface

4.1 Navigation bar

- **About** provides details of the FBIS, including the funders and partners.
- **Map** is where you explore the data.
- **Contact** to send us a query or question.
- **Help** provides access to a User Manual and video tutorials demonstrating FBIS functionality.
- **"Your Name"** is for editing your profile and viewing your contributions.
- **Add Site** is a shortcut to add a new site and associated data to FBIS.

4.2 Tool bar



Zoom in and out on the map

Search and filter records

Lasso Control to select and group specific sites using a polygons

Turning on and changing transparency of layers

Select third party data (MiniSASS and water quality data served by InWARDS)

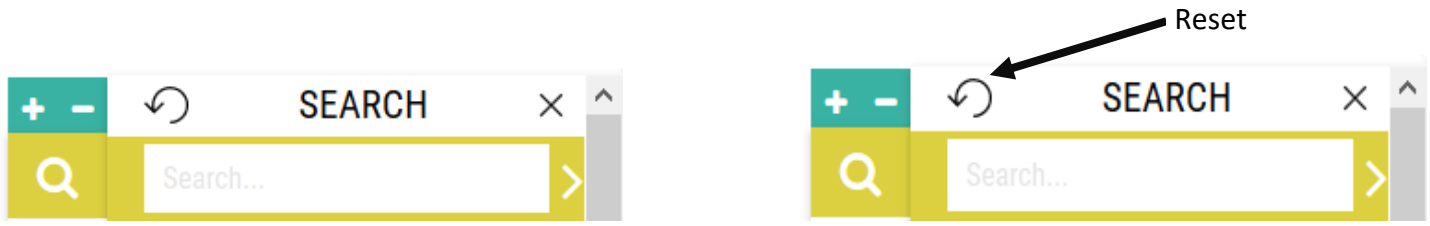
Locate options using coordinates and farm codes

Print a PNG of your map

Copy a sharable link for your map

Change the base map. Options include Bing Satellite Hybrid, Terrain, Topography, Aerial photograph or Plain B & W.

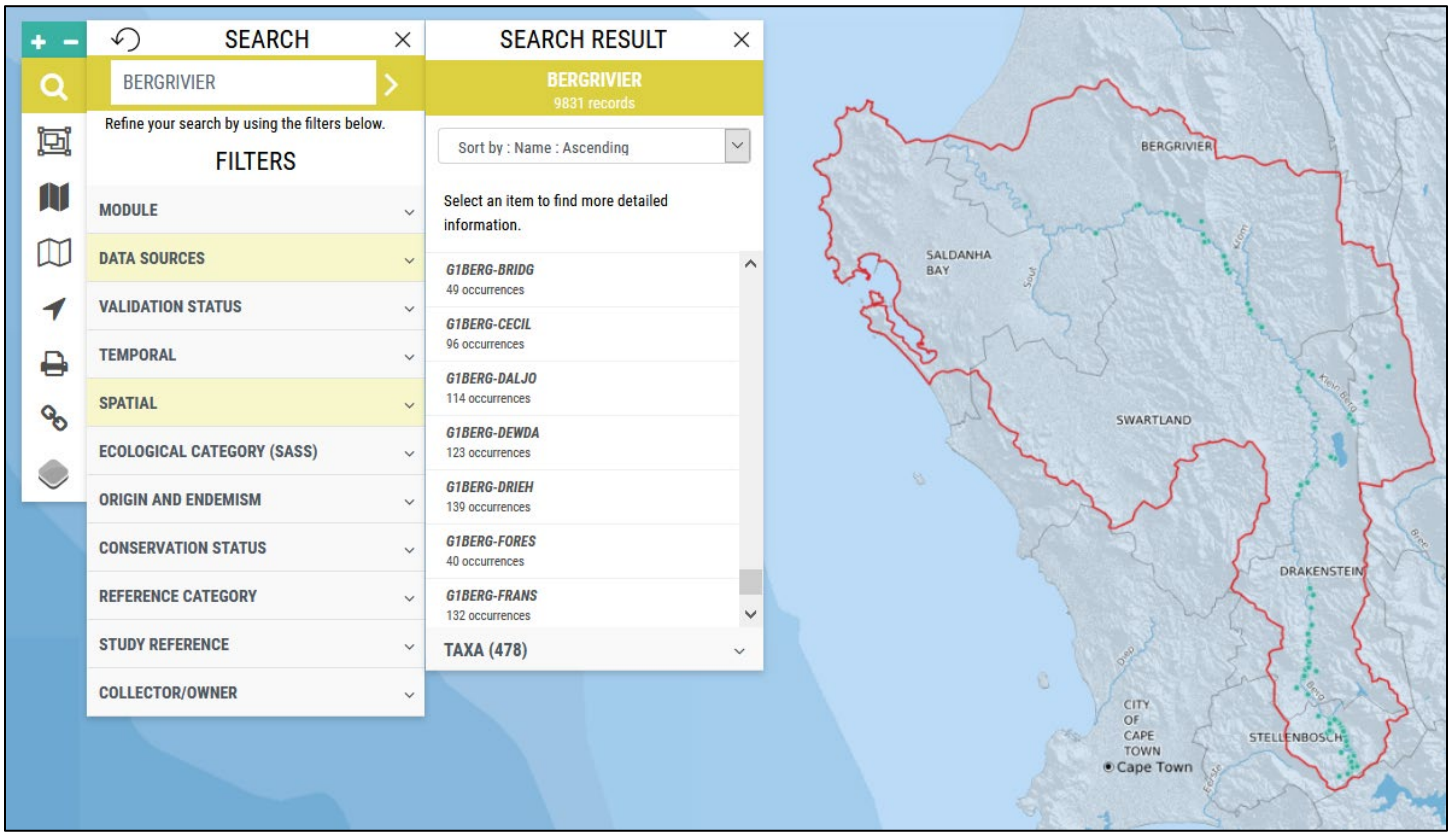
5 Search



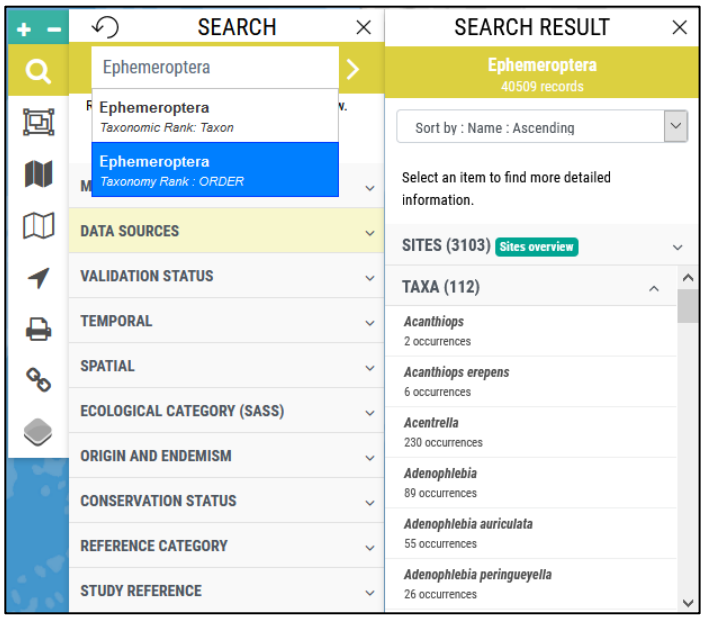
FBIS supports search auto-completion based on FBIS site code, taxon name (scientific) and river name. With this implementation it is very easy to, for example, quickly extract all of the sites along a given river as per the example shown below (Figure 2).

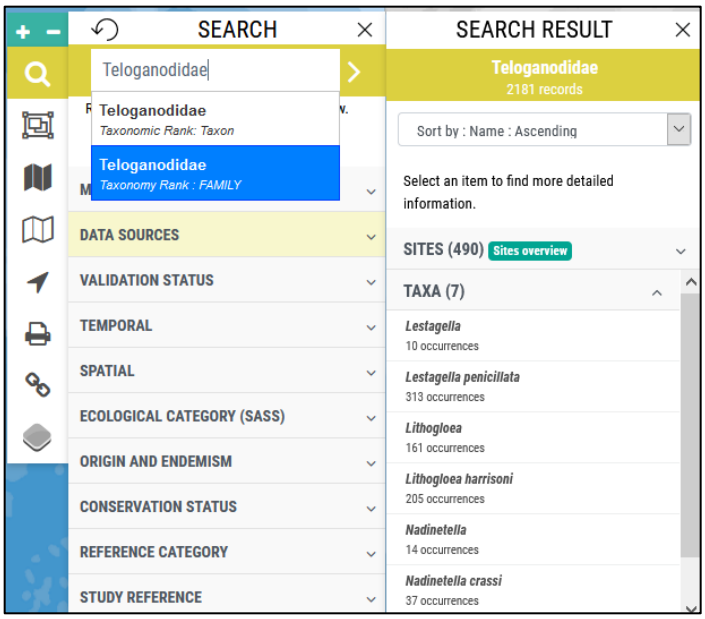
Accessed by: Clicking on the magnifying glass search icon and then entering a taxon name, FBIS site code or river name into the search box. A user can search using **Taxon Rank** (species, genus, family or order) as well as Taxon, which is the lowest taxon provided in a study reference (Figure 3).

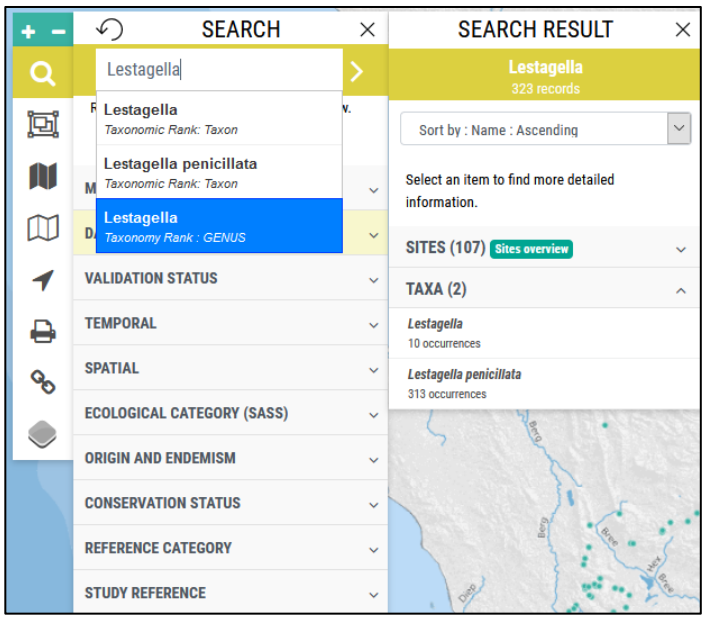
To clear search criteria use "**Reset**".

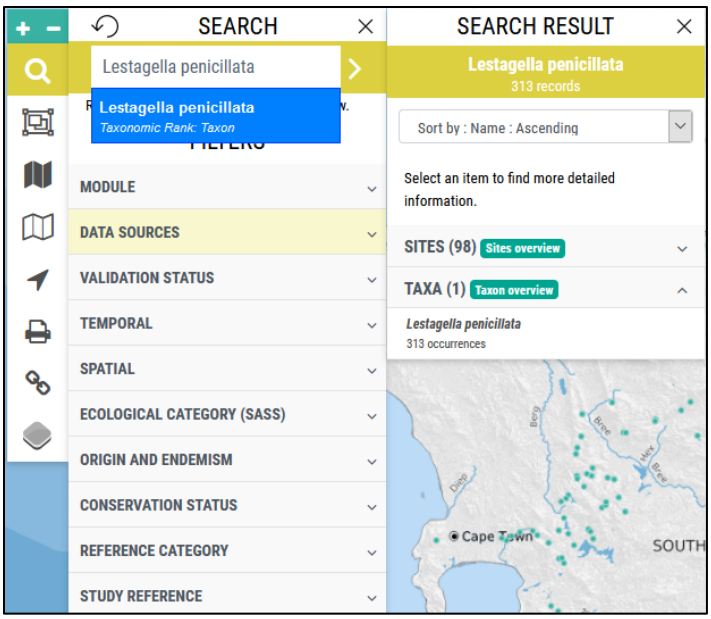


Search based on river name









Search based on Taxon Name and Rank, showing Order Ephemeroptera, Family Teloganodidae, Genus *Lestagella* and Species *Lestagella penicillata*.

6 Filtering

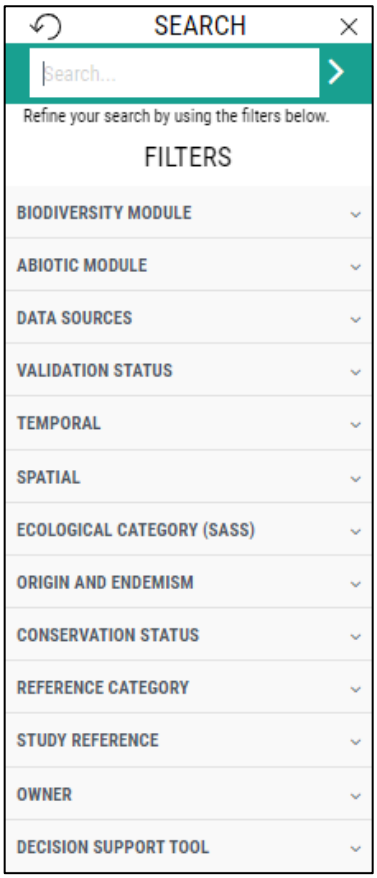
Two types of filters are supported on FBIS: Contextual filters, which filter based on the site or collection record attributes in the database, and map based filters which operate by selection of sites on the map.

6.1 Contextual filters

One of the key technologies 'under the hood' in FBIS is the use of Kartoza's GeoContext service. GeoContext provides a way to, in a single query, obtain contextual data for any geographical point across multiple Open Geospatial Consortium (OGC) web services (WMS, WFS). The results are aggregated into a single document and made available to FBIS which then stores this aggregate data as properties of a site. Having this rich collection of GeoContext data for each site allows us to filter the records shown on the map and in dashboards in fairly arbitrary ways. For example, selecting only records from a given catchment or ecoregion. A description of each filter is provided in Table 1.

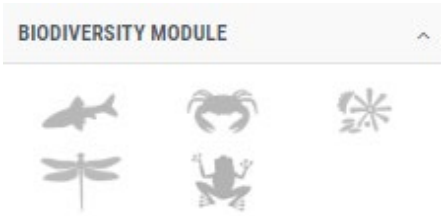
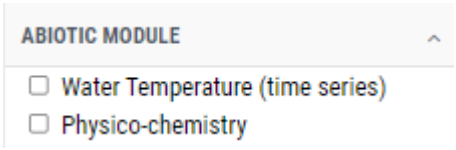
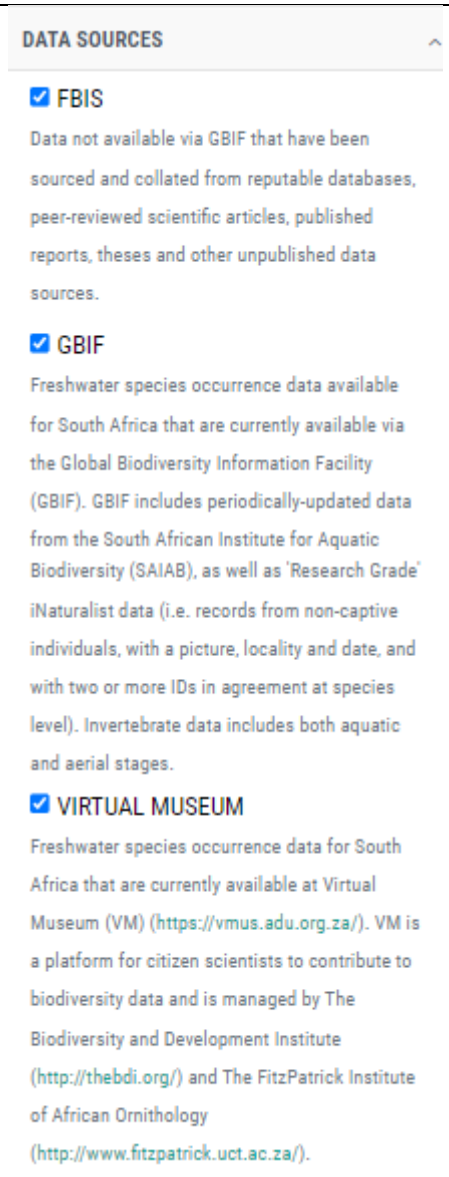
Filtering is done using a hierarchical 'tree view' in the filter panel (Figure 4). Tree nodes can be expanded or collapsed and selecting a specific node or set of nodes will allow you to apply the selected filters to the records displayed on the map and search result areas as shown below:

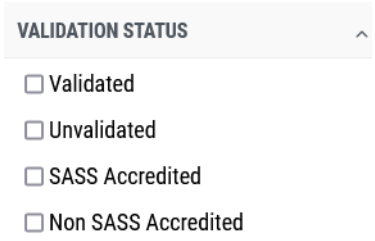
Example of some of the filters available for querying the data.



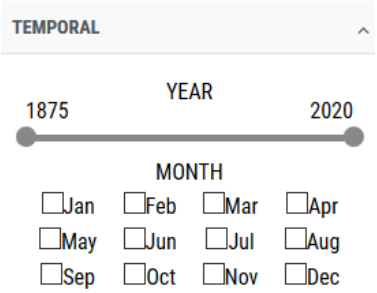
To apply the filter click **Apply**; to clear the click **Clear**.

Table 1. Details of the filters provided in FBIS.

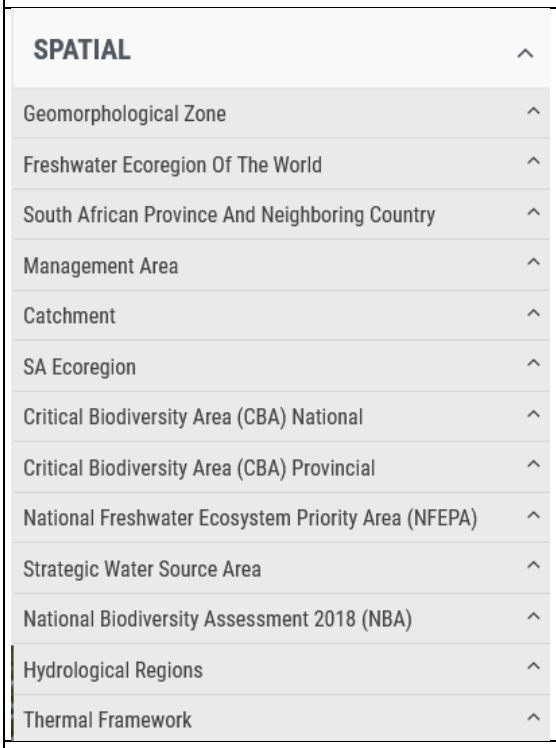
	**Biodiversity module** Filter records for fish, invertebrates, algae, adult odonates or anuran only by clicking the appropriate icon. To filter records for sites that have more than one biodiversity module (e.g. fish and invertebrates), use the Shift Click function to select multiple modules.
	**Abiotic module** Filter records for sites that have water temperature time series data, or physico-chemical data.
	**Data sources** The default setting in FBIS is all data collated specifically for FBIS, existing GBIF records and existing Virtual Museum records are provided. Uncheck those sources that you do not want records for. Note that neither GBIF or Virtual Museum data have not been validated by the FBIS team.



Validation status
The default setting in FBIS is that all Validated, unvalidated, SASS Accredited and Non SASS Accredited data are provided. Validated data have been checked by FBIS admin and /or designated expert, while unvalidated data have not been checked. SASS Accredited and Non SASS Accredited relates specifically to whether the assessor was SASS accredited at the time of doing the SASS assessment. Filter records by checking the relevant boxes to include specific data only.

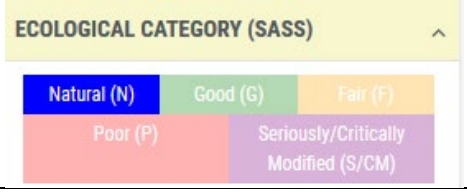


Temporal
Filter records using the sliding scale to specify year(s), and/or check specific months.

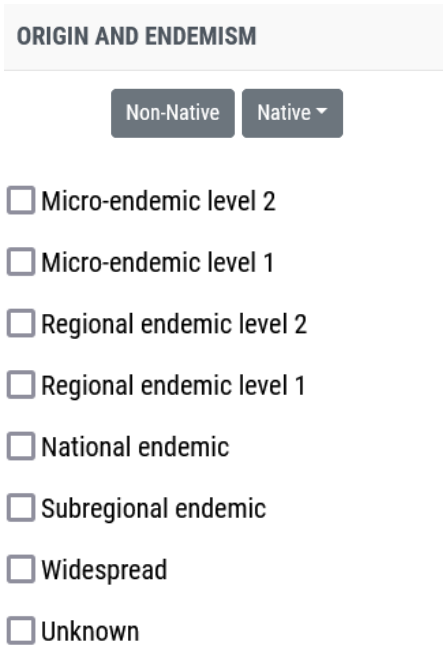
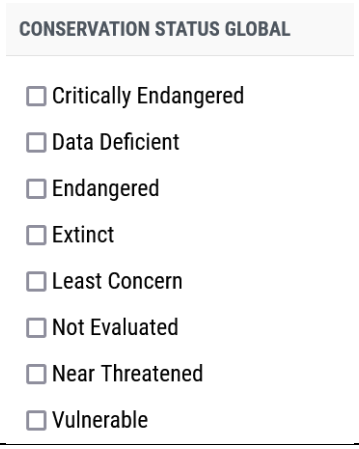
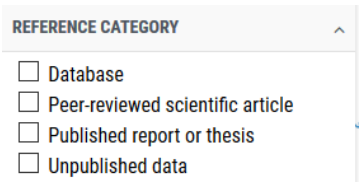


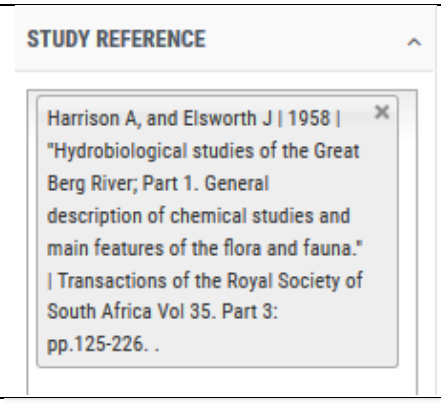
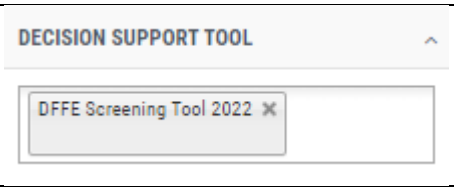
Spatial
Thirteen spatial filters are currently provided for users to filter the records shown on the map and in dashboards. For example, selecting only records from a given province, catchment or SA ecoregion. Further details are provided in section 7.2. The current list of spatial filters lodged in FBIS include:

- Geomorphological Zones
- Freshwater Ecoregions of the World
- South African Province and Neighbouring Country
- Management Area
- Catchments
- SA Ecoregions
- National and Provincial Critical Biodiversity Areas
- National Freshwater Ecosystem Priority Areas
- Strategic Water Source Areas
- National Biodiversity Assessments 2018
- Hydrological Regions
- Thermal Framework

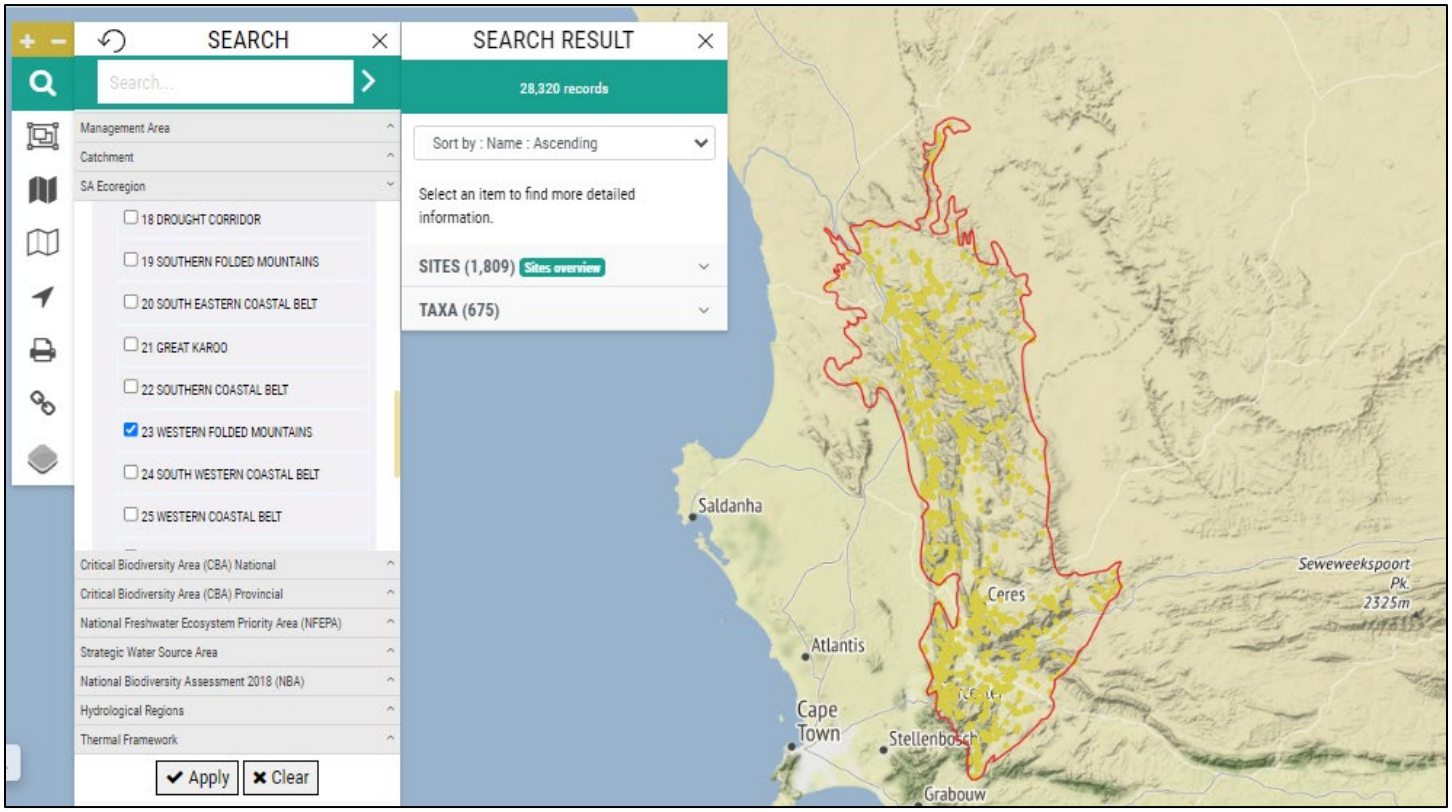


Ecological category (SASS)
Filter records based on ecological categories, interpreted from SASS data interpretation guidelines of Dallas (2007).

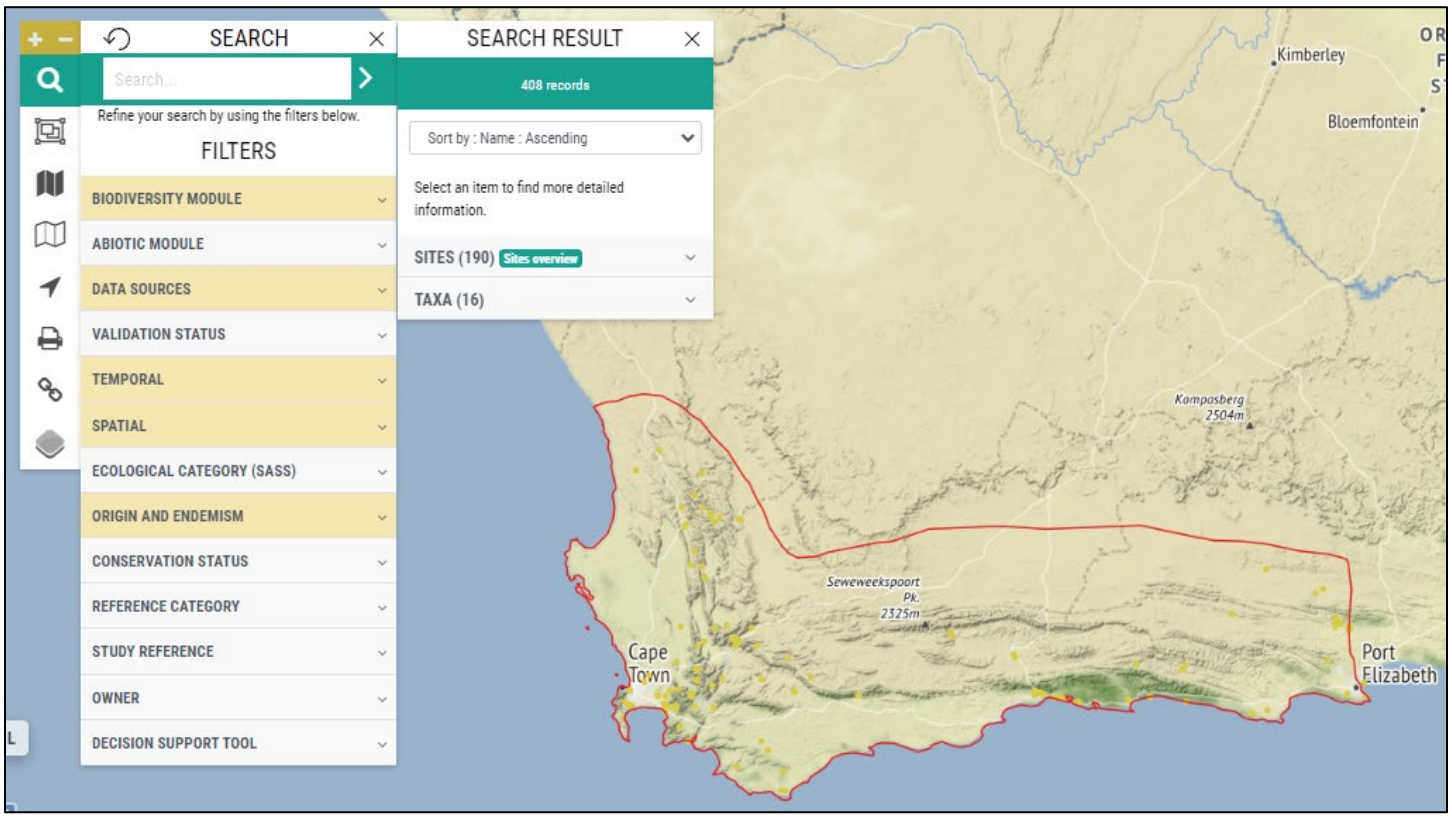
	**Origin and endemism** Filter records based on origin: native or non-native, where non-native includes both alien and extralimital taxa. Filter records based on endemism, where taxa are divided into eight categories as follows: • Micro-endemic level 2 (Endemic to a single river or wetland) • Micro-endemic level 1 (Endemic to less than 5 rivers or wetlands) • Regional endemic level 2 (Endemic to a single primary catchment) • Regional endemic level 1 (Endemic to a single Freshwater Ecoregion (e.g. CFE), more than one primary catchment) • National endemic (Endemic to South Africa, occurs in more than one Freshwater Ecoregion within SA) • Subregional endemic (Endemic to southern Africa) • Widespread (Occurs beyond southern Africa) • Unknow (Endemism is unknown)
	**Conservation status** Derived from the International Union for Conservation of Nature's (IUCN) Red List of Threatened Species, a user may filter records based on global conservation status.
	**Reference category** Filter records based on type of reference.

	**Study reference** Filter records by selecting a specific study reference.
	**Owner** Filter records collected by a specific person.
	**Decision support tool** Filter records that have been used to support management and conservation decision making by contributing to a specific Decision Support Tool.

Applying a filter returns a subset of the data based on your filter criteria, for example records in SA Ecoregion = Western Folded Mountains. When a filter is in effect, you will see a yellow highlight of the 'drawers' which have filter options enabled (highlighted in yellow). The filter system only displays filter options for categories that have sites associated. For example, if you do not see an option in the 'Provinces' filter for Northern Cape, it means we do not have any data (sites) for that province.



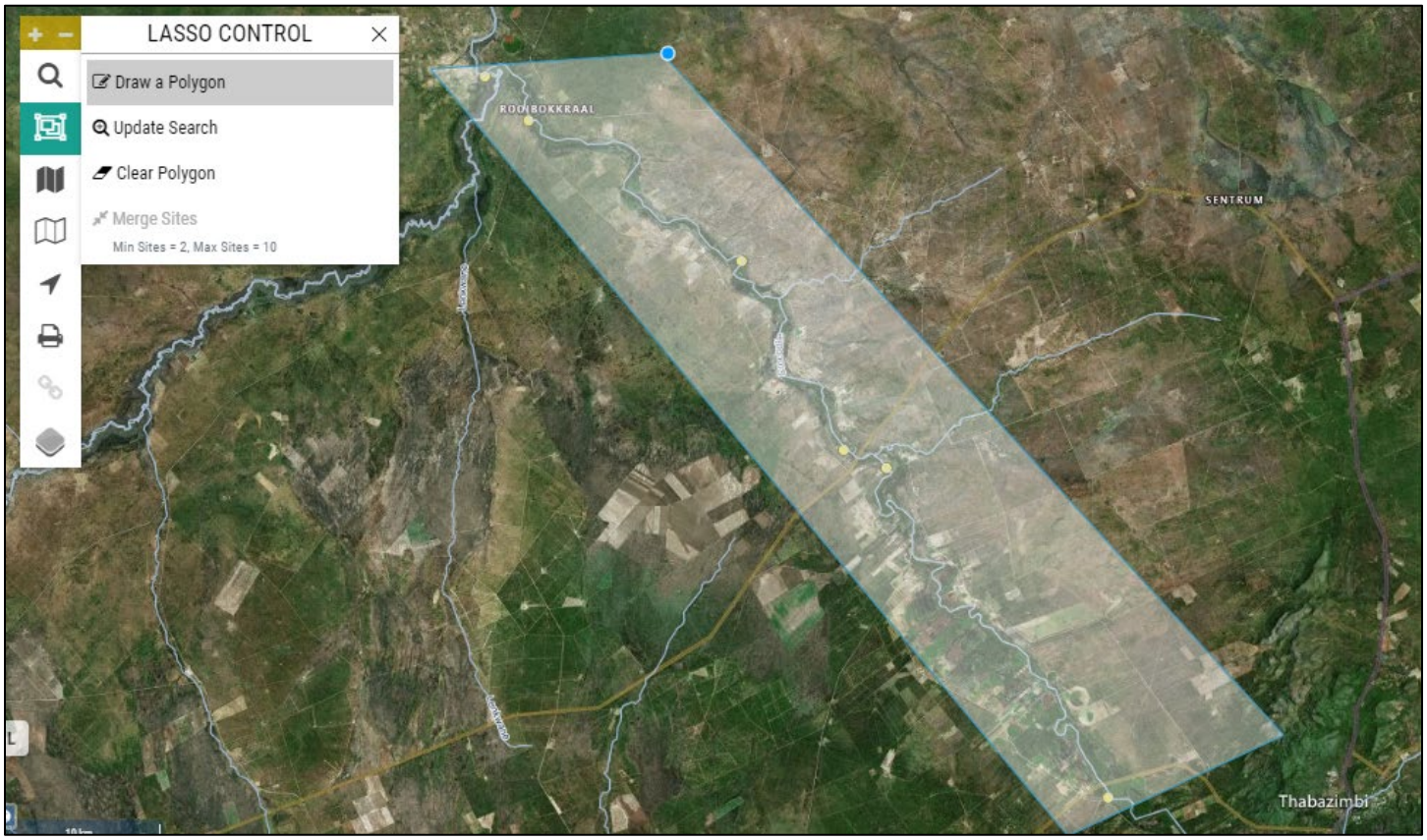
Filtering sites to show only those in SA Ecoregion = Western Folded Mountains.



Highlighting drawers where a filter condition is active.

6.2 Map based filtering

Sites may also be selected by using Lasso Control. This feature allows the user to draw a polygon around specific sites to include in dashboards. By clicking “Update search” the user will see the search results for all the sites in the polygon. Note that to close your lasso selection you must click on the starting point again. The “Merge sites” feature allows the administrator to merge the data from the sites in the polygon into one site. The clear Polygon, resets to zero.



Drawing a polygon to select and group sites.

7 Mapping

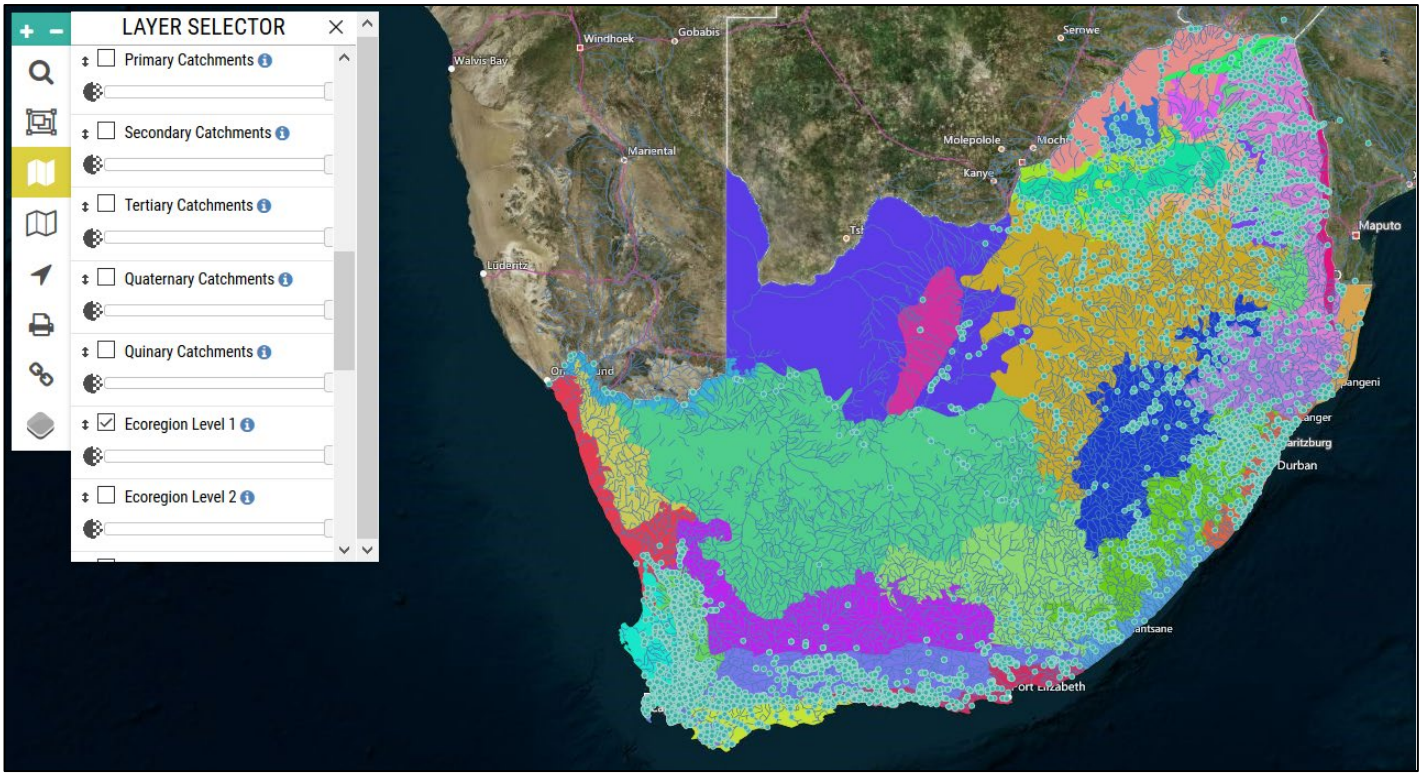
7.1 Spatial Layers

Spatial layers, which may be turned on and off in the FBIS map, function as background layers upon which biodiversity data are displayed. Often spatial layers are used for generating geocontext data. Geocontext data are contextual data for any geographical point, sourced from relevant spatial layers and aggregated as properties of a site. Spatial layers served in FBIS are based on stakeholder discussions and user requirement assessments. Layers are used both as contextual underlays (e.g. “show catchment boundaries in the background of the map”) on the interactive web map and as the basis for filtering biodiversity data (see section 6.1, e.g. “show me all sites in catchment G2”). The current list of spatial layers lodged in FBIS is enumerated below.

- Sites
- Rivers
- Dams
- Geomorphological Zones
- Freshwater Ecoregions of the World
- Water Management Areas
- Sub Water Management Areas
- River Management Units (currently only Western Cape)
- Catchments (Primary, Secondary, Tertiary, Quaternary, Quinary)
- SA Ecoregions (Ecoregion Level 1, Ecoregion Level 2)
- Fish sanctuaries
- National Critical Biodiversity Areas
- Protected areas
- National Freshwater Ecosystem Priority Areas
- National Ecological Support Areas
- Strategic Water Source Areas
- Land Use Classes
- Hydrological Regions
- Hydrological Region Flow Type
- Thermal Framework

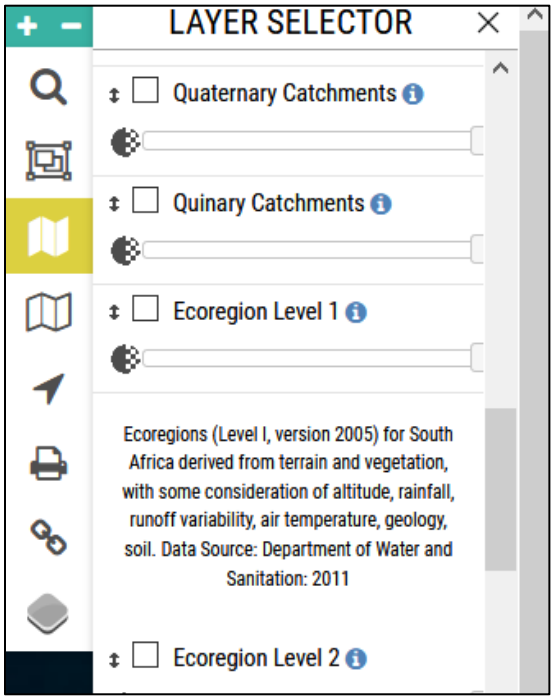
Each layer may be turned on by checking the relevant box, and the transparency of each layer may be increased or decreased using the slider (Figure 8).

The order of layers in the side panel can also be adjusted by dragging layers up and down with the mouse. Layers at the top of the layer list will be shown in the foreground.



Selection of spatial layers for displaying biodiversity data.

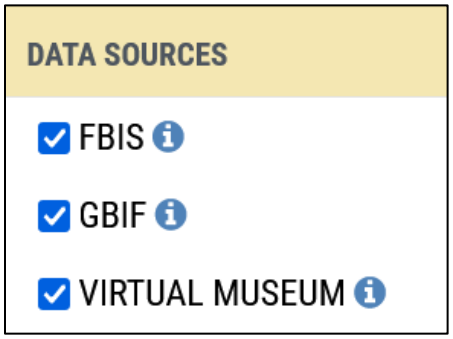
To view the metadata for each layer, click on the blue source 'i' button.



Map layer metadata display in FBIS Version 3.

8 Biodiversity Data

In FBIS we have provision for freshwater fish, invertebrate, algal, adult odonate, anuran and wetland plant data, as well as SASS (invertebrate) data. Biodiversity data served include data collated for FBIS, data harvested from GBIF and data harvested from the Virtual Museum.



8.1 Taxonomy

A Master List of Species or Taxa has been created for each biodiversity module. In each case, best available information has been used, and consultation with relevant experts undertaken where possible. It is envisaged that these lists will be updated as new data are included and new species described.

8.2 FBIS Fish data

FRC has collated and cleaned fish data (23,243 records from scientific papers, reports, theses, and other unpublished datasets) for South Africa, which are now being served by the FBIS. An additional 22,312 records are harvested from GBIF. These data are primarily from the South African Institute for Aquatic Biodiversity. The fish data include formally described native and non-native species that occur in South Africa. Primary and secondary freshwater species, as well as diadromous species, are included, but marine species are excluded.

8.3 FBIS Invertebrate data

Legacy data from the Biobase (Dallas et al. 1999) for South Africa and collated and cleaned invertebrate data from scientific papers, reports, theses, and other unpublished datasets, are now being served by the FBIS. 255,326 records of invertebrates (including SASS data, see section 8.4) are thus served in FBIS. An additional 78,758 records are harvested from GBIF.

8.4 SASS (invertebrate) Data

Approximately 10,000 records of SASS data from the legacy Rivers Database (River Health Programme, 2007) were imported into FBIS. Data from 12,961 SASS assessments are currently served on FBIS.

Note: SASS data imported from the Rivers database have not yet been thoroughly corrected or validated. Errors in the original Rivers Database will systematically be checked in FBIS V3. Please advise us of any errors that you note during your exploration (fbis@frcsa.org.za).

8.5 FBIS Algal data

Collated and cleaned algal data (approximately 6,152 records from scientific papers, reports, theses, and other unpublished datasets) for South Africa, are now being served by the FBIS. An additional 6,260 records are harvested from GBIF.

8.6 Odonate adult data

Odonate adult data currently served on FBIS is sourced from the Virtual Museum (99,302records).

8.7 Anuran data

Anuran data currently served on FBIS is sourced from collated and cleaned data (5 records from Unpublished data), from GBIF (28,252 records) and from the Virtual Museum (8873 records).

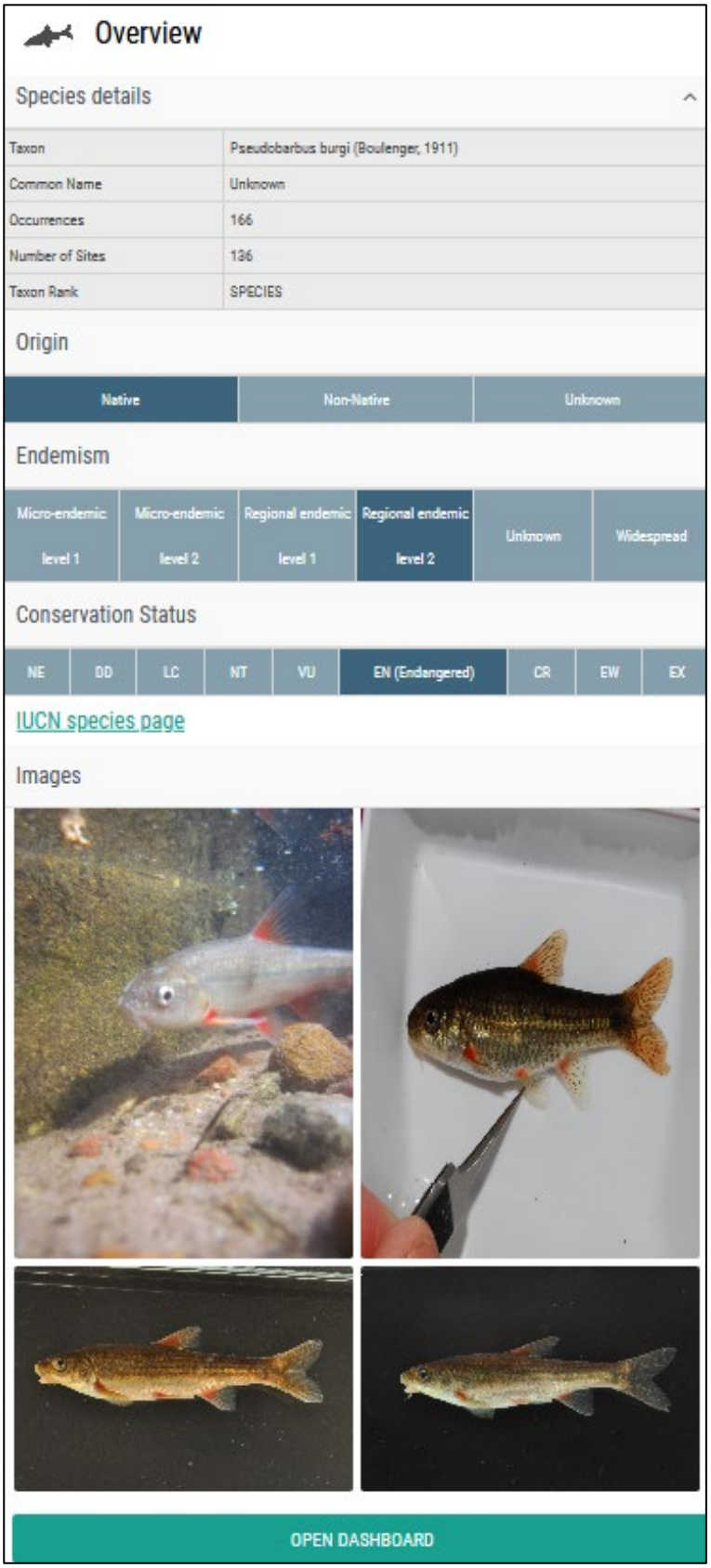
9 Overview panels

The overview panels - visible on the side of the map - are used for quick visualisation / summaries of single taxon, single-site and multi-site search results.

9.1 Single taxon overview panel

The single taxon overview panel provides an at-a-glance overview of records for the taxon, and the taxon's origin, endemism and conservation status. It also includes an outbound link to the IUCN status page for that taxon, and fetches specimen images from GBIF if available.

By clicking **Open Dashboard,** the user can then open the Dashboard to see further information on the taxon.

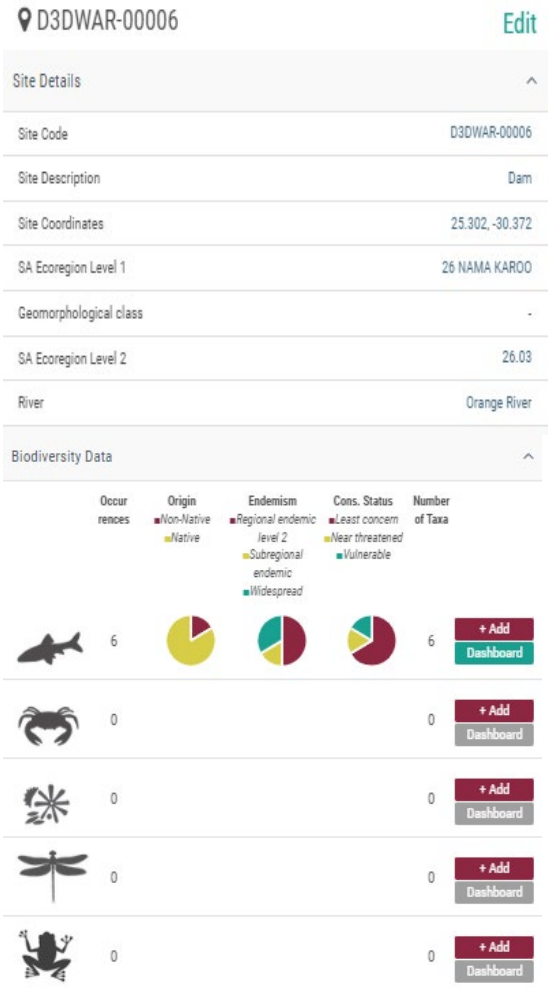


Single taxon overview panel

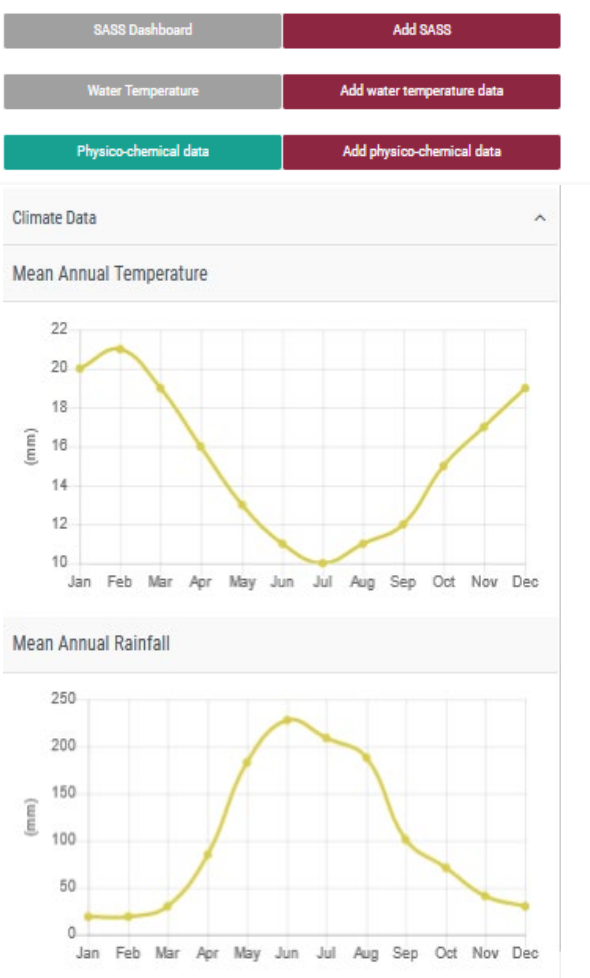
9.2 Single-site overview panel

For single-sites, we display summary data, including useful context information (GeoContext-derived data) such as the Geomorphological Zone and Ecoregions (Figure 13). The number of occurrences for each module (fish, invertebrates, algae, odonate adults and anura), pie charts showing the proportion of taxa in each Origin (see section 10.1.8), Endemism (see section 10.1.9) and Conservation Status (see section 10.1.10) category, as well as number of taxa is shown for each group.

The "dashboards and forms" on the overview panel provides onward links to available fish, invertebrate, algal and SASS dashboards (see Section 10) and forms for uploading data (see Section 11). Temperature and rainfall charts (data for which is also harvested from GeoContext) can be found at the bottom of the panel. See below which illustrates the bottom section of the overview panel.



Single-site overview panel - top.

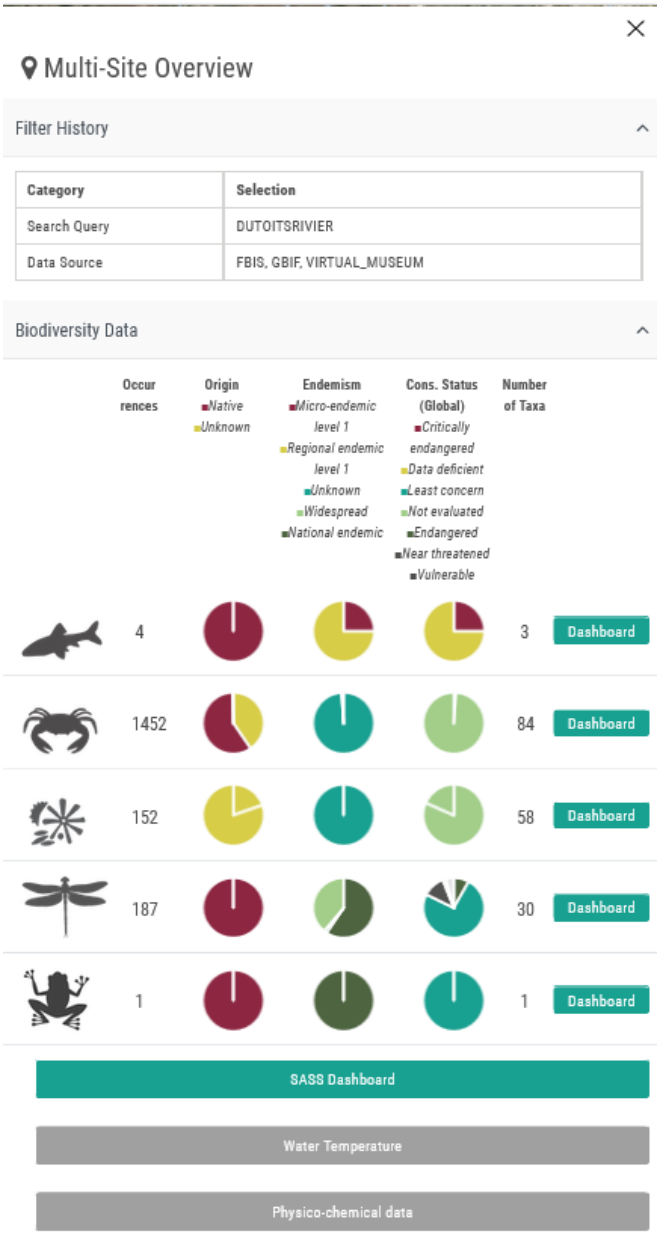


Single-site overview panel - bottom

9.3 Multi-site overview panel

For multiple sites, 'multi-sites', we display the filter history for selecting records, but not the detailed contextual site information found in the single-site overview panel because these data will not be the same across all the sites in a multi-site. The number of occurrences and number of sites for each module (fish, invertebrates and algae), pie charts showing the proportion of taxa in each Origin (see section 10.1.8), Endemism (see section 10.1.9) and Conservation Status (see section 10.1.10) category, as well as number of taxa is shown for each group.

The "dashboards" on the overview panel provide onward links to available biodiversity and abiotic (see Section 10), where you are able to also drill down to the detailed multi-site dashboards for each module.



Multi-site overview panel.

10 Dashboards

Dashboards are a key component of FBIS - they provide tabular and graphical (via charts and maps) breakdowns and visualisations of taxa encountered at sites. Beyond simply enumerating taxa, the dashboards also show aggregate information such as trends over time, conservation status, site sensitivity etc.

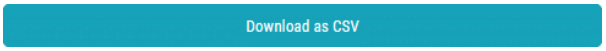
FBIS has seven dashboard visualisations:

1. Taxon dashboard
2. Single-site biodiversity dashboards
3. Multi-site biodiversity dashboards
4. Single-site SASS dashboard
5. Multi-site SASS dashboard
6. Water temperature dashboard
7. Physico-chemical dashboard

In the following sections we provide a brief overview of the key dashboard components and then of the different dashboards.

10.1 Key dashboard components

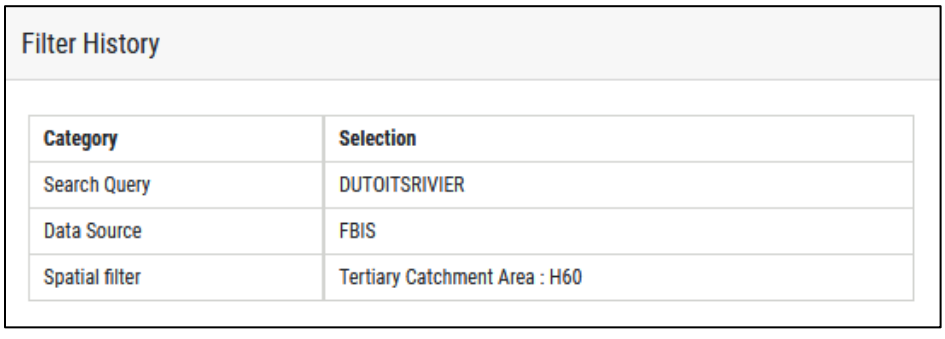
Below we provide a brief description of the different dashboard components. **Note** that whenever a component includes a  symbol in the component header, clicking that icon will download a graphic file 'snapshot' of that component. This approach allows you to quickly grab any elements you need from the dashboard and include them in your reports. We took this approach over producing a full PDF report so that you have the flexibility of choosing which specific elements of the dashboard to use in your papers and reports.

More detailed data downloads are available via the 

button.

10.1.1 Filter history

The filter history component is intended to make it clear how the data displayed in the dashboard have been filtered and what specific search criteria have been applied.



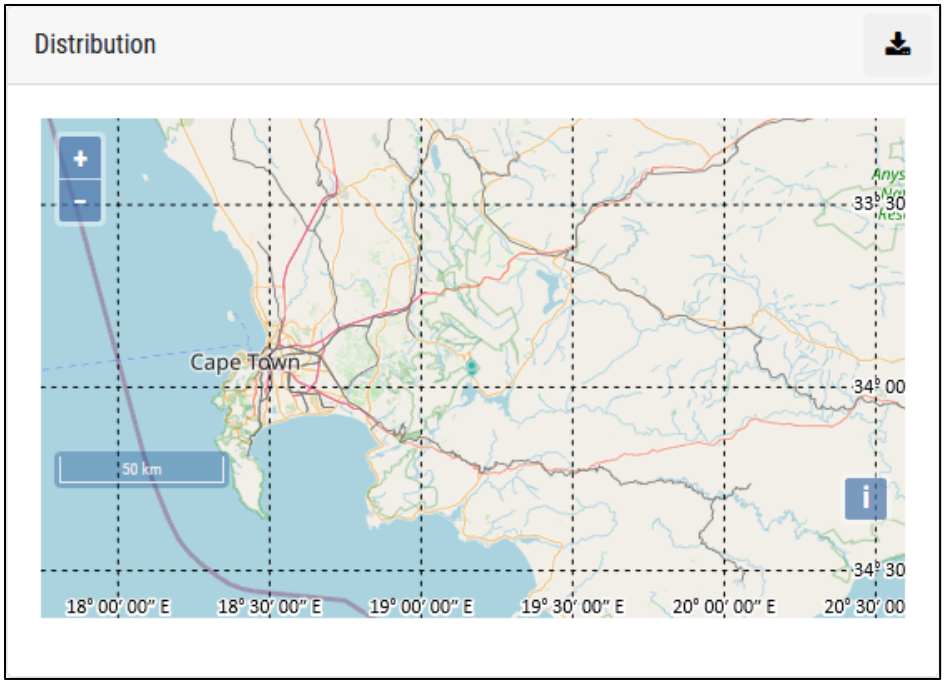
The filter history component details what search and filter query were active when generating the current dashboard report.

This component is present in these dashboards:

- Taxon dashboard
- Single-site biodiversity dashboards
- Multi-site biodiversity dashboards
- Multi-site SASS dashboard

10.1.2 Map

The map provides a cartographic representation of the selected site or sites used when generating the dashboard report. The map includes a scale bar and a graticule with graticule labels so that the viewer may orientate themselves as to the location of the data depicted on the map. Note that the background map is © OpenStreetMap and contributors and is used with permission. This attribution (© OpenStreetMap and contributors) should be included anywhere the downloaded map image is published.



The distribution component of the dashboards shows selected sites on a map.

This component is present in these dashboards:

- Taxon dashboard
- Single-site biodiversity dashboards
- Multi-site biodiversity dashboards
- Single-site SASS dashboard

- Multi-site SASS dashboard
- Water temperature dashboard
- Physico-chemical dashboard

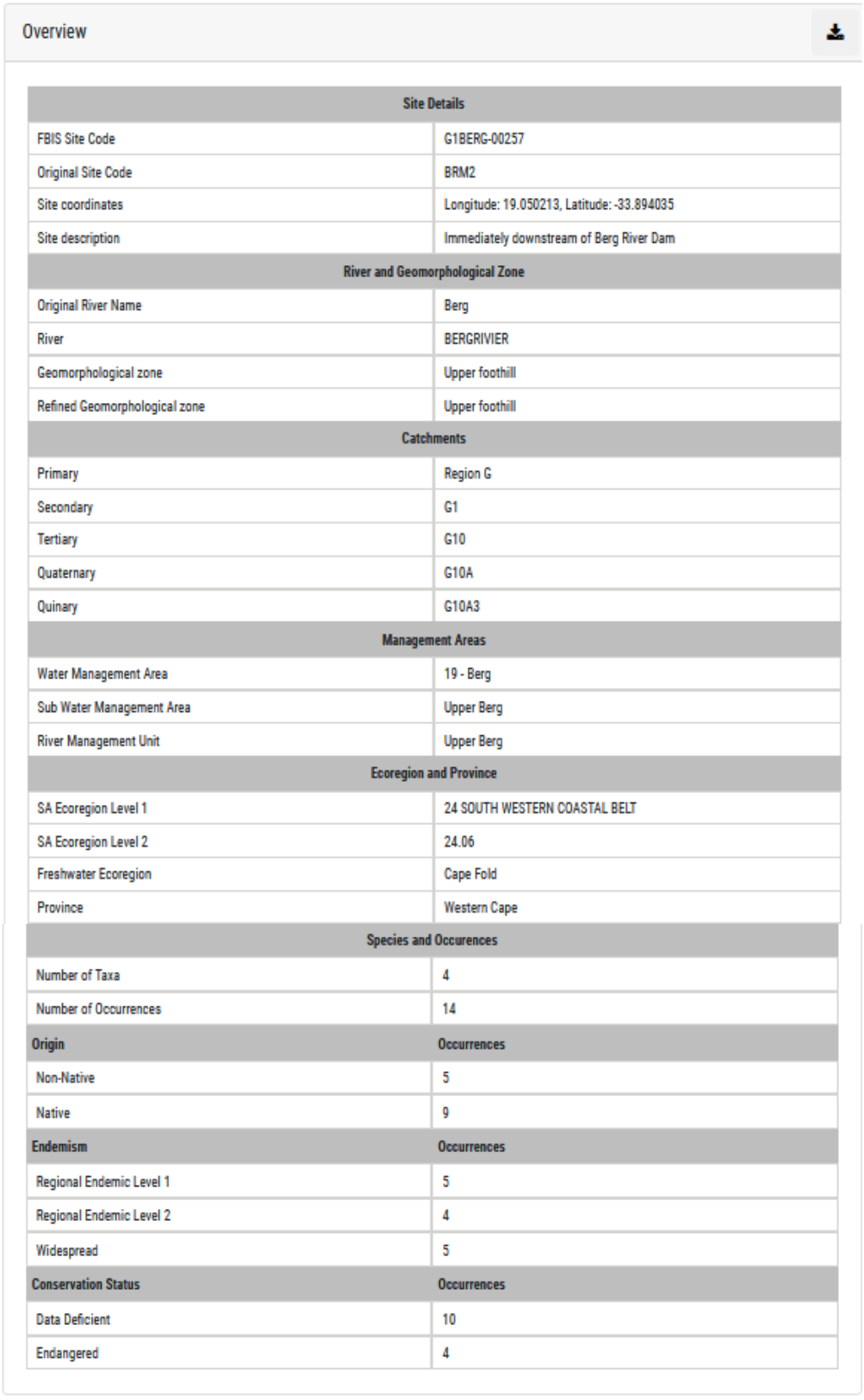
10.1.3 Site photograph(s)

Photographs of the site are provided when available. These can be scrolled through if more than one is available. Future versions of FBIS will include a date stamp.

This component is present in these dashboards:

- Taxon dashboard
- Single-site biodiversity dashboards
- Single-site SASS dashboard
- Water temperature dashboard
- Physico-chemical dashboard

10.1.4 Overview



Overview

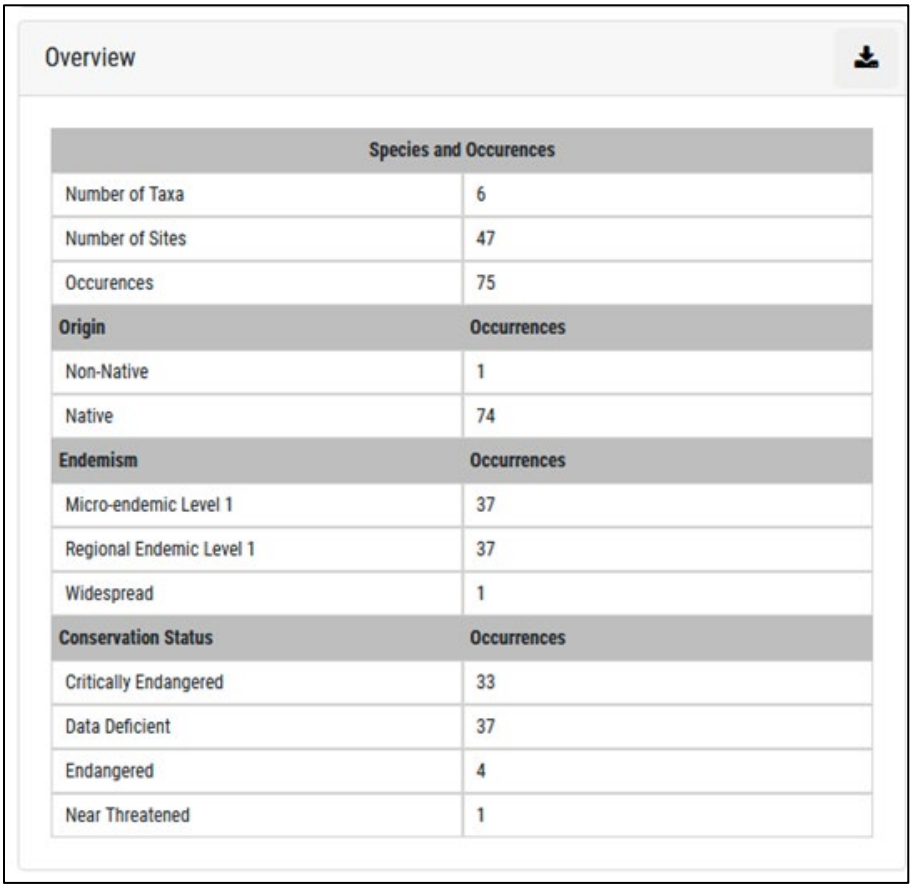
Site Details	
FBIS Site Code	G1BERG-00257
Original Site Code	BRM2
Site coordinates	Longitude: 19.050213, Latitude: -33.894035
Site description	Immediately downstream of Berg River Dam
River and Geomorphological Zone	
Original River Name	Berg
River	BERGRIVIER
Geomorphological zone	Upper foothill
Refined Geomorphological zone	Upper foothill
Catchments	
Primary	Region G
Secondary	G1
Tertiary	G10
Quaternary	G10A
Quinary	G10A3
Management Areas	
Water Management Area	19 - Berg
Sub Water Management Area	Upper Berg
River Management Unit	Upper Berg
Ecoregion and Province	
SA Ecoregion Level 1	24 SOUTH WESTERN COASTAL BELT
SA Ecoregion Level 2	24.06
Freshwater Ecoregion	Cape Fold
Province	Western Cape
Species and Occurences	
Number of Taxa	4
Number of Occurrences	14
Origin	**Occurrences**
Non-Native	5
Native	9
Endemism	**Occurrences**
Regional Endemic Level 1	5
Regional Endemic Level 2	4
Widespread	5
Conservation Status	**Occurrences**
Data Deficient	10
Endangered	4

The overview component of the dashboard provides a detailed situational analysis for a site.

The overview component provides context information (from GeoContext) and biodiversity status tabular breakdown of the site (or sites) being reported on (based on the currently applied filters and search query). The overview is broken down into different sections:

- Site details
- River and geomorphological zone
- Catchments
- Water Management Areas
- Ecoregion and province
- Species and occurrences. For single-site dashboards, the site count is not shown.
- Origin (number of native versus non-native species)
- Endemism
- Conservation status

For multi-site dashboards, a reduced version of the overview panel is shown. This is because many of the items listed above are not relevant in the context of a multi-site dashboard.



Species and Occurences	
Number of Taxa	6
Number of Sites	47
Occurences	75
Origin	**Occurrences**
Non-Native	1
Native	74
Endemism	**Occurrences**
Micro-endemic Level 1	37
Regional Endemic Level 1	37
Widespread	1
Conservation Status	**Occurrences**
Critically Endangered	33
Data Deficient	37
Endangered	4
Near Threatened	1

Simplified version of the overview panel used for multi-site dashboards.

This component is present in these dashboards:

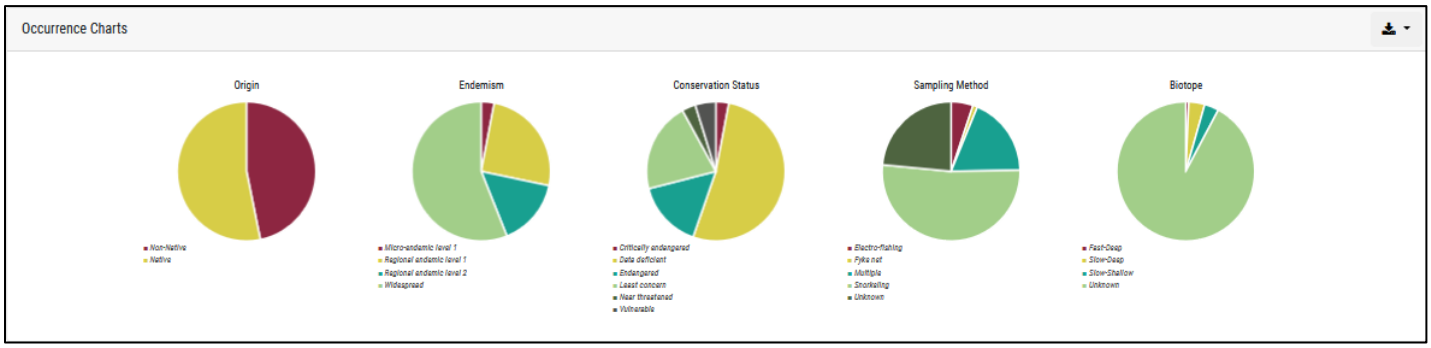
- Taxon dashboard
- Single-site biodiversity dashboards
- Multi-site biodiversity dashboards
- Single-site SASS dashboard
- Water temperature dashboard (excluding biodiversity aspects)
- Physico-chemical dashboard (excluding biodiversity aspects)

10.1.5 Occurrence charts

The occurrence pie charts summarise the following details for the taxa recorded at the site or sites (Figure 19):

- Origin
- Endemism
- Conservation status
- Sampling method
- Biotope

Note there is a paucity of sampling method data lodged in the database. The FBIS encourages users to capture sampling method (and effort) so we have included it as a data capture and reporting element, even though the sampling method will often be unpopulated.



Occurrence chart dashboard component.

All of the pie charts have tool tips enabled - hovering the mouse over a particular pie segment will show the details for that segment.

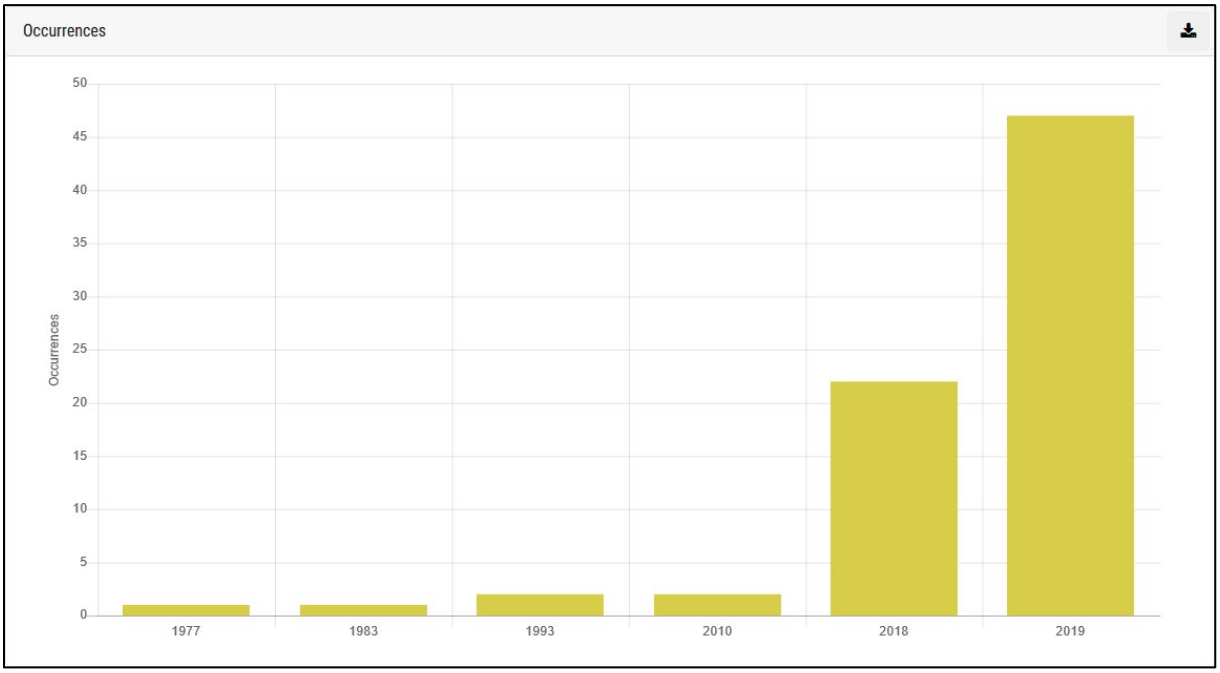
This component is present in these dashboards:

- Taxon dashboard
- Single-site biodiversity dashboards

- Multi-site biodiversity dashboards

10.1.6 Occurrences

The occurrences chart provides a breakdown of the number of observation records (across all taxa) recorded over time (aggregated by year).



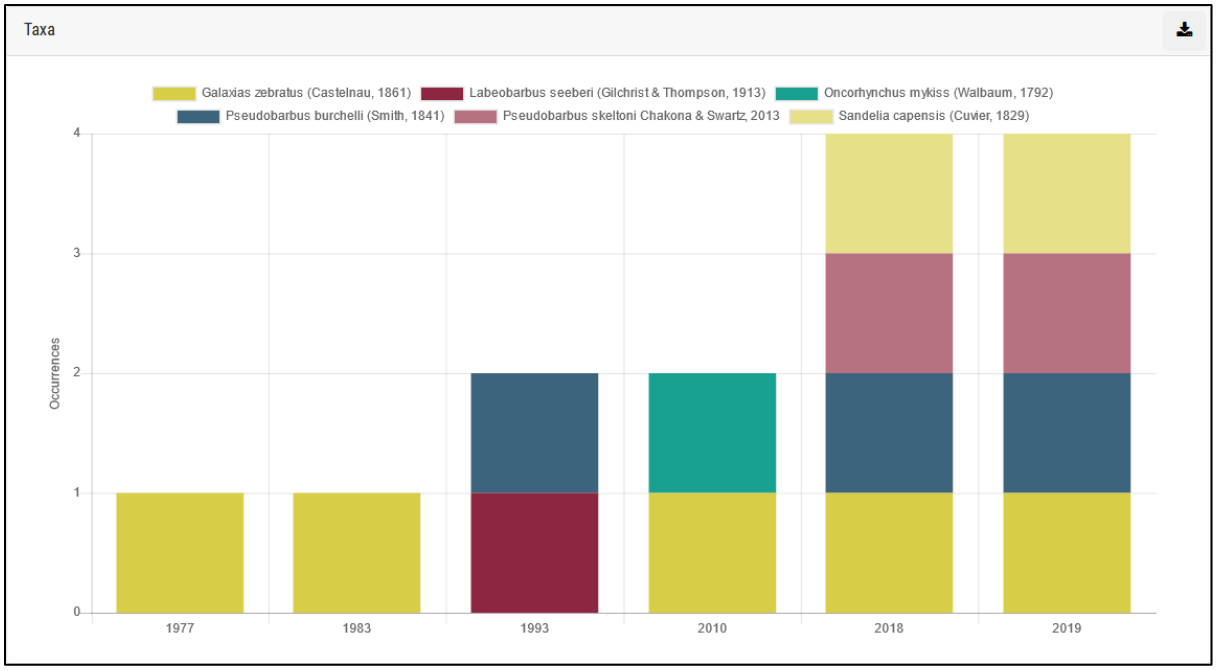
Occurrences chart showing recorded observations over time.

This component is present in these dashboards:

- Taxon dashboard
- Single-site biodiversity dashboards
- Multi-site biodiversity dashboards

10.1.7 Taxa

The taxa chart breaks down the occurrences per year by taxa as a stacked bar chart. The chart is interactive: clicking on a legend item will remove that taxon from the chart.



Occurrences chart showing recorded taxa over time.

This component is present in these dashboards:

- Single-site biodiversity dashboards
- Multi-site biodiversity dashboards

10.1.8 Origin

The origin chart breaks down the occurrence data by origin (native vs. non-native vs. translocated status) per year. The chart is interactive: clicking on a legend item will remove that origin status from the chart.

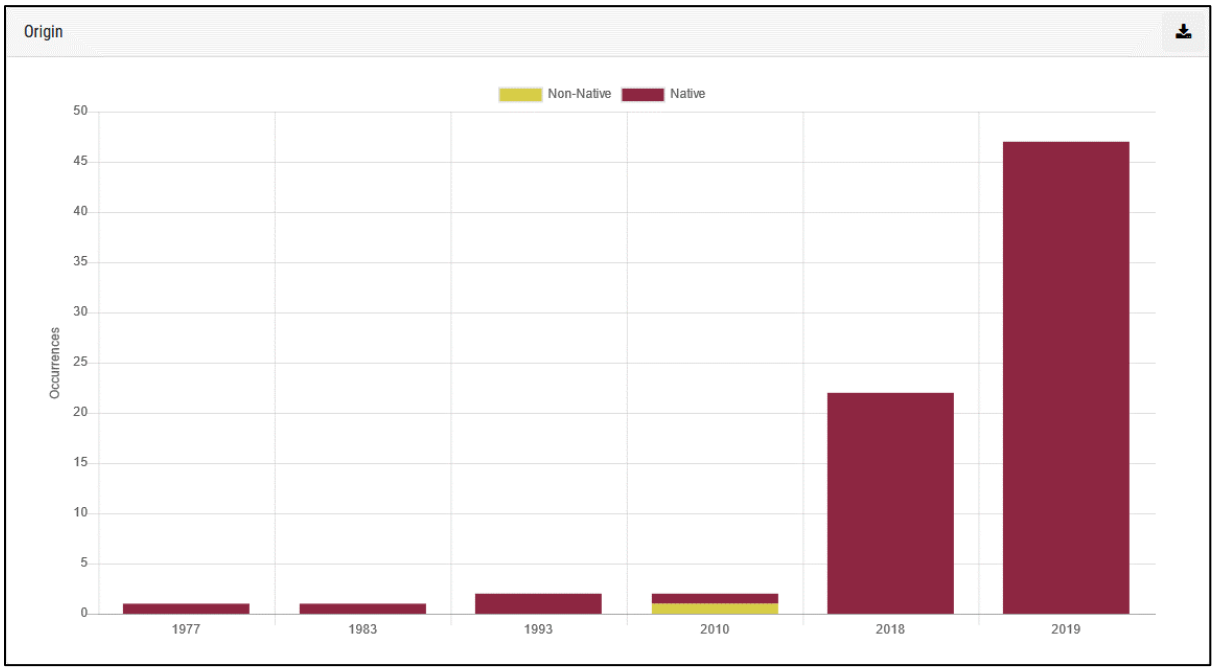
This component is present in these dashboards:

- Single-site biodiversity dashboards
- Multi-site biodiversity dashboards

Origin has only been captured for fish and for some invertebrates, and will be updated as information becomes available.

Origin categories:

- Native: (or indigenous) means a taxon occurring within its natural range (past or present) and dispersal potential (i.e. within the range it occupies naturally or could occupy without direct or indirect introduction or care by humans).
- Non-Native: a category that includes both alien and extralimital taxa.



Origin chart.

10.1.9 Endemism

This component provides a breakdown of the occurrence data based on the endemism status of the taxa recorded.

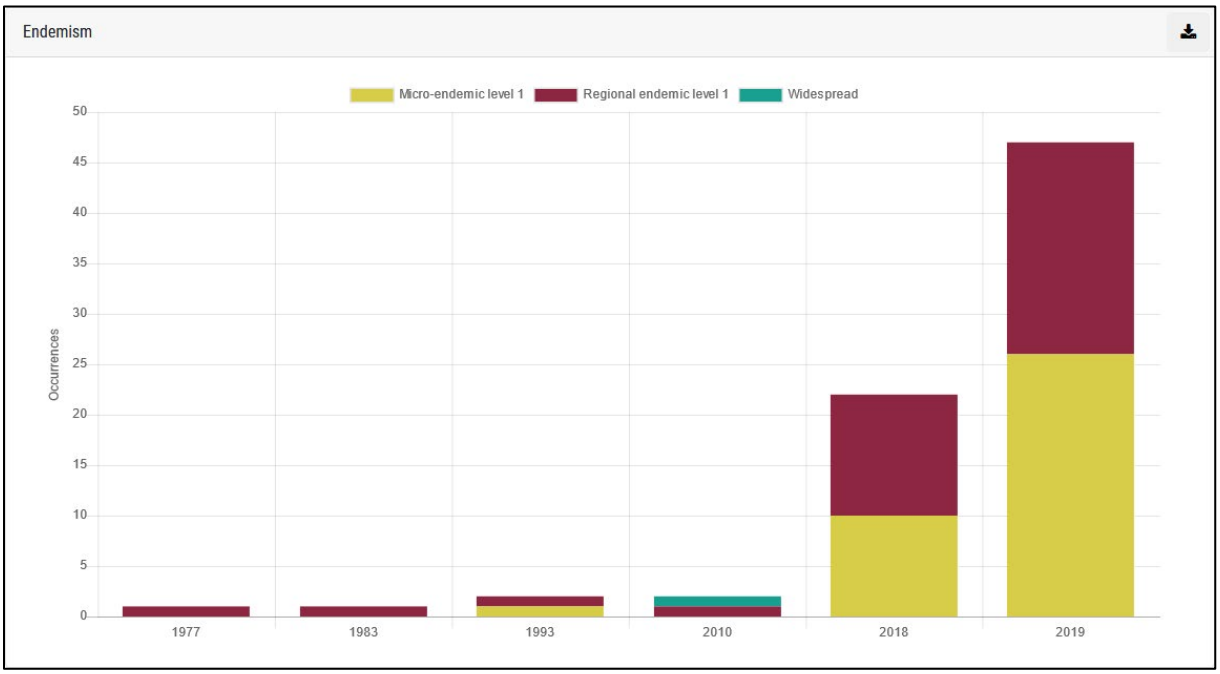


Figure 23: Endemism chart.

Endemism categories:

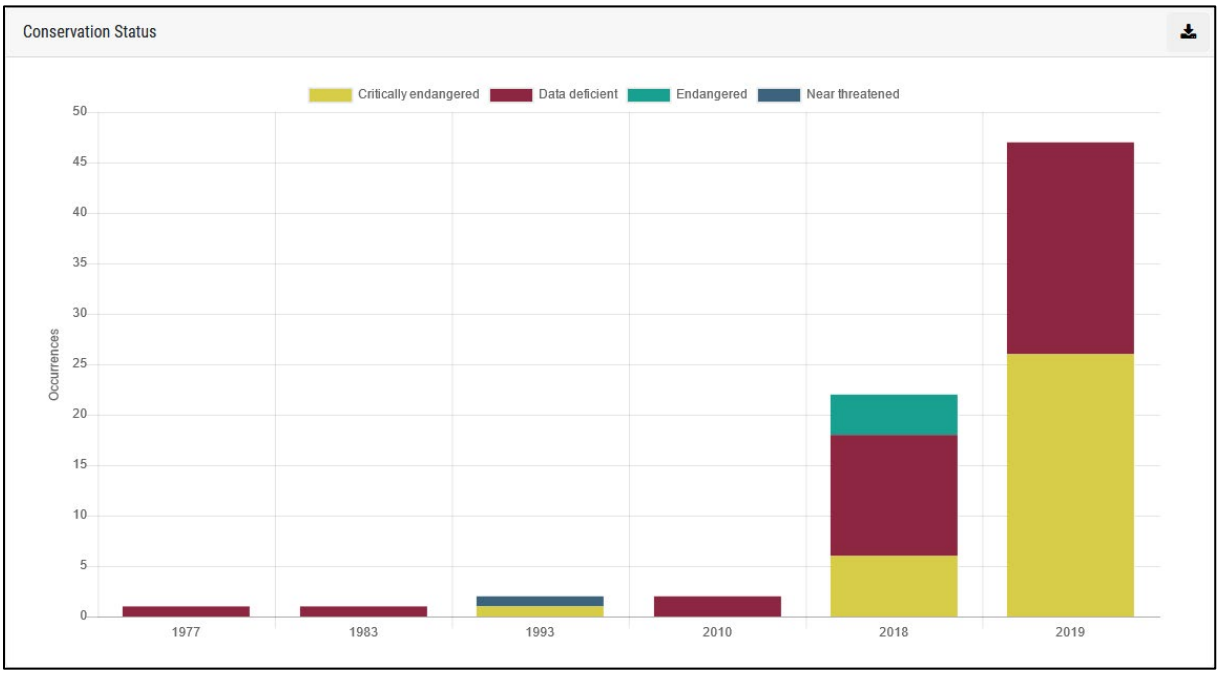
- Micro-endemic level 2 (Endemic to a single river or wetland)
- Micro-endemic level 1 (Endemic to less than 5 rivers or wetlands)
- Regional endemic level 2 (Endemic to a single primary catchment)
- Regional endemic level 1 (Endemic to a single Freshwater Ecoregion (e.g. CFE), more than one primary catchment)
- National endemic (Endemic to South Africa, occurs in more than one Freshwater Ecoregion within SA)
- Subregional endemic (Endemic to southern Africa)
- Widespread (Occurs beyond southern Africa)
- Unknow (Endemism is unknown)

Endemism has only been captured for fish and some invertebrates, and will be updated as information becomes available.

This component is present in these dashboards:

- Single-site biodiversity dashboards
- Multi-site biodiversity dashboards

10.1.10 Conservation status



Conservation status chart.

This component provides a breakdown of occurrences, aggregated by year, according to the conservation status (based on IUCN categories) of the taxa recorded. The IUCN Red List of Threatened Species website (IUCN Red List, 2020) classifies species into six main categories based on their extinction risk. Clicking on the legend entry will hide or show that category from the chart.

Conservation status has only been captured for fish as conservation status has not yet been evaluated for invertebrates or algae. It will be updated as information becomes available.

Conservation status categories:

- Not evaluated
- Data deficient
- Least concern
- Near threatened
- Vulnerable
- Endangered
- Critically endangered

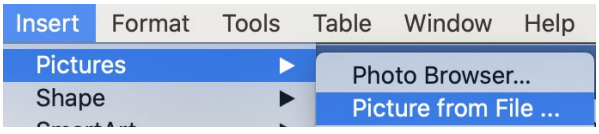
This component is present in these dashboards:

- Single-site biodiversity dashboards
- Multi-site biodiversity dashboards

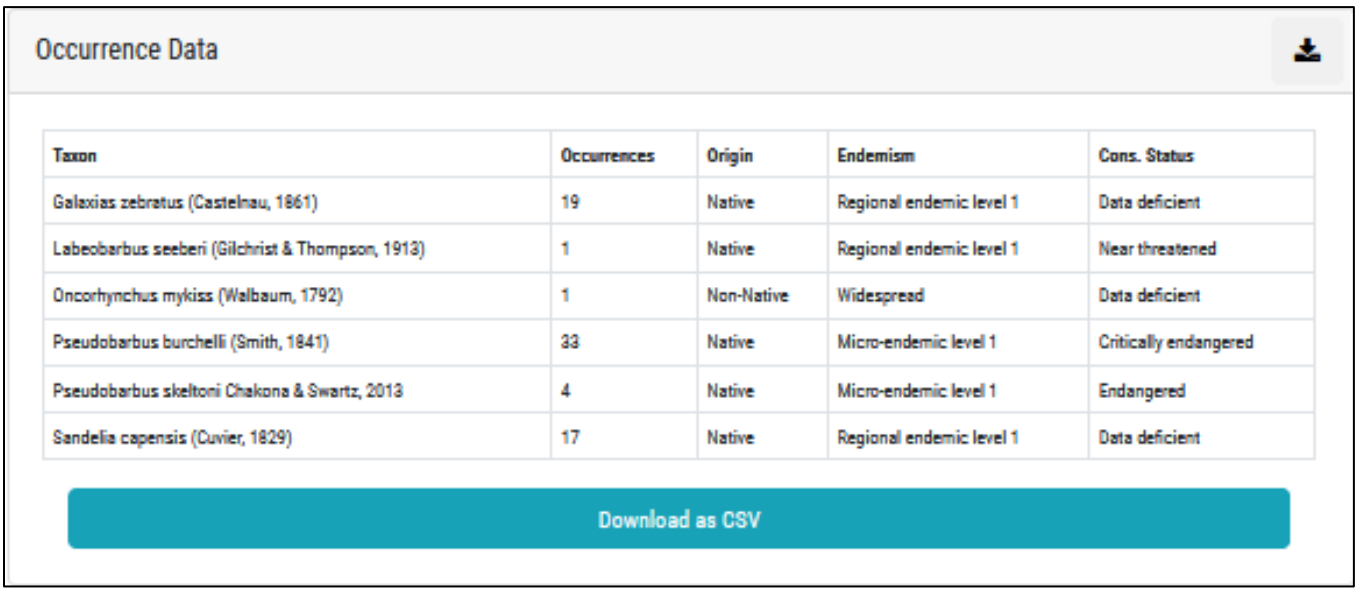
A general note for all charts

When downloading a chart using the icon, the resulting downloaded file will be saved to your device as an 'SVG' (Scalable Vector Graphic) file or in some cases a .png file. This file can be arbitrarily resized and maintain its quality, allowing it to be used in print publications or large format printing projects.

To use the SVG, use the **Insert -> Pictures -> From File** option in Word or Excel. Once added it to your document, you can resize the frame and the quality will be preserved.



10.1.11 Occurrence data



Occurrence Data

Taxon	Occurrences	Origin	Endemism	Cons. Status
Galaxias zebratus (Castelnau, 1861)	19	Native	Regional endemic level 1	Data deficient
Labeobarbus seeberi (Gilchrist & Thompson, 1913)	1	Native	Regional endemic level 1	Near threatened
Oncorhynchus mykiss (Walbaum, 1792)	1	Non-Native	Widespread	Data deficient
Pseudobarbus burchelli (Smith, 1841)	33	Native	Micro-endemic level 1	Critically endangered
Pseudobarbus skeltoni Chakona & Swartz, 2013	4	Native	Micro-endemic level 1	Endangered
Sandelia capensis (Cuvier, 1829)	17	Native	Regional endemic level 1	Data deficient

Download as CSV

Tabular summary of occurrence data.

This module provides a tabular summary of occurrence data. The data are aggregated per taxon (giving a total count of recorded occurrences for that taxon). Additional columns indicate the origin, endemism and conservation status for each taxon.

The download link will provide a Comma Separated Values (CSV) file which can easily be opened in a spreadsheet application like Microsoft Excel, or a GIS application like QGIS. The CSV document also includes the individual records (not aggregated as in the summary table) with all associated spatial and abiotic data for each occurrence record.

UUID	Original river name	River name	Original site code	Fbis site code	Site description	Latitude	Longitude	Sampling date	Kingdom	Phylum	Class	Order	Family	Genus	Species	Taxon	Taxon rank	Sampling method
d1266152-c8ec-4369-b71b-243a33e80c35	Du Toits	DUTOITSRIVIER	Du Toits	G1DUTO-00002	Du Toits	-33.9475	19.16944	1/1/1983	Animalia	Chordata	Actinopterygii	Osmeriformes	Galaxiidae	Galaxias	zebratus	Galaxias zebratus	Species	
e6749b46-51b4-4c09-8233-06d569401d00	Du Toits	DUTOITSRIVIER	Du Toits	G1DUTO-00003	Du Toits	-33.95278	19.17472	1/1/1977	Animalia	Chordata	Actinopterygii	Osmeriformes	Galaxiidae	Galaxias	zebratus	Galaxias zebratus	Species	
39b596b5-ef81-4a80-885f-c6057b36adf4	Du Toits	DUTOITSRIVIER	Du Toits	H6DUTO-00009	Du Toits	-33.95	19.16833	1/1/1993	Animalia	Chordata	Actinopterygii	Cypriniformes	Cyprinidae	Cheilobarbus	capensis	Cheilobarbus capensis	Species	
4dcdcd09-d95f-4e09-9d4b-e3ab12c45295	Du Toits	DUTOITSRIVIER	Du Toits	H6DUTO-00009	Du Toits	-33.95	19.16833	1/1/1993	Animalia	Chordata	Actinopterygii	Cypriniformes	Cyprinidae	Pseudobarbus	burchelli	Pseudobarbus burchelli	Species	
72915589-5c82-4698-9077-88b173d7669d	Du Toits	DUTOITSRIVIER	Du Toits	H6DUTO-00065	Du Toits	-33.938857	19.168158	11/1/2018	Animalia	Chordata	Actinopterygii	Cypriniformes	Cyprinidae	Pseudobarbus	burchelli	Pseudobarbus burchelli	Species	Snorkeling
474e83d9-8c00-43df-b20f-97f6e2cb7a0c	Du Toits	DUTOITSRIVIER	Du Toits	H6DUTO-00066	Du Toits	-33.941871	19.170521	11/1/2018	Animalia	Chordata	Actinopterygii	Perciformes	Anabantidae	Sandelia	capensis	Sandelia capensis	Species	Snorkeling
9724ad4d-087c-4f50-8c30-2c5de05f09ea	Du Toits	DUTOITSRIVIER	Du Toits	H6DUTO-00066	Du Toits	-33.941871	19.170521	11/1/2018	Animalia	Chordata	Actinopterygii	Cypriniformes	Cyprinidae	Pseudobarbus	skeltoni	Pseudobarbus skeltoni	Species	Snorkeling
b0b88f99-9388-4bd3-a91d-5f23c1b1fe2e	Du Toits	DUTOITSRIVIER	Du Toits	H6DUTO-00066	Du Toits	-33.941871	19.170521	11/1/2018	Animalia	Chordata	Actinopterygii	Cypriniformes	Cyprinidae	Pseudobarbus	burchelli	Pseudobarbus burchelli	Species	Snorkeling
f2753487-4cc3-40e2-ae4f-ebf5609f9f58	Du Toits	DUTOITSRIVIER	Du Toits	H6DUTO-00067	Du Toits	-33.936535	19.167595	3/6/2019	Animalia	Chordata	Actinopterygii	Cypriniformes	Cyprinidae	Pseudobarbus	burchelli	Pseudobarbus burchelli	Species	Snorkeling
2792e1a3-9cdb-4436-acb3-d3755f53093d	Du Toits	DUTOITSRIVIER	Du Toits	H6DUTO-00068	Du Toits	-33.936763	19.167911	3/6/2019	Animalia	Chordata	Actinopterygii	Cypriniformes	Cyprinidae	Pseudobarbus	burchelli	Pseudobarbus burchelli	Species	Snorkeling

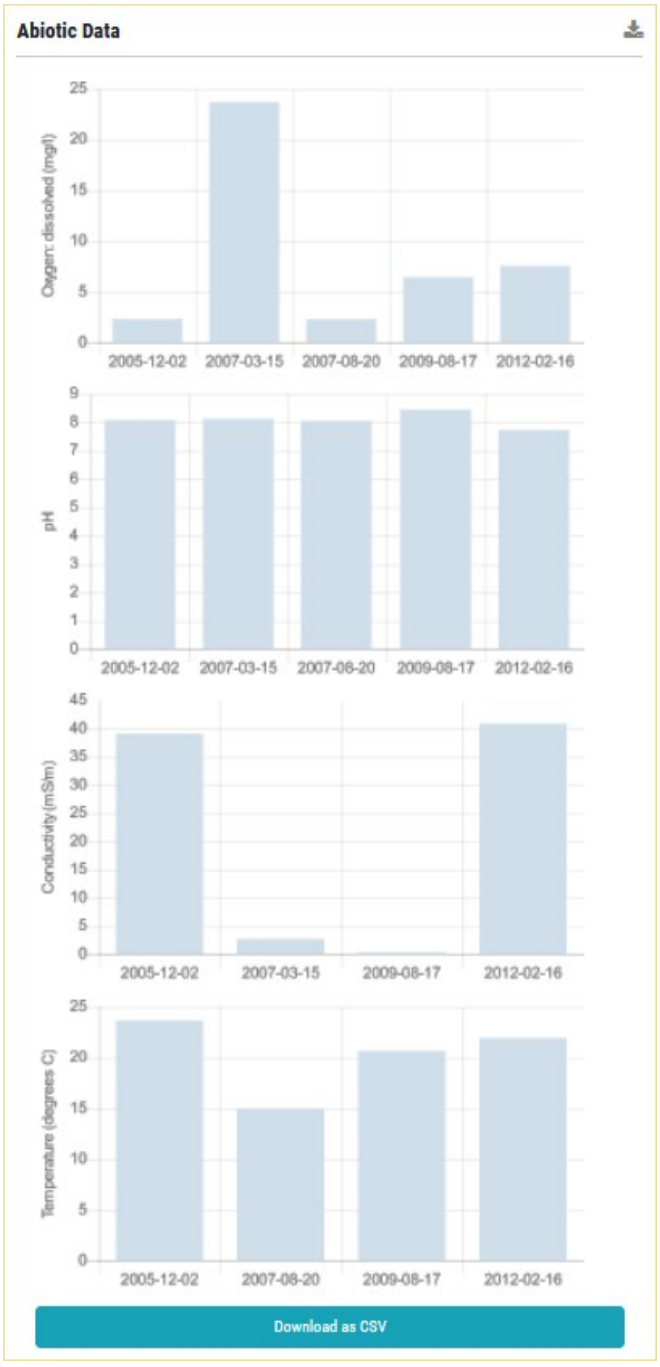
CSV Download example.

This component is present in these dashboards:

- Taxon dashboard
- Single-site biodiversity dashboards
- Multi-site biodiversity dashboards

10.1.12 Abiotic data graphs

Physico-chemical data are provided as graphs for four variables. All other abiotic data collected at the same time as the survey may be downloaded In the CSV document.



Abiotic data charts.

This component is present in these dashboards:

- Single-site biodiversity dashboards
- Single-site SASS dashboard

10.1.13 Metadata Table

All metadata associated with occurrence records are provided in a metadata table. Sources of biodiversity data have been categorised into one of the following five categories: peer-reviewed scientific articles, theses, published reports, databases and unpublished data. Links to the citation are provided via DOI, URL or as a PDF for published reports, if available.

Metadata Table

Reference Category	Author/s	Year	Title	Source	DOI/URL	Notes
Peer-reviewed scientific article	T. D. Harrison	1998	A PRELIMINARY SURVEY OF THE COASTAL RIVER SYSTEMS OF FALSE BAY, SOUTH-WEST COAST OF SOUTH AFRICA, WITH PARTICULAR REFERENCE TO THE FISH FAUNA	Transactions of the Royal Society of South Africa	10.1080/00359199809520371	-
Database	-	-	Cape Nature State of Biodiversity Database, 2015	Cape Nature State of Biodiversity Database, 2015	-	-
Database	-	-	Department of Water and Sanitation Regional Fish Database, 2016	Department of Water and Sanitation Regional Fish Database, 2016	-	-
Published report or thesis	Wishart MJ	2002	A comparative phylogeographic approach toward defining functional units for the conservation of biodiversity in lotic ecosystems.	-	http://hdl.handle.net/10072/366626	-
Published report or thesis	Hayes JB	2002	Assessment of fish as bio-indicators of river health in rivers of the southwestern Cape	-	http://scholar.sun.ac.za/handle/10019.1/52704	-
Peer-reviewed scientific article	Marcus Wishart, Jane Hughes, Barbara Stewart, Dean Impson	2006	Extreme levels of intra-specific divergence among Cape Peninsula populations of the Cape galaxias,Galaxias zebratusCastelnau 1861, reveals a possible species complex	African Journal of Aquatic Science	10.2989/16085910609503876	-
Peer-reviewed scientific article	Dumisani Khosa, Sean M. Marr, Ryan J. Wasserman, Tsungai A. Zengeya, Olaf L. F. Weyl	2019	An evaluation of the current extent and potential spread of Black Bass invasions in South Africa	Biological Invasions	10.1007/s10530-019-01930-0	-
Published report or thesis	Olsen T	2018		-	http://hdl.handle.net/11427/29349	-

Metadata table example.

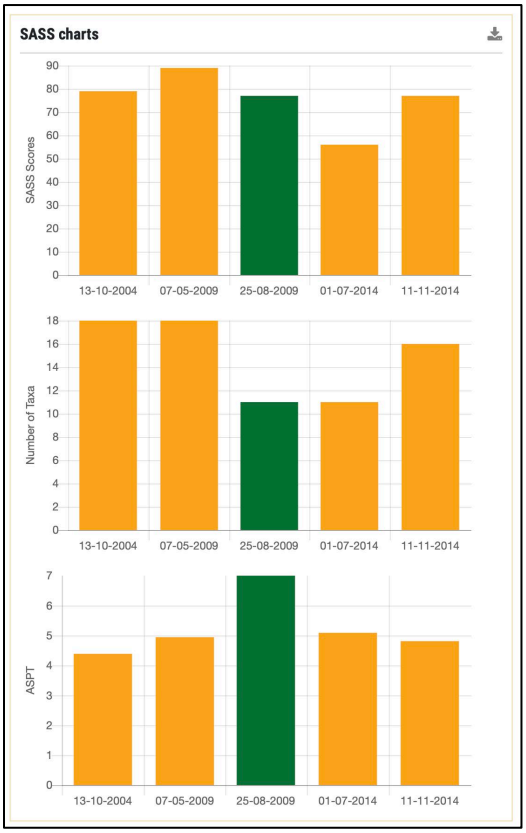
This component is present in these dashboards:

- Single-site biodiversity dashboards
- Multi-site biodiversity dashboards
- Single-site SASS dashboard
- Multi-site SASS dashboard
- Water temperature dashboard

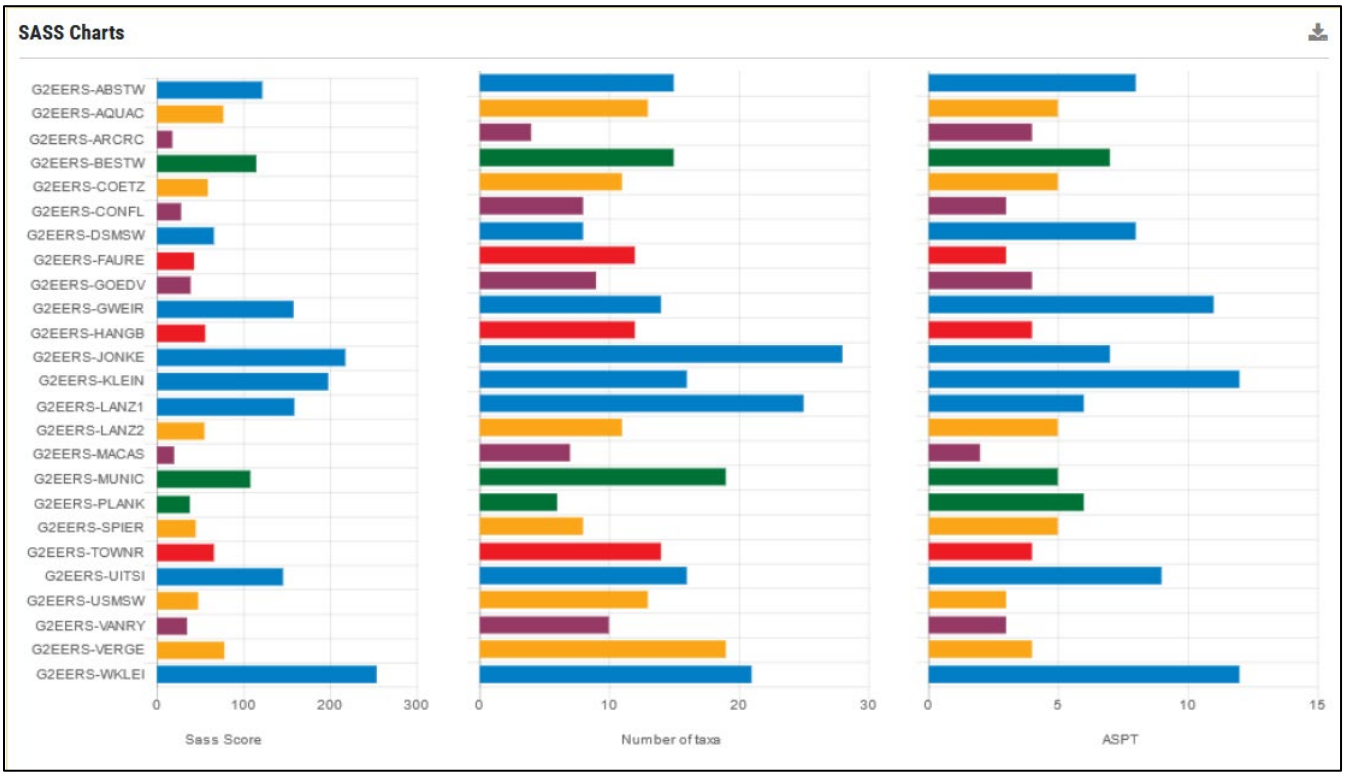
10.2 SASS Dashboard components

10.2.1 SASS Charts

This component shows a collection of SASS Charts indicating the SASS Score, Number of Taxa and ASPT (Average Score Per Taxon) for each site (in the case of the single-site SASS dashboard) or a group of sites (in the case of a multi-site SASS dashboard). The numbers shown are for the most recent survey for each site. In the multi-site version, the display order of sites is currently not significant. The charts are colour-coded according to the ecological category.



SASS Charts for a single-site showing changes in SASS metrics and ecological category over time



Multi-site SASS charts showing the most recent survey in at each site.

This component is present in these dashboards:

- Single-site SASS dashboard
- Multi-site SASS dashboard

10.2.2 SASS Summary

The SASS Summary component is a table that provides a detailed breakdown of the latest SASS surveys for a collection of sites selected by the user. The table provides detailed information about the SASS surveys carried out at each site. The numbers in parentheses show the minimum/maximum value for each site. The whole table can be downloaded as a CSV document to be opened in a spreadsheet application.

SASS Summary Download summary data : Download as CSV

Site Code	Average (min-max) SASS Score	Average (min-max) Number of Taxa	Average (min-max) ASPT	Number of assessments	Latest SASS Score	Latest Number of Taxa	Latest ASPT	Date of latest SASS assessment
G2EERS-JONKE	137(83-223)	16(9-27)	8.49(6.46-10.29)	16	151	16	9	29-07-2014
G2EERS-ABSTW	69(59-85)	16(14-19)	4.26(4.07-4.47)	15	61	15	4	01-04-1995
G2EERS-BESTW	43(30-55)	11(9-14)	3.77(3.33-4.18)	14	55	14	3	01-03-1994
G2EERS-KLEIN	103(103-103)	16(16-16)	6.44(6.44-6.44)	16	103	16	6	01-04-1995
G2EERS-LANZ1	111(65-159)	18(10-25)	6.32(6.11-6.50)	25	159	25	6	01-10-2004
G2EERS-UITSI	73(73-73)	16(16-16)	4.56(4.56-4.56)	16	73	16	4	01-04-1995
G2EERS-LANZ2	58(55-61)	11(10-11)	5.55(5.00-6.10)	11	55	11	5	22-10-2000
G2EERS-GWEIR	81(81-81)	14(14-14)	5.79(5.79-5.79)	14	81	14	5	01-10-1995
G2LANZ-LANZ1	61(61-61)	10(10-10)	6.10(6.10-6.10)	10	61	10	6	01-10-1994
G2LANZ-LANZ2	47(47-47)	9(9-9)	5.22(5.22-5.22)	9	47	9	5	01-10-1994

SASS Summary table.

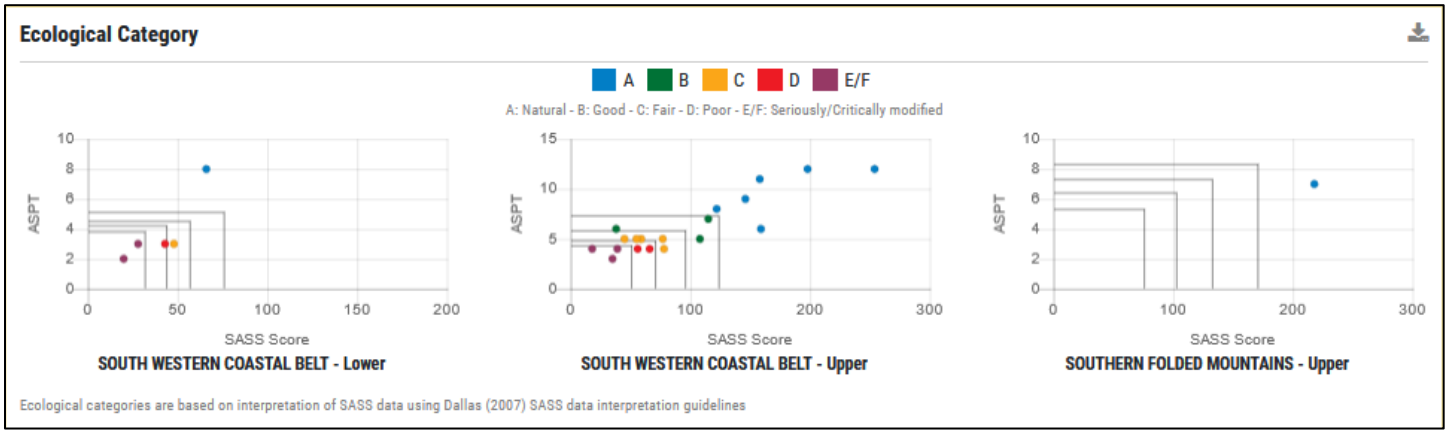
This component is present in this dashboard:

- Multi-site SASS dashboard

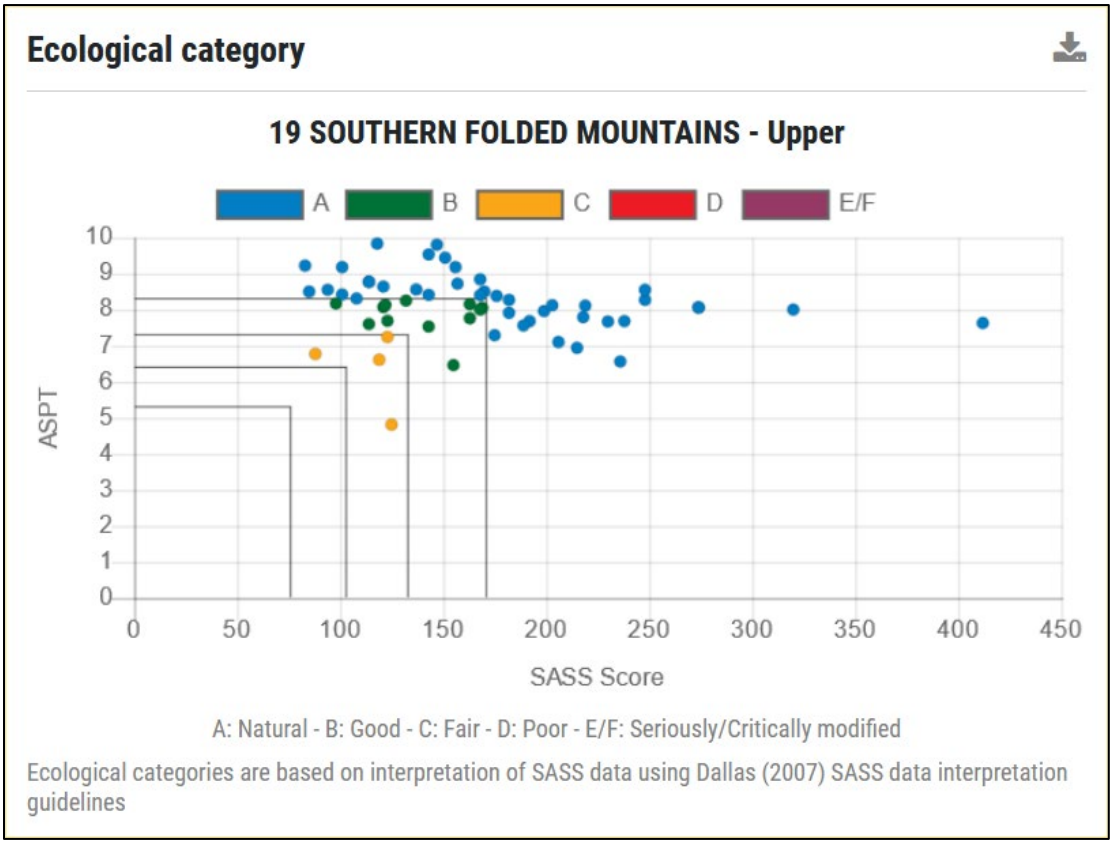
10.2.3 Ecological category

The ecological category component represents the condition of a collection of sites or a single-site (Figure 33) selected by the user. In the former case, the plots show the last recorded SASS survey's ecological category for each site. In the latter case, the plot shows the history of SASS surveys over time. For the multi-site plots the charts are separated by ecoregion and, due to space constraints, only the first three ecoregions are provided on the report. The Y-Axis represents the ASPT value for each site, the X-Axis represents the SASS score. The scatterplot points are colour coded according to their ecological category (which is a factor of the ASPT value and SASS Score). The meanings of these ecological category are described in the table below:

Ecological Category	Ecological Category Name
A	Natural
B	Good
C	Fair
D	Poor
E	Seriously modified
F	Critically modified



Multi-site ecological category scatterplots.



Single-site ecological category scatterplots.

This component is present in these dashboards:

- Single-site SASS dashboard
- Multi-site SASS dashboard

10.2.4 SASS Taxa per biotope

The SASS Taxa per biotope dashboard component is again rendered slightly differently depending on whether the dashboard is a multi-site SASS dashboard or a single-site SASS dashboard. It provides a tabular display in format similar to the SASS data capture sheet familiar to any certified SASS data collector. The table lists SASS scores per biotope and per taxon. In cases where no biotope recordings have been made for a given taxon in the original SASS survey, those taxa rows are omitted from the report. In the multi-site rendering, the table includes a column group for each site consisting of: sensitivity weighting, stones [S], vegetation [V], gravel, sand and mud [G] and the site score. In multi-site dashboards, the SASS Taxa per biotope displayed represent the latest SASS survey per site and the date of the most recent survey is indicated under the site code.

SASS Taxa per biotope

Download all SASS data : Download as CSV

			A1NGOT-PUANE 16-02-2012				A2APIE-PRETO 26-11-2012				A2BLOU-KROMD 29-11-2012				A2BLOU-RIETF 29-11-2012				A2BL 28-1
Taxa		**Sensitivity Weighting**	**S**	**V**	**G**	**Site**	**S**	**V**	**G**	**Site**	**S**	**V**	**G**	**Site**	**S**	**V**	**G**	**Site**	**S**
PORIFERA	PORIFERA	5																	
PLATYHELMINTHES	TURBELLARIA	3																	
ANNELIDA	OLIGOCHAETA	1			A	A	A		A	A									
	HIRUDINEA	3																	
CRUSTACEA	POTAMONAUTIDAE	3	A		A	A						A		A	A	A	1	A	
	ATYIDAE	8		A		A													
	PALAEMONIDAE	10																	
ARACHNIDA	HYDRACARINA	8			A	A													
PLECOPTERA	PERLIDAE	12																	
EPHEMEROPTERA	BAETIDAE 1 SP	4							A										
	BAETIDAE 2 SP	6	B	B	A	B	B	A				B	A	B	B	A	B	B	
	BAETIDAE > 2 SP	12																	
	CAENIDAE	6	A	A	B	B		1		1			A	A			A	A	
	HEPTAGENIIDAE	13																	
	LEPTOPHLEBIIDAE	13																	
	TRICORYTHIDAE	9																	
	PROSOPISTOMATIDAE	15						1		1									
	TELOGANODIDAE	12																	
ODONATA	LESTIDAE	8																	
	CHLOROCYPHIDAE	10		A		A						1		1					
	SYNLESTIDAE/CHLOROLESTIDAE	8		A		A													
	COENAGRIONIDAE	4		B		B		1		1		A		A					
	LIBELLULIDAE	4																	
	AESHNIDAE	8																	
	GOMPHIDAE	6	A	A	B	B													
	CORDULIIDAE	8																	
GASTROPODA	PHYSIDAE	3																	
	THIARIDAE	3	1			1													
PELECYPODA	CORBICULIDAE	5																	
SASS Score			**135**	**123**	**135**	**192**	**57**	**33**	**41**	**74**	**158**	**103**	**132**	**218**	**188**	**86**	**46**	**196**	**56**
Number of Taxa			**21**	**20**	**23**	**30**	**11**	**7**	**7**	**15**	**26**	**17**	**23**	**35**	**30**	**17**	**10**	**32**	**11**
ASPT			**6.43**	**6.15**	**5.87**	**6.40**	**5.18**	**4.71**	**5.86**	**4.93**	**6.08**	**6.06**	**5.74**	**6.23**	**6.27**	**5.06**	**4.60**	**6.13**	**5.09**

Multi-site SASS taxa per biotope table.

For single-sites, only the most recent survey is displayed as illustrated below. Both configurations provide the ability to download the table as editable text (CSV) data for further analysis offline.

SASS Taxa per biotope **Nov. 11, 2014**

TAXA		Weight	S	V	G	Site
PLATYHELMINTHES	TURBELLARIA	3	B	C	B	B
ANNELIDA	HIRUDINEA	3		A		A
CRUSTACEA	POTAMONAUTIDAE	3	A			A
EPHEMEROPTERA	BAETIDAE > 2 SP	12	B	B	B	B
	CAENIDAE	6	A		A	A
ODONATA	COENAGRIONIDAE	4		A		A
	LIBELLULIDAE	4	1			1
HEMIPTERA	CORIXIDAE	3			A	A
	VELIIDAE/MESOVELIIDAE	5		B		B
TRICHOPTERA	HYDROPSYCHIDAE > 2 SP	12	B		B	B
COLEOPTERA	GYRINIDAE	5	A	B	1	1
DIPTERA	CHIRONOMIDAE	2	B		B	B
	CULICIDAE	1		B		B
	SIMULIIDAE	5	C	B	B	B
GASTROPODA	ANCYLIDAE	6		A		A
	LYMNAEIDAE	3		A		A
SASS Score			**52**	**47**	**48**	**77**
Number of Taxa			**9**	**10**	**8**	**16**
ASPT			**5.78**	**4.70**	**6.00**	**4.81**

Download latest SASS data for this site : Download as CSV

Single-site SASS taxa per biotope table.

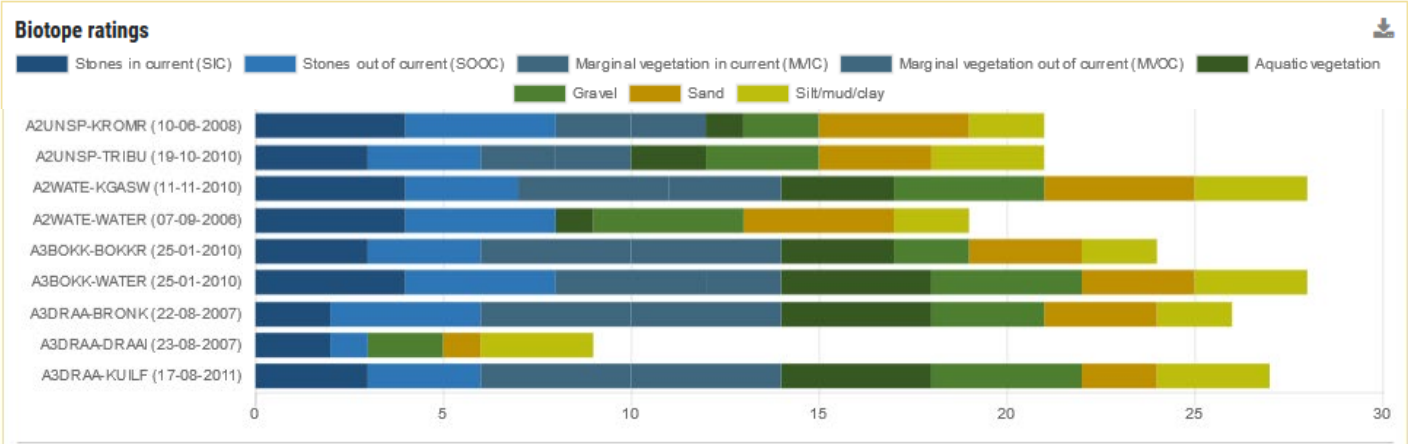
This component is present in these dashboards:

- Single-site SASS dashboard
- Multi-site SASS dashboard

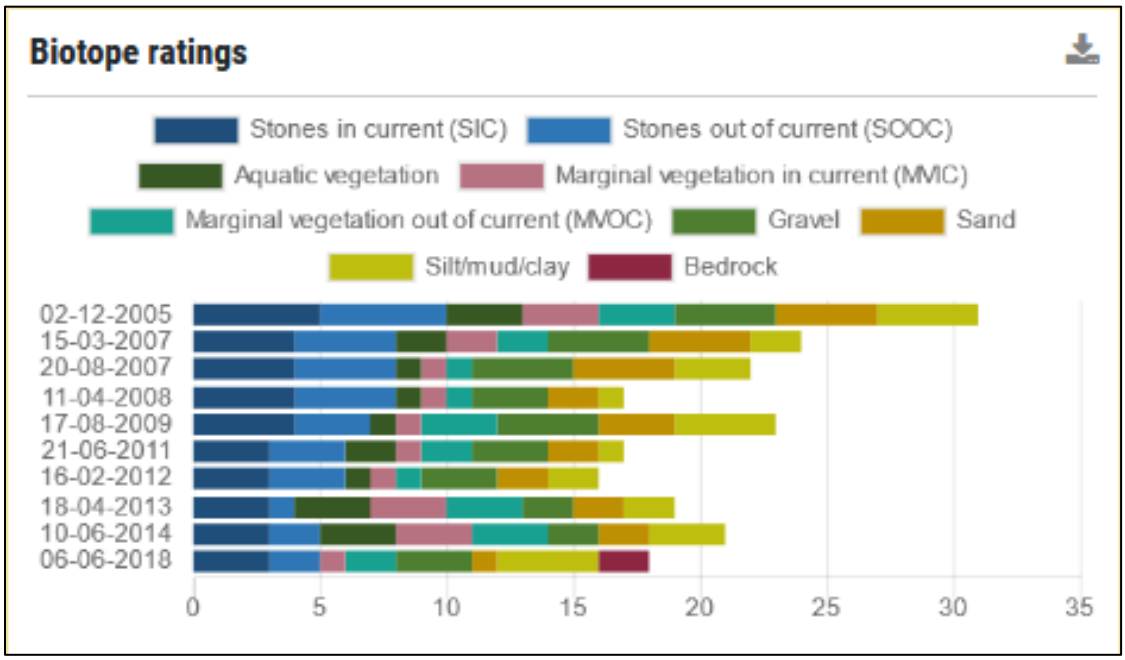
10.2.5 Biotope ratings

Note: SASS versions 1 to 4 did not require biotope ratings, and therefore data associated with this method will not have biotope ratings.

The SASS biotope ratings dashboard component is also rendered slightly differently depending on whether the dashboard is a multi-site SASS dashboard or a single-site SASS dashboard. It provides a stacked graph display showing the biotope rating for each recorded SASS survey. In the multi-site rendering, the chart includes an entry on the Y-Axis for each SASS survey site. In the case of single-site dashboard, the Y-Axis contains an entry for each date on which a SASS survey was carried out. In both permutations, the X-Axis represents the cumulative biotope rating across different biotopes.



Multi-site biotope ratings graph.



Single-site biotope ratings graph.

This component is present in these dashboards:

- Single-site SASS dashboard
- Multi-site SASS dashboard

10.2.6 SASS Record Summary

This dashboard component summarises the SASS Score, Number of Taxa and ASPT values for all SASS surveys at a given site. It also shows the total count of SASS records and the data range of those records. The data presented in the table can be downloaded as a CSV file for offline use.

Number of SASS records	10
Earliest record	December 2, 2005
Latest record	June 6, 2018

Metrics Data

Metric	Average	Minimum	Maximum
SASS Score	179	113	248
Number of Taxa	29	18	40
ASPT	6.16	5.65	6.50

Download summary data : Download as CSV

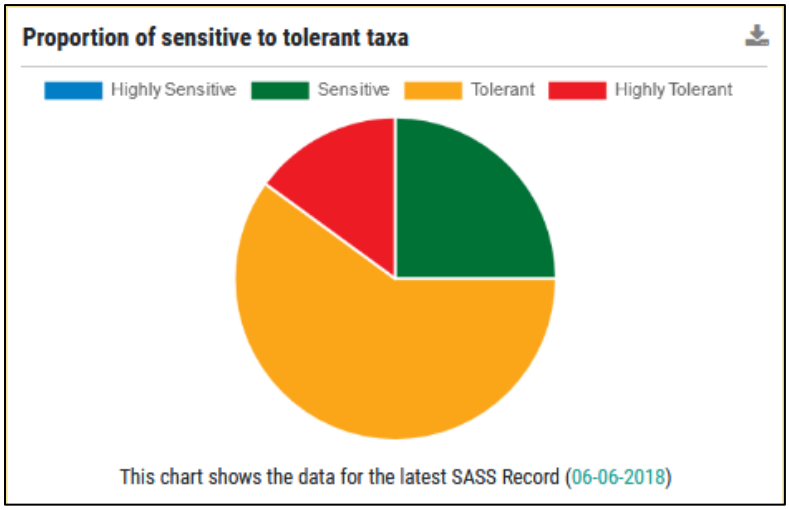
SASS single-site dashboard summary.

This component is present in this dashboard:

- Single-site SASS dashboard

10.2.7 Proportion of sensitive to tolerant taxa

This component, presented as a pie chart, provides a visualisation of the proportion of taxa in different sensitivity categories. These data are derived from the latest SASS survey for a given site. It is based on the following categorisation of SASS sensitivity weightings: Highly tolerant (1 to 3), Tolerant (4 to 7), Sensitive (8 to 11), Highly sensitive (12 to 15).



Single-site SASS visualisation of taxon sensitivity.

This component is present in these dashboards:

- Single-site SASS dashboard

10.2.8 SASS Records

This component, presented as a table, provides a summary of previously conducted SASS surveys for a site. The data can also be downloaded for offline use (as a CSV file). The table provides a 'drill down' link for each record which will take the user to the actual completed SASS survey data sheet for that row.

This component is present in these dashboards:

- Single-site SASS dashboard

SASS Records

Date	SASS5/SASS4 Score	Number of Taxa	ASPT
02-12-2005	248	40	6.20
15-03-2007	210	34	6.18
20-08-2007	197	34	5.79
11-04-2008	211	34	6.21
17-08-2009	177	29	6.10
21-06-2011	197	31	6.35
16-02-2012	176	28	6.29
18-04-2013	143	22	6.50
10-06-2014	114	18	6.33
06-06-2018	113	20	5.65

Download all SASS data for this site : Download as CSV

Summary table fo SASS surveys for a site.

Date	02/16/2015
Owner	H Rous
	recorded at the time of collection
Source Reference	Database Rivers Database 2015
Site Image	-

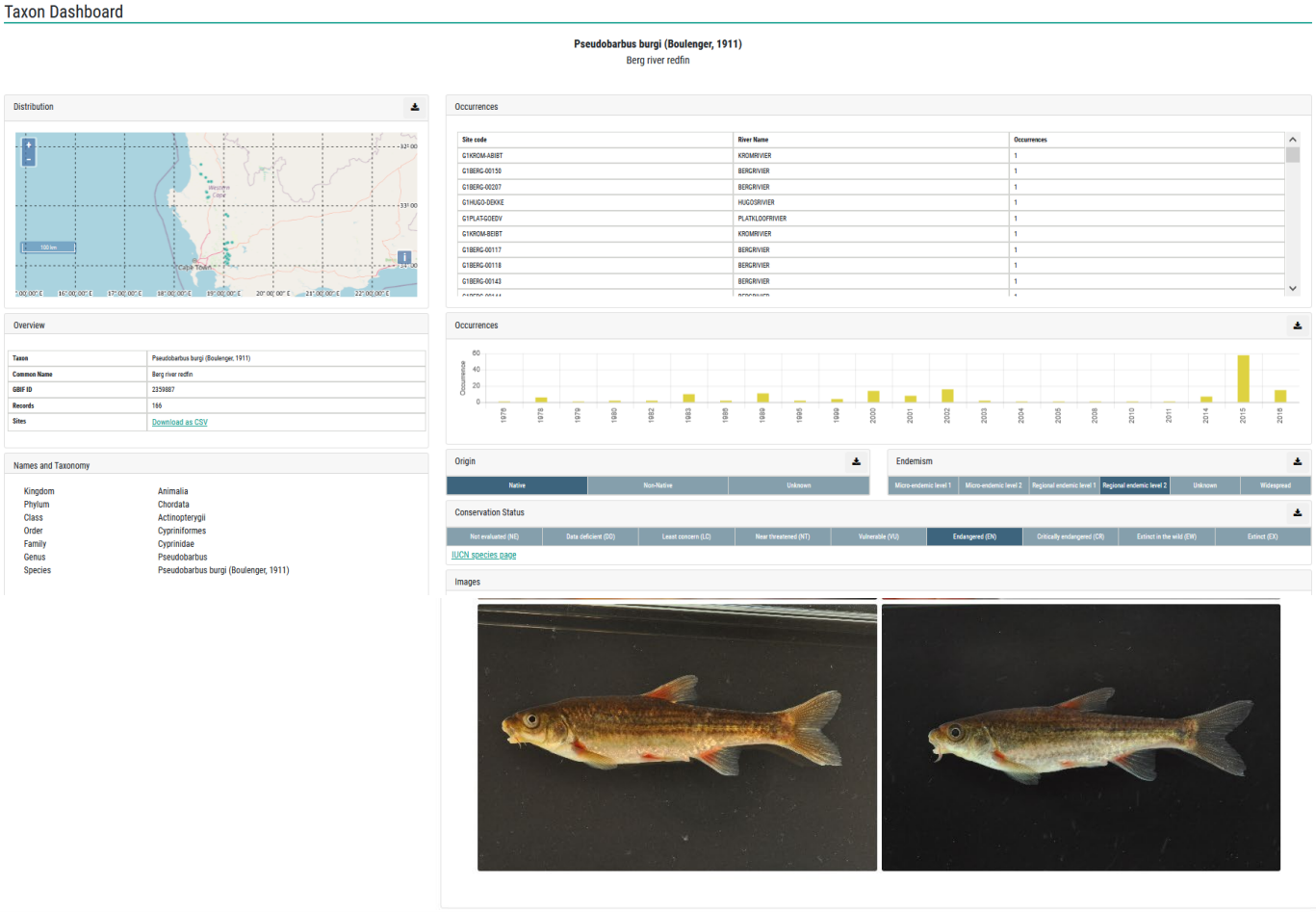
Biotopes Sampled	0	1	2	3	4	5
Stones in current	○	○	○	●	○	○
Stones out of current	○	○	○	●	○	○
Bedrock	○	○	○	○	○	○
Aquatic vegetation	○	●	○	○	○	○
Marginal vegetation in current	○	●	○	○	○	○
Marginal vegetation out of current	○	●	○	○	○	○
Gravel	○	○	○	●	○	○
Sand	○	○	●	○	○	○
Silt/mud/clay	○	○	●	○	○	○

Taxon	Stones	Vegetation	Gravel, sand, mud	Total
PORIFERA	A			A
OLIGOCHAETA	A		A	A
POTAMONAUTIDAE	B		A	B
ATYIDAE		A	A	A
BAETIDAE > 2 SP	B	A	A	B
CAENIDAE	B	A	A	B
LEPTOPHLEBIIDAE	A	A	A	B
TRICORYTHIDAE	A			A
CHLOROCYPHIDAE	A			A
COENAGRIONIDAE		A		A
AESHNIDAE	A			A
GOMPHIDAE	B	A	B	B
GERRIDAE	B	B	B	B
VELIIDAE/MESOVELIIDAE	B	B	B	B
SYNOMIDAE	1			1
HYDROPSYCHIDAE 2 SP			A	
HYDROPSYCHIDAE > 2 SP	B			B
PHILOPOTAMIDAE	1			1
HYDROPTILIDAE	A	A		A
DYTISCIDAE/NOTERIDAE	A			A
GYRINIDAE	A		A	A
ATHERICIDAE	A			A
CERATOPOGONIDAE	A		A	A
CHIRONOMIDAE	A	A	A	B
CULICIDAE	A			A
SIMULIIDAE	A	A	A	A
TABANIDAE			1	1
TIPULIDAE			1	1
ANCYLIDAE	A			A
SASS Score	154	66	88	176
Number of Taxa	24	11	16	28
ASPT	6.4	6.2	5.5	6.3

Read-only view of a SASS form for a site.

10.3 Taxon dashboard

This dashboard provides details of a single taxon or species. It is presented whenever an interaction (search / filter / click on map) results in a single taxon being highlighted. For demonstration purposes we have generated it for a fish species, although the same applies for invertebrate and algal species as well.



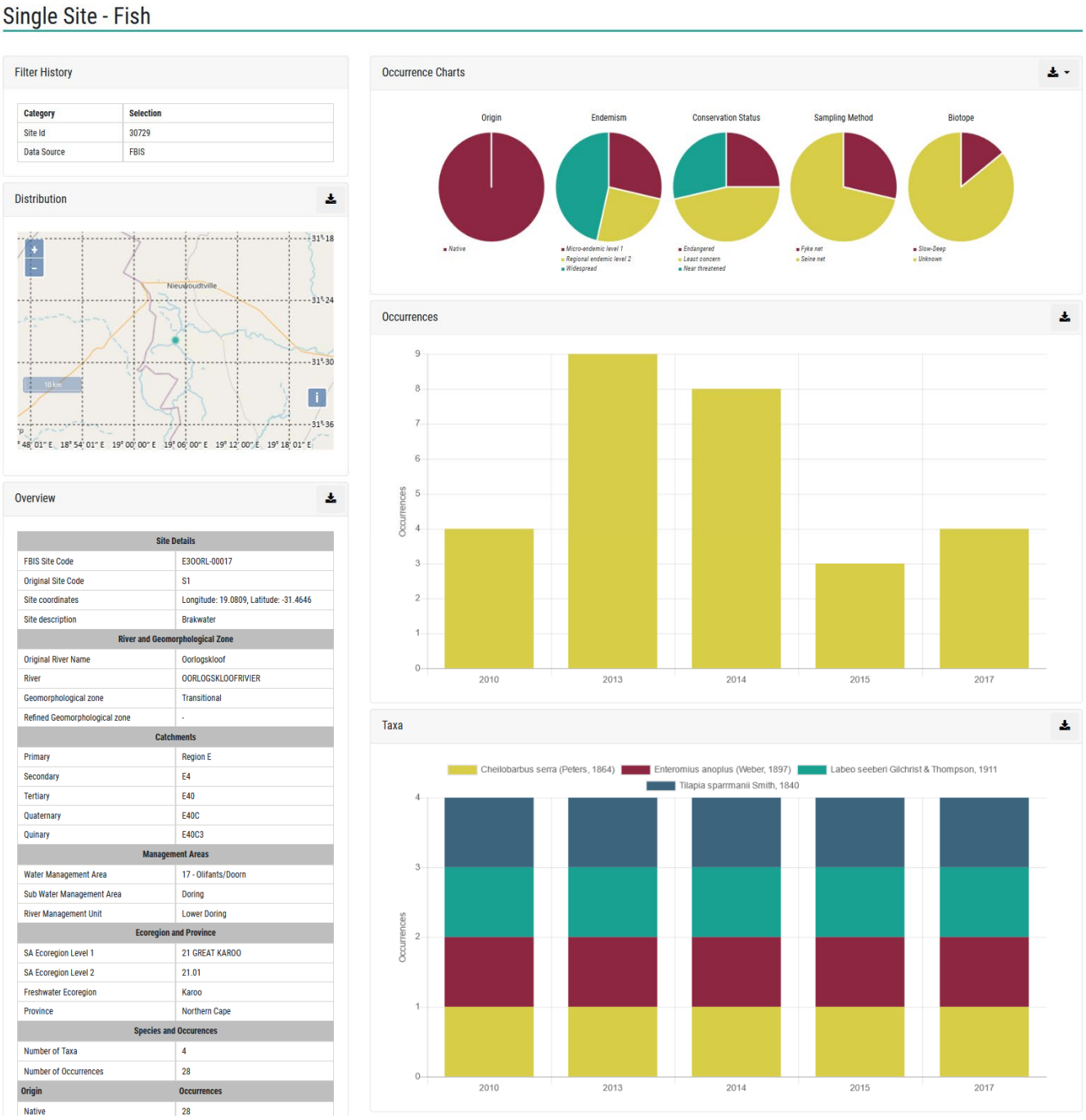
Metadata Table

Reference Category	Author/s	Year	Title	Source	DOI/URL	Notes
Peer-reviewed scientific article	B. M. Clark, D. Impson, J. Rall	2009	Present status and historical changes in the fish fauna of the Berg River, South Africa	Transactions of the Royal Society of South Africa	10.1080/00359190909519249	-
Peer-reviewed scientific article	DJ Woodford, ND Impson	2004	A preliminary assessment of the impact of alien rainbow trout (Oncorhynchus mykiss) on indigenous fishes of the upper Berg River, Western Cape Province, South Africa	African Journal of Aquatic Science	10.2989/16085910409503799	-

Single taxon dashboard.

10.4 Single-site biodiversity dashboards

This biodiversity dashboard is a collation of all the dashboard components marked as 'single-site dashboard' above. For demonstration purposes we have generated it for a fish species, although the same applies for invertebrate, algal, adult odonate, anuran and plants species as well. It is presented to the user whenever an interaction (search / filter / click on map) results in a single-site being highlighted. See below for an example.



Single-site fish dashboard part 1.

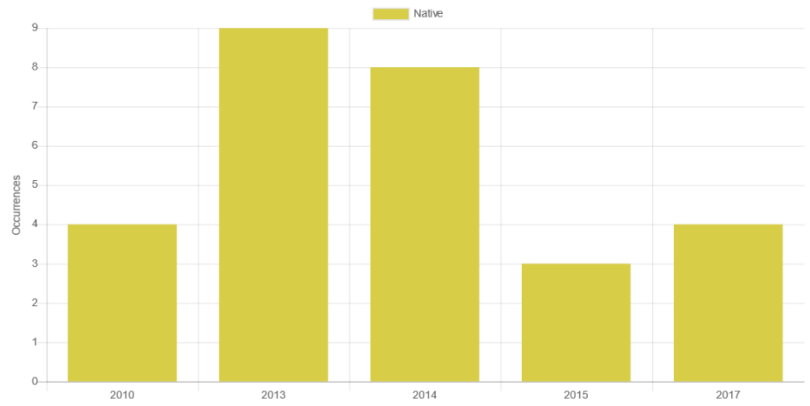
Endemism	Occurrences
Micro-endemic Level 1	8
Regional Endemic Level 2	7
Widespread	13
Conservation Status	**Occurrences**
Endangered	7
Least Concern	13
Near Threatened	8

Occurrence Data

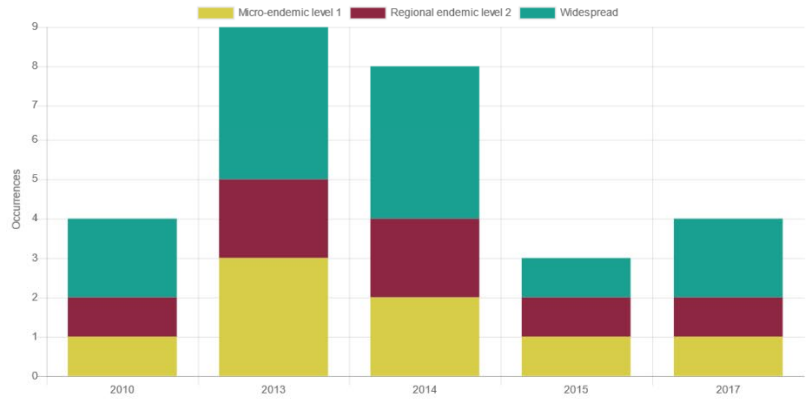
Taxon	Occurrences	Origin	Endemism	Cons. Status
Cheilobarbus serra (Peters, 1864)	8	Native	Micro-endemic level 1	Near threatened
Enteromius anoplus (Weber, 1897)	7	Native	Widespread	Least concern
Labeo seeberi Gilchrist & Thompson, 1911	7	Native	Regional endemic level 2	Endangered
Tilapia sparrmanii Smith, 1840	6	Native	Widespread	Least concern

Download as CSV

Origin



Endemism



Conservation Status

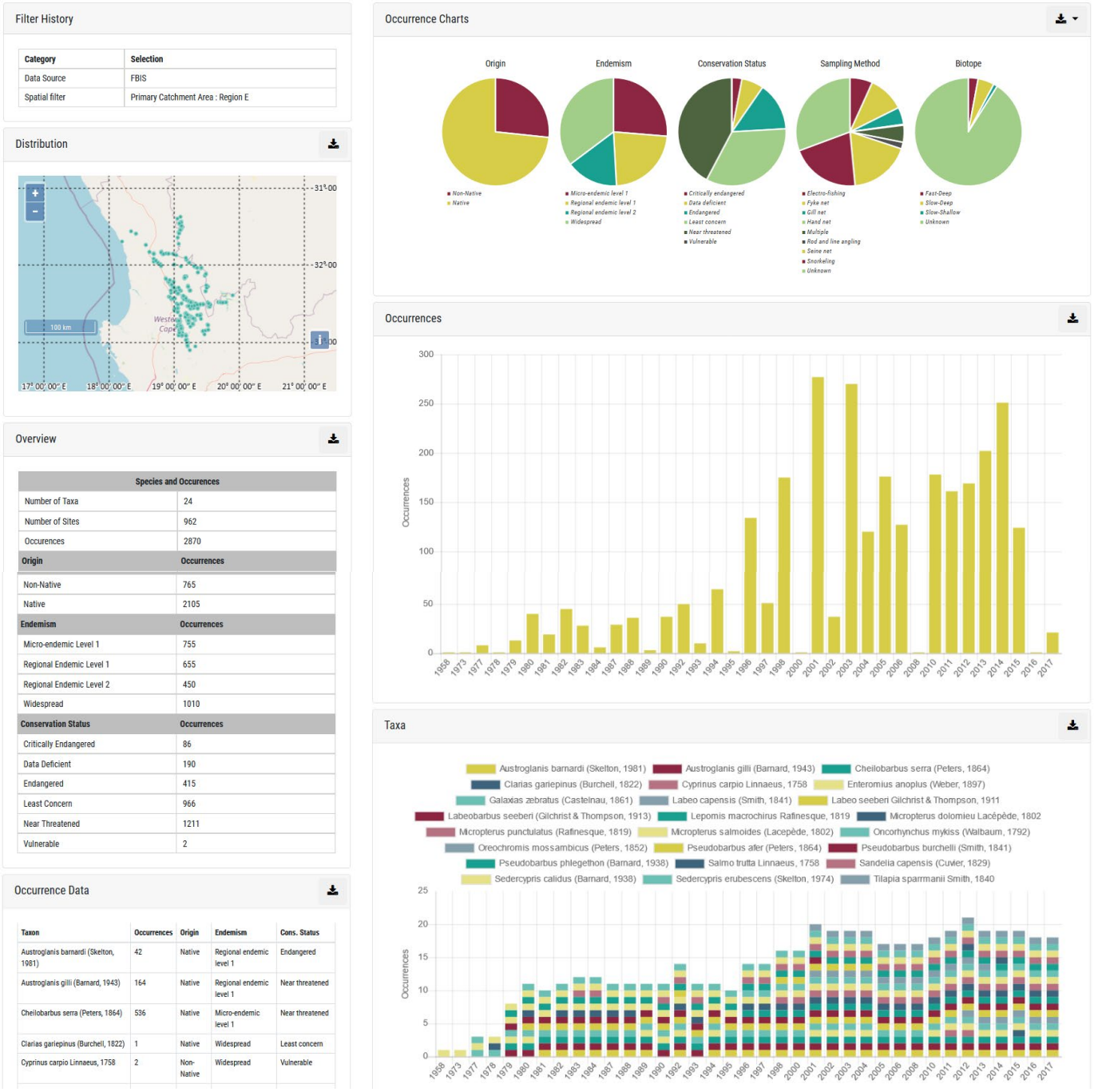
Metadata Table

Reference Category	Author/s	Year	Title	Source	DOI/URL	Notes
Unpublished data	-	-	Northern Cape Department of Environment and Nature Conservation	Northern Cape Department of Environment and Nature Conservation, 2018	-	Northern Cape Department of Environment and Nature Conservation, 2018

Single-site fish dashboard part 2.

10.5 Multi-site biodiversity dashboards

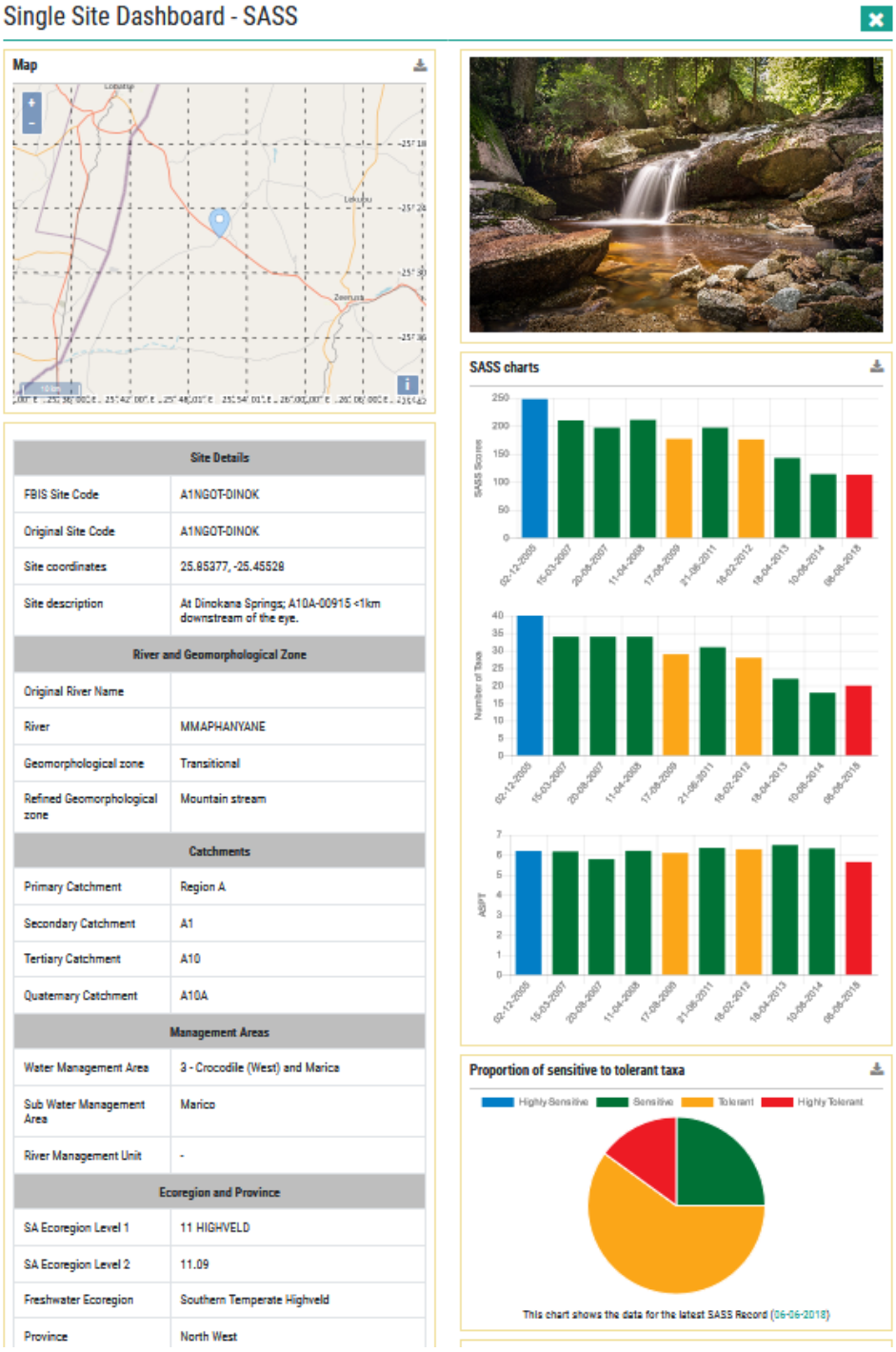
This biodiversity dashboard is a collation of all the dashboard components marked as 'multi-site dashboard' above. For demonstration purposes we have generated it for a fish species, although the same applies for invertebrate, algal, adult odonate and anuran species as well. It is presented to the user whenever an interaction (search / filter / click on map) results in a multiple-sites being highlighted. See below for an example – note only the first section has been shown as the remainder are the same as the single-site dashboard.



Multi-site fish dashboard

10.6 Single-site SASS dashboard

This dashboard is a collation of all the dashboard components marked as 'single-site SASS dashboard' above. It is presented to the user whenever an interaction (search / filter / click on map) results in a single-site SASS being highlighted. See below.



Site Details	
FBIS Site Code	A1NGOT-DINOK
Original Site Code	A1NGOT-DINOK
Site coordinates	25.85377, -25.45528
Site description	At Dinokana Springs; A10A-00915 <1km downstream of the eye.
River and Geomorphological Zone	
Original River Name	
River	MMAPHANYANE
Geomorphological zone	Transitional
Refined Geomorphological zone	Mountain stream
Catchments	
Primary Catchment	Region A
Secondary Catchment	A1
Tertiary Catchment	A10
Quaternary Catchment	A10A
Management Areas	
Water Management Area	3 - Crocodile (West) and Marica
Sub Water Management Area	Marico
River Management Unit	-
Ecoregion and Province	
SA Ecoregion Level 1	11 HIGHVELD
SA Ecoregion Level 2	11.09
Freshwater Ecoregion	Southern Temperate Highveld
Province	North West

SASS Single-site dashboard – Part 1.

Number of SASS records	10
Earliest record	December 2, 2005
Latest record	June 6, 2018

Metrics Data

Metric	Average	Minimum	Maximum
SASS Score	179	113	248
Number of Taxa	29	18	40
ASPT	6.16	5.65	6.50

Download summary data : Download as CSV

SASS Taxa per biotope June 6, 2018

TAXA		Weight	S	V	G	Site
ANNELIDA	OLIGOCHAETA	1		A		A
CRUSTACEA	POTAMONAUTIDAE	3	A	A		A
EPHEMEROPTERA	BAETIDAE 2 SP	6	A		A	A
	LEPTOPHLEBIIDAE	9	A		1	1
	TRICORYTHIDAE	9	1			1
ODONATA	COENAGRIONIDAE	4		1		1
	AESHNIDAE	8	A			A
HEMIPTERA	GERRIDAE	5	A	A	A	A
	VELIIDAE/MESOVELIIDAE	5	B		A	A
COLEOPTERA	DYTISCIDAE/NOTERIDAE	5		1		1
	GYRINIDAE	5	1			1
	HYDROPHILIDAE	5		1		1
DIPTERA	CHIRONOMIDAE	2	A		1	1
SASS Score			52	23	27	67
Number of Taxa			9	6	5	13
ASPT			5.78	3.83	5.40	5.15

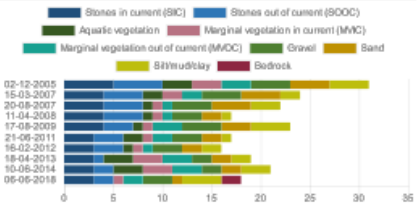
Download latest SASS data for this site : Download as CSV

SASS Records

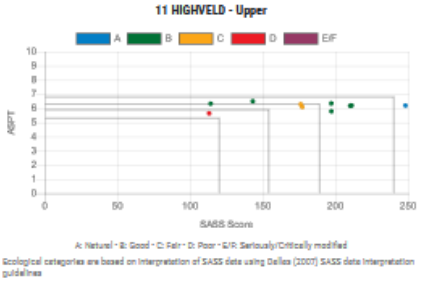
Date	SASS5/SASS4 Score	Number of Taxa	ASPT
02-12-2005	248	40	6.20
15-03-2007	210	34	6.18
20-08-2007	197	34	5.79
11-04-2008	211	34	6.21
17-08-2009	177	29	6.10
21-06-2011	197	31	6.35
16-02-2012	176	28	6.29
18-04-2013	143	22	6.50
10-06-2014	114	18	6.33
06-06-2018	113	20	5.65

Download all SASS data for this site : Download as CSV

Biotope ratings



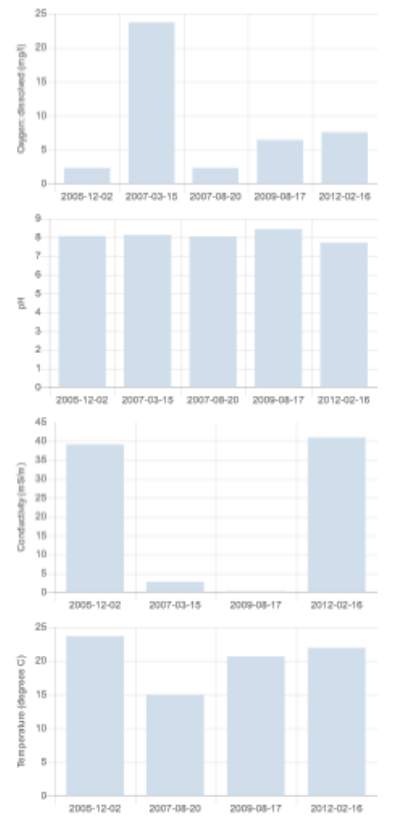
Ecological category



A: Natural - B: Good - C: Fair - D: Poor - E/F: Seriously/Critically modified

Ecological categories are based on interpretation of SASS data using Dallas (2007) SASS data interpretation guidelines

Abiotic Data



Download as CSV

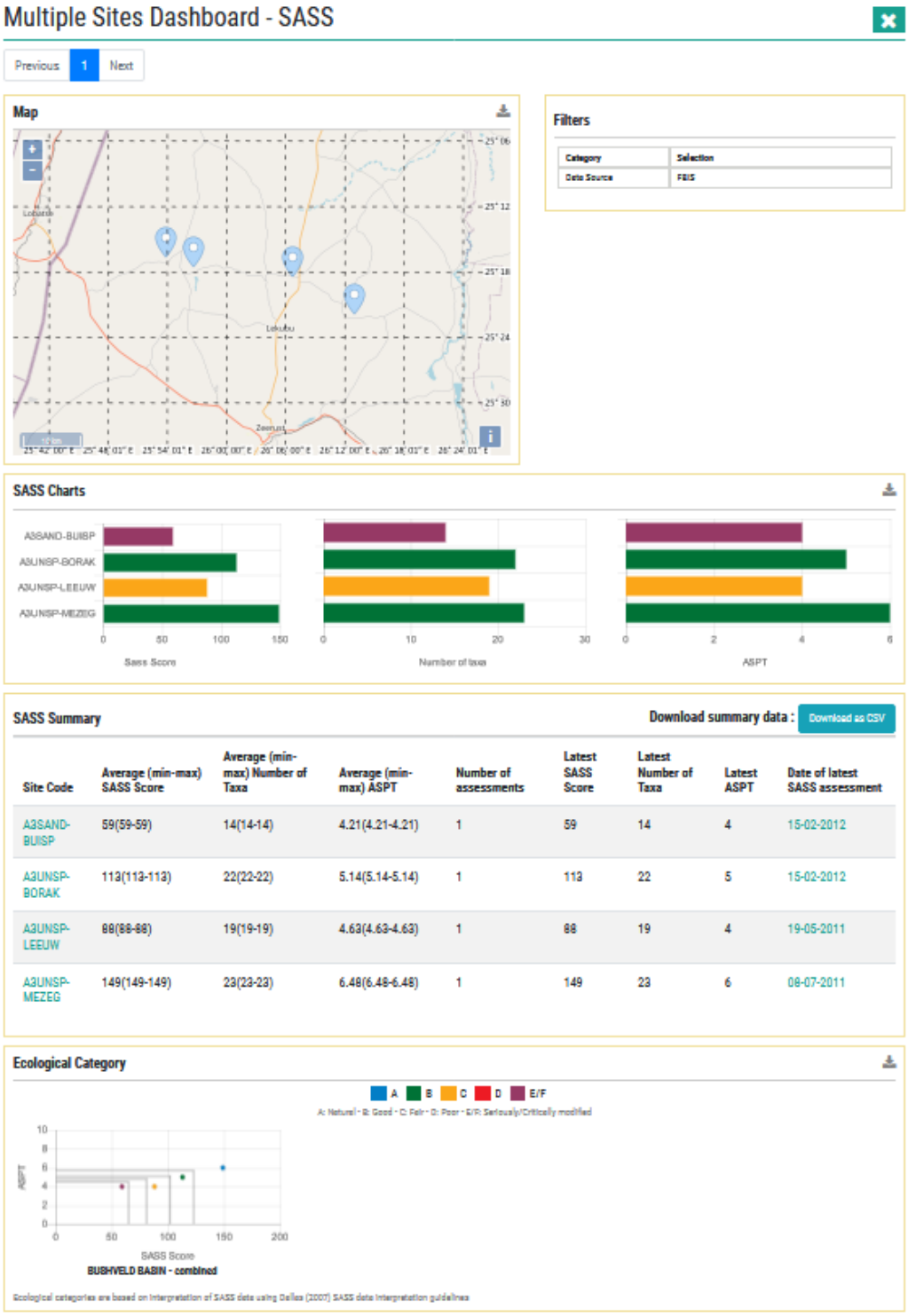
Metadata Table

Reference Category	Author/s	Year	Title	Source	DOI/URL	Notes
Database	-	-	Rivers Database 2015	Rivers Database 2015	-	-

SASS Single-site dashboard – Part 2.

10.7 Multi-site SASS dashboard

This dashboard is a collation of all the dashboard components marked as 'multi-site SASS dashboard' above. It is presented to the user whenever an interaction (search / filter / click on map) results in multiple sites containing SASS data being highlighted. See below.

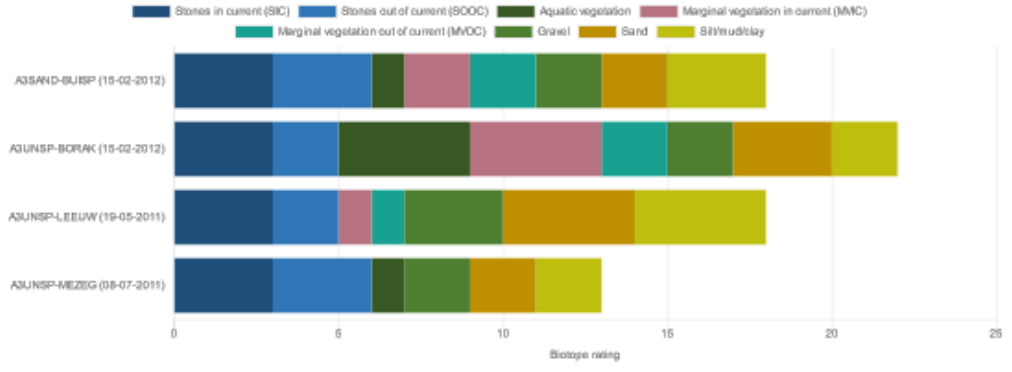


SASS Multi-site dashboard – Part 1.

SASS Taxa per biotope — Download all SASS data : Download as CSV

			A3SAND-BUISP 15-02-2012				A3UNSP-BORAK 15-02-2012				A3UNSP-LEEUW 19-05-2011				A3UNSP-MEZEG 08-07-2011			
Taxa		**Sensitivity Weighting**	**S**	**V**	**G**	**Site**	**S**	**V**	**G**	**Site**	**S**	**V**	**G**	**Site**	**S**	**V**	**G**	**Site**
PLATYHELMINTHES	TURBELLARIA	3													B	A	B	B
ANNELIDA	OLIGOCHAETA	1	1		A	A									1		1	A
	HIRUDINEA	3																1
CRUSTACEA	AMPHIPODA	13														1		1
	POTAMONAUTIDAE	3	A	A	A	B	A	A	A	A			A	A				
EPHEMEROPTERA	BAETIDAE 1 SP	4	A	A		B												
	BAETIDAE 2 SP	6					B	B	B	B	B	B	B	C	B	A	A	
	BAETIDAE > 2 SP	12																B
	LEPTOPHLEBIIDAE	9					A			A								
ODONATA	SYNLESTIDAE/CHLOROLESTIDAE	8					A	B	A	B								
	COENAGRIONIDAE	4		A	1	A	B	B	B	C	1	A		A	A	A		A
	PROTONEURIDAE	8														A		A
	AESHNIDAE	8						B		B						A	A	A
	LIBELLULIDAE	4		A		A		B	B	B	A	A	B	B	B	A	A	B
HEMIPTERA	CORIXIDAE	3		B	B	B	A	B	B	B					A		A	
	GERRIDAE	5										A		A	A			A
	HYDROMETRIDAE	6											A	A				
	VELIIDAE/MESOVELIIDAE	5	A	B		B	B	B	B	B		A	A	B	A	A		A
TRICHOPTERA	HYDROPTILIDAE	6		A		A												
	LEPIDOSTOMATIDAE	10													A	B	B	B
COLEOPTERA	DYTISCIDAE/NOTERIDAE	5						A	A	A		A		A		1		1
	GYRINIDAE	5					B	B	B	B		A		A	A			A
	SCIRTIDAE	12													A	A	A	B
	HYDRAENIDAE	8						A	A	A								
DIPTERA	CHIRONOMIDAE	2		A	B	B	A	A	A	A	A	A	A	B	A	A	A	B
GASTROPODA	ANCYLIDAE	6									A			A				
SASS Score			**13**	**31**	**13**	**32**	**45**	**61**	**53**	**70**	**22**	**36**	**26**	**51**	**60**	**80**	**49**	**100**
Number of Taxa			**4**	**8**	**5**	**9**	**9**	**12**	**11**	**13**	**5**	**8**	**6**	**11**	**12**	**12**	**9**	**16**
ASPT			**3.25**	**3.88**	**2.60**	**3.56**	**5.00**	**5.08**	**4.82**	**5.38**	**4.40**	**4.50**	**4.33**	**4.64**	**5.00**	**6.67**	**5.44**	**6.25**

Biotope ratings



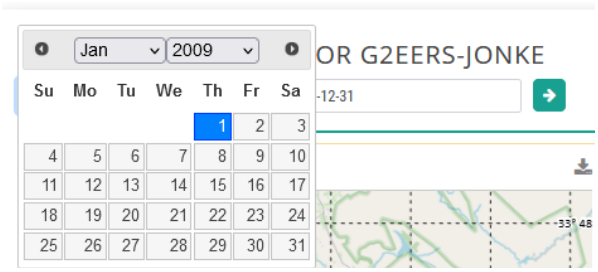
Metadata Table

Reference Category	Author/s	Year	Title	Source	DOI/URL	Notes
Database	-	-	Rivers Database 2015	Rivers Database 2015	-	-

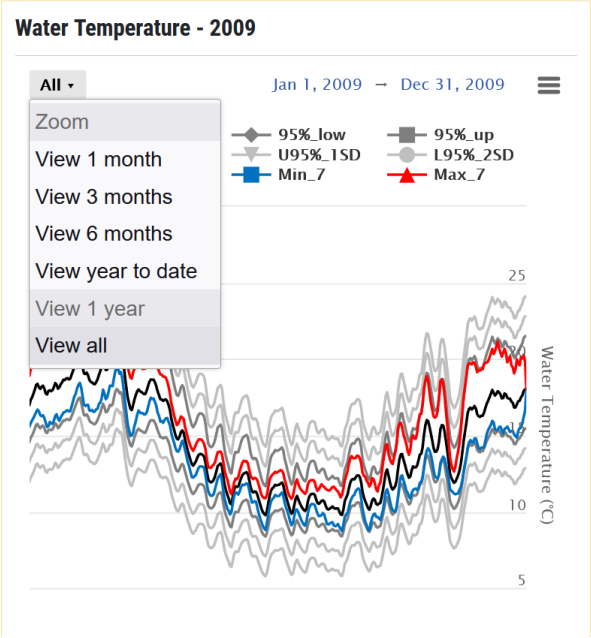
SASS Single-site dashboard – Part 2.

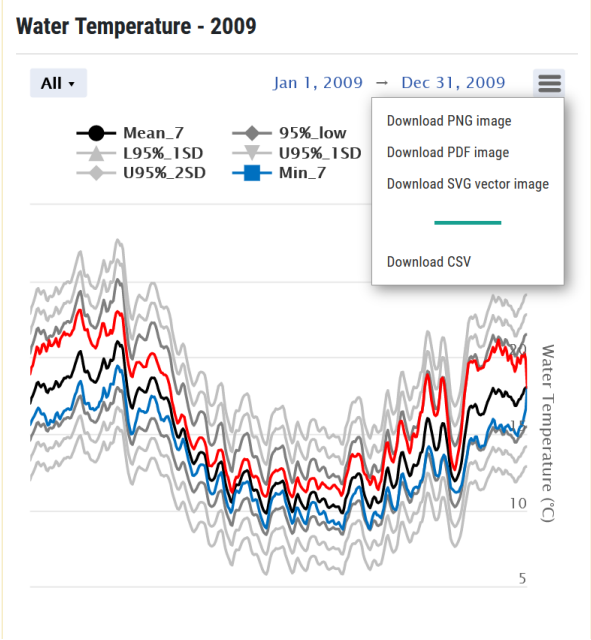
10.8 Water temperature time series dashboard

This dashboard includes some of the components in the biodiversity dashboards such as map, site photograph and overview, which provides geocontext data for the site, and metadata. The water temperature data is shown for one year at a time, so the user need to first select the day, month and year for the start and end of the data series. Note: it is not possible to select data for longer than 1 year, and the start and end year need to be the same.

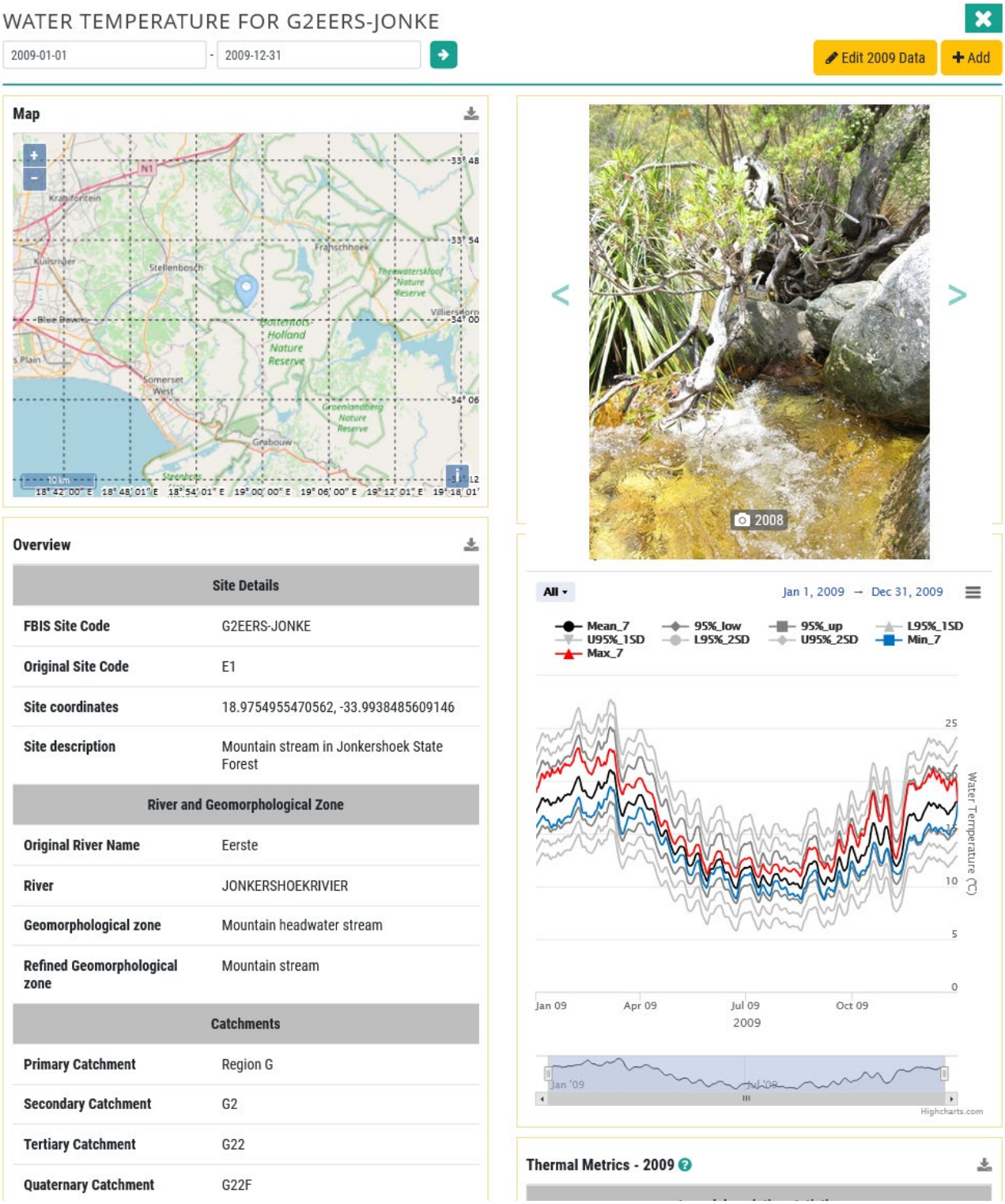


A thermograph is provided for the site based on the one year of water temperature data time series specified. Sub-daily data are transformed into daily data and plotted as smoothed daily temperature means based on a seven-day moving average, and smoothed daily range using daily minima and maxima. For Reference thermograph the reference condition thermal envelope plus one and two standard deviations are shown. Further manipulation of the time series is possible using the All dropdown (view 1 month, 3 months, 6 months etc) and the graph may be downloaded in different formats.





Tables of thermal metrics and monthly magnitudes (mean, minimum, maximum and range) are provided. The user is referred to Dallas and Rivers-Moore (2019, 2022) for more details. Thermal metrics describe an annual thermal regime using broad descriptive statistics, such as mean annual temperature, annual coefficient of variability, predictability and maximum daily range, as well as water temperature events in terms of their magnitude, frequency, duration of extreme events (Rivers-Moore et al. 2013).



Water temperature dashboard – Part 1.

Tertiary Catchment	G22
Quaternary Catchment	G22F
Management Areas	
Water Management Area	19 - Berg
Sub Water Management Area	Greater Cape Town
River Management Unit	Upper Berg
Ecoregion and Province	
SA Ecoregion Level 1	19 SOUTHERN FOLDED MOUNTAINS
SA Ecoregion Level 2	19.04
Freshwater Ecoregion	Cape Fold
Province	-

Monthly magnitudes - 2009

Monthly magnitudes	Mean	Min	Max	Range
Jan	17.91	16.04	20.44	4.40
Feb	19.19	17.21	21.76	4.55
Mar	18.78	17.19	20.68	3.49
Apr	16.70	15.61	17.97	2.35
May	12.58	11.75	13.51	1.76
Jun	11.34	10.66	12.16	1.49
Jul	10.98	10.24	11.91	1.67
Aug	10.76	9.75	12.02	2.28
Sep	11.25	10.07	12.72	2.65
Oct	13.85	12.22	16.08	3.87
Nov	14.79	13.12	17.04	3.92
Dec	17.31	15.16	20.11	4.94

Thermal Metrics - 2009

Annual descriptive statistics	
Mean Annual temperature (MAT)	14.59
Standard deviation of MAT	3.42
Annual coefficient of variability	23.43
Mean of annual range	3.10
Standard deviation of annual range	1.64
Mean of annual minima	13.22
Mean of annual maxima	16.33
Magnitudes of extreme water temperature conditions	
Mean_7	21.05
Min_7	8.75
Min_30	9.48
Min_90	9.87
Max_7	23.11
Max_30	21.88
Max_90	21.63
Frequency and duration (successive days exceeding thresholds) of extreme water temperature conditions	
Mean_7cnt	70
Min_7cnt	166
Max_7cnt	0
Mean_7dur	54
Min_7dur	130
Max_7dur	0

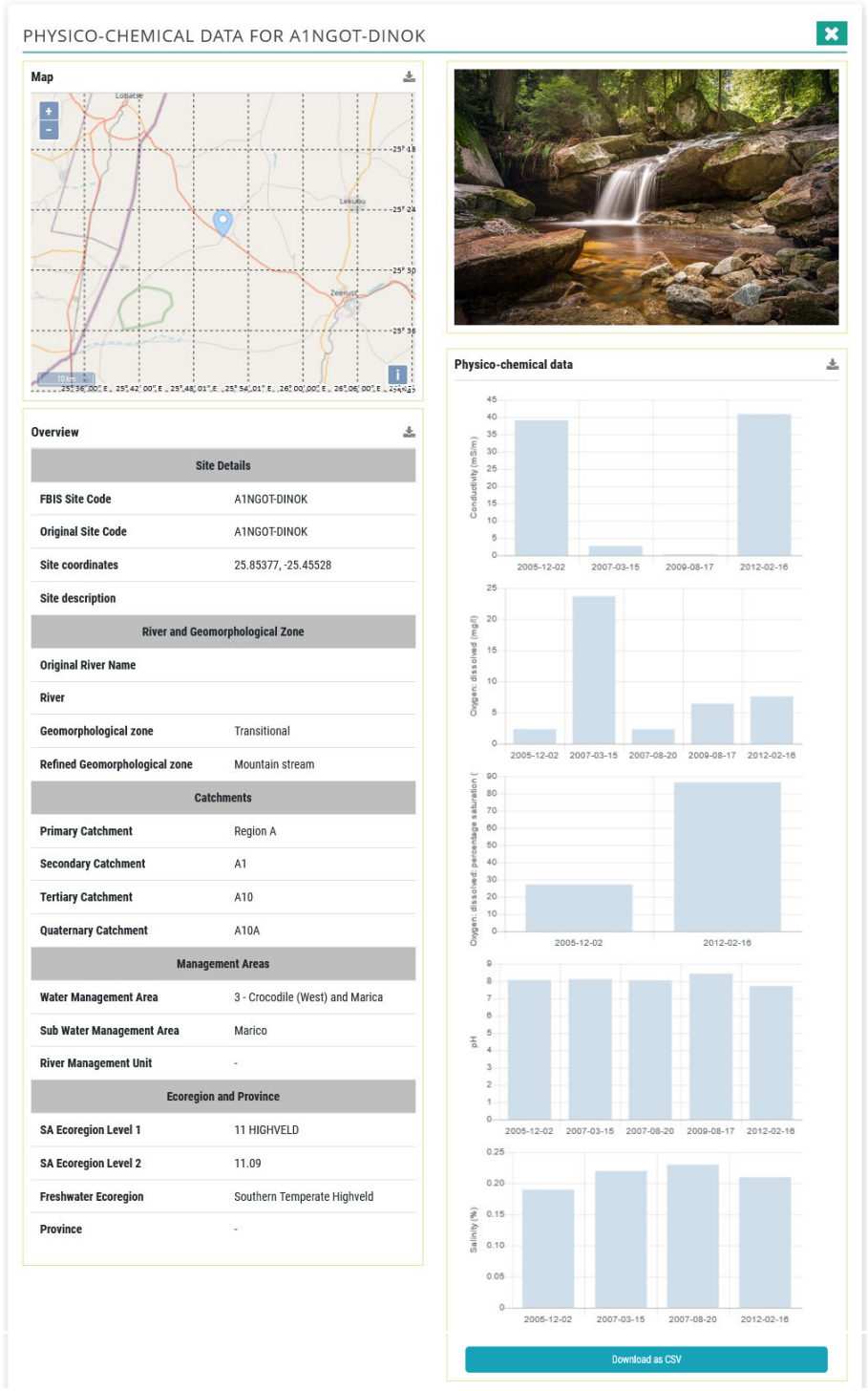
Metadata Table

Reference Category	Author/s	Year	Title	Source	DOI/URL	Notes
Published report or thesis	Helen Dallas & Nick Rivers-Moore	2012	Water temperatures and the ecological Reserve.	Water Research Commission Report KV 1799/1/12. Water Research Commission, Pretoria, South Africa.	Download	-

Water temperature dashboard – Part 2.

10.9 Physico-chemical dashboard

This dashboard includes some of the components in the biodiversity dashboards such as map, site photograph and overview, which provides geocontext data for the site. All data are shown as bar charts per variable and data can be downloaded as csv a file.



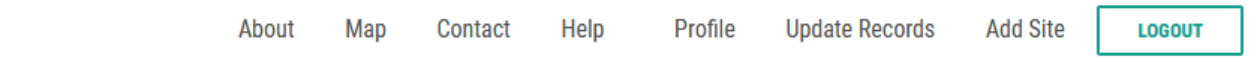
Physico-chemical (abiotic) dashboard.

11 Data Upload Forms

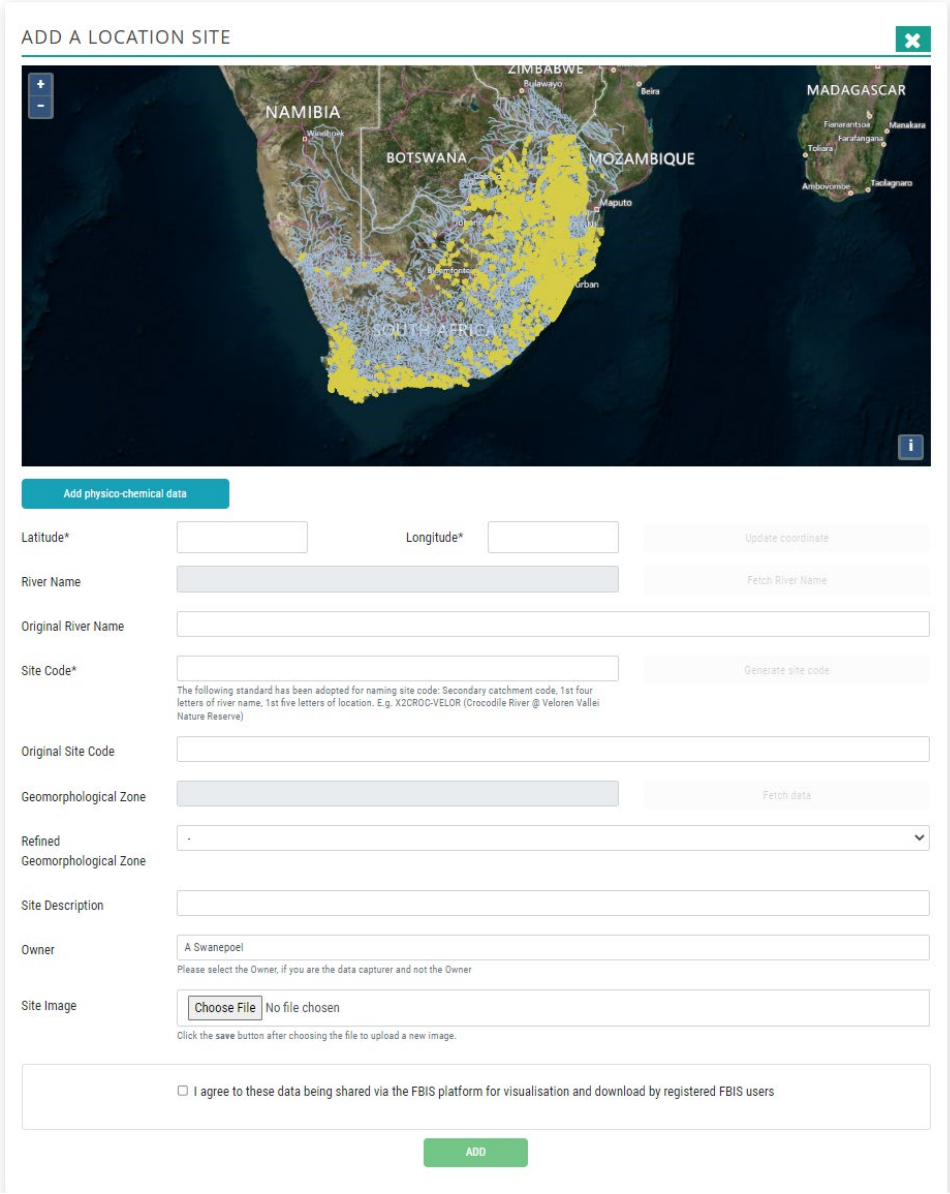
Data upload forms have been created for creating a site, capturing biodiversity data, SASS data, water temperature time series data and physico-chemical data.

11.1 Create a site

A site is added using the **Add Site** on the navigation bar. The **Add a location site** forms then opens.



Add Site button to create a new site.



The Add Site form

The user should fill in the new site details on this form.

- Coordinates can either be manually entered, or the site can be selected on the map and this will auto-populate the latitude and longitude.
- River Name is auto-generated based on the closest river to the selected site location (click fetch river name) If the user specifies the Original River Name, then this will be used. This is useful for tributaries that are not named on the 1: 500 000 DWS river map, where the names are derived.
- A site code can be auto-generated (click generate site code) or the user can fill in their own site code using the standard described. Original Site Code can be added if known.
- The geomorphological zone is auto-generated from the geomorphological zone layer (from a DTM) currently in FBIS. A user can update this by adding a Refined Geomorphological Zone, which is the ground-truthed zone and is programmed to override the geomorphological zone derived from the DTM.
- Add a site description of the site (optional).
- The owner field will auto-populate to the logged in user. It may be assigned to someone else if the data capturer is not the owner by using the dropdown list. Site image(s) can be uploaded.
- Add a site image (optional).
- Lastly, the user has to agree to the data being shared via the FBIS platform for visualisation and download by registered FBIS users.

Biodiversity data, SASS data, water temperature and physico-chemical data may be added to the newly created site by clicking the appropriate button. The user will then be taken to the relevant form (Figures 53, 54, 55, 56, 60 and 61) to enter the data.

Add fish, add invertebrate data, add SASS data, add algal data, add odonate adults data, add anura data, add water temperature data and add physico-chemical data buttons.

11.2 Adding fish data

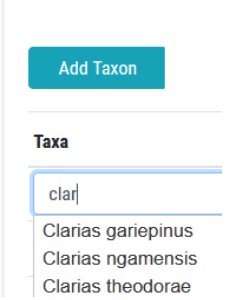
A fish data upload form allows for the capture of fish occurrence data as well as associated abundance, biotopes (broad, specific, substratum), sampling method and effort. Through this form, we hope to encourage collectors to also record abundance, biotope type, sampling method and effort so we developed the form with these capabilities.

Details as follows:

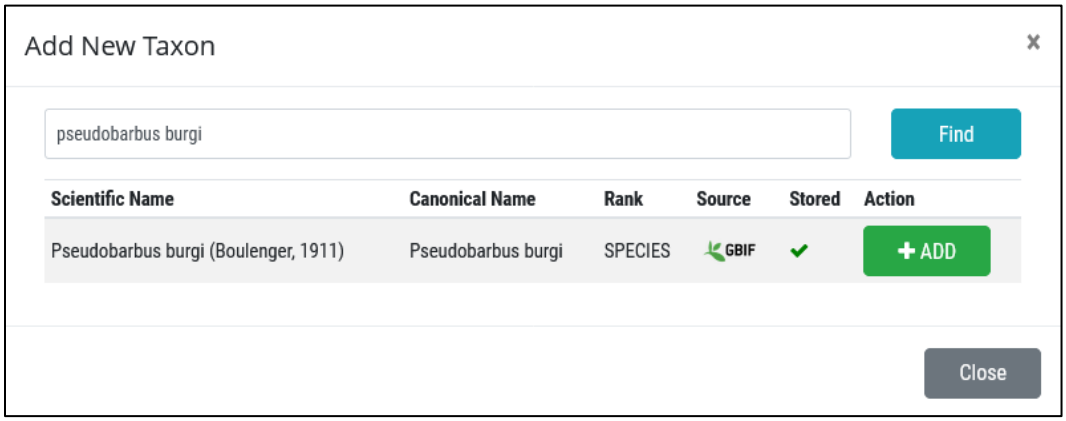
- Broad biotope: Unspecified, Mixed, Slow-Shallow, Slow-Deep, Fast-Shallow, Fast-Deep
- Specific biotope: Unspecified, Mixed, Backwater, Bedrock, Cascade, Chute, Detritus, Pool, Rapid, Riffle, Run, Slackwater, Waterfall
- Substratum: Unspecified, Mixed, Bedrock, Boulder, Cobble, Detritus, Gravel, Pebble, Sand, Silt/Mud/Clay
- Sampling method: Unspecified, Multiple, Electro-fishing, Fyke net, Gill net, Hand net, Rod and line angling, Seine net, Snorkelling, Underwater video analysis

- Sampling effort measure: Time (min), Area (m^2), Replicates
- Abundance measure: Number, Percentage Abundance, Density (m^2)
- Record type: Visual observation, Photographic record, Specimen record, Acoustic survey, DNS sample

We also added 'smart' logic that pre-populates the form with taxa that have previously been identified in the local area, and then it is up to the user to check (or not check) the boxes associated with each taxon. If the taxon you need to add a record for is not listed, you can also add an existing or new taxon on this form, by clicking Add Taxon, and typing a few letters of the taxon.

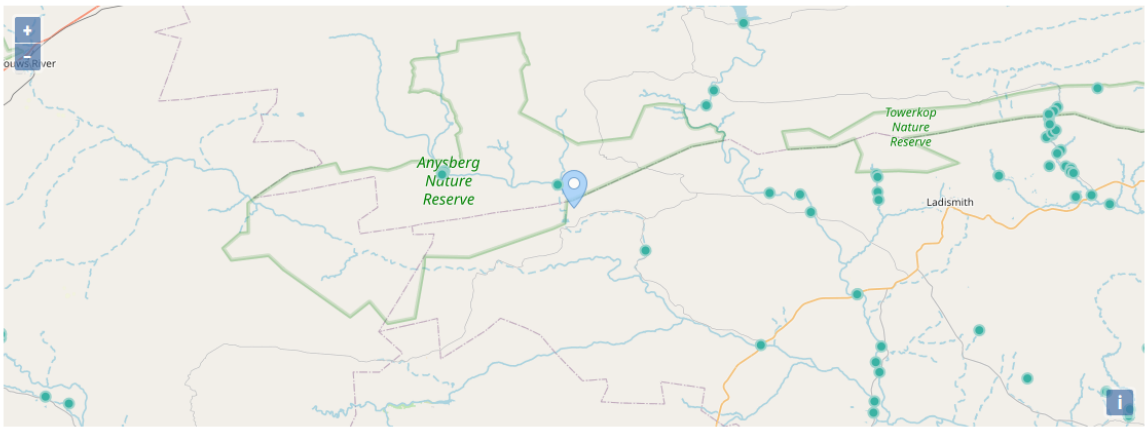


If the taxon name is not in the list, then the user can also add a New Taxon by clicking Add New Taxon. This opens up a new sub-form where you type in the name of the taxon, which then links to GBIF and the taxon is returned. By clicking Add this taxon is then added to FBIS. Final approval of this new taxon requires validation by the FBIS administrators.



After adding fish data, the user has the option to add **Abiotic data** (optional) (see section 11.6), followed by **Adding Source reference for records** (see section 11.9).

Add Fish data for site J1ANYS-00015



Latitude -33.5084235511 Longitude 20.7641601562 Update Coordinate

Date

Owner Helen Dallas

Please select the Owner, if you are the data capturer and not the Owner

Broad Biotope: Not specified

Specific Biotope: Not specified

Substratum: Not specified

Sampling Method: Not specified

Sampling Effort: Not specified

Site Image: Browse... No file selected.

Add Taxon | Add New Taxon

Taxa	Observed	Abundance: Number
Anguilla marmorata	☐	0
Anguilla mossambica	☐	0
Cheilobarbus capensis	☐	0
Clarias gariepinus	☐	0
Cyprinus carpio	☐	0
Enteromius anoplus	☐	0
Enteromius lineomaculatus	☐	0

☐ I agree to these data being shared via the FBIS platform for visualisation and download by registered FBIS users

Next

Fish data form.

11.3 Adding invertebrate data

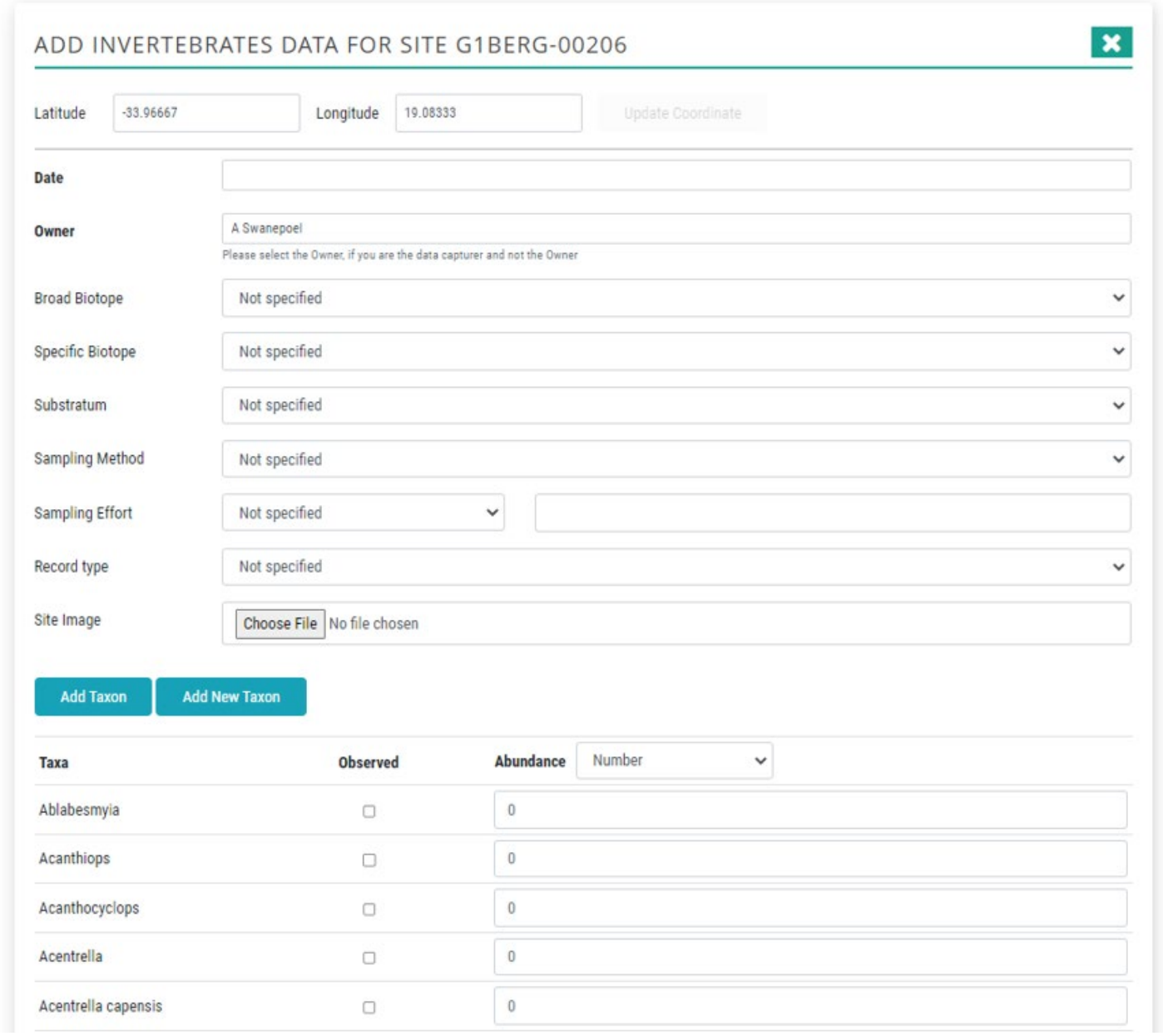
An invertebrate data upload form allows for the capture of invertebrate occurrence data as well as associated abundance, biotopes (broad, specific, substratum), sampling method and effort. Through this form, we hope to encourage collectors to also record abundance, biotope type, sampling method and effort so we developed the form with these capabilities.

Details as follows:

- Broad biotope: Unspecified, Mixed, Stones In Current, Stones Out Of Current, Marginal Vegetation, Aquatic Vegetation, Gravel/Sand/Mud
- Specific biotope: Unspecified, Mixed, Backwater, Bedrock, Cascade, Chute, Detritus, Pool, Rapid, Riffle, Run, Slackwater, Waterfall
- Substratum: Unspecified, Mixed, Bedrock, Boulder, Cobble, Detritus, Gravel, Pebble, Sand, Silt/Mud/Clay
- Sampling method: Unspecified, Multiple, Baited Line, Box/Surber, Drift Net, Hand Net, Kick Net, Light Trap, Stone
- Sampling effort measure: Time (min), Area (m^2), Replicates
- Abundance measure: Number, Percentage Abundance, Density (m^2)
- Record type: Visual observation, Photographic record, Specimen record, Acoustic survey, DNS sample

We also added 'smart' logic that pre-populates the form with taxa that have previously been identified in the local area, and then it is up to the user to check (or not check) the boxes associated with each taxon. If the taxon you need to add a record for is not listed, you can also add an existing or new taxon on this form, in the same way as for fish.

After adding invertebrate data, the user has the option to add **Abiotic data** (optional) (see section 11.6), followed by **Adding Source reference for records** (see section 11.9).



Invertebrate data form.

11.4 Adding algal data

An algal data upload form allows for the capture of algal occurrence data as well as associated abundance, biotopes (broad, specific, substratum), sampling method and effort. Through this form, we hope to encourage collectors to also record abundance, biotope type, sampling method and effort so we developed the form with these capabilities. In addition, for algae, we have included details related to the curation process, and allowed for capture of biomass (Chlorophyll A and Ash Free Dry Mass) and the autotrophic index value.

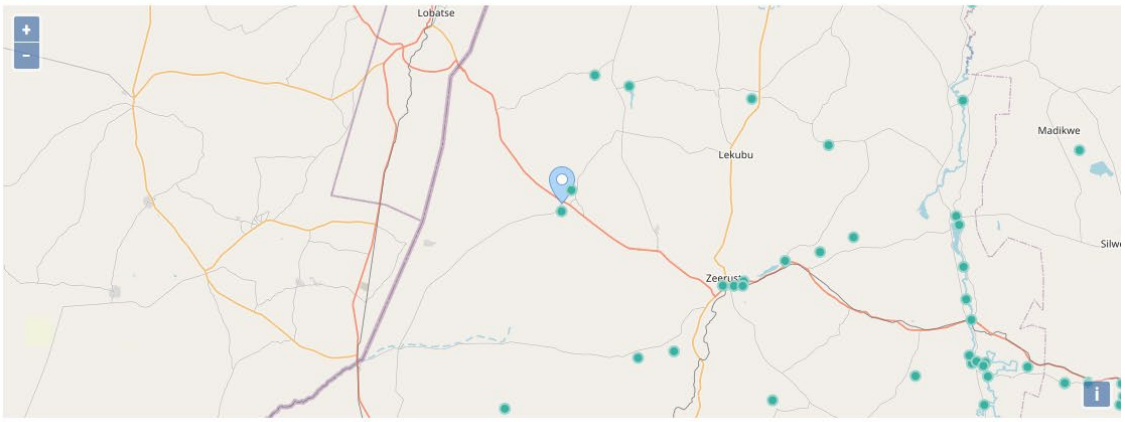
Details as follows:

- Broad biotope: Unspecified, Mixed, Stones In Current, Stones Out Of Current, Marginal Vegetation, Aquatic Vegetation, Gravel/Sand/Mud, Artificial substrate
- Specific biotope: Unspecified, Mixed, Backwater, Bedrock, Cascade, Chute, Detritus, Pool, Rapid, Riffle, Run, Slackwater, Waterfall
- Substratum: Unspecified, Mixed, Bedrock, Boulder, Cobble, Detritus, Gravel, Pebble, Sand, Silt/Mud/Clay
- Sampling method: Unspecified, Multiple, Scrubbing, Soft Bottom, Vegetation, In situ
- Sampling effort measure: Time (min), Area (m^2), Replicates
- Abundance measure: Percentage Abundance, Species valve/frustule count, Density (cells/m^2), Density (cells/mL)
- Curation process: Acid cleaned, Frozen, Preserved lugols
- Biomass indicator: CHLA-B: Whole cobble, Soft Bottom, In situ, Artificial substrate
- Biomass indicator: AFDM-B: Whole cobble, Soft Bottom, Artificial substrate

We also added ‘smart’ logic that pre-populates the form with taxa that have previously been identified in the local area, and then it is up to the user to check (or not check) the boxes associated with each taxon. If the taxon you need to add a record for is not listed, you can also add an existing or new taxon on this form, in the same way as for fish.

After adding algal data, the user has the option to add **Abiotic data** (optional) (see section 11.6), followed by **Adding Source reference for records** (see section 11.9).

Add Algae data for site A1NGOT-DINOK



Latitude -25.45528 Longitude 25.85377 Update Coordinate

Date

Owner Helen Dallas

Please select the Owner, if you are the data capturer and not the Owner

Broad Biotope: Not specified

Specific Biotope: Not specified

Substratum: Not specified

Sampling Method: Not specified

Sampling Effort: Not specified

Curation Process: Not specified

Site Image: Browse... No file selected.

Biomass

Indicators		Sampling details	Measurement	
Chl A	CHLA-B	Whole cobble		mg/m2
AFDM	AFDM-B	Whole cobble		mg/m2
Autotrophic Index (AI)				

Add Taxon | Add New Taxon

Taxa	Observed	Abundance: Species valve/frustule count
Achnanthidium	☐	0
Achnanthidium catenatum	☐	0
Achnanthidium eutrophilum	☐	0
Achnanthidium saprophilum	☐	0
Amphora montana	☐	0

Algal data form.

11.5 Adding anuran data

An anuran data upload form allows for the capture of anuran occurrence data as well as associated abundance, biotopes (broad, specific, substratum), sampling method and effort. Through this form, we hope to encourage collectors to also record abundance, biotope type, sampling method and effort so we developed the form with these capabilities.

Details as follows:

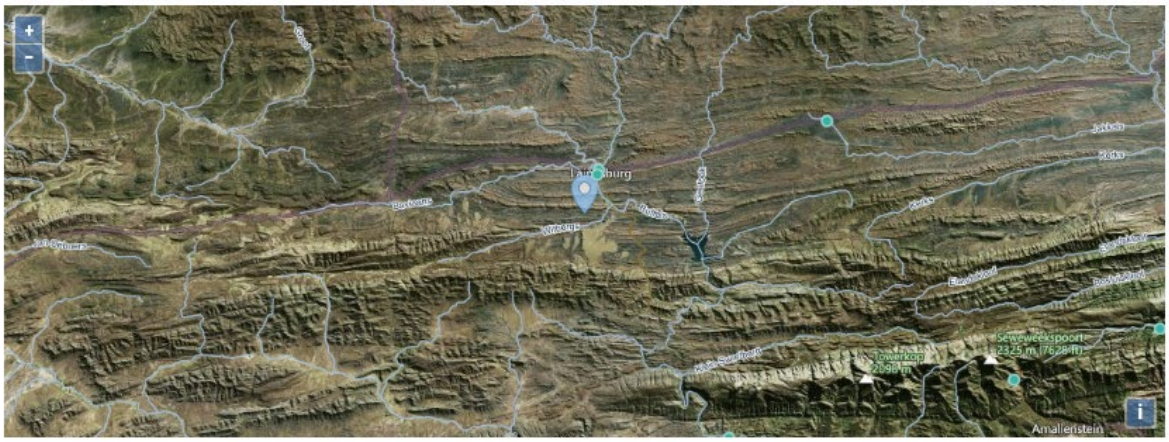
- Broad biotope: Unspecified, Mixed, Stones In Current, Stones Out Of Current, Marginal Vegetation, Aquatic Vegetation, Gravel/Sand/Mud
- Specific biotope: Unspecified, Mixed, Backwater, Bedrock, Cascade, Chute, Detritus, Pool, Rapid, Riffle, Run, Slackwater, Waterfall
- Substratum: Unspecified, Mixed, Bedrock, Boulder, Cobble, Detritus, Gravel, Pebble, Sand, Silt/Mud/Clay
- Sampling method: Unspecified, Electro-fishing, Hand net, Active acoustic survey, Passive acoustic survey, Baited trapping, Visual observation, Non-baited trapping, Photographic record
- Sampling effort measure: Time (min), Area (m^2), Replicates
- Abundance measure: Number, Percentage Abundance, Density (m^2)

We also added 'smart' logic that pre-populates the form with taxa that have previously been identified in the local area, and then it is up to the user to check (or not check) the boxes associated with each taxon. If the taxon you need to add a record for is not listed, you can also add an existing or new taxon on this form, in the same way as for fish.

After adding invertebrate data, the user has the option to add **Abiotic data** (optional) (see section 11.6), followed by **Adding Source reference for records** (see section 11.9).

About

ADD ANURA DATA FOR SITE J1WITB-00004



Latitude -33.24822049840331 Longitude 20.83763122558594 Update Coordinate

Date 09/02/2022

Owner Helen Dallas

Please select the Owner, if you are the data capturer and not the Owner

Broad Biotope: Unspecified

Specific Biotope: Unspecified

Substratum: Unspecified

Sampling Method: Active acoustic survey

Sampling Effort: Not specified

Record type: Acoustic record

Site Image: Browse... No file selected.

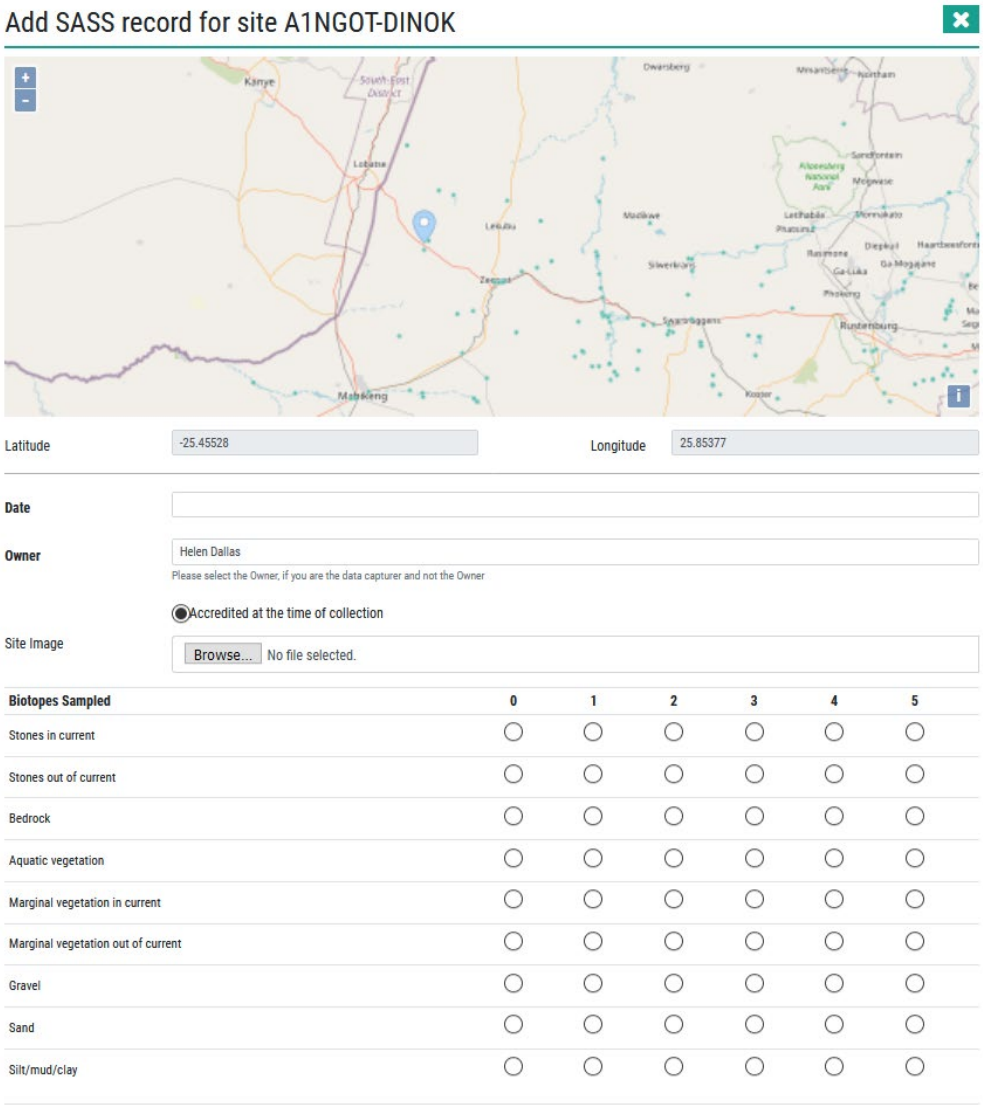
Add Taxon | Add New Taxon

Taxa	Observed	Abundance (Number)
Amietia delalandii	☐	0
Amietia fuscigula	☐	0
Amietia poyntoni	☐	0
Amietia vandijki	☐	0
Breviceps gibbosus	☐	0

11.6 Adding SASS data

A standard SASS data capture form, which is based on the field datasheet, facilitates the capture of SASS data. The form includes validation and is designed to streamline the process of digital capture of SASS data and also to reduce the possibility for errors when calculating SASS metrics. All standard SASS sampling protocols have been included such as rating biotopes and adding abundances for taxa per biotope. It will constrain user input to valid entries, to auto-calculate the SASS score for each taxon (with allowances for overriding of abundances at site level where appropriate) and will auto-calculate the overall SASS, Number of Taxa and ASPT for the survey. The owner is the person who undertook the SASS assessment, and if accredited at the time, it should be recorded.

After adding SASS data, the user has the option to add **Abiotic data** (optional) (see section 11.6), followed by **Adding Source reference for records** (see section 11.9).



SASS data form – Part 1.

Taxa		Stones	Vegetation	Gravel, sand, mud	Site
PORIFERA	PORIFERA				
COELENTERATA	COELENTERATA				
PLATYHELMINTHES	TURBELLARIA				
ANNELIDA	OLIGOCHAETA				
	HIRUDINEA				
CRUSTACEA	AMPHIPODA				
	POTAMONAUTIDAE				
	ATYIDAE				
	PALAEMONIDAE				
ARACHNIDA	HYDRACARINA				
PLECOPTERA	NOTONEMOURIDAE				
	PERLIDAE				
EPHEMEROPTERA	BAETIDAE 1 SP				
	BAETIDAE 2 SP				
	BAETIDAE > 2 SP				
	CAENIDAE				
	EPHEMERIDAE				
	HEPTAGENIIDAE				
	LEPTOPHLEBIIDAE				
	OLIGONEURIDAE				
	POLYMITARCYIDAE				
	PROSOPISTOMATIDAE				
	TELOGANODIDAE				
	TRICORYTHIDAE				
ODONATA	CALOPTERYGIDAE				
	CHLOROCYPHIDAE				
	SYNLESTIDAE/CHLOROLESTIDAE				
	COENAGRIONIDAE				
	LESTIDAE				
	PLATYCNEMIDAE				
	PROTONEURIDAE				
	AESHNIDAE				
	CORDULIIDAE				
	GOMPHIDAE				
	LIBELLULIDAE				
LEPIDOPTERA	CRAMBIDAE (PYRALIDAE)				
	BELOSTOMATIDAE				
HEMIPTERA	CORIXIDAE				
	GERRIDAE				
	HYDROMETRIDAE				
	NAUCORIDAE				
	NEPIDAE				
	NOTONECTIDAE				
	PLEIDAE				
	VELIIDAE/MESOVELIIDAE				
MEGALOPTERA	CORYDALIDAE				
	SIALIDAE				
TRICHOPTERA	DIPSEUDOPSIDAE				
	ECNOMIDAE				
	HYDROPSYCHIDAE 1 SP				
	HYDROPSYCHIDAE 2 SP				
	HYDROPSYCHIDAE > 2 SP				
	PHILOPOTAMIDAE				
	POLYCENTROPODIDAE				
	PSYCHOMYIIDAE/XIPHOCENTRONIDAE				
	BARBAROCHTHONIDAE				

SASS data form – Part 2.

	CALAMOCERATIDAE				
	GLOSSOSOMATIDAE				
	HYDROPTILIDAE				
	HYDROSALPINGIDAE				
	LEPIDOSTOMATIDAE				
	LEPTOCERIDAE				
	PETROTHRINCIDAE				
	PISULIIDAE				
	SERICOSTOMATIDAE				
COLEOPTERA	DYTISCIDAE/NOTERIDAE				
	ELMIDAE/DRYOPIDAE				
	GYRINIDAE				
	HALIPLIDAE				
	SCIRTIDAE				
	HYDRAENIDAE				
	HYDROPHILIDAE				
	LIMNICHIDAE				
	PSEPHENIDAE				
DIPTERA	ATHERICIDAE				
	BLEPHARICERIDAE				
	CERATOPOGONIDAE				
	CHIRONOMIDAE				
	CULICIDAE				
	DIXIDAE				
	EMPIDIDAE				
	EPHYDRIDAE				
	MUSCIDAE				
	PSYCHODIDAE				
	SIMULIIDAE				
	SYRPHIDAE				
	TABANIDAE				
	TIPULIDAE				
GASTROPODA	ANCYLIDAE				
	BULININAE				
	HYDROBIIDAE				
	LYMNAEIDAE				
	PHYSIDAE				
	PLANORBINAE				
	THIARIDAE				
	VIVIPARIDAE				
PELECYPODA	CORBICULIDAE				
	SPHAERIIDAE				
	UNIONIDAE				
SASS Score		0	0	0	0
Number of Taxa		0	0	0	0
ASPT		0.0	0.0	0.0	0.0

Other biota:

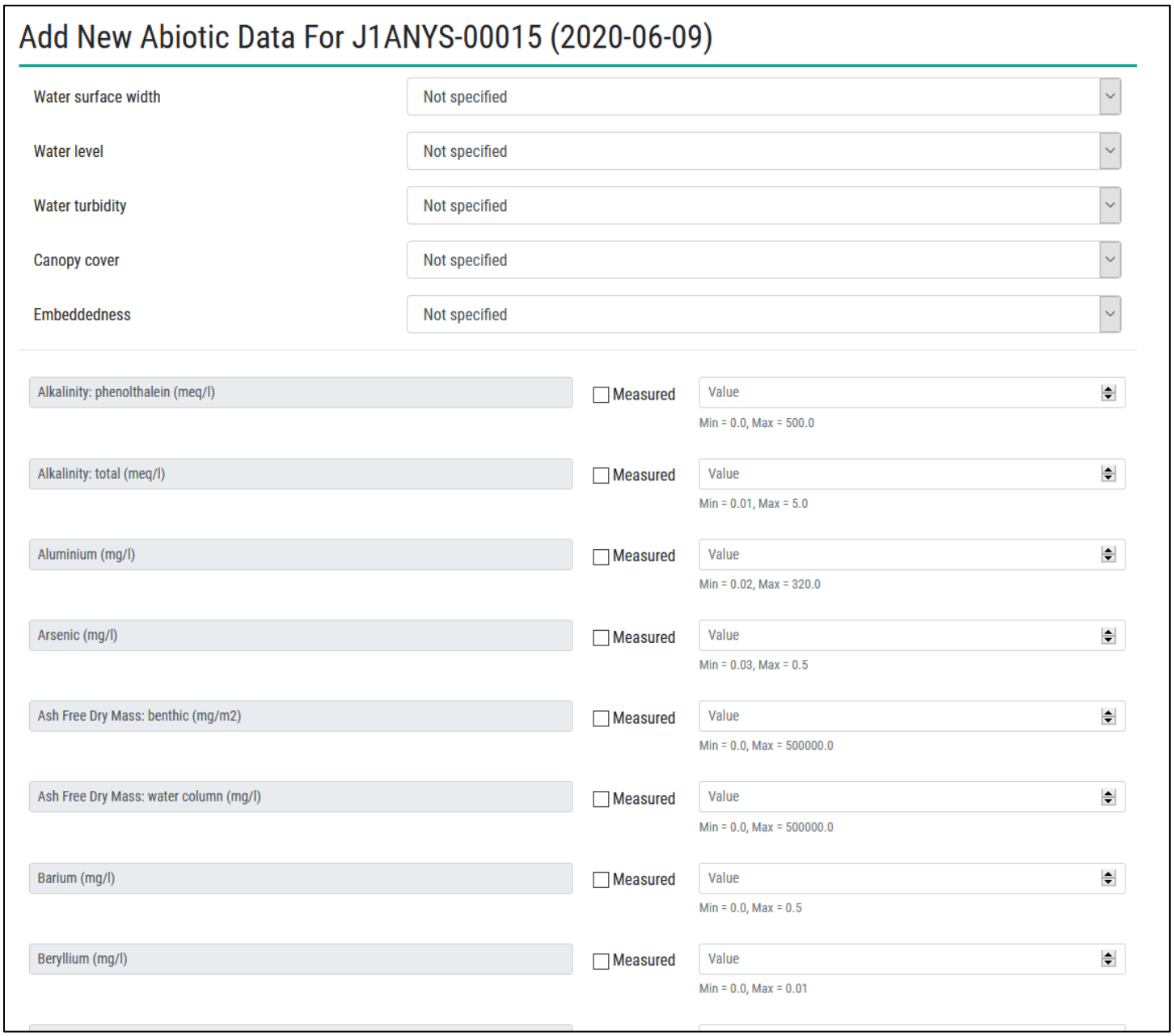
Comments/Observations:

☐ agree to these data being shared via the FBIS platform for visualisation and download by registered FBIS users

SASS data form – Part 3.

11.7 Adding abiotic data

Once occurrence or SASS data have been captured the user has the option to add associated abiotic data that was collected at the same time as the survey data. This is done using the **Add new abiotic data** form. Five variables have been categorised namely, water surface width, water level, water turbidity, canopy cover and embeddedness. The remaining variables are added by checking the **Measured** box and adding the value of each variable. Note all units have been standardised and users need to convert to these standard unit before capturing the data. Minimum and maximum values have also been included for data integrity checks.



Adding abiotic data.

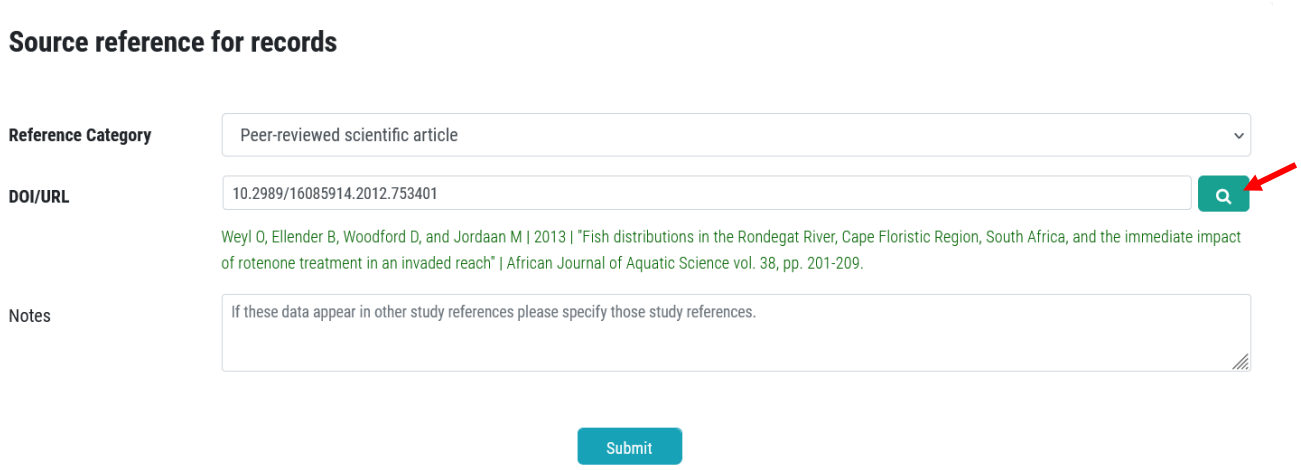
11.8 Adding Source reference for records

All data added to FBIS needs metadata associated with it. The user needs to select the Reference category, and then follow the relevant upload form to add the details of the database, DOI, report / thesis details, and URL or PDF.

Adding the source reference for the records.

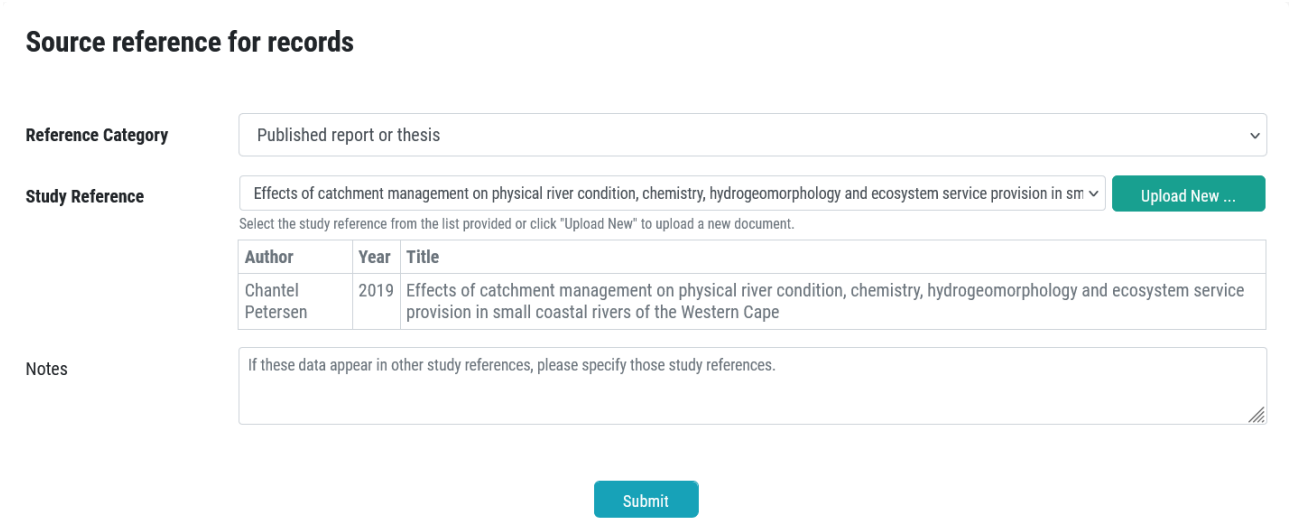
Peer-reviewed scientific articles

Select the reference category and insert the DOI or URL and click the search button. The citation is then retrieved via an online citation management system and inserted. Click Submit to save.

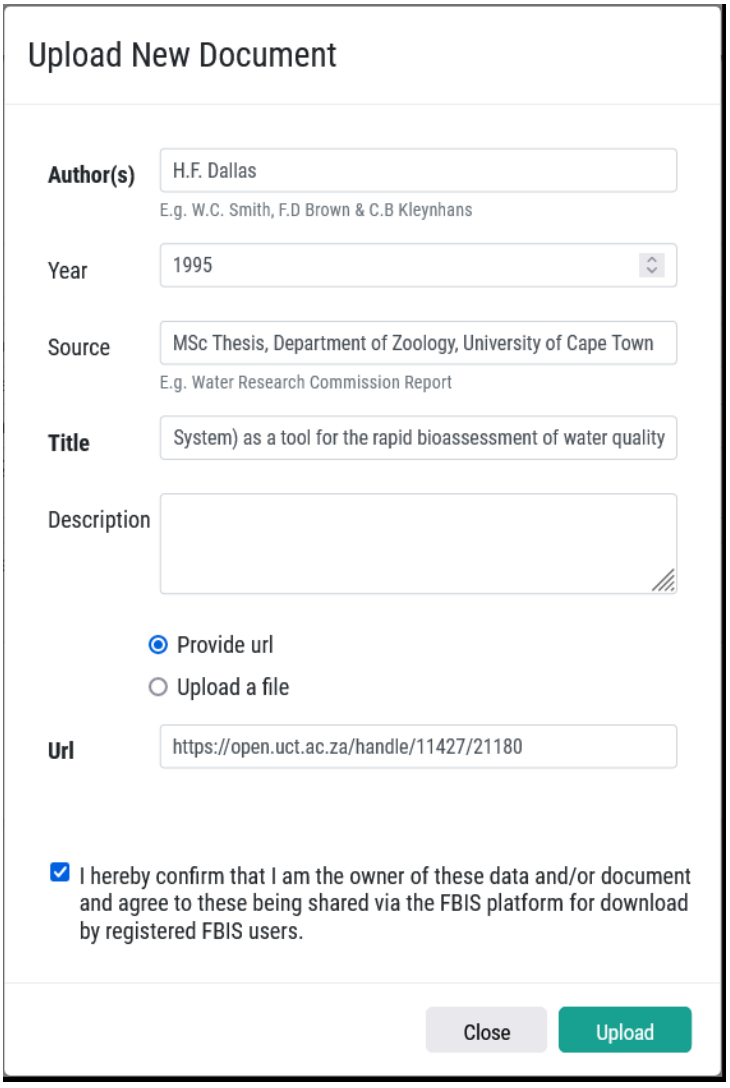


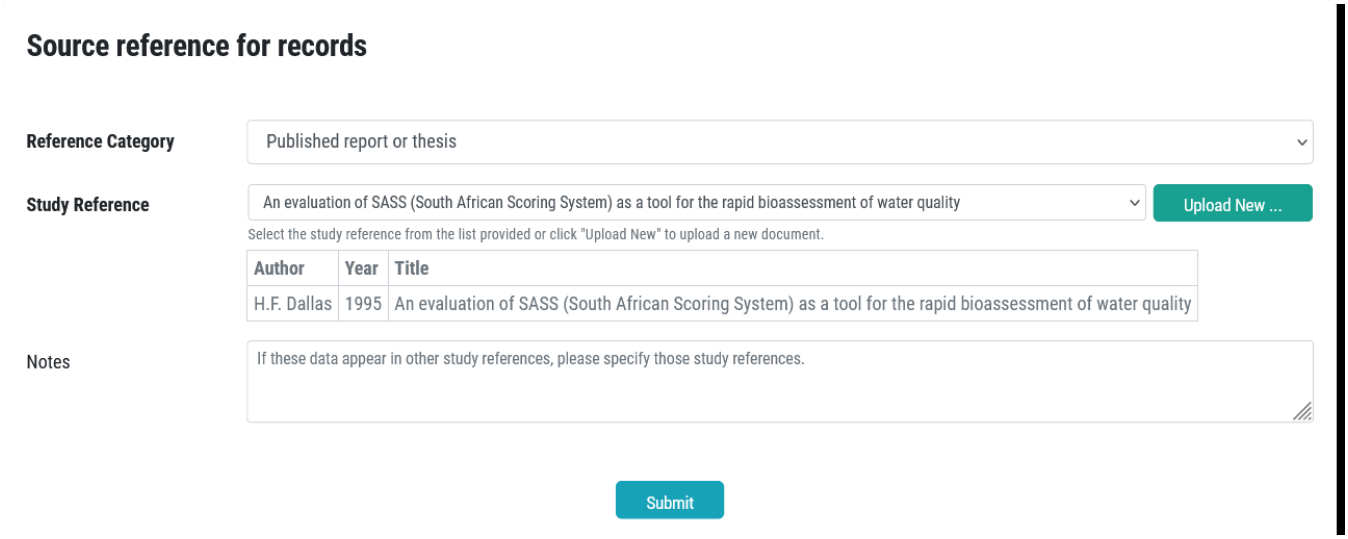
Published reports and theses

Select the reference category and select from the dropdown list of titles, if the published report or thesis is already uploaded, or select “Upload new” to add a new published report or thesis.



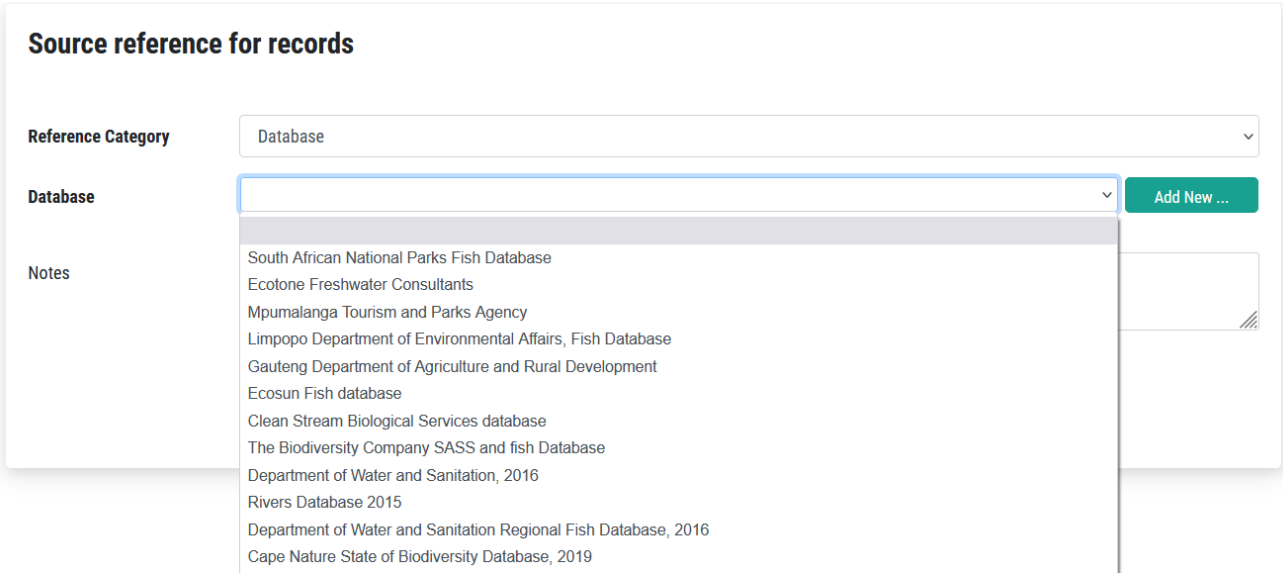
When uploading a new published report or thesis, complete the fields using the format indicated including Author(s), Year, Source, Title, Description (if desired) and Url or upload file. Confirm that you are owner of the document being added and Upload. This is then submitted.



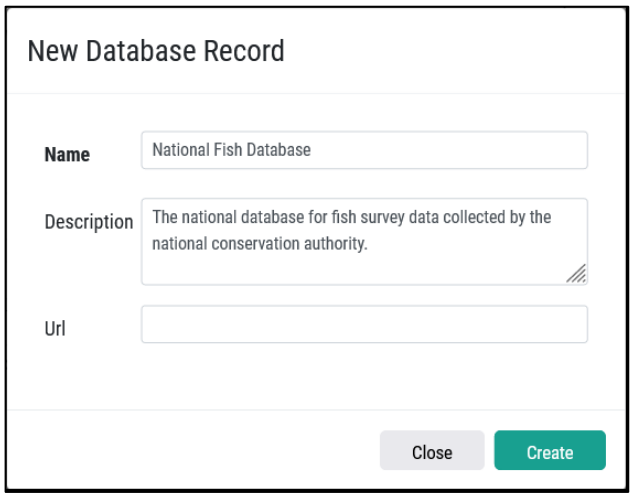


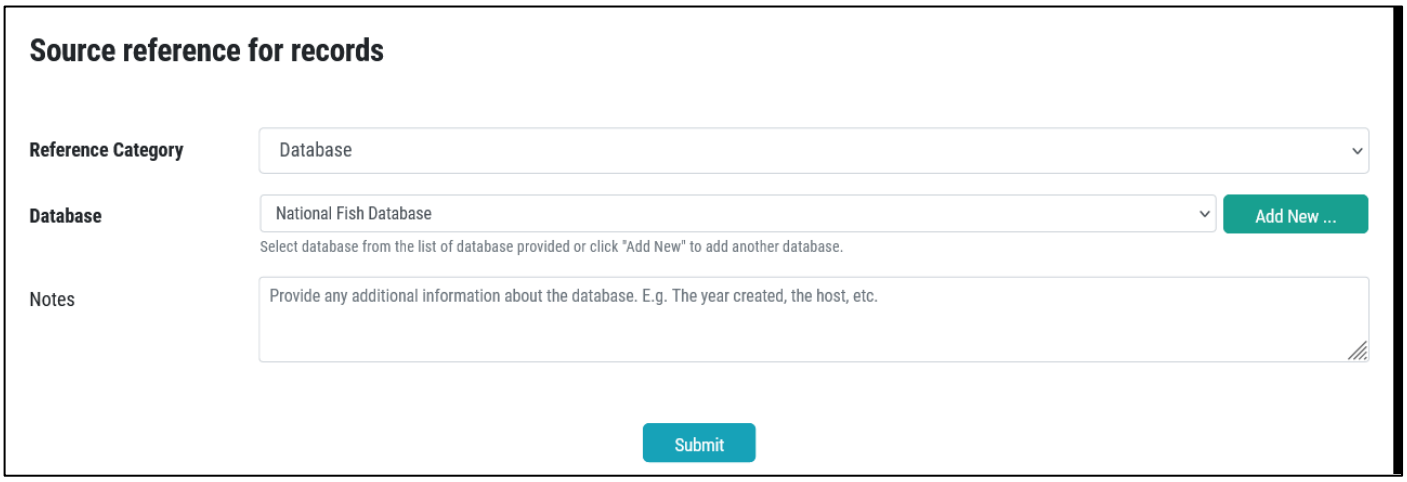
Databases

Select the reference category and select from the dropdown list of database, if the database already is already created, or select “Add new” to add a new database.



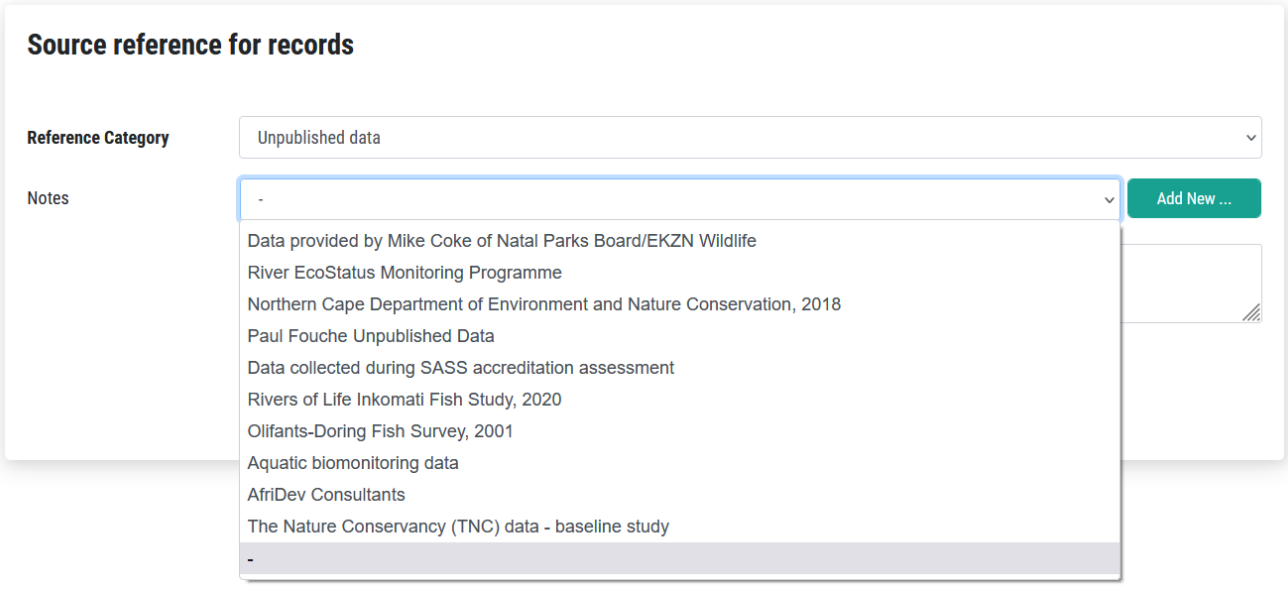
When adding a new database, complete the name and provide a description. Add the url if it exists and click create. Add notes if desired.

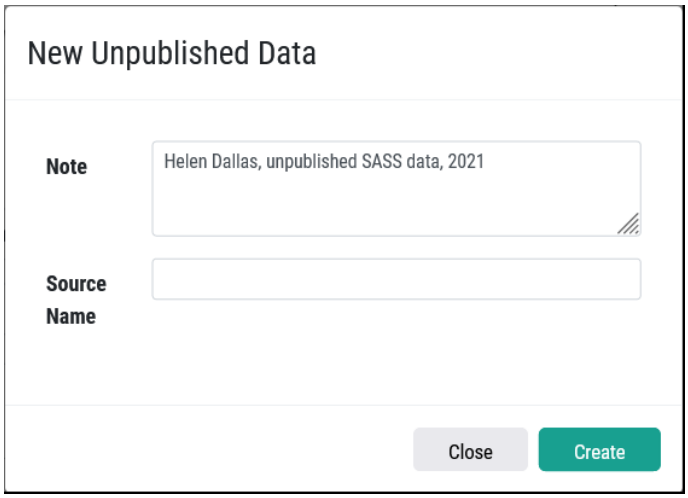




Unpublished data

Select the reference category and select from the dropdown list under notes. If the unpublished dataset exists, select the unpublished dataset name, or if the unpublished dataset needs to be created, select “Add new” to add a new unpublished dataset. In the notes, add the name of the person, details of the study and date if possible or applicable.

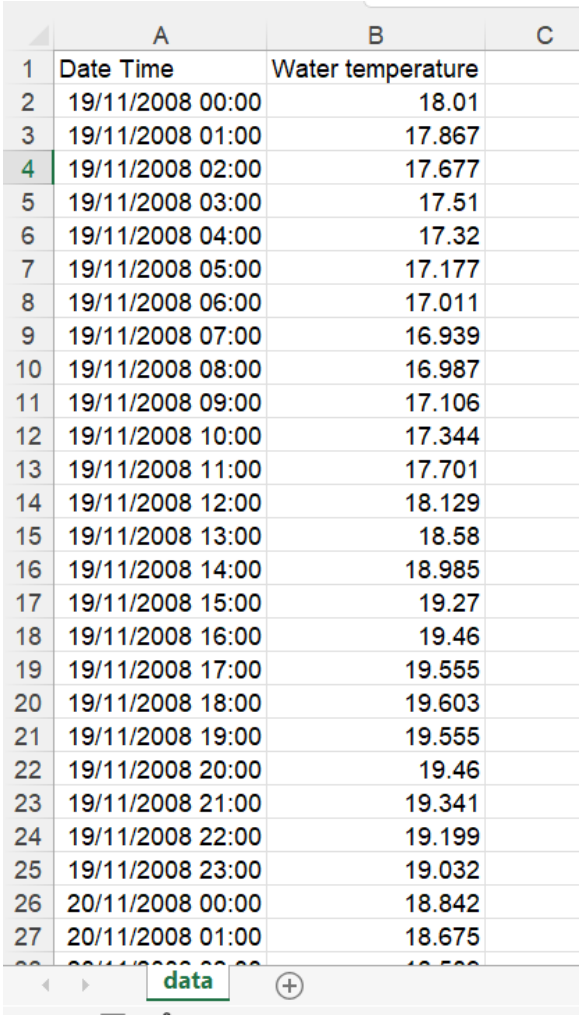

Source reference for records
Reference Category
Unpublished data
Notes
-
Add New ...
Data provided by Mike Coke of Natal Parks Board/EKZN Wildlife
River EcoStatus Monitoring Programme
Northern Cape Department of Environment and Nature Conservation, 2018
Paul Fouche Unpublished Data
Data collected during SASS accreditation assessment
Rivers of Life Inkomati Fish Study, 2020
Olifants-Doring Fish Survey, 2001
Aquatic biomonitoring data
AfriDev Consultants
The Nature Conservancy (TNC) data - baseline study
-


New Unpublished Data
Note
Helen Dallas, unpublished SASS data, 2021
Source Name
Close
Create

11.9 Adding water temperature data

A data capture form has been added for uploading water temperature time series data. The user needs to follow the following steps:

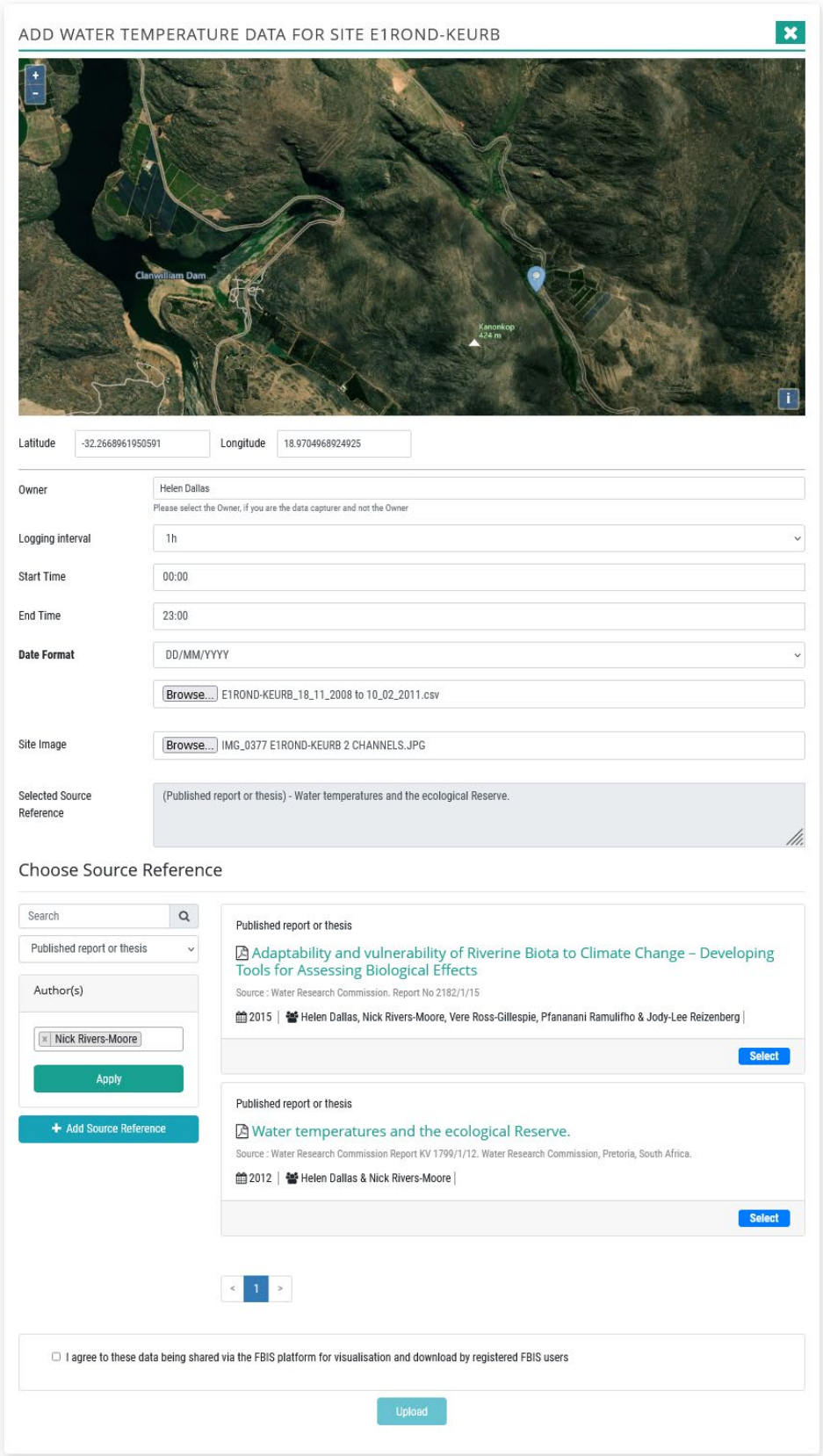
- Select the Owner if not the logged in owner
- Select the logging interval (0.5h, 1h, 2h, 3h, 24h)
- Start time and end time
- Date format
- Upload file as a csv, with the following column headers: Date Time; Water temperature (see excel sheet below)
- Add site image
- Select Source Reference by using search filter and selecting.
- Click "I agree to these data being shared via the FBIS platform for visualisation and download by registered FBIS users" and Submit



	A	B	C
1	Date Time	Water temperature	
2	19/11/2008 00:00	18.01	
3	19/11/2008 01:00	17.867	
4	19/11/2008 02:00	17.677	
5	19/11/2008 03:00	17.51	
6	19/11/2008 04:00	17.32	
7	19/11/2008 05:00	17.177	
8	19/11/2008 06:00	17.011	
9	19/11/2008 07:00	16.939	
10	19/11/2008 08:00	16.987	
11	19/11/2008 09:00	17.106	
12	19/11/2008 10:00	17.344	
13	19/11/2008 11:00	17.701	
14	19/11/2008 12:00	18.129	
15	19/11/2008 13:00	18.58	
16	19/11/2008 14:00	18.985	
17	19/11/2008 15:00	19.27	
18	19/11/2008 16:00	19.46	
19	19/11/2008 17:00	19.555	
20	19/11/2008 18:00	19.603	
21	19/11/2008 19:00	19.555	
22	19/11/2008 20:00	19.46	
23	19/11/2008 21:00	19.341	
24	19/11/2008 22:00	19.199	
25	19/11/2008 23:00	19.032	
26	20/11/2008 00:00	18.842	
27	20/11/2008 01:00	18.675	

data

Format of excel file for preparing water temperature data.

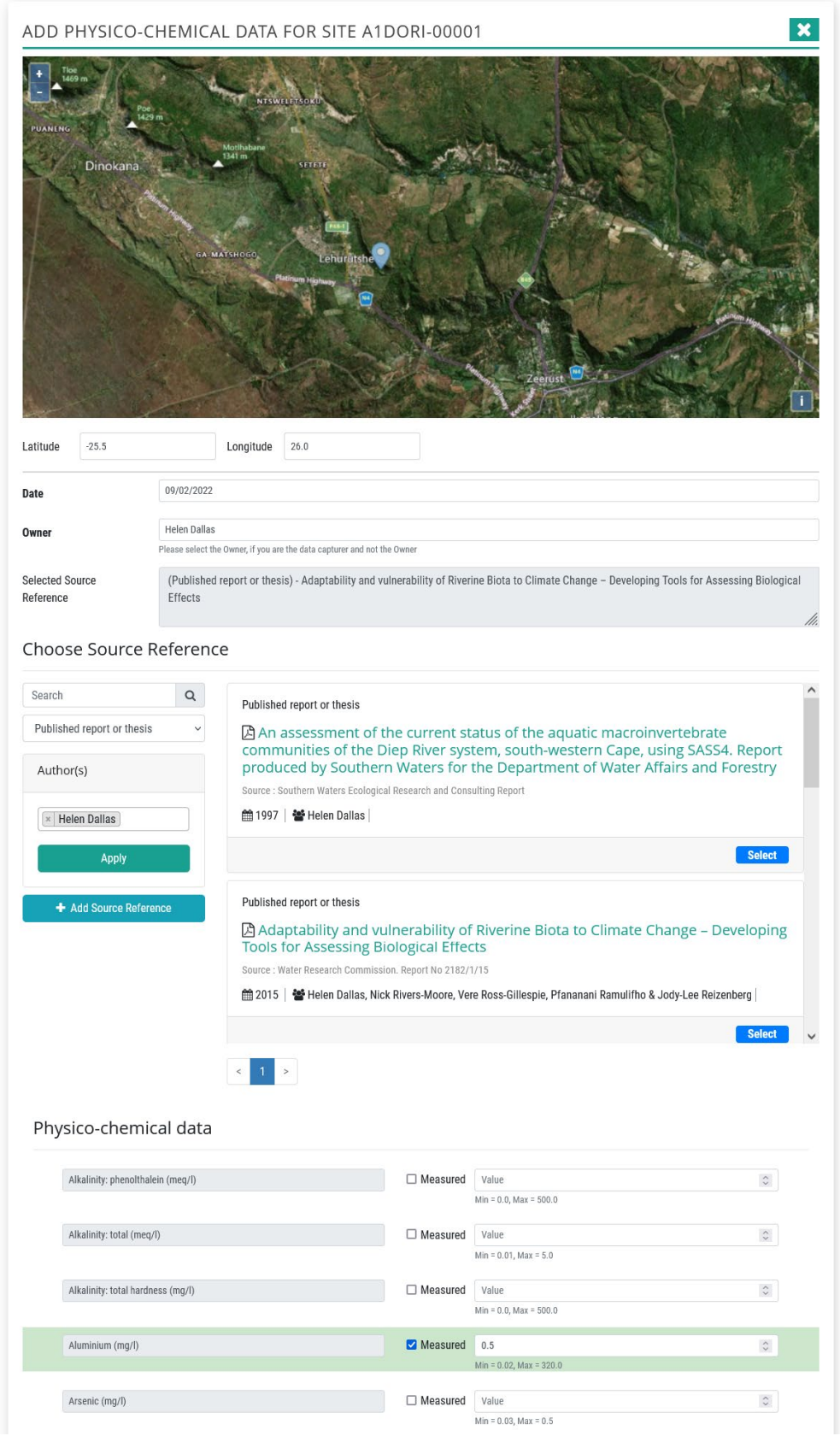


Adding water temperature data.

11.10 Adding physico-chemical data

A data capture form has been added for uploading physic-chemical data. The user needs to follow the following steps:

- Select the Date
- Select the Owner
- Select Source Reference by using search filter and selecting.
- Add specific variables by checking the **Measured** box and adding the value of each variable. Note all units have been standardised and users need to convert to these standard unit before capturing the data. Minimum and maximum values have also been included for data integrity checks.
- Click “I agree to these data being shared via the FBIS platform for visualisation and download by registered FBIS users” and Submit



Adding physico-chemical data.

12 References

Dallas HF, Janssens MP & Day JA. 1999. An aquatic macroinvertebrate and chemical database for riverine ecosystems. Water SA 25 (1): 1-8.

Dallas HF and Rivers-Moore NA. 2019. Dallas HF and Rivers-Moore NA. 2019. Environmental water temperature guidelines for perennial rivers in South Africa. Volume 2: A technical manual for setting water temperature targets. Water Research Commission Report no. TT 799/2/19. Water Research Commission, Pretoria, South Africa.

Dallas HF and Rivers-Moore NA. 2022. A protocol and tools for setting environmental water temperature guidelines for perennial rivers in South Africa. African Journal of Aquatic Science. DOI: 10.2989/16085914.2021.1982673

River Health Programme. 2007. Rivers Database. Department of Water Affairs and Forestry, Pretoria, South Africa.

Rivers-Moore NA, Dallas HF & Morris C. 2013a. Towards setting environmental water temperature guidelines: A South African example. Journal of Environmental Management 128: 380-392.