



NextGIS Web documentation

Release 3.1

NextGIS team

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CONTENTS

INTRODUCTION

This document is a user manual for a **NextGIS Web** version 3.0 Web GIS. The manual covers general information about the software installation, configuration and usage, description of administrator interface, and an overview of basic user and administrator tasks.

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QUICKSTART TUTORIAL

2.1 Quickstart tutorial for advanced users

NextGIS Web - is a server *geographical information system* (GIS (geographical information system)), which allows to store and to edit geodata and to display maps in web browser. Also NextGIS Web can share *geodata* with other NextGIS software.

NextGIS Web has the following features:

- Create and display maps in web browser (unlimited number of maps with different layers and styles)
- Flexible access management
- Geodata could be loaded from *PostGIS* or imported from files in GIS formats: *ESRI Shape*, *GeoJSON*, *GeoTIFF*, *GeoPackage* and many others.
- Vector data could be downloaded in the following formats: *GeoJSON*, *CSV*, *ESRI Shape*, *DXF*, *Mapinfo TAB*, *MIF/MID*, *GeoPackage*.
- Map styles could be imported from *QGIS* project or could be set manually
- Act as a server for *TMS*, *WMS*, *WFS*
- Act as a client for *TMS* and *WMS*
- User can *add photos to records* (page ??), *change records attributes* (page ??), *with a support for a WFS-T protocol for editing* (page ??).
- Listed features are available through a REST API from external software

System requirements listed in **`section [http://docs.nextgis.com/docs_ngweb/source/genera hardware`](http://docs.nextgis.com/docs_ngweb/source/genera hardware)**.

2.2 Integration with other NextGIS software

To manage geodata in NextGIS Web you can use the specialized plugin for NextGIS QGIS - [NextGIS Connect](#)¹.

Use the specialized NextGIS Knnekt module to manage geodata in NextGIS Web.

This software simplifies batch processing of data in NextGIS Web.

Mobile application [NextGIS Mobile](#)² allow to upload geodata collected in the field directly to Web GIS in online or offline mode.

Several mobile devices could see data changes in a single layer.

2.3 Map creation

To create a vector layer from *ESRI Shape* follow these steps:

1. Compress a shapefile to a zip-archive
2. Create a vector layer using a zip-archive through administrator interface
3. Add a style to newly created vector layer

To create a vector layer from *GeoJSON* follow these steps:

1. Create a vector layer from GeoJSON file through administrator interface
2. Add a style to newly created vector layer

To create a vector layer from *PostGIS* follow these steps:

1. Add a PostGIS connection (user login and password are required for access to database)
2. Add layers using created connection
3. Create styles for added layers

To create a raster layer follow these steps:

1. Prepare a raster file meeting the requirements
2. Create a raster layer from a raster file
3. Add a style to raster layer

After layers are loaded they should be added to a web map in web map properties page. Then a link to web map could be opened in a web browser.

¹ https://docs.nextgis.com/docs_ngconnect/source/toc.html

² http://docs.nextgis.ru/docs_ngmobile/source/intro.html

GENERAL INFORMATION

NextGIS Web is a web mapping application designed to store, manage access and visualize geographic data.

NextGIS Web is *open source* software. NextGIS Web supports Open Geospatial Consortium (OGC³) open data exchange protocols and meets the modern requirements for application architecture implemented on the basis of free software (*Open Source*).

NextGIS Web allows:

1. Creation and display of maps.
2. Map navigation (zooming, shifting).
3. Manage the map through web-interface.
4. Vector (*ESRI Shape*, *PostGIS* etc) and raster data import.
5. Use of standart protocols (*WMS*, *WFS-T*, *TMS*).
6. Manage access rights for layers, groups of layers, maps and other resources.
7. Interaction through API.

NextGIS Web has server and client sides.

Server side stores and renders geodata. It's written in Python using Pyramid framework. Client side is a user interface for interactive *geodata* management as maps and separate resources.

Client is written in JavaScript. System's configuration is stored in a PostgreSQL database with a *PostGIS* extension. Page markup for user interface is written using HTML. Style for user interface is added using cascading style sheets - CSS. Queries to databases use SQL language.

NextGIS Web is a modular system with several core modules and extensions. Extensions could be enabled or disabled at the application configuration step. NextGIS Web components communicate with each other using internal API methods.

NextGIS Web is designed to operate in Linux operating system environment (Debian-based distributives are recommended, e.g. Ubuntu Server). Read more in section *Recommended software versions* (page ??). NextGIS Web client-side works in all modern browsers. User interface with a published Web Map is shown on Fig. ??.

³ <http://www.opengeospatial.org/>

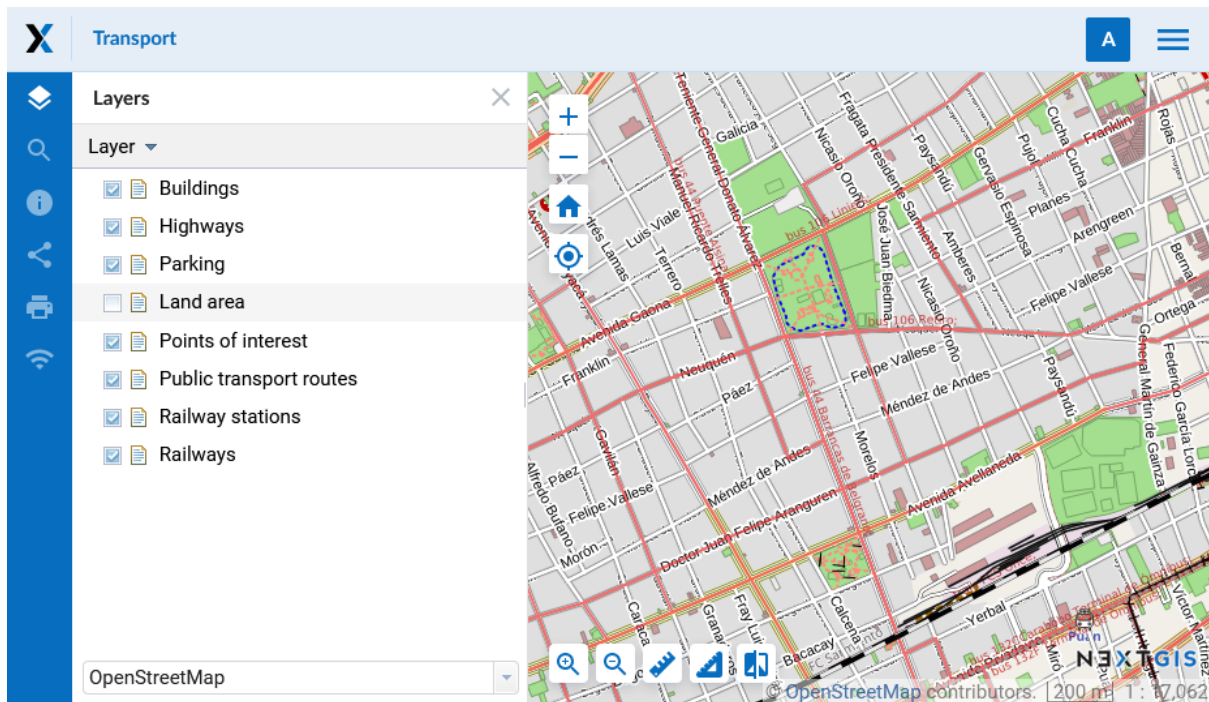


Fig. 3.1: User interface with a published Web Map

3.1 Key features of NextGIS Web

NextGIS Web has the following key features:

3.1.1 Data layers

- Creation of raster and vector layers and data upload for them using web interface.
- Creation of *WMS* and *TMS* layers and connections to existing services.
- Creation of *PostGIS* layers and connection to layers in external databases.
- A set of standard basemaps: OpenStreetMap and others from [QuickMapServices](https://www.quickmapservices.com/)⁴.
- WFS service.
- WMS service.
- Dictionary (with extension).
- File set.
- “Key-value” function, support for metadata.
- Export to various formats (see [full list here](https://docs.nextgis.com/docs_ngcom/source/data_export.html#how-to-export-data)⁵).

⁴ <https://qms.nextgis.com/>

⁵ https://docs.nextgis.com/docs_ngcom/source/data_export.html#how-to-export-data

3.1.2 Access management

- Detailed settings of access rights for each connected layer.
- Setting of access rights for resources and resource groups.

3.1.3 Rendering and symbology

- Symbology import from QGIS with automated conversion “for renderer”.
- Pluggable renderers: *MapServer*, *QGIS* (import a project from desktop software NextGIS QGIS with the same layers, styles etc.).
- Several symbology options for the single data layer.

3.1.4 Web Maps

- Own set of layers and layer tree management for each map.
- Reuse of the same layer representation in different maps.

3.1.5 User interface

- Layer tree.
- Layer groups.
- Navigation tools panel.
- Search by attributes.
- Bookmarks for fast access to some regions of the map.
- Layer description view.
- Feature table view for layer with fast switch between a table and a map.
- Annotations.

3.1.6 Editing

- Editing of feature attributes.
- Editing of layer description.
- Adding of photos and other attachments.
- Editing features with WFS-T.

3.2 Minimum hardware

Minimum hardware requirements for NextGIS Web software:

- 4 vCPU
- 8 Gb of RAM
- 250 Gb HDD (SSD would be much better)

3.3 Recommended software versions

- Ubuntu Server 20.04 LTS
- Python ≥ 3.8
- PostgreSQL ≥ 10
- PostGIS ≥ 2.5
- GDAL ≥ 3
- Node.js $\geq 14.x$
- Yarn $\geq 1.x$

Recommended browsers are:

- Google Chrome (version 94 or newer)
- Mozilla Firefox (version 91 or newer)
- Edge (version 94 or newer)
- Safari (version 14 or newer)

Microsoft Internet Explorer browser is not supported.

NextGIS Web would probably work with other versions, but this is not guaranteed.

ADMINISTRATOR INTERFACE (ADMIN CONSOLE)

4.1 Authorization

To open the admin console, open the Web GIS and press “Sign in” in the top right corner.

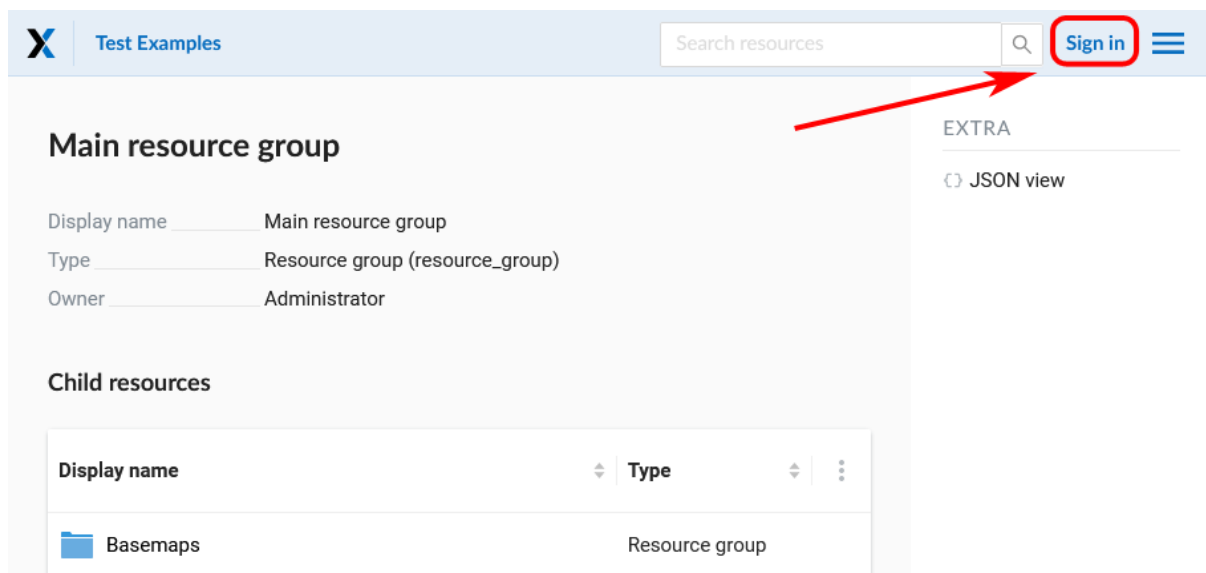


Fig. 4.1: Signing in from Web GIS main page

In the opened dialog press the blue button that reads **Sign in with NextGIS ID**. You will be redirected to my.nextgis.com authorization page. Enter your username or email you used for registration and your password.

After the authorization is completed successfully you will be redirected back to the Web GIS.

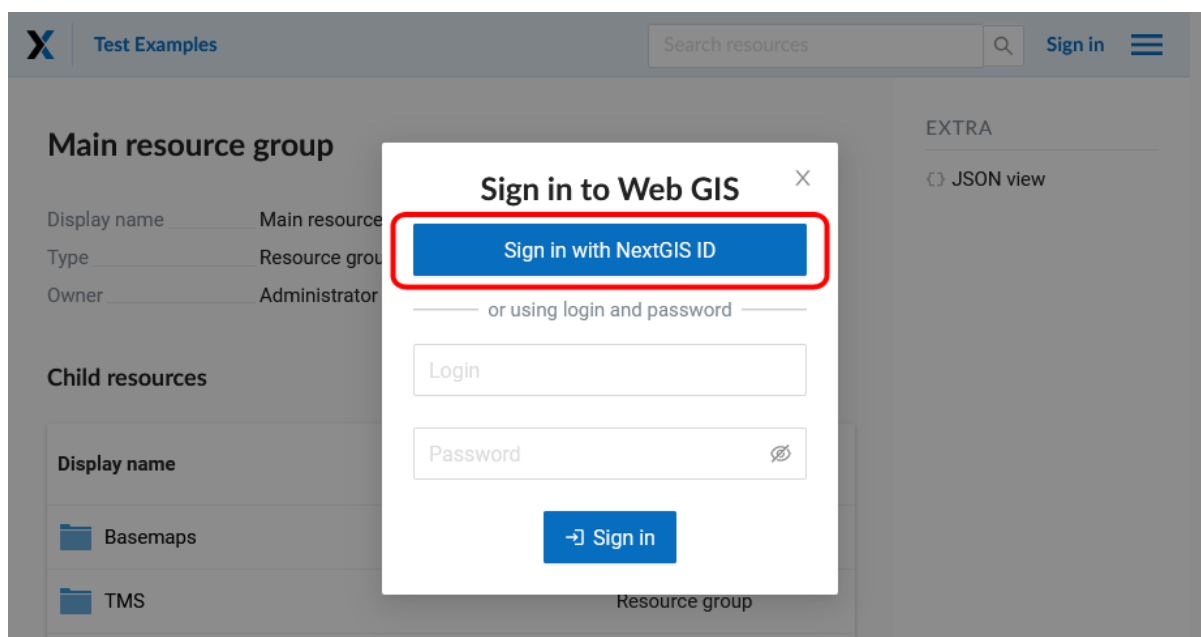


Fig. 4.2: Selecting sign-in via NextGIS


NEXTGIS


Sign in

Sign in

 or [Sign up](#) [Forgot password?](#)

Or sign in using social networks:

 Sign in with Google






Fig. 4.3: Signing in with NextGIS

4.2 Home page

After login to administrative interface the user is taken to the home page shown on Fig. ??

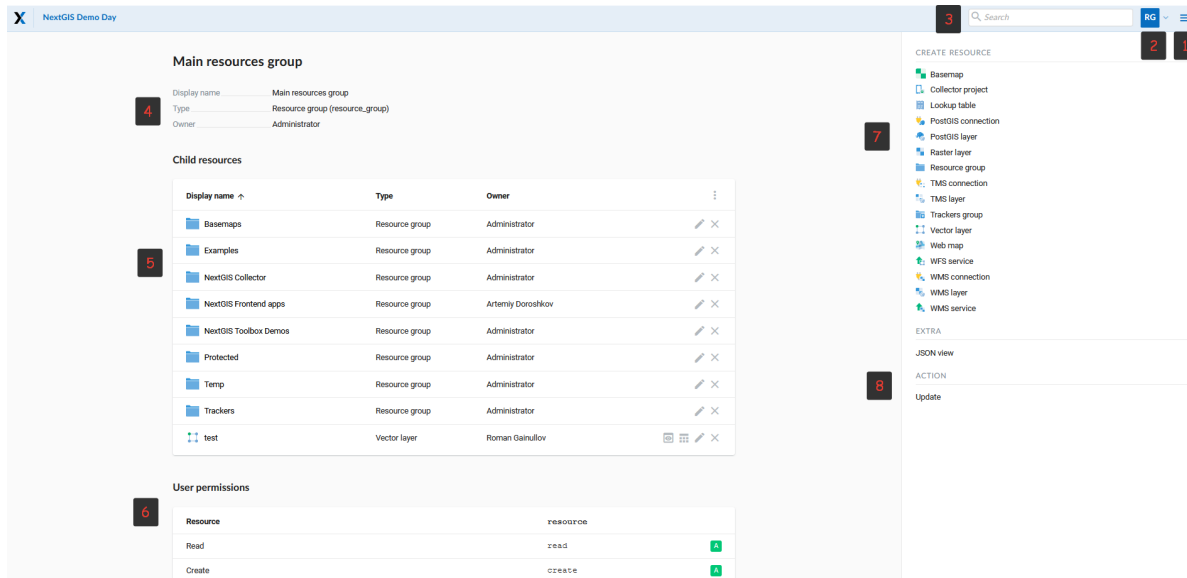


Fig. 4.4: Administrator interface home page

The numbers indicate: 1 - Main menu; 2 - User settings (Exit and Change language); 3 - Resource search bar in Web GIS 4 - Main resource group description; 5 - Child resources; 6 - User permissions for main resource group; 7 - Types of items that could be added to the main resource group; 8 - Actions that could be performed with main resource group

Home page includes a main menu pane, (see item 1 in Fig. ??) which has the following links (see Fig. ??):

- Resources
- Control Panel
- Help
- Account

Description pane (see item 4 in Fig. ??) displays a main group description (if available).

Child resources pane (see item 5 in Fig. ??) contains a list of all resources placed in a main group. In the form of a table, the parameters such as name, type and owner of the resource are available. At the same time there are buttons of different actions over resources (edit, delete, preview, open the attribute table).

User permissions pane (see item 6 in Fig. ??) displays list of permissions the current user granted for the current group. Green and red marks indicate that user has/don't have corresponding permission.

- A - allow
- D - deny
- M - mask (indirectly deny)

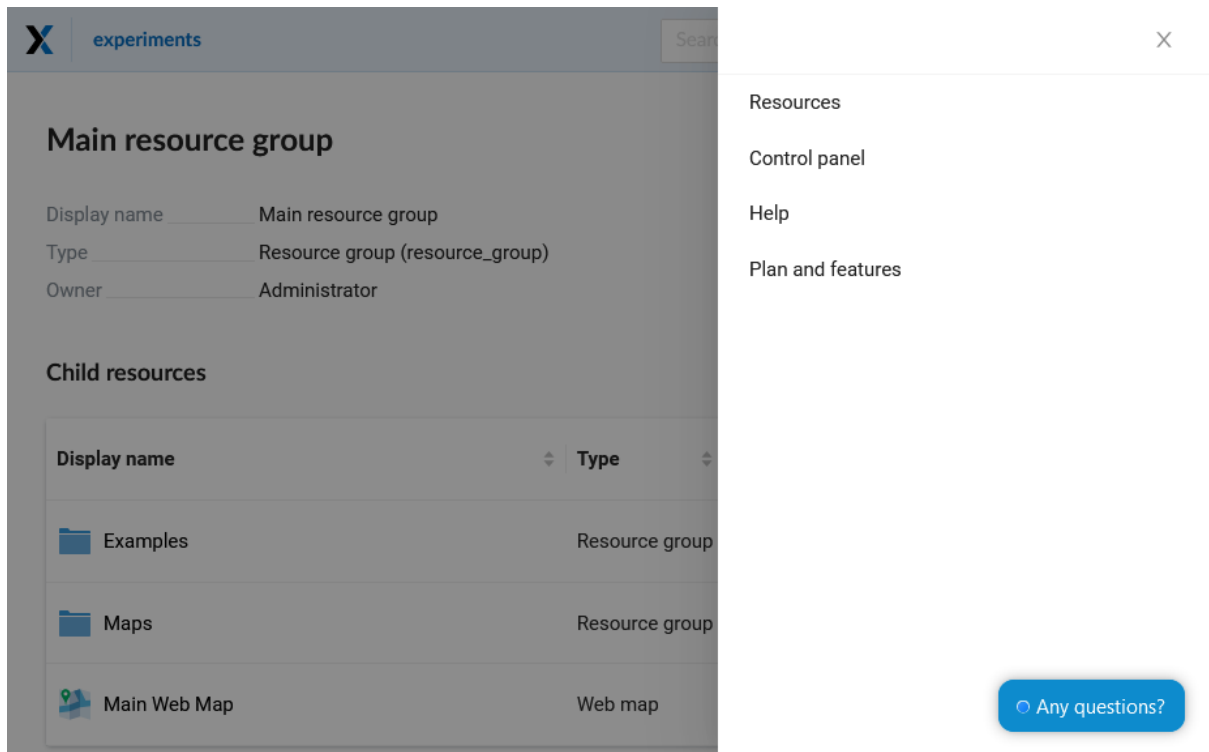


Fig. 4.5: Main menu in NextGIS Web

- E - empty (actually deny)

Possible permissions are the following:

- All
- Read
- View permissions
- Create
- Update (Edit)
- Delete
- Manage children
- Change permissions

Actions pane (see items 7 and 8 in Fig. ??) contains tools for adding data and executing operations with the root group.

In current version it is possible to add the following types of data:

- Basemap
- Collector project
- Lookup table
- PostGIS connection
- PostGIS layer
- Raster layer

- Resource group
- TMS connection
- TMS layer
- Trackers group
- Vector layer
- Web Map
- WFS service
- WMS connection
- WMS layer
- WMS service

Depending on your NGW version may also be connected:

- SVG marker library
- 3D model
- 3D scene
- 3D tileset

Possible operations are (see item 8 in Fig. ??):

- Update
- Delete

4.3 Control panel

NextGIS Web Control panel is available through the main menu (see item 1 in Fig. ??), where you need to select “Control panel” (see Fig. ??). It is presented on Fig. ??.

Control panel allows to execute the following actions:

- Manage NextGIS Web groups and users
- Display information about the system and storage
- Access cadaster services
- Create user accounts for Collector projects
- Set the name of your Web GIS
- Configure CORS
- Set CSS styles
- Specify NGW start page (home path)
- Set Logo (in the upper left corner)
- Customize a type of users who have permission to export data

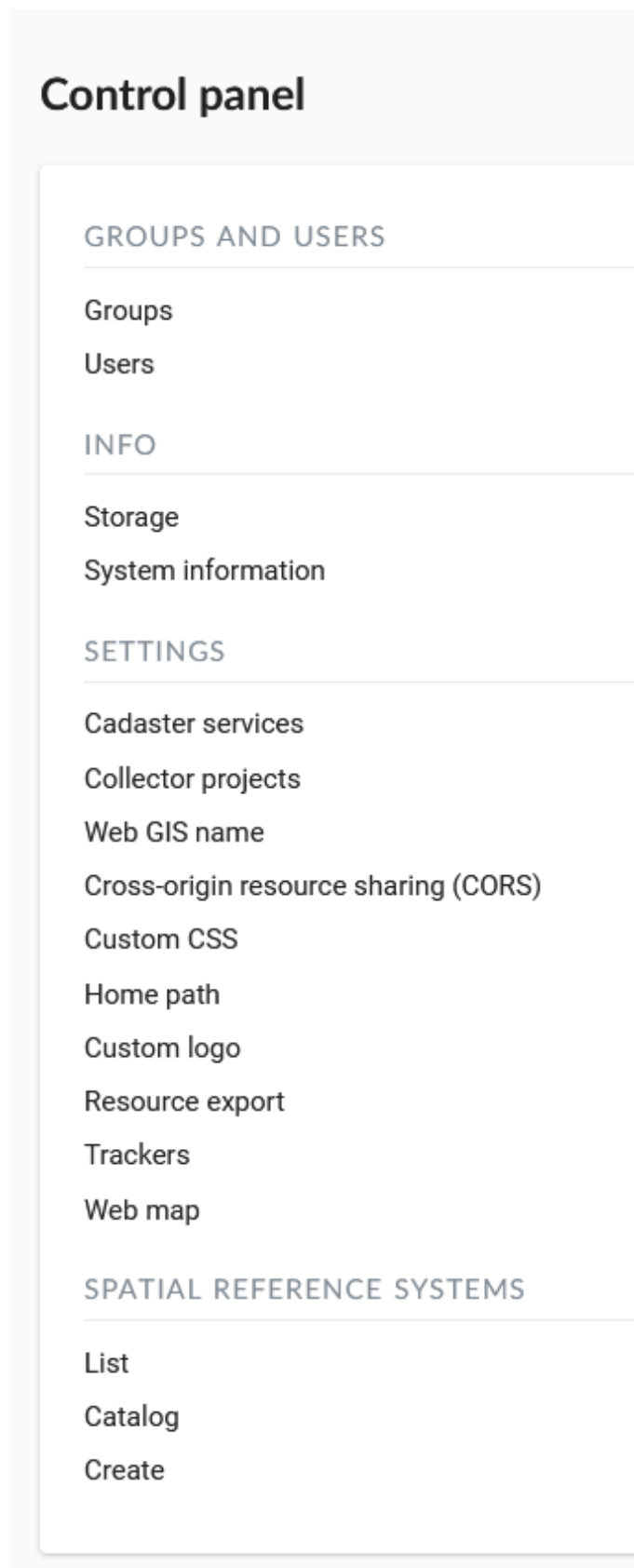


Fig. 4.6: Control panel

- Customize Tracking
- Customize Web Map
- Add spacial reference systems

For more information about creation of user groups and users and granting permissions see topic *Administrative tasks* (page ??).

4.4 Resource view

After login to administrative interface the user is taken to home page shown on Fig. ??.

Main resource group

Display name: Main resource group
 Type: Resource group (resource_group)
 Owner: Administrator

Child resources

Display name	Type	
Examples	Resource group	
Maps	Resource group	
Main Web Map	Web map	

User permissions

Resource	resource	
Read	read	
Create	create	

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer
- Web map
- WFS service
- WMS connection
- WMS layer
- WMS service

EXTRA

- JSON view

ACTION

- Update

Fig. 4.7: Resource groups

To open a resource group and view the contents, click on it in the child resource pane.

Resource parameters are displayed after a click on the name of the resource in the list. User is taken to a page containing properties, attributes, user permissions, a link for external access and a list of child resources if there are any (see Fig. ??).

Main resource group
Examples
Madison

Madison boundary

Display name

Madison boundary

SRS identifier

3857

Geometry type

Multipolygon

Feature count

1





Type

Vector layer (vector_layer)

Owner

Administrator


Child resources

Display name	Type	
 Madison boundary-style	QGIS style	  

External access

Use these links to plug data into external applications.

MVT Vector Tiles ⓘ

https://experiments.nextgis.com/api/component/feature_layer/mvt?resource=72&...


Attributes

Keyname	Type	Display name	Table
admin_leve	STRING	admin_leve	Yes

CREATE RESOURCE

 Form

 MapServer style

 QGIS style

EXTRA

 JSON view

 Preview

FEATURES

 Save as

 Table

ACTION

 Update

 Delete

Any questions?

Fig. 4.8: Vector layer parameters

4.5 Feature table

Some resources contain a set of features that can be viewed as a table. Press the “Table” icon opposite the resource name or select an action for a vector layer called “Table” in the features pane.

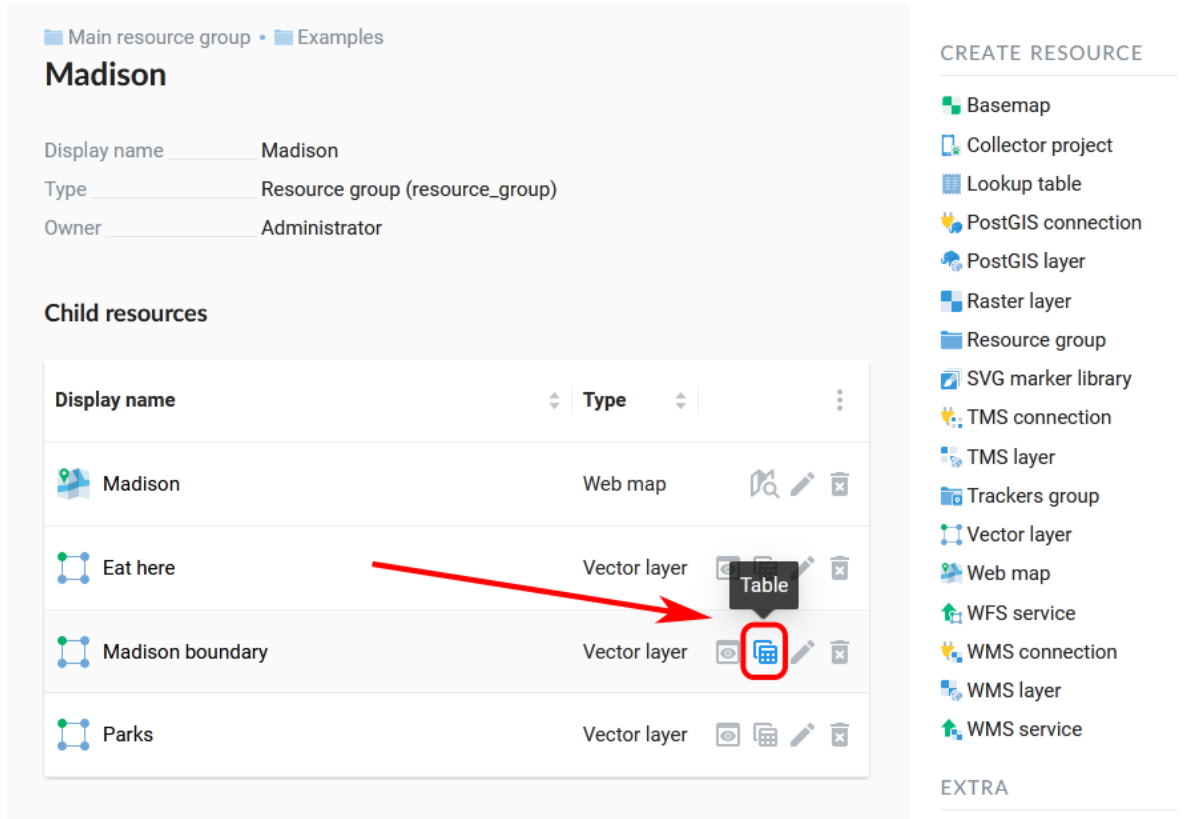


Fig. 4.9: Opening feature table from the resource list

Feature table allows to perform the following operations with a selected feature (see Fig. ??):

1. Open
2. Edit (in a new tab or in the same tab)
3. Delete
4. Save as (advanced or quick export available)
5. Use Search Box
6. Refresh the table
7. Open table settings

There is another way to open Feature table. In the administrative interface navigate to a child resource group where resource types are marked and find a resource with a type Web Map. Open it by clicking on the “Display” icon (see Fig. ??):

Alternatively, you can go to the resource page and click “Display” in the Web Map actions pane on the right.

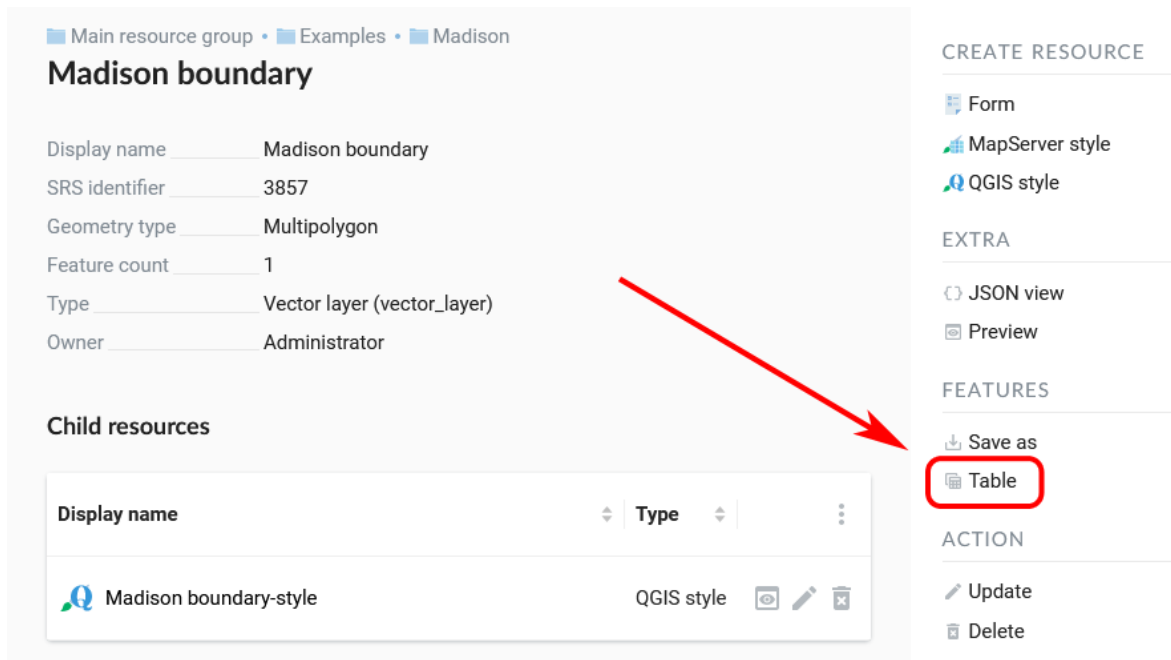


Fig. 4.10: Opening feature table from the resource page

Main resource group - Examples - Madison - Eat here

Feature table

#	Name	Type	OSM_TYPE	OSM_ID	orig_ogc_f
1	Franks Diner	restaurant	node	983946166	0
2	Subway	restaurant	node	851169236	1
3	Ponderosa Steakhouse	restaurant	node	851165824	2
4	Dock of DuBay Bar and Grill	restaurant	node	3886269582	3
5	Pizza Corral	restaurant	node	864278706	4
6	Starbucks	cafe	node	3892054366	5

Fig. 4.11: Actions for the selected feature in the feature table

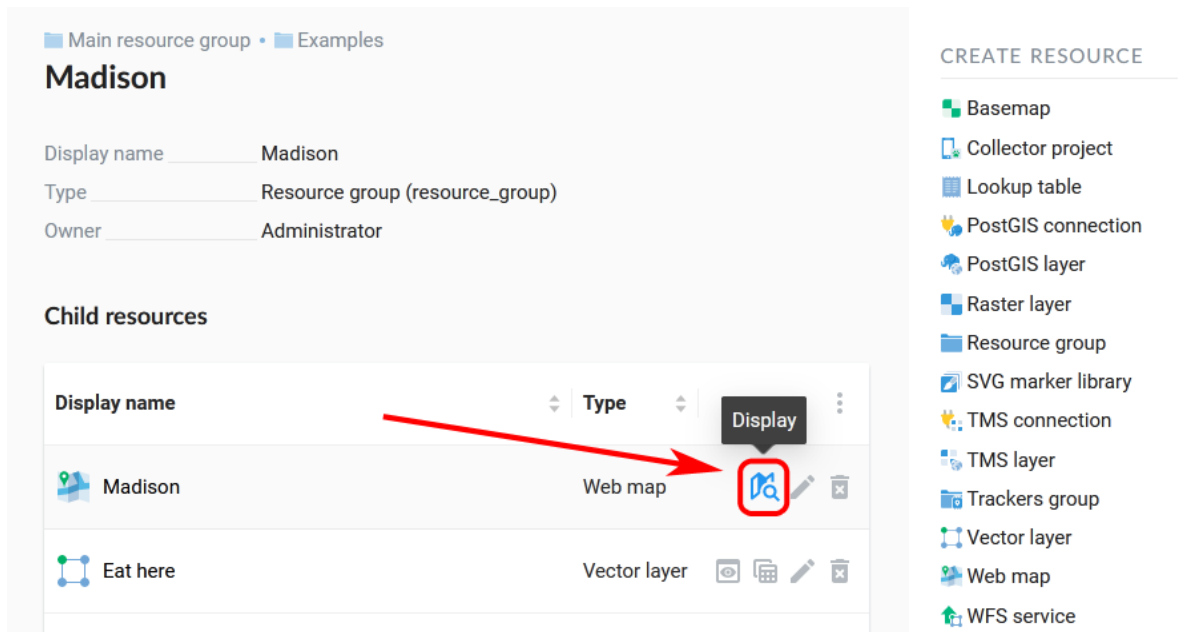


Fig. 4.12: Opening a Web Map from the list

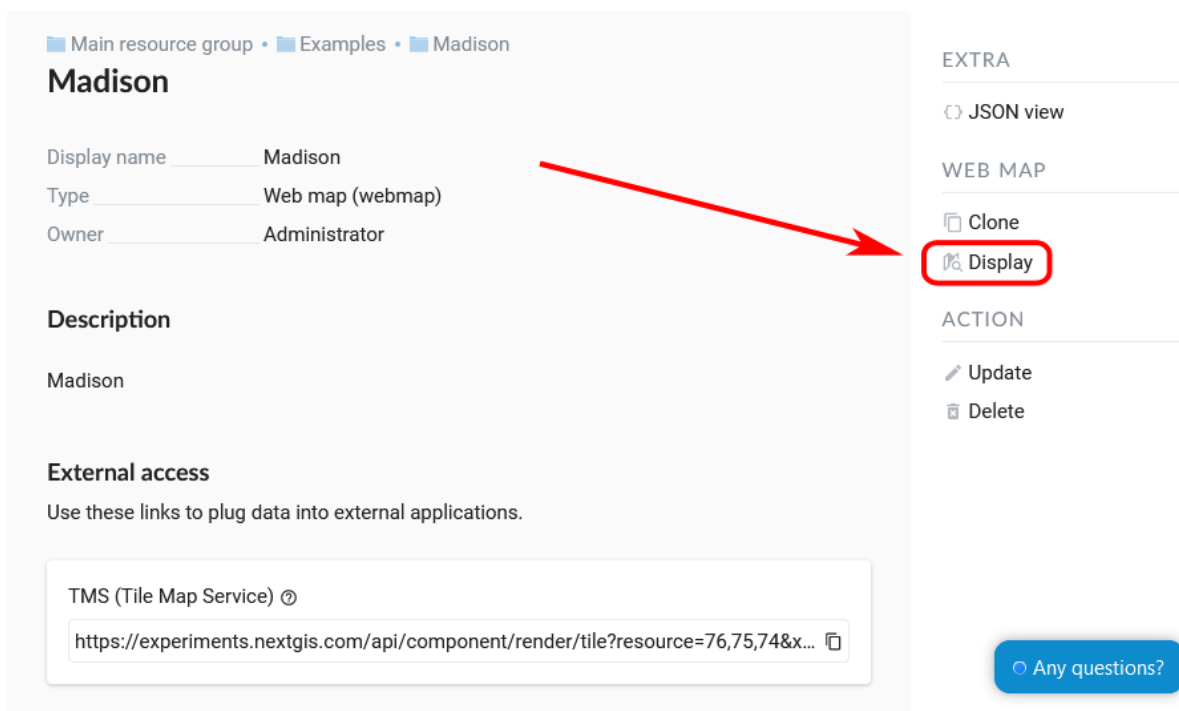


Fig. 4.13: Opening a Web Map from the resource page

A Web Map will be opened with a layer tree (left) and a map (right). To view a feature table select the required layer in layer tree and then select “Feature table” command in the Layer drop down menu at the top of layer tree Fig. ??:

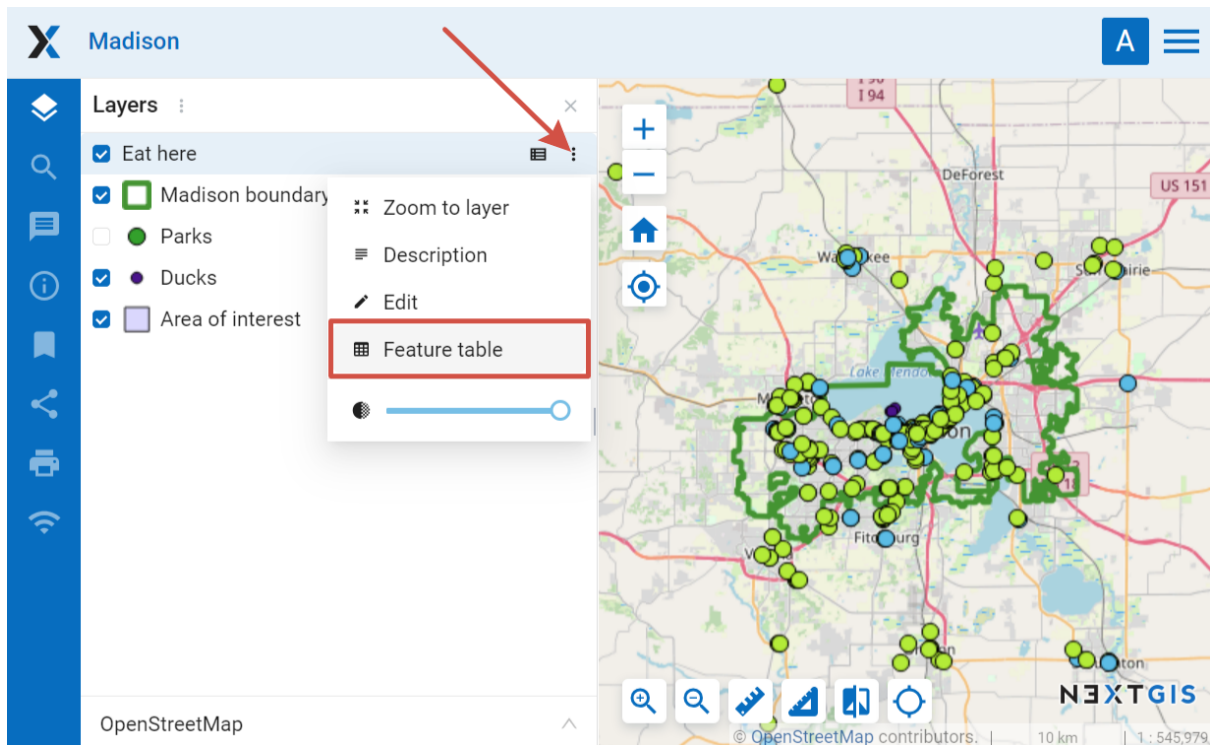


Fig. 4.14: Opening feature table from the map

A table will be displayed in a new tab. Table allows to perform the following operations with the selected feature Fig. ??:

1. Open in a new tab
2. Edit
3. Delete
4. Go to (after a click the selected feature will be displayed on the map)
5. Save as (advanced or quick export available)
6. Zoom to filtered features
7. Filter features by area 5. Use Search Box 6. Refresh the table 7. Open table settings

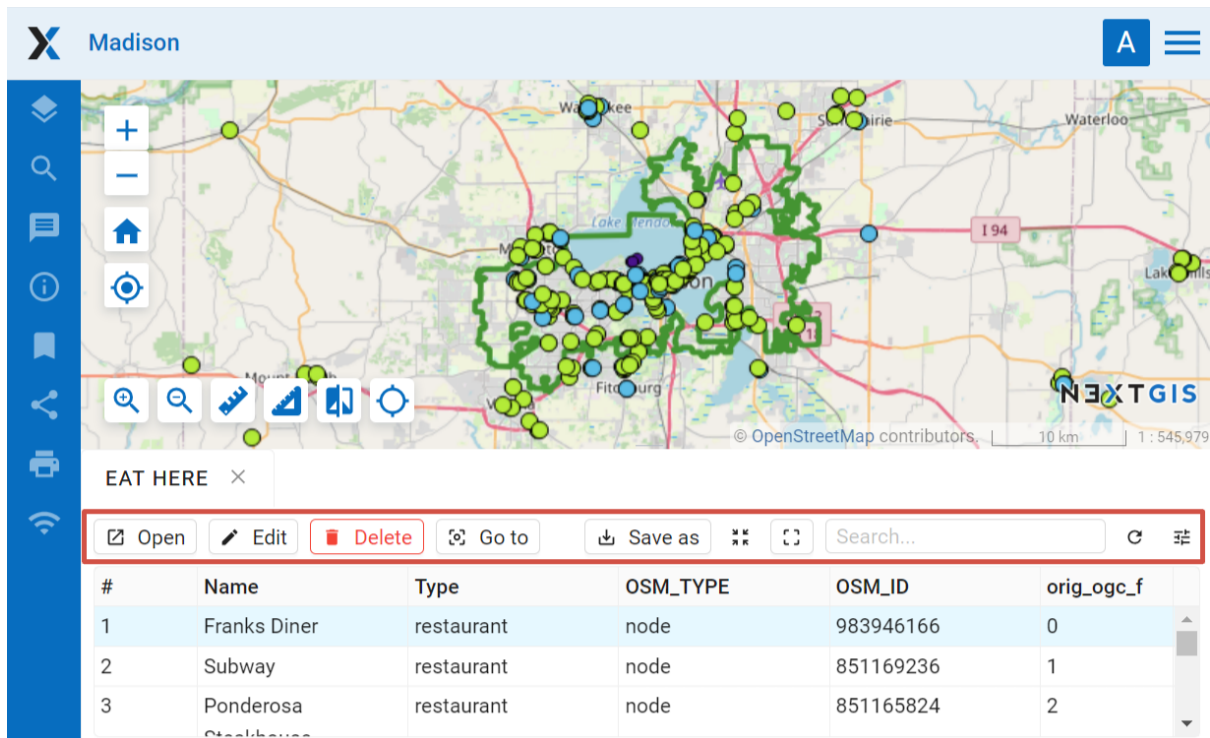


Fig. 4.15: Actions for the selected record in feature table

4.5.1 Filter layer features on the Web Map by area

NextGIS Web has a tool in the Feature table that filters all layer features within a selected area. To choose area limits just draw them on the Web Map.

Open the feature table and click on the button with a dotted frame. In the dropdown menu select the geometry of the area:

- circle (click twice on the map, to choose the center of the circle and its size, the radius length is shown in meters)
- line (features intersected by the line will be filtered)
- rectangle (click on diagonally opposite apexes)
- free-hand drawn polygon (each click creates an apex, the area covered by the polygon is highlighted; to finish the shape, double-click on an apex, the polygon will be completed automatically)

Now the feature table only contains the features within the selected area. The tool button will have the current area shape on it. In the dropdown menu you can use one of the following options:

- Show/Hide the outline and fill of the selected area
- Zoom to the filtering area
- Clear filtering geometry

You can use quick export to save the filtered features in a variety of common geo-data formats. Click **Save as** and select in the dropdown menu Quick export with

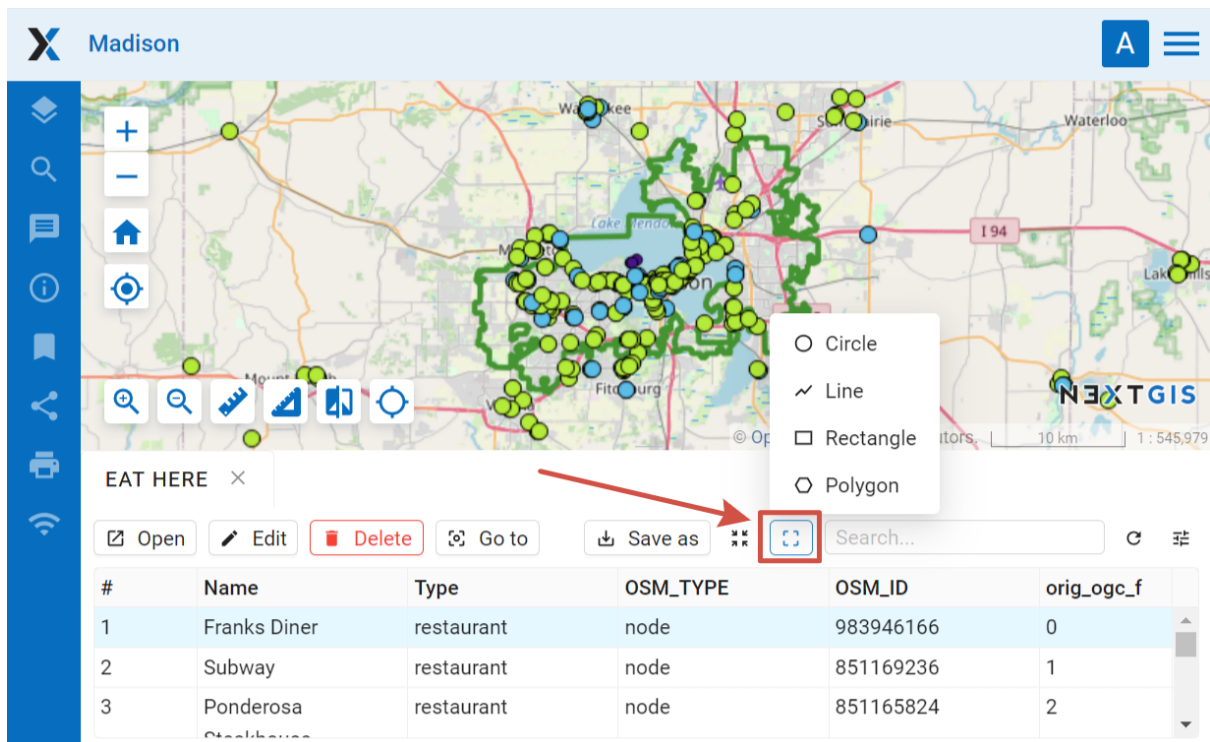


Fig. 4.16: Selecting filter geometry

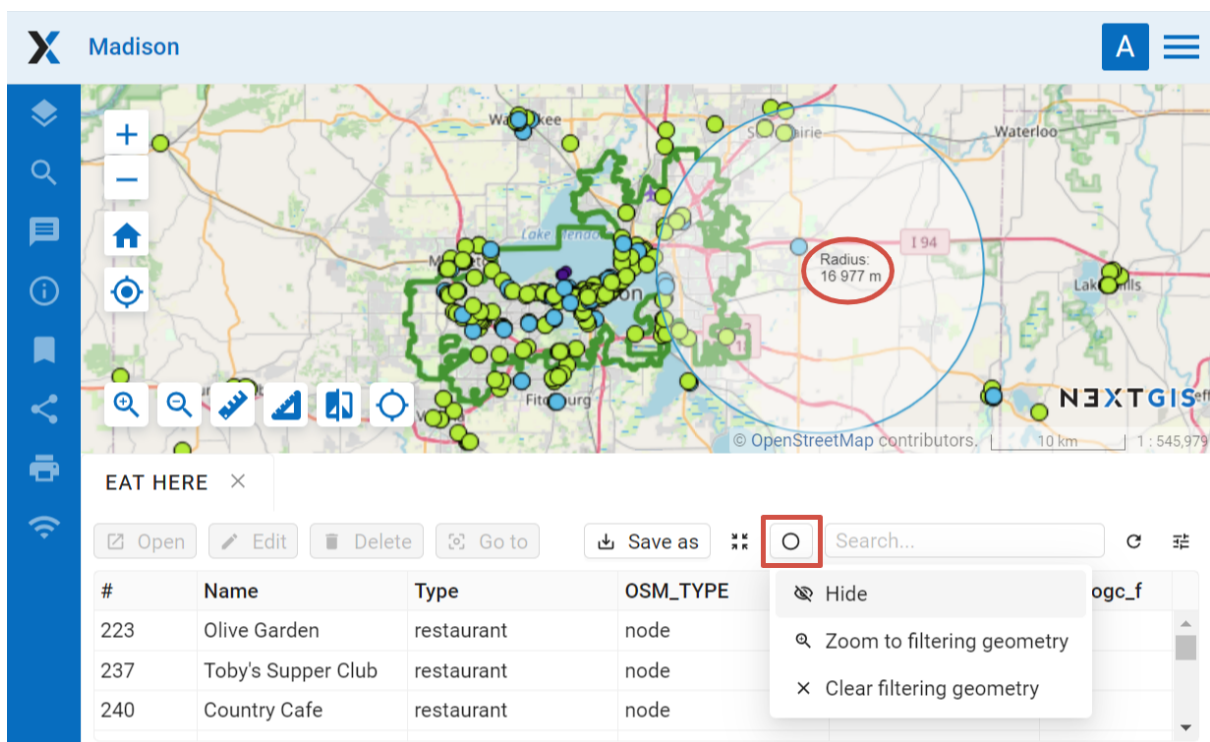
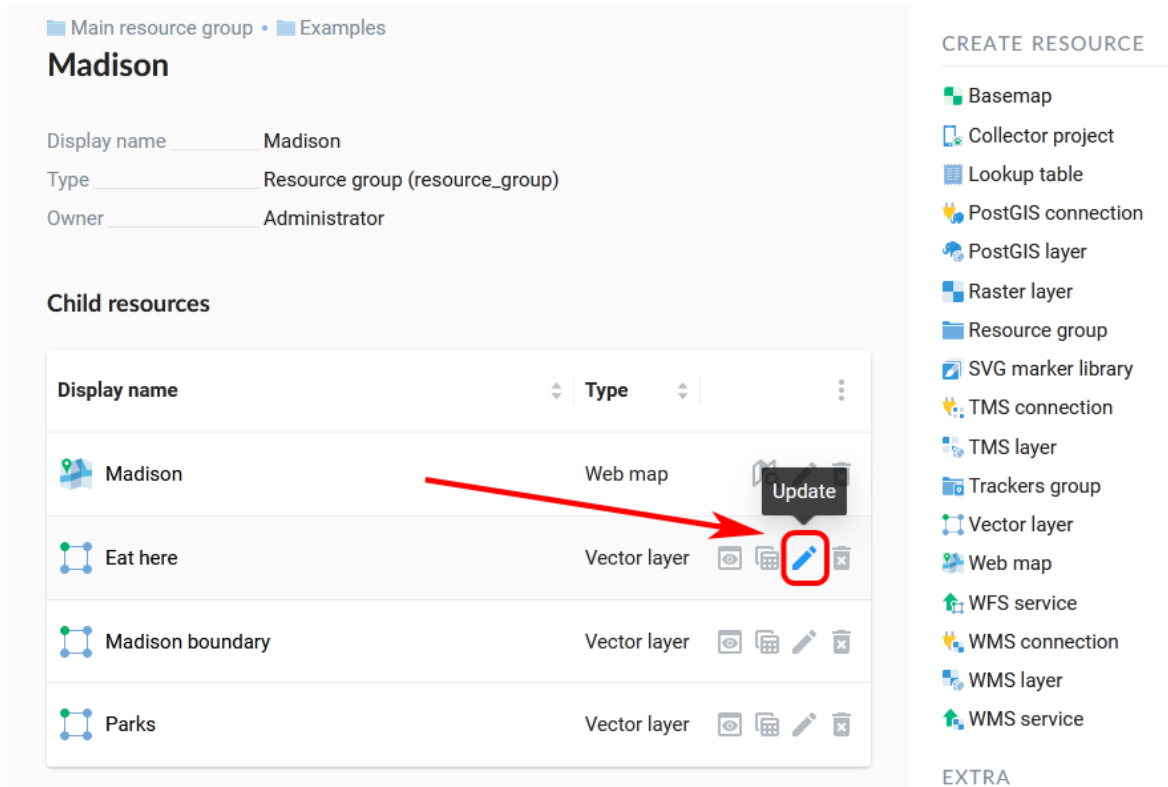


Fig. 4.17: Filter actions

default settings or Advanced export to modify parameters (see detailed description below).

4.6 Update resource

In the group page press the pencil icon opposite the resource.



Alternatively, open the resource properties page and then select “Update” in the actions pane (see Fig. ??).

In opened window “Update resource” (see Fig. ??) you can edit parent of the selected resource, add description, metadata and attributes of the resource.

On the first tab “Resource” you can edit the next fields:

1. Display name (you can change the resource’s name)
2. Parent (you can change the resource group through moving the resource)
3. Owner
4. Keyname

You can move resources from one resource group to another. To do it press the arrow at the end of the Parent field and select resource group to move the resource to in the pop-up window (see Fig. ??). Then press **OK** and **Save** button.

If the resource is moved successfully, the information about it appears in the new resource group and is removed from the previous one.

If in the selected folder there is already a resource with the same name as the one you want to transfer, it will not be moved and the following message will appear:

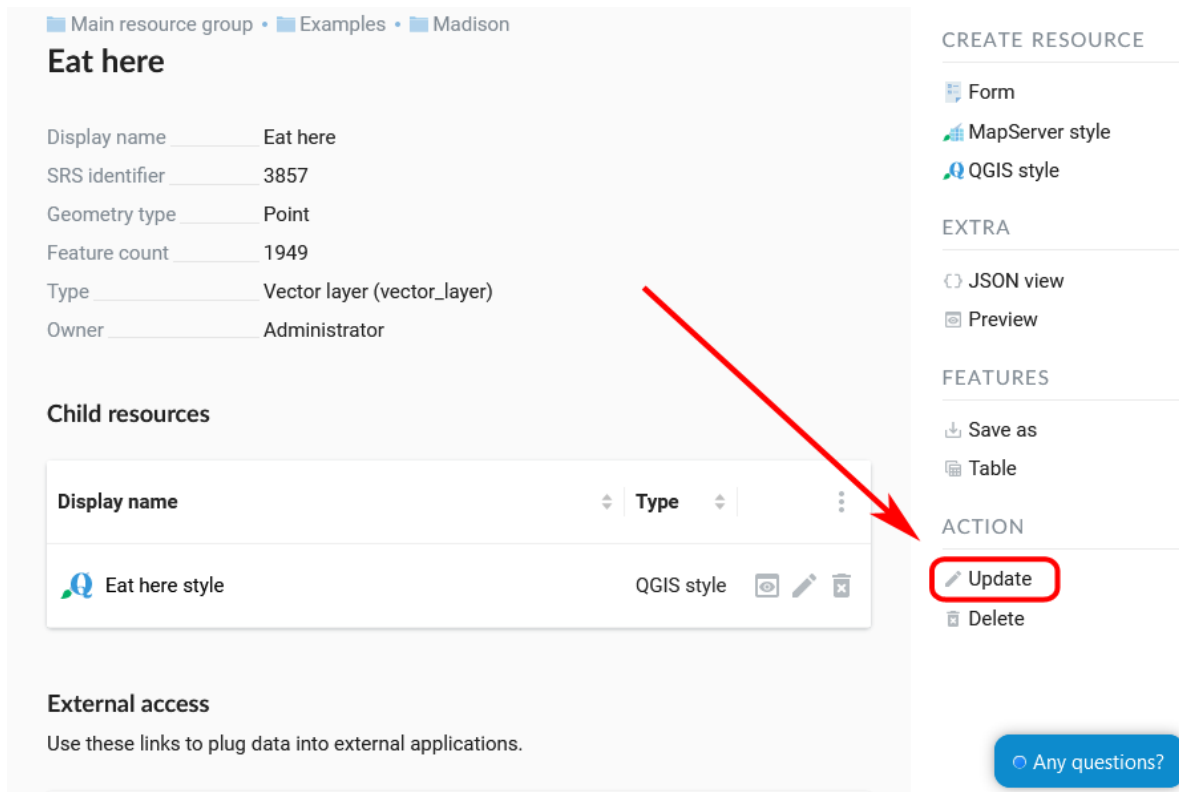


Fig. 4.18: Selection of “Update” action in the actions pane

Close the alert window, change the name of the resource and try to change the parent again.

The tab “Description” allows to add text, links and images describing the resource.

The tab “Metadata” allows to add and delete metadata, and to display them in a table using “Add” (Text, Integer, Float) and “Remove” operations:

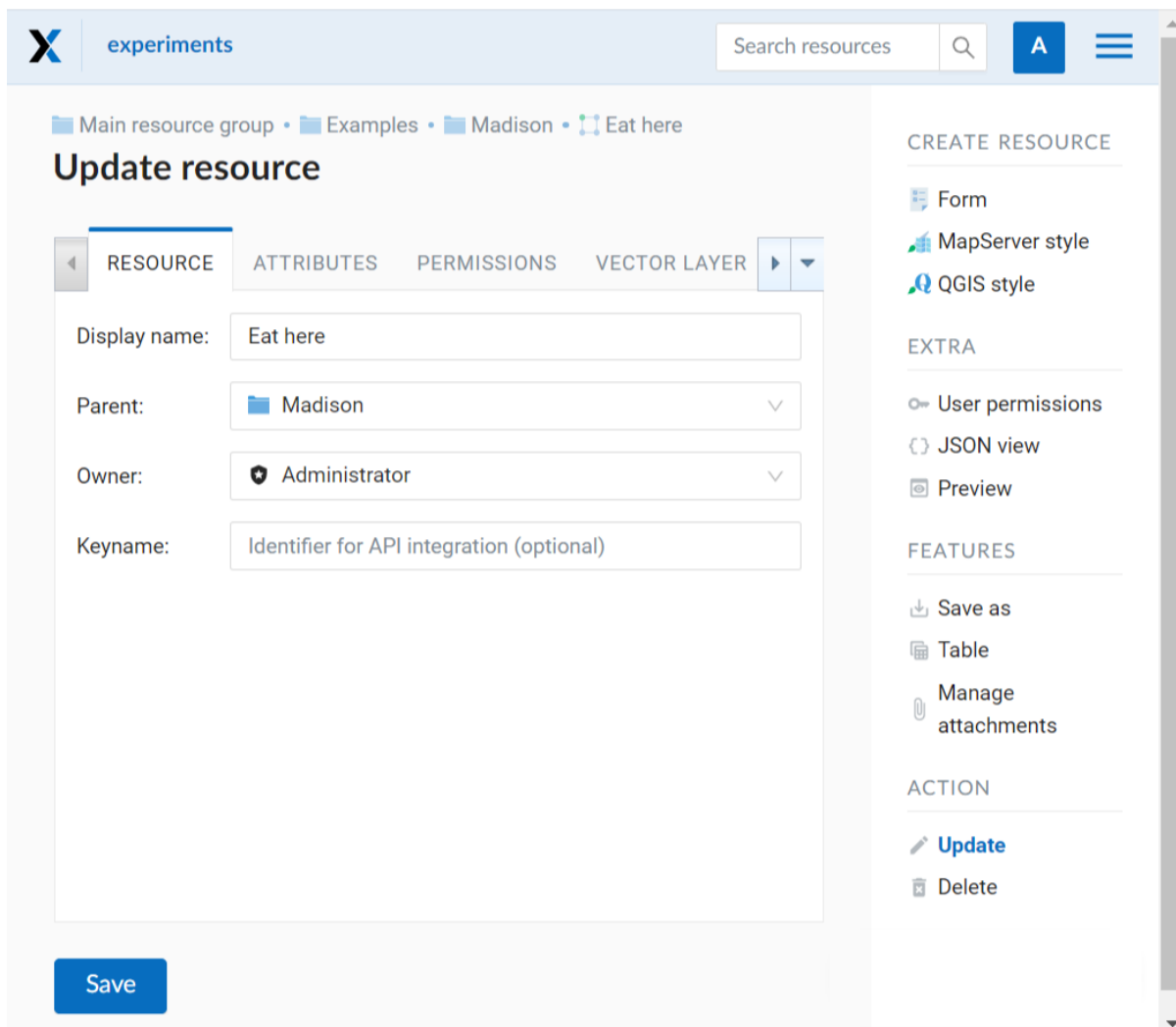
The table contains three columns:

1. Key. It allows to describe metadata features (author, date, version etc.)
2. Type: String, Numer, Boolean, Empty (if you select “Empty”, the value field will be cleared)
3. Value. Value corresponds to the key type

The tab “Attributes” contains a table with vector layer attributes (see Fig. ??).

- Tick in “FT” column means that the attribute is displayed in the identification window.
- Tick in “LA” column means that the attribute is used for bookmarks.

For each field name you can set the display name to use it in the identification window instead of the keyname.



experiments Search resources **A**

Main resource group • Examples • Madison • Eat here

Update resource

RESOURCE ATTRIBUTES PERMISSIONS VECTOR LAYER

Display name: Eat here

Parent: Madison

Owner: Administrator

Keyname: Identifier for API integration (optional)

Save

CREATE RESOURCE

- Form
- MapServer style
- QGIS style

EXTRA

- User permissions
- JSON view
- Preview

FEATURES

- Save as
- Table
- Manage attachments

ACTION

- Update
- Delete

Fig. 4.19: “Update resource” window

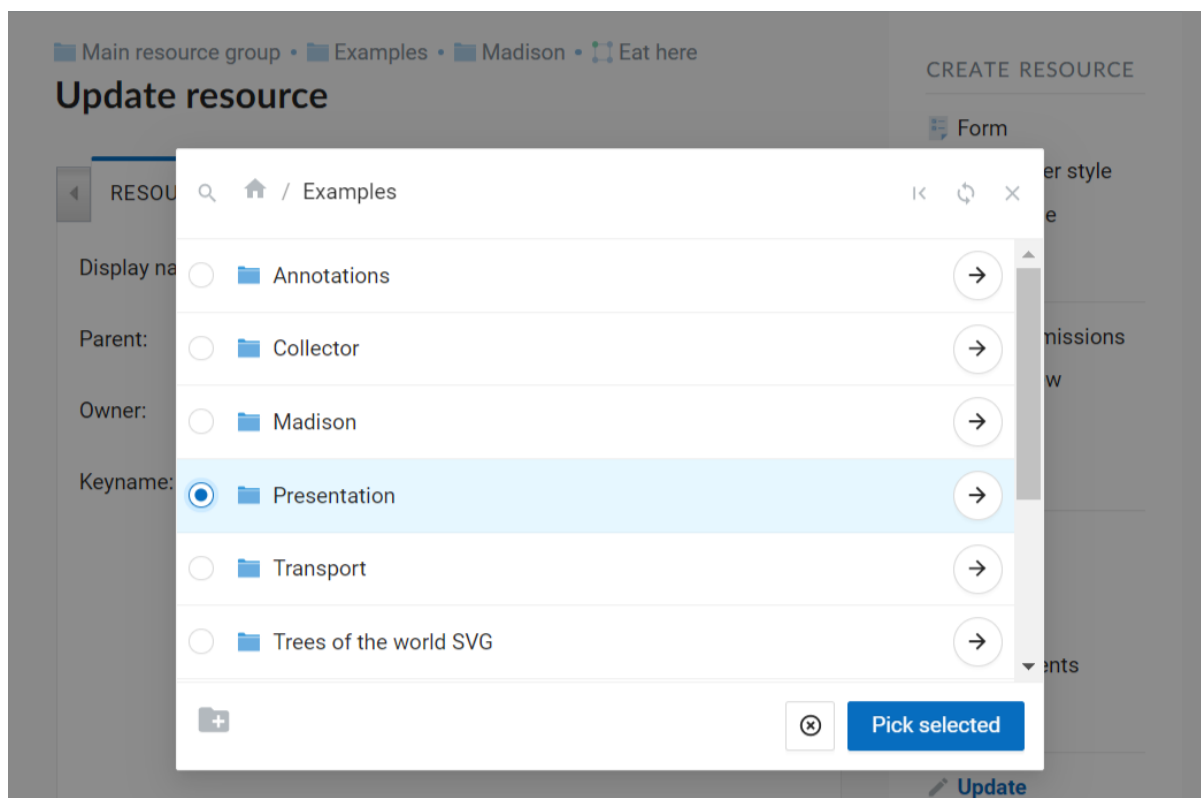


Fig. 4.20: Folder selection window

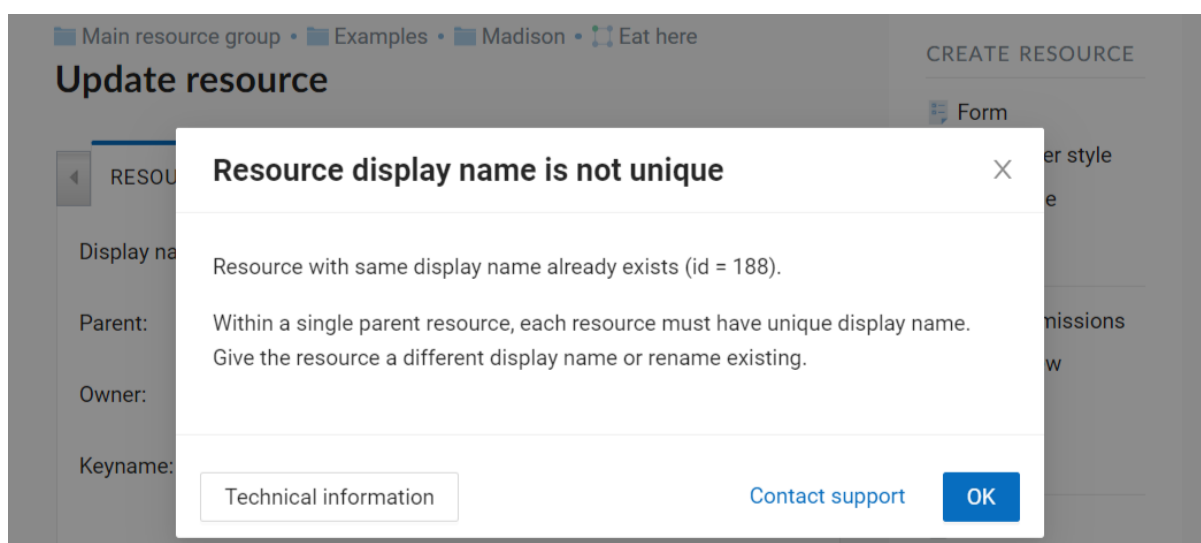


Fig. 4.21: Alert in case if the name is not unique

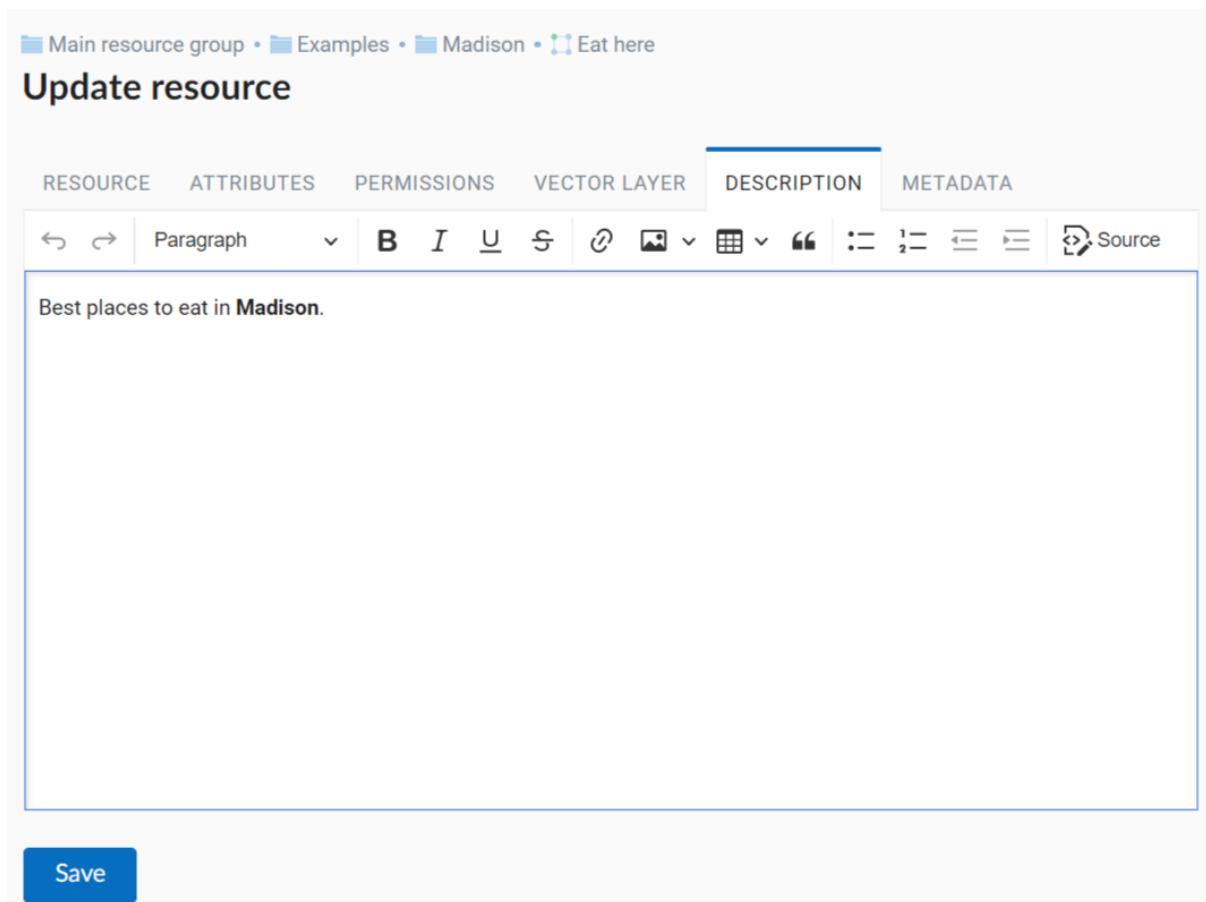


Fig. 4.22: “Description” tab

Main resource group • Examples • Madison • Eat here

Update resource

◀ ATTRIBUTES PERMISSIONS VECTOR LAYER DESCRIPTION METADATA ▶ ▼

Key	Type	Value	
City	String ▼	Madison	✕
Version	Number ▼	3	✕
Type here to add a new key...			

String

Number

Boolean

Empty

Save

Fig. 4.23: “Metadata” tab

experiments

A
≡

Main resource group
Examples
Madison
Eat here

Update resource

RESOURCE
PERMISSIONS
DESCRIPTION
ATTRIBUTES
METADATA

Add
Remove
↑
↓

#	Keyname	Type	Display name	FT	LA
1	NAME	STRING	Name	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	MAN_MADE	STRING	MAN_MADE	<input type="checkbox"/>	<input type="checkbox"/>
3	LEISURE	STRING	LEISURE	<input type="checkbox"/>	<input type="checkbox"/>
4	AMENITY	STRING	Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	OFFICE	STRING	OFFICE	<input type="checkbox"/>	<input type="checkbox"/>
6	SHOP	STRING	SHOP	<input type="checkbox"/>	<input type="checkbox"/>
7	TOURISM	STRING	TOURISM	<input type="checkbox"/>	<input type="checkbox"/>
8	SPORT	STRING	SPORT	<input type="checkbox"/>	<input type="checkbox"/>
9	OSM_TYPE	STRING	OSM_TYPE	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Save

CREATE RESOURCE

- Form
- MapServer style
- QGIS style

EXTRA

- JSON view
- Preview

FEATURES

- Save as
- Table

ACTION

- Update
- Delete

Any questions?

Fig. 4.24: “Attributes” tab

Madison

A
≡

Layers

Layer

- ☒ Eat here
- ☒ Madison boundary-style
- ☐ Parks

OpenStreetMap

+

-

Home

Full Screen

Map

Layers

Measure

Identify

Print

Fullscreen

Features: 2

Rocky Rococo Pizza (Eat here)

Attributes

Name

Rocky Rococo Pizza

Type

restaurant

OSM_TY

PE

node

-89.407429, 43.067445 WGS 84 / Lon

Fig. 4.25: The identification window

4.7 Delete resource

Web GIS allows to delete uploaded data through deleting of the corresponding resources.

In the group page press the cross icon opposite the resource.

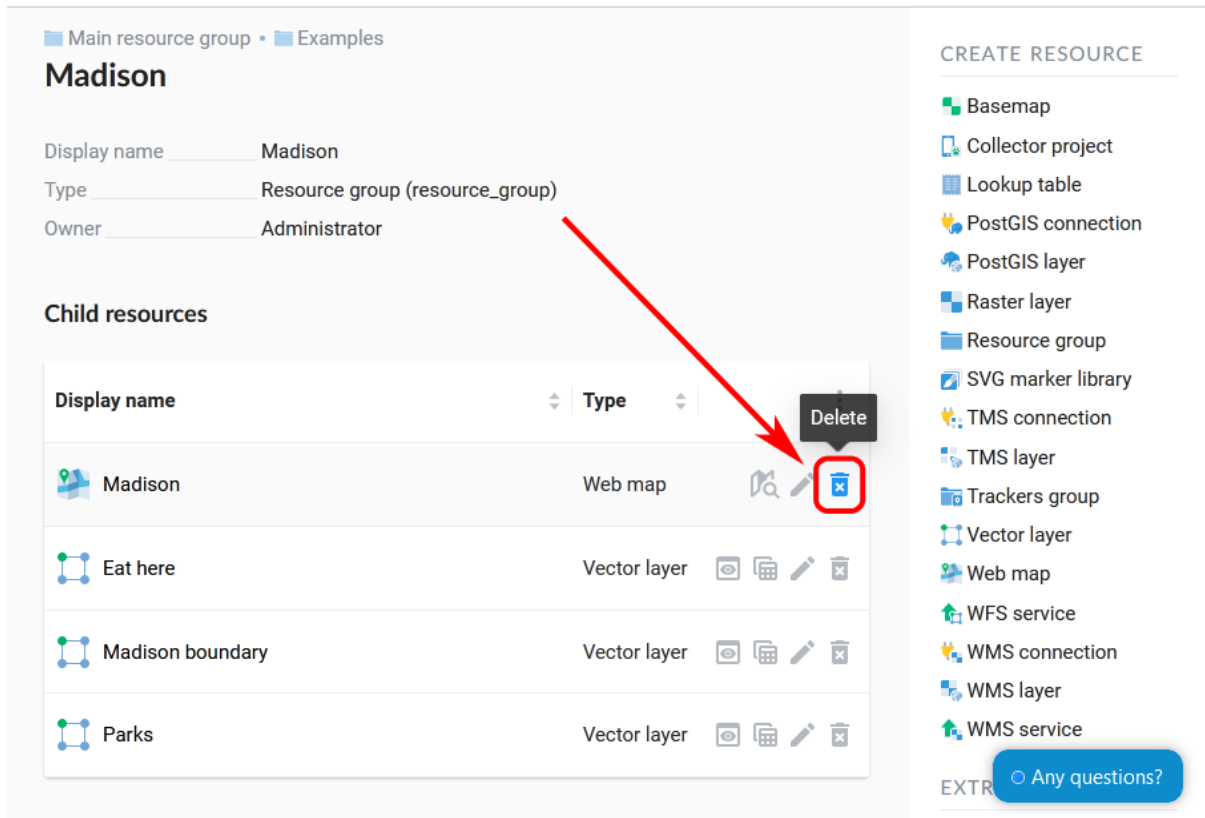


Fig. 4.26: Deleting resource from the group

A pop-up window for confirmation will appear. Click **Delete** to confirm.

Alternatively, open the resource page and then select "Delete" in the actions pane (see Fig. ??).

In the opened "Delete resource" window you need to tick "Confirm deletion of the resource" and press **Delete** button.

If the resource was deleted successfully, the information about it disappear from the corresponding resource group.

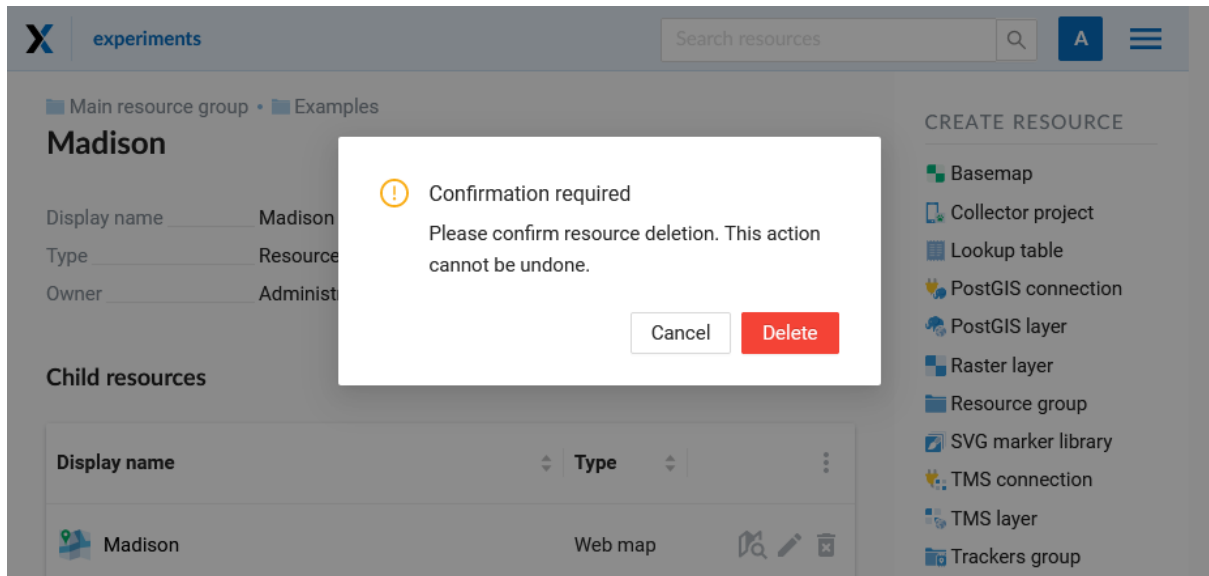


Fig. 4.27: Confirmation to delete a resource

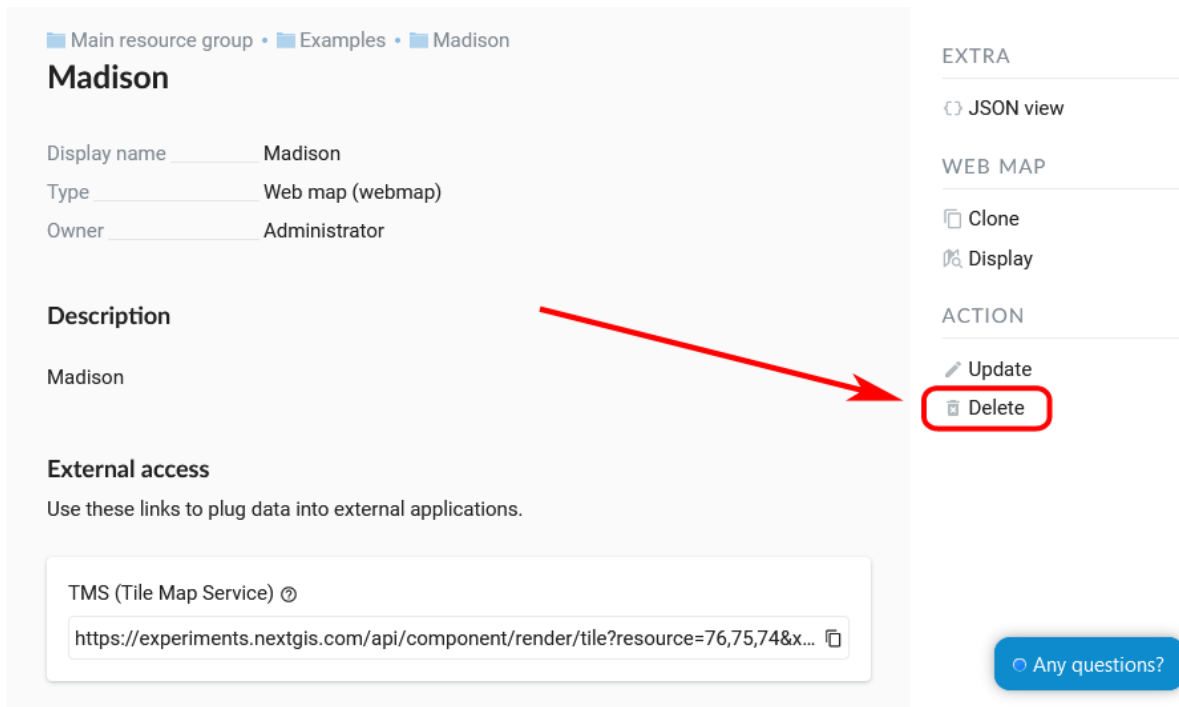


Fig. 4.28: Selection of "Delete" action in the action pane

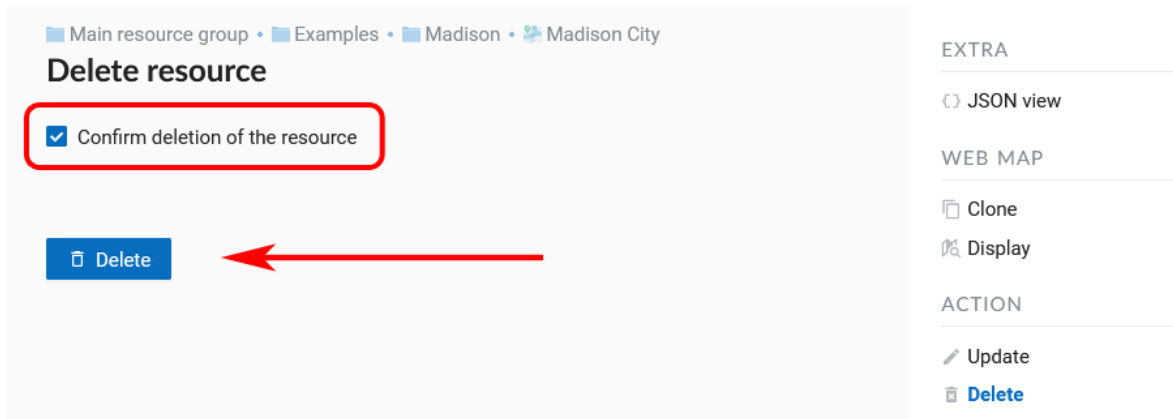


Fig. 4.29: “Delete resource” window

4.7.1 Deleting several resources at once

In the parent resource open the child resources list menu and enable multiple selection.

Tick the resources and select “Delete” from the same menu. Confirm the operation in the pop-up window.

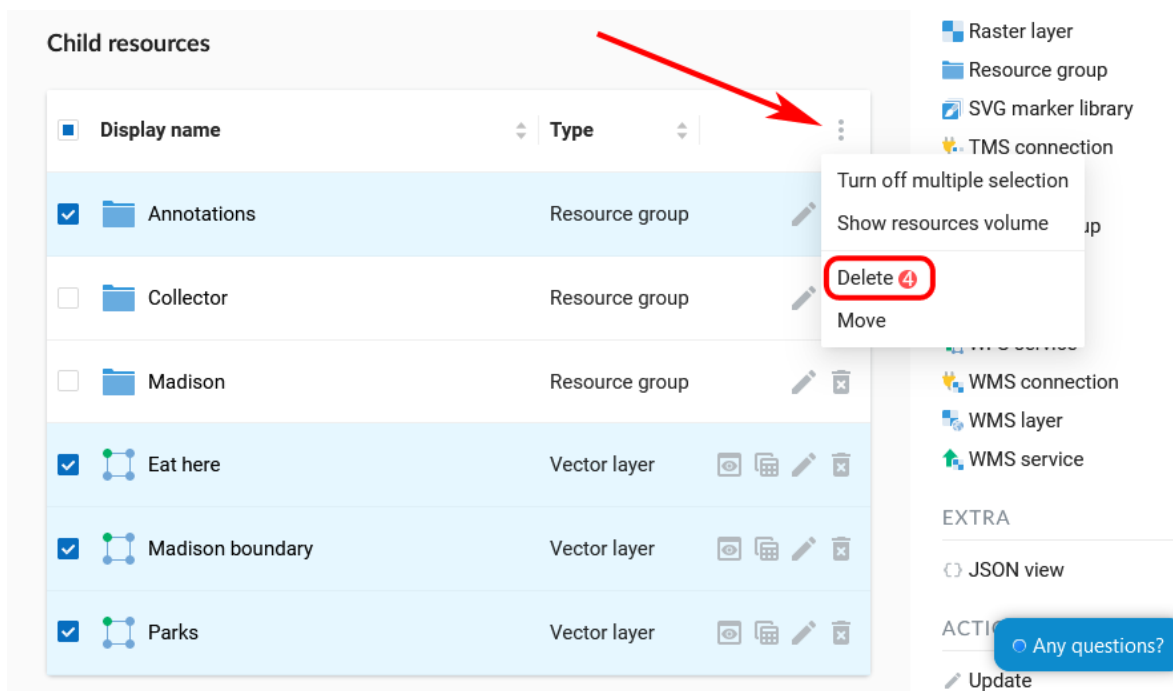


Fig. 4.30: Deleting multiple resources

4.8 Data export

NextGIS Web allows you to export data in the following formats:

- *GeoJSON*
- CSV
- CSV for Microsoft Excel
- ESRI Shapefile
- AutoCAD DXF
- Mapinfo TAB
- MapInfo MIF/MID
- GeoPackage

While exporting to some formats additional files are created, for example CSVT (field description) and PRJ (projection description) for CSV, CPG (code page) for ESRI Shapefile.

To export data:

1. Open a Vector or PostGIS layer, the data of which you want to export;
2. Select the item: menuselection: *Features* -> *Save As* on the right pane :ref:`web interface <ngw_admin_interface>` ;
3. Specify the format and encoding of the data and select fields to be exported;
4. If necessary, you can compress the result into a ZIP archive (for a number of formats this is the default setting);
5. Save the file to your device.

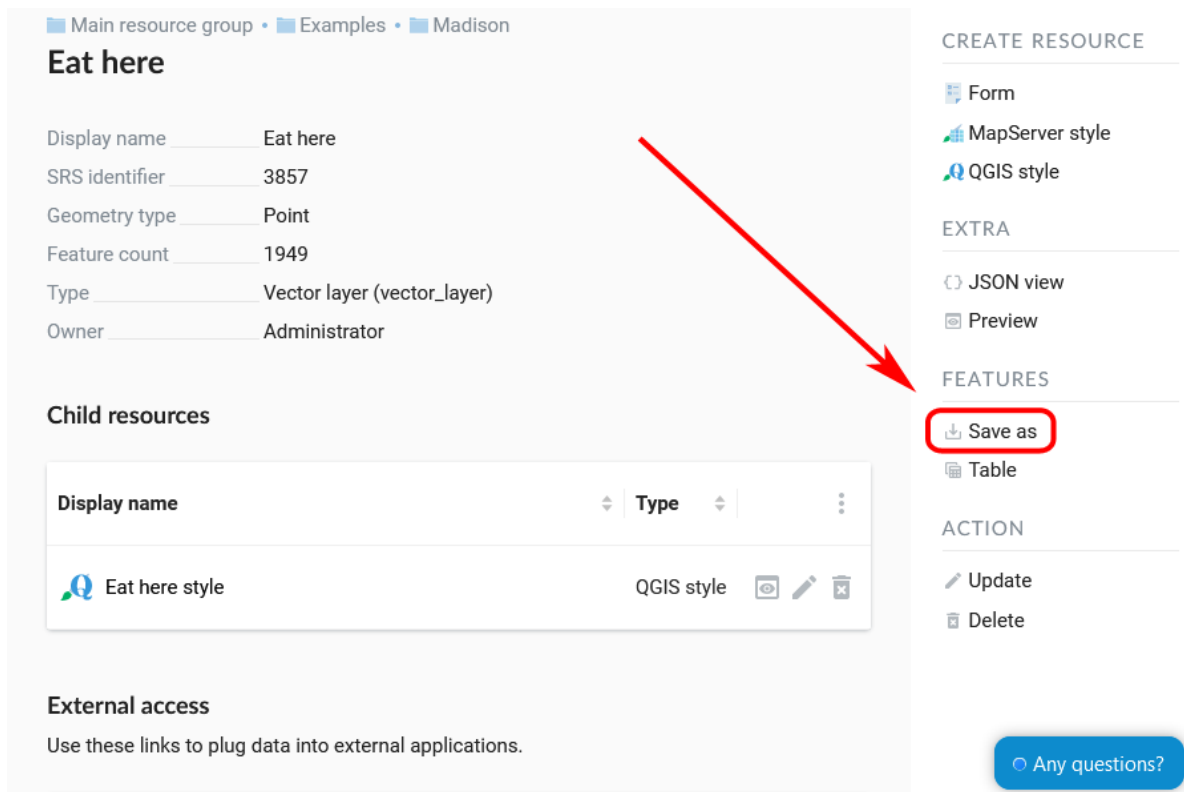


Fig. 4.31: Selecting “Save as” action to export data

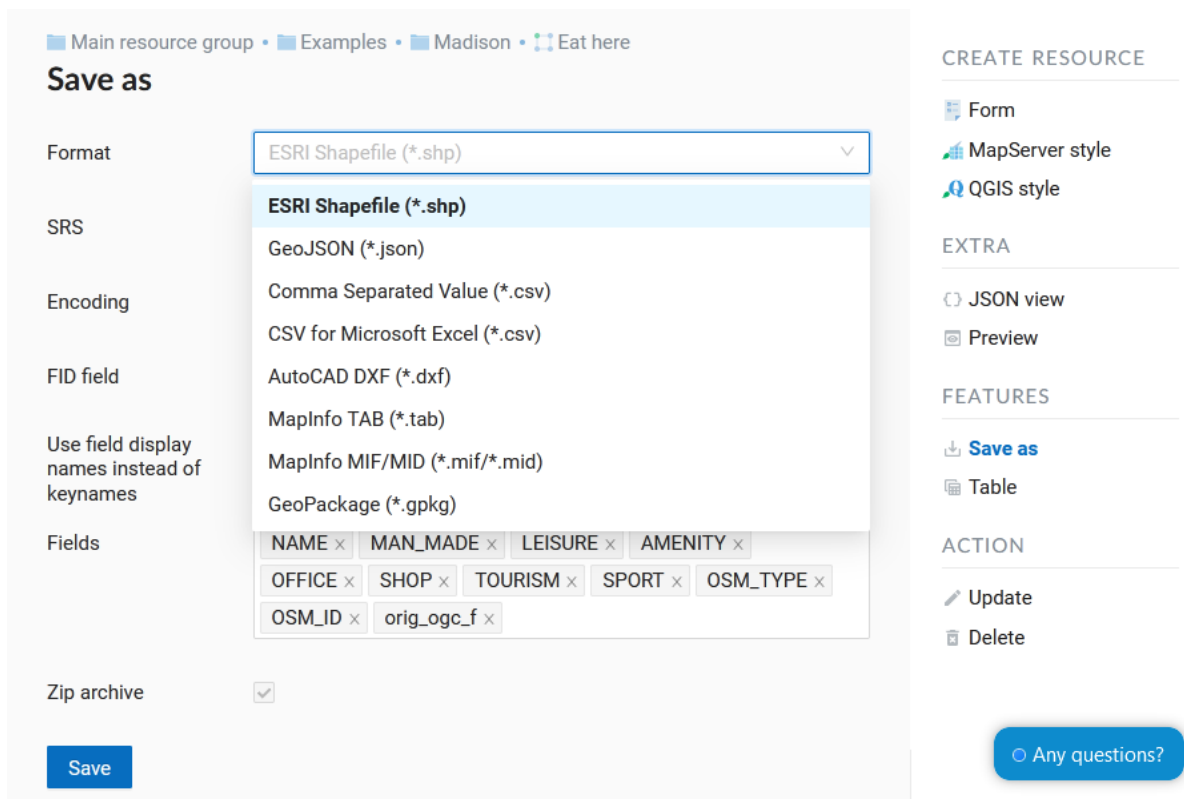


Fig. 4.32: Data export in various formats

ADDING RESOURCES

NextGIS Web is built on a **resource-based** approach - each component of the system (layer, group, service) is a resource. One of these resources is a **layer** - a raster image or vector file (database table).

For each layer you can create an **unlimited** number of **styles** - ways of visualizing geodata on a Web Map.

Interface for adding of PostGIS layers, vector and raster layers is practically the same. First, you specify the parameters for the layer, and then you add a style that renders data on the Web Map.

5.1 Basemap

In the “Create resource” actions pane click **Basemap** (Fig. ??). In the opened window enter the name of the resource that will be displayed in the administrator interface (Fig. ??).

The “Description” and “Metadata” of the resource are configured on the corresponding tabs (Fig. ??). On the “Description” tab you can add any text describing the content.

In the “Basemap” tab you must enter the URL-address of the TMS service (Fig. ??). There are two ways to do so:

- Use the search bar to find a map in the [QuickMapServices catalog](https://qms.nextgis.com/)⁶. After a map is selected, URL field will be filled in automatically and option “Use options from QMS” will be activated.
- Enter the address manually. Works if the QMS flag is unchecked.

⁶ <https://qms.nextgis.com/>

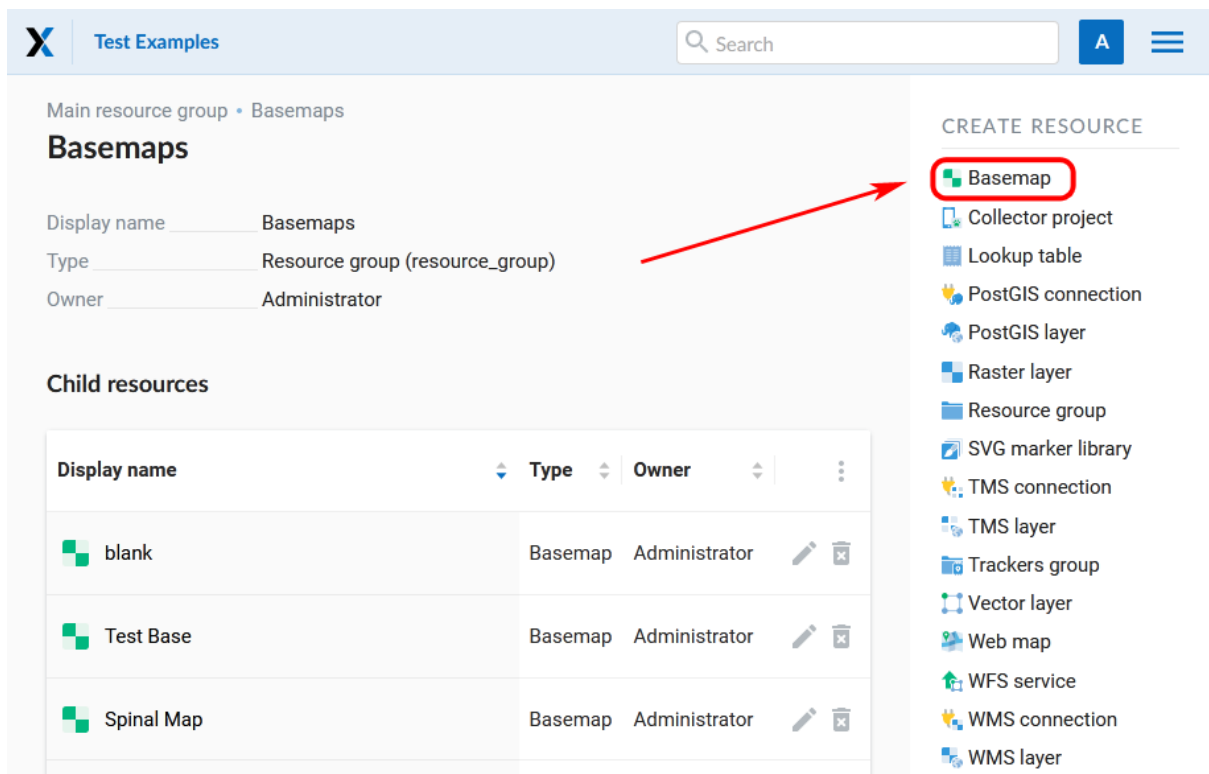


Fig. 5.1: Selection of “Basemap” action

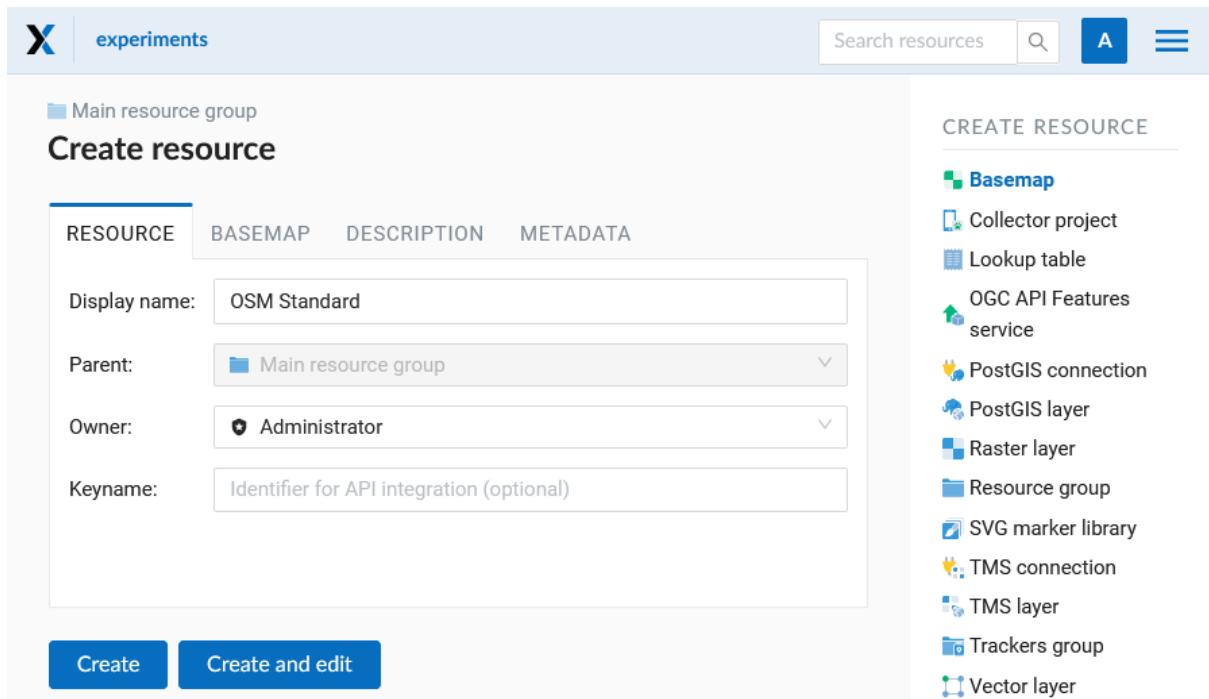


Fig. 5.2: Basemap name

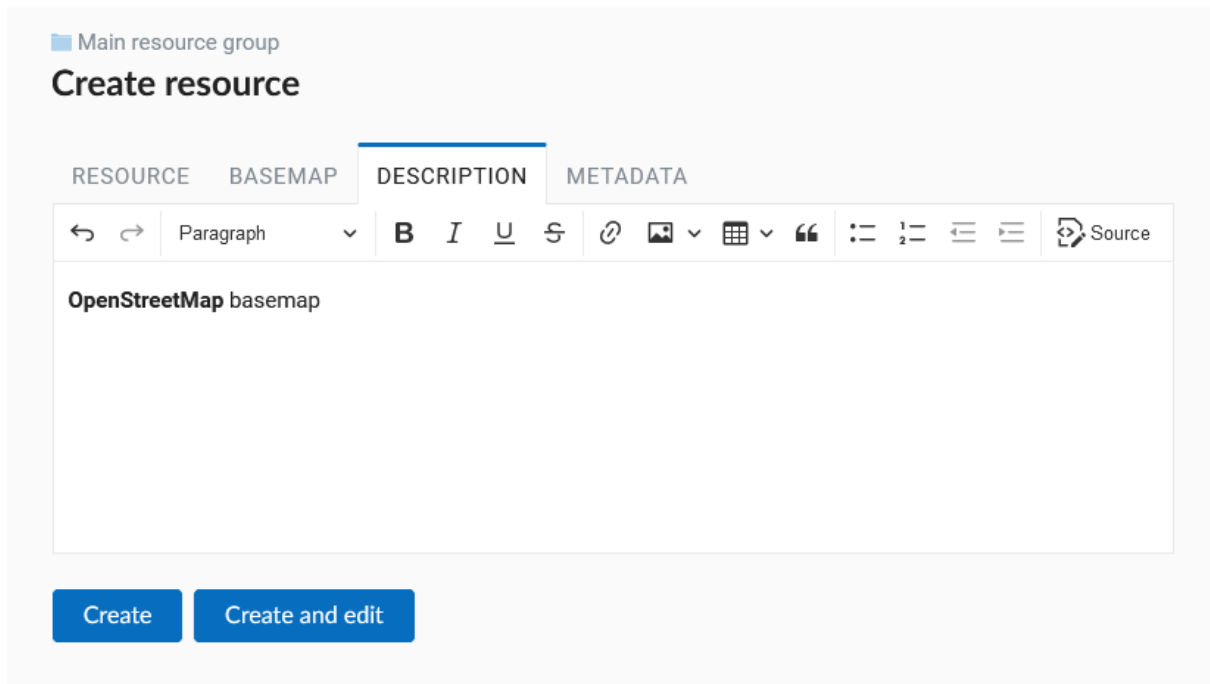


Fig. 5.3: Basemap description

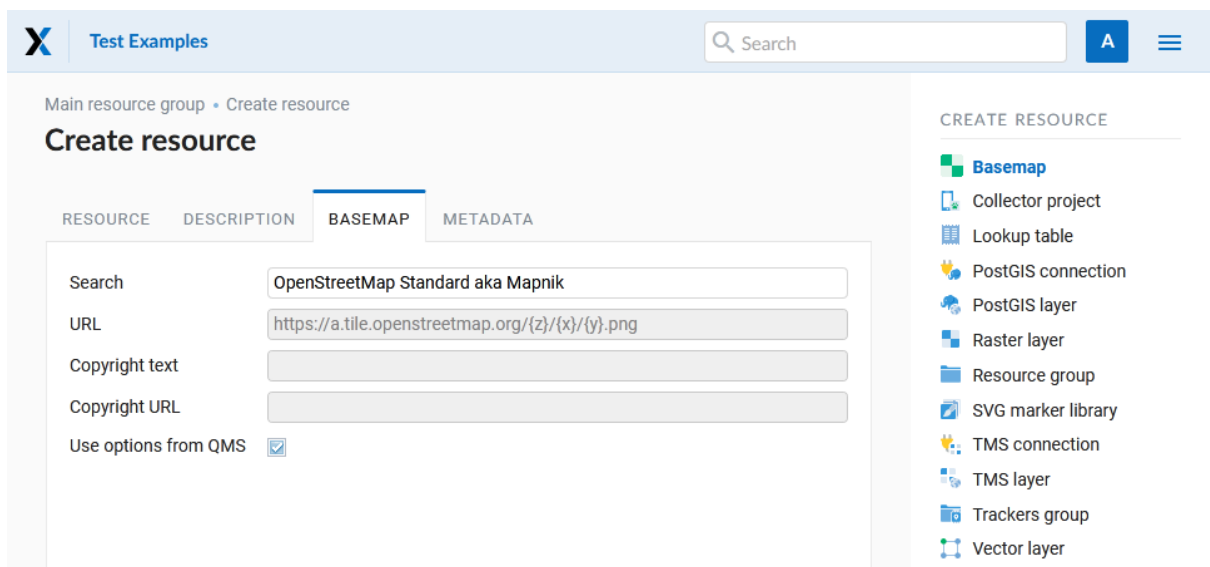


Fig. 5.4: Basemap settings

5.2 Data Preview

The preview function allows you to see the uploaded data on the basemap without adding it on the Web Map.

Note: For vector data, previews are available for both the layer and the style. For rasters - for style only. For TMS and WFS layers, preview is also available.

While in the corresponding resource, click the “eye” icon opposite the name of the child resource or the **Preview** button in the right menu in the **Extra** section.

A visual preview of the uploaded geometries will open without the possibility of more detailed interaction (viewing attributes, identifying objects, etc).

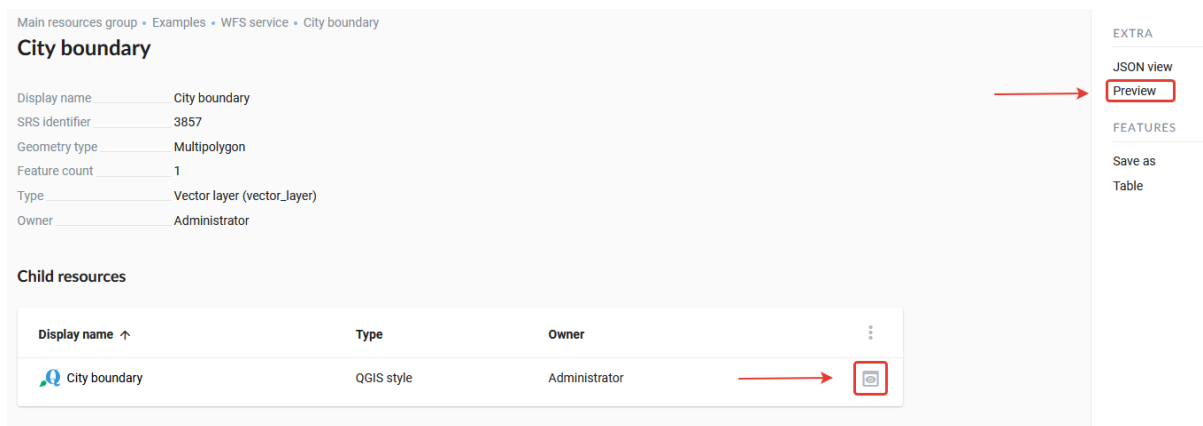


Fig. 5.5: Selecting Data Preview Function

5.3 Raster layer

Raster images in NextGIS Web should be loaded using the “Raster Layer” special resource.

5.3.1 Creation process

To add a raster layer navigate to a group where you want to create it. In the “Create resource” actions pane click **Raster layer** (see Fig. ??).

On the “Raster layer” tab you need to upload a geodata file in GeoTIFF format. The upload dialog indicates the maximum file size allowed on your subscription plan (Fig. ??).

If you plan to use this raster in QGIS directly from your Web GIS, tick the Upload as Cloud Optimized GeoTIFF (COG) checkbox. This will optimize the raster to ensure fast display.

In the “Resource” tab specify the name of the raster layer (see Fig. ??). It will be displayed in the admin interface. The “Key” field is optional.

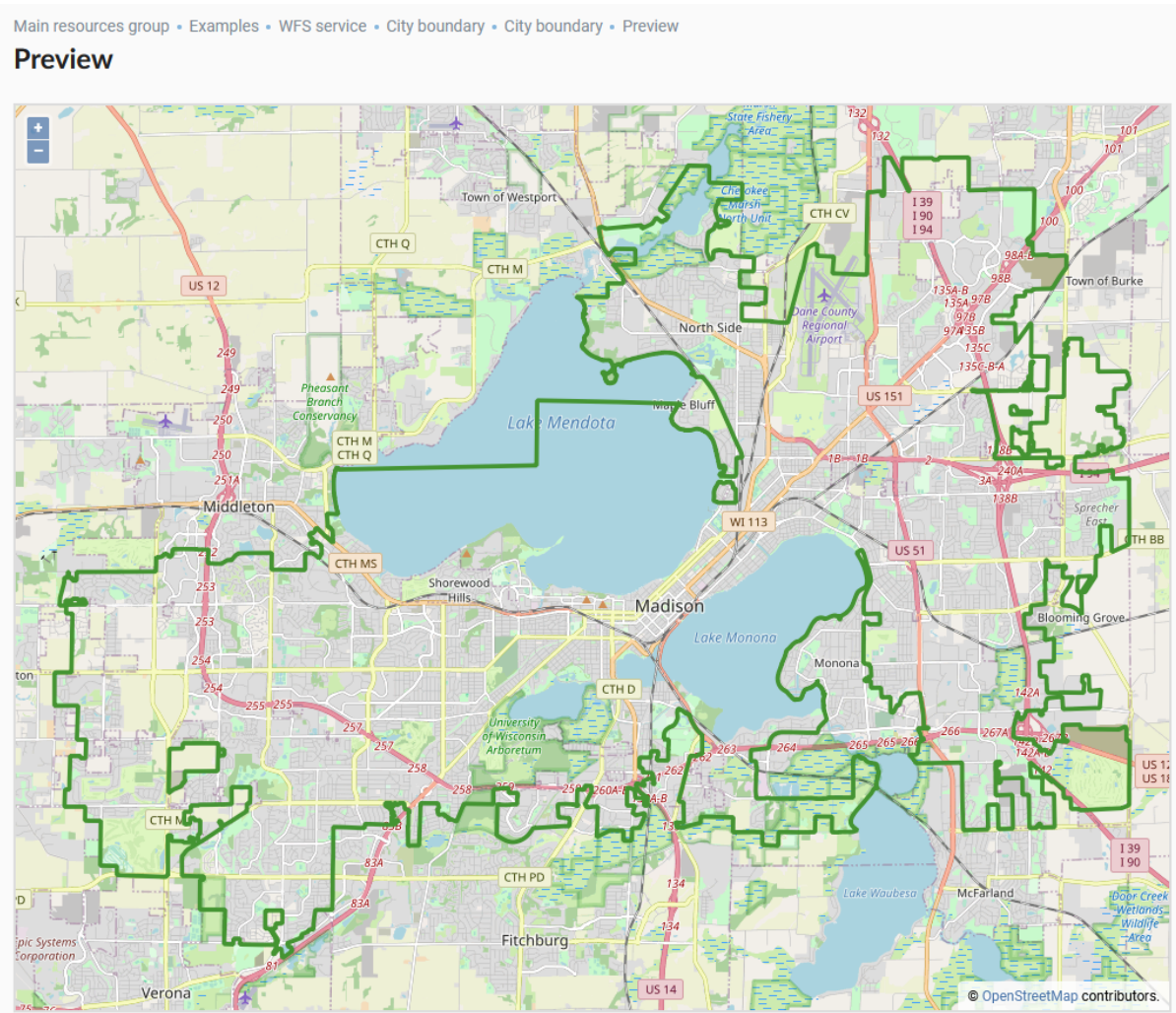
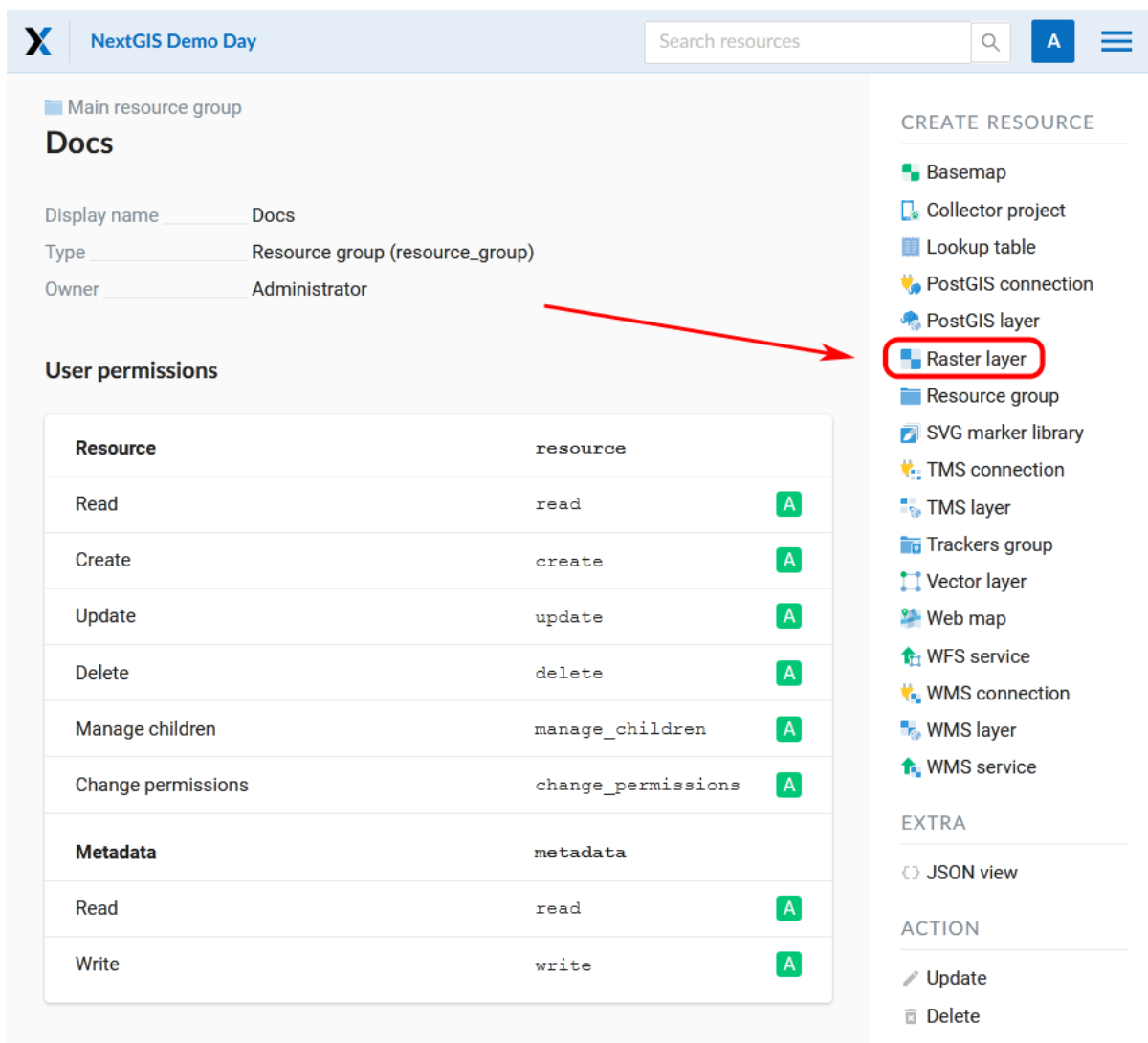


Fig. 5.6: Data preview



The screenshot shows the NextGIS Web interface. The top header includes the NextGIS logo, 'NextGIS Demo Day', a search bar, and user controls. The main content area is divided into two sections: 'Docs' and 'User permissions'.

Docs

Display name: Docs
Type: Resource group (resource_group)
Owner: Administrator

User permissions

Resource	resource	
Read	read	A
Create	create	A
Update	update	A
Delete	delete	A
Manage children	manage_children	A
Change permissions	change_permissions	A
Metadata	metadata	
Read	read	A
Write	write	A

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- PostGIS connection
- PostGIS layer
- Raster layer**
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer
- Web map
- WFS service
- WMS connection
- WMS layer
- WMS service

EXTRA

- JSON view

ACTION

- Update
- Delete

Fig. 5.7: Selection of “Raster layer” action

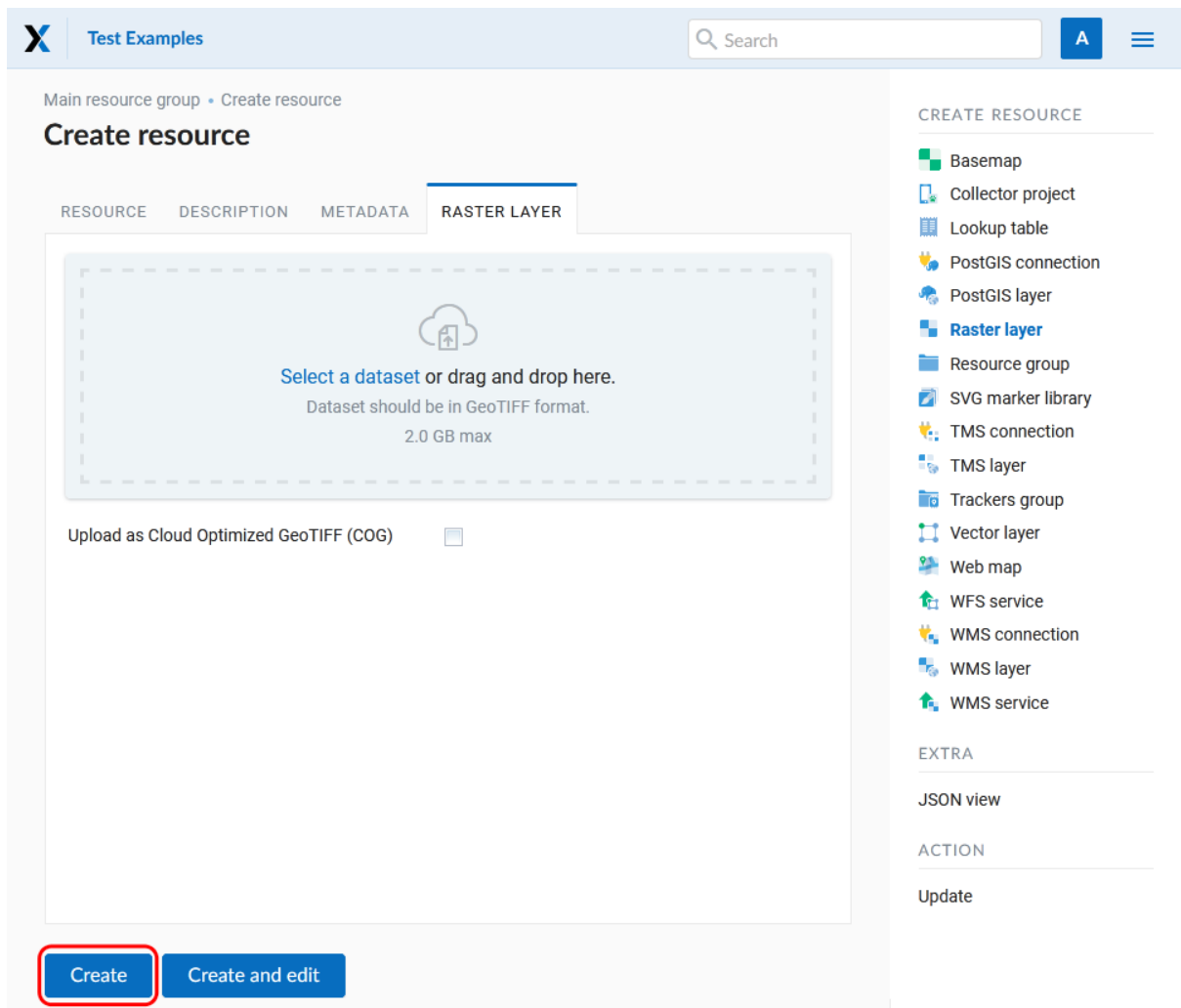


Fig. 5.8: Uploading raster file

The screenshot shows the 'Create resource' form in the NextGIS Web interface. The 'RESOURCE' tab is selected, displaying input fields for 'Display name' (filled with 'Satellite image'), 'Parent' (a dropdown menu showing 'Main resource group'), 'Owner' (a dropdown menu showing 'Administrator'), and 'Keyname' (filled with 'Identifier for API integration (optional)'). Below these fields are two buttons: 'Create' and 'Create and edit'. To the right, a sidebar titled 'CREATE RESOURCE' lists various resource types: Basemap, Collector project, Lookup table, OGC API Features service, PostGIS connection, PostGIS layer, **Raster layer** (highlighted in blue), Resource group, SVG marker library, TMS connection, TMS layer, Trackers group, and Vector layer.

Fig. 5.9: Raster layer name

On the “Description” tab you can add any text describing the content of this layer (Fig. ??).

In the “Metadata” tab you can enter information in the “key-value” format (Fig. ??).

To complete click the **Create** button.

5.3.2 Raster style (QGIS)

After a raster file is successfully uploaded and a raster layer is created, you need to create a QGIS style. This procedure is similar to adding a vector layer [style](#)⁷. You can create one in NextGIS QGIS. You will need this style to add the raster to a Web Map when creating one (for more information see subsection *Creating a Web Map* (page ??)).

5.3.3 Raster layer with transparency (clip or alpha channel)

Most of utilities do not create an alpha channel and only add a NoData value. To transform NoData value to an alpha channel use the command line utility **gdal-warp**. Here is an example of this command.

```
gdalwarp -t_srs EPSG:3857 -multi -dstalpha -dstnodata none -wo \
"UNIFIED_SRC_NODATA=YES" -co COMPRESS=JPEG \
d:\temp\o\ast_20010730_010043_rgb.tif d:\temp\o\ast_20010730_010043_
→ rgba.tif
```

⁷ https://docs.nextgis.com/docs_ngweb/source/mapstyles.html#qgis-style

Main resource group

Create resource

RESOURCE RASTER LAYER DESCRIPTION METADATA

↶ ↷ Paragraph **B** *I* U ~~S~~ Source

Satellite imagery for the area

Create Create and edit

Fig. 5.10: Raster layer description

Main resource group

Create resource

RESOURCE RASTER LAYER DESCRIPTION METADATA

Key	Type	Value
bits	Number	16
Type here to add a new key...		

String
Number
Boolean
Empty

Create Create and edit

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- OGC API Features service
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer
- Web map

Fig. 5.11: Raster layer metadata

5.3.4 Uploading Indexed Color Rasters

Indexed Color raster files are uploaded just like the RGB raster files. If the file is not in GeoTIFF format, you can convert it as follows:

```
gdal_translate yaroslavl.map yaroslavl.tif
```

5.4 Vector layer from file

You can create vector layers based on ESRI Shapefile, *GeoJSON*, KML, CSV, GML and GeoPackage formats in NextGIS Web.

5.4.1 Creation process

Navigate to the resource group (folder) in which to create a vector layer. In the “Create resource” actions pane select **Vector layer** (see Fig. ??).

The screenshot shows the NextGIS Web interface. On the left, the 'Main resource group' is 'Vector data'. Below it, the 'Display name' is 'Vector data', 'Type' is 'Resource group (resource_group)', and 'Owner' is 'Administrator'. Under 'User permissions', a table lists permissions for 'Resource' and 'Metadata'.

Resource	resource	
Read	read	A
Create	create	A
Update	update	A
Delete	delete	A
Manage children	manage_children	A
Change permissions	change_permissions	A
Metadata	metadata	
Read	read	A
Write	write	A

On the right, the 'CREATE RESOURCE' pane lists various actions. The 'Vector layer' action is highlighted with a red circle and a red arrow points to it from the permissions table.

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer**
- Web map
- WFS service
- WMS connection
- WMS layer
- WMS service

EXTRA

- JSON view

ACTION

- Update
- Delete

Fig. 5.12: Selection of “Vector layer” action

In the opened tab you need to upload a geodata file in ESRI Shapefile (zip-archive), *GeoJSON*, KML, GML or GeoPackage format. The upload dialog indicates the maximum file size allowed on your subscription plan (Fig. ??). Web GIS can process multi-layer datasets. If an archive contains several layers, then after it is uploaded, you will be asked to select which layer will be used for creating Vector layer resource.

Below it is proposed to define advanced options for creating a vector layer. Depending on the quality of the data you can handle geometry errors when uploading a file as follows:

- Not fix errors
- Fix whatever is possible
- Fix without losing data

Next - the type of geometry, the presence/absence of multigeometries, Z-coordinates and the source of the FID (FID field, determine automatically or indicate from a particular field) are indicated. [More about advanced options](#)⁸.

In the “Resource” tab enter the name of the vector layer (Fig. ??). It will be displayed in the admin interface. The “Key” field is optional.

In the “Description” tab you can add any text describing the content of this layer (Fig. ??).

In the “Metadata” tab you can add information in the “key-value” format (Fig. ??).

After uploading the file and specifying the parameters, click the **Create** button.

Then you can create a [style](#)⁹ that will later visualize the data layer on a [Web Map](#)¹⁰.

5.4.2 Input data requirements

Source files could be in the following formats:

- ESRI Shapefile
- *GeoJSON*
- KML
- GML
- GeoPackage

Use NextGIS Connect if you need to upload data in other formats.

Note: In case of ESRI Shapefile, all components (dbf, shp, shx, prj and other files) should be compressed to a zip-archive.

⁸ https://docs.nextgis.com/docs_ngweb/source/vect_layer_upload_params.html

⁹ https://docs.nextgis.com/docs_ngweb/source/mapstyles.html#qgis

¹⁰ https://docs.nextgis.com/docs_ngweb/source/webmaps_admin.html#ngw-map-create

Main resource group • Examples

Create resource

RESOURCE
VECTOR LAYER
DESCRIPTION
METADATA

Load features from file

Select a dataset or drag and drop here.

ESRI Shapefile (zip), GeoPackage, GeoJSON, GML, KML, CSV or XLSX formats are supported. For CSV and XLSX only points are supported, coordinates must be put in lat and lot columns.

2.0 GB max

Source layer

Advanced options

Fix errors
Whatever possible

☒ Skip features with unfixable errors

Geometry type
Auto

☐ Only load features of the selected geometry type

Multi-geometry
Auto
Z-coordinate
Auto

FID source
Auto
FID field(s)
ngw_id,id

Fig. 5.13: Vector file upload tab

The screenshot shows the 'Create resource' form in the NextGIS Web interface. The top navigation bar includes the 'X experiments' logo, a search bar, and a user menu. The main content area is titled 'Main resource group' and 'Create resource'. The 'VECTOR LAYER' tab is selected, showing fields for 'Display name' (Elevation), 'Parent' (Main resource group), 'Owner' (Administrator), and 'Keyname' (Identifier for API integration (optional)). A 'CREATE RESOURCE' sidebar on the right lists various resource types, with 'Vector layer' highlighted. At the bottom are 'Create' and 'Create and edit' buttons.

Fig. 5.14: Vector layer name

The screenshot shows the 'Create resource' form in the NextGIS Web interface, with the 'DESCRIPTION' tab selected. The form includes a rich text editor with a toolbar containing icons for undo, redo, paragraph, bold, italic, underline, strikethrough, link, image, table, quote, list, and source. The text 'Relief contours' is entered in the editor. At the bottom are 'Create' and 'Create and edit' buttons.

Fig. 5.15: Vector layer description

Fig. 5.16: Vector layer metadata

Warning: Avoid using Unicode symbols in data field names. While such data can be uploaded to the Web GIS and displayed on Web Maps, you can experience problems working with it in NextGIS Mobile or visualization (especially if labels are using such fields). Use plain Latin for field names and set up field aliases to show Unicode names.

If input data layer contains fields named id (ID) or geom (GEOM), they will be renamed on import. If id has meaningful identifiers, they will automatically be turned into internal FIDs.

5.5 Empty vector layer

Creating an empty vector layer allows you to start a data base in your WebGIS without using a desktop app.

Navigate to the resource group (folder) in which to create a vector layer. In the “Create resource” actions pane select Vector layer (see Fig. ??).

In the opened window use the dropdown menu to select “Create empty layer”. In the field below select geometry type for the layer. By default, a point layer will be created.

In the “Resource” tab enter the name of the vector layer (Fig. ??). It will be displayed in the admin interface. The “Key” field is optional.

In the “Description” tab you can add any text describing the content (Fig. ??).

In the “Metadata” tab you can add information in the “key-value” format (Fig. ??).

After uploading the file and specifying the parameters, click the Create button.

NextGIS Demo Day

Main resource group

Vector data

Display name

Type

Owner

User permissions

Resource	resource	
Read	read	<input type="button" value="A"/>
Create	create	<input type="button" value="A"/>
Update	update	<input type="button" value="A"/>
Delete	delete	<input type="button" value="A"/>
Manage children	manage_children	<input type="button" value="A"/>
Change permissions	change_permissions	<input type="button" value="A"/>
Metadata	metadata	
Read	read	<input type="button" value="A"/>
Write	write	<input type="button" value="A"/>

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer**
- Web map
- WFS service
- WMS connection
- WMS layer
- WMS service

EXTRA

- JSON view

ACTION

- Update
- Delete

Fig. 5.17: Selecting “Vector layer” action

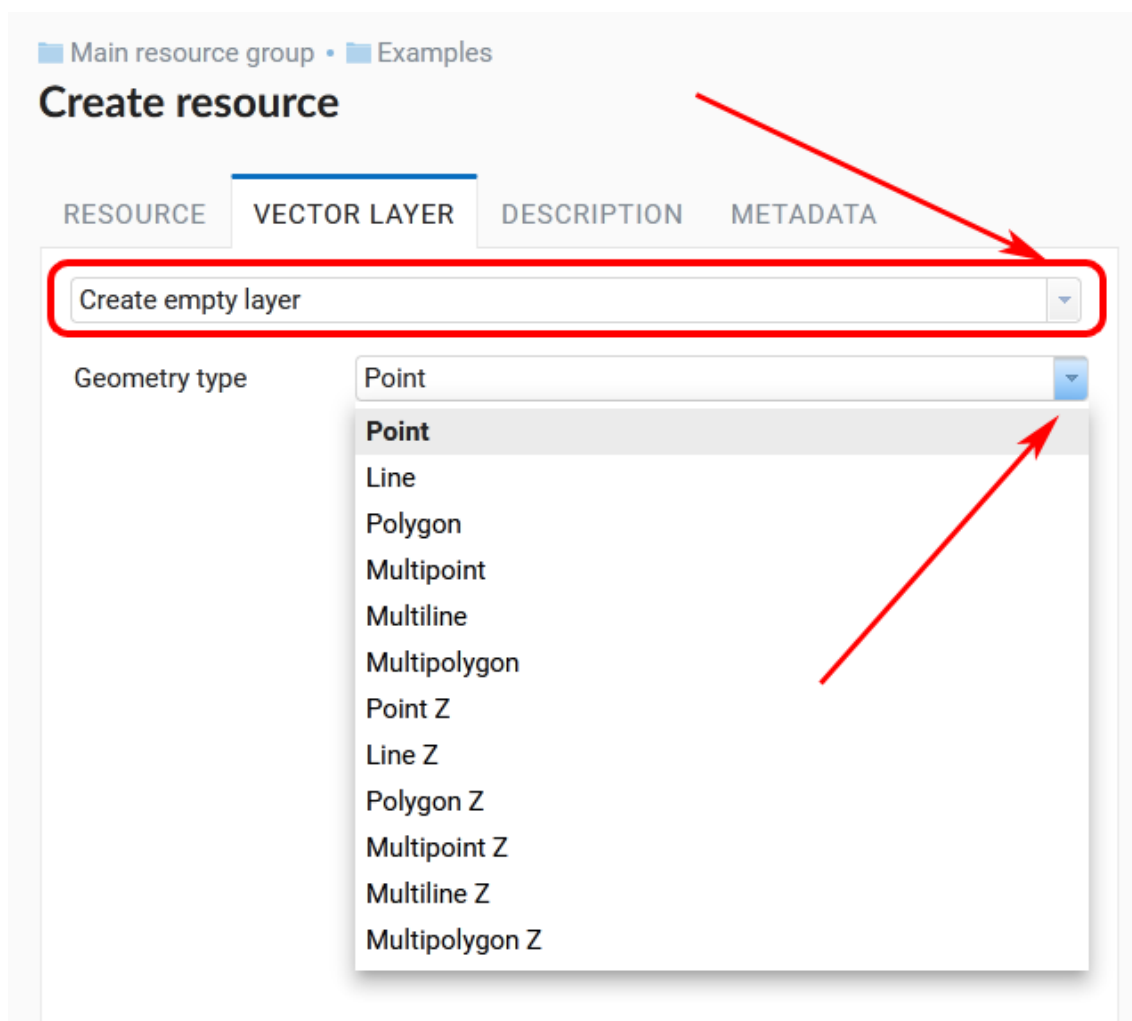


Fig. 5.18: Selecting geometry type for an empty layer

Then you can create a [style](#)¹¹ that will later visualize the data layer on a [Web Map](#)¹².

To add features to the newly created layer you can use the [editing toolbar](#)¹³.

5.6 Vector layer from PostGIS

To add a vector layer from PostgreSQL database with PostGIS extension, you need to create a PostGIS connection resource. It is enough to create one connection.

5.6.1 Creating PostGIS connection

In the “Create resource” actions pane click **PostGIS connection** (see Fig. ??).

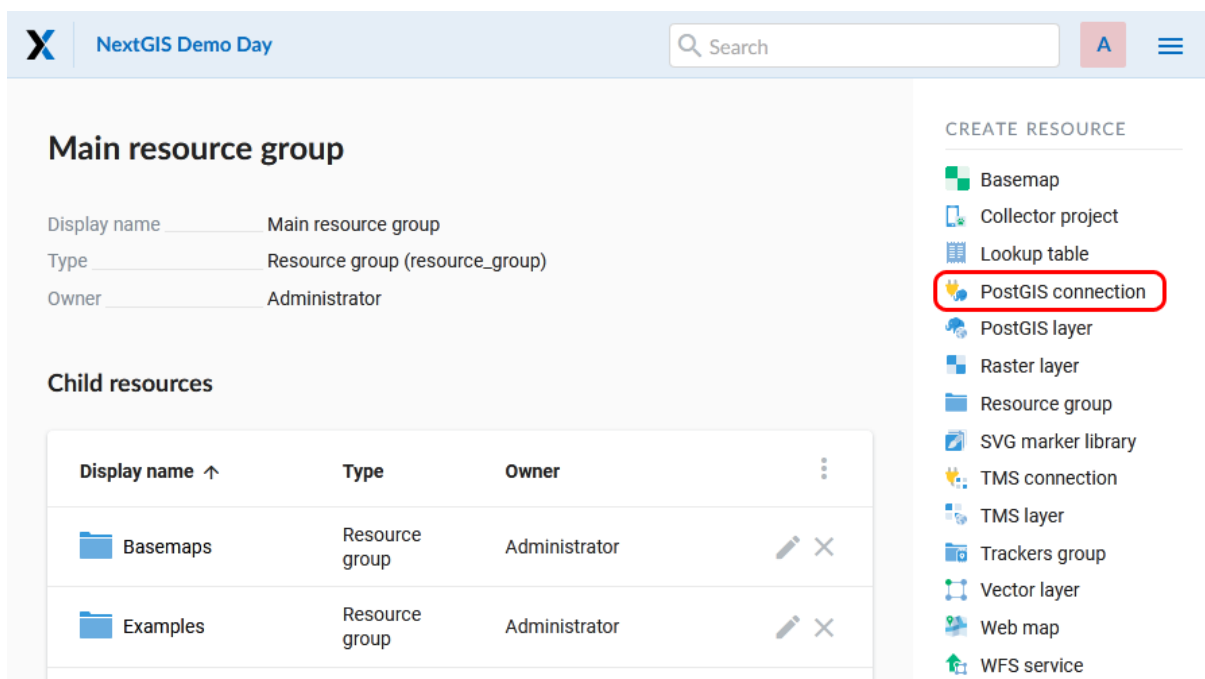


Fig. 5.19: Selection of “PostGIS connection” action

Enter a display name that will be visible in the administrator interface. Not to be confused with layer name in a database.

“Keyname” field is optional.

You can also add resource description and metadata on the corresponding tabs.

Switch from “Resource” to “PostGIS connection” tab, which is presented on Fig. ??.

In this tab you should enter connection parameters for the PostGIS database that you are going to take data from. Then click **Create**.

¹¹ https://docs.nextgis.com/docs_ngweb/source/mapstyles.html#qgis

¹² https://docs.nextgis.com/docs_ngweb/source/webmaps_admin.html#ngw-map-create

¹³ https://docs.nextgis.com/docs_ngcom/source/data_edit.html#create-a-new-feature-point-line-polygon

The screenshot shows the 'Create resource' dialog in the NextGIS Web interface. The top bar includes the 'X experiments' logo, a search bar, and a user menu. The main area is titled 'Main resource group' and 'Create resource'. It features four tabs: 'RESOURCE', 'POSTGIS CONNECTION', 'DESCRIPTION', and 'METADATA'. The 'RESOURCE' tab is active, showing fields for 'Display name' (PostGIS connection), 'Parent' (Main resource group), 'Owner' (Administrator), and 'Keyname' (Identifier for API integration (optional)). There are 'Create' and 'Create and edit' buttons at the bottom. On the right, a 'CREATE RESOURCE' sidebar lists various resource types, with 'PostGIS connection' highlighted.

Fig. 5.20: Create resource dialog for PostGIS connection

The screenshot shows the 'PostGIS connection description' dialog. The 'DESCRIPTION' tab is active, displaying a rich text editor with a toolbar containing icons for undo, redo, paragraph, bold, italic, underline, strikethrough, link, unlink, image, table, quote, list, and source. The text area contains the description: 'PostGIS connection for the **city boundaries** database, *Madison, WI*'. At the bottom, there are 'Create' and 'Create and edit' buttons.

Fig. 5.21: PostGIS connection description

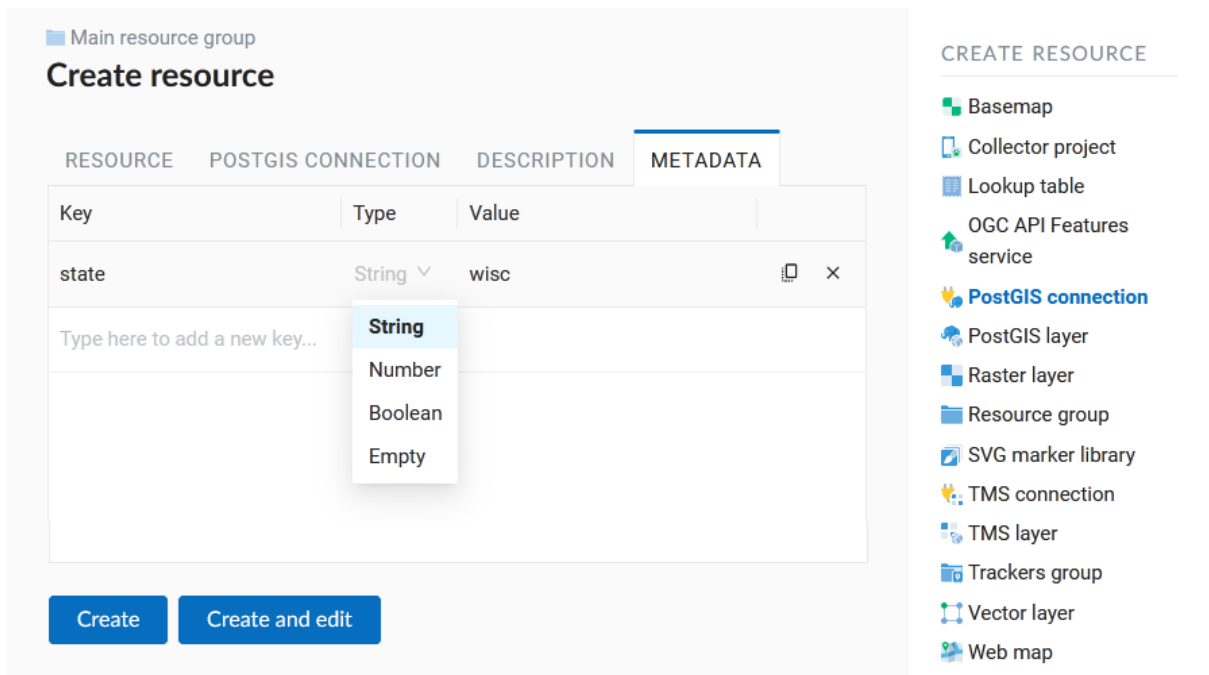


Fig. 5.22: PostGIS connection metadata

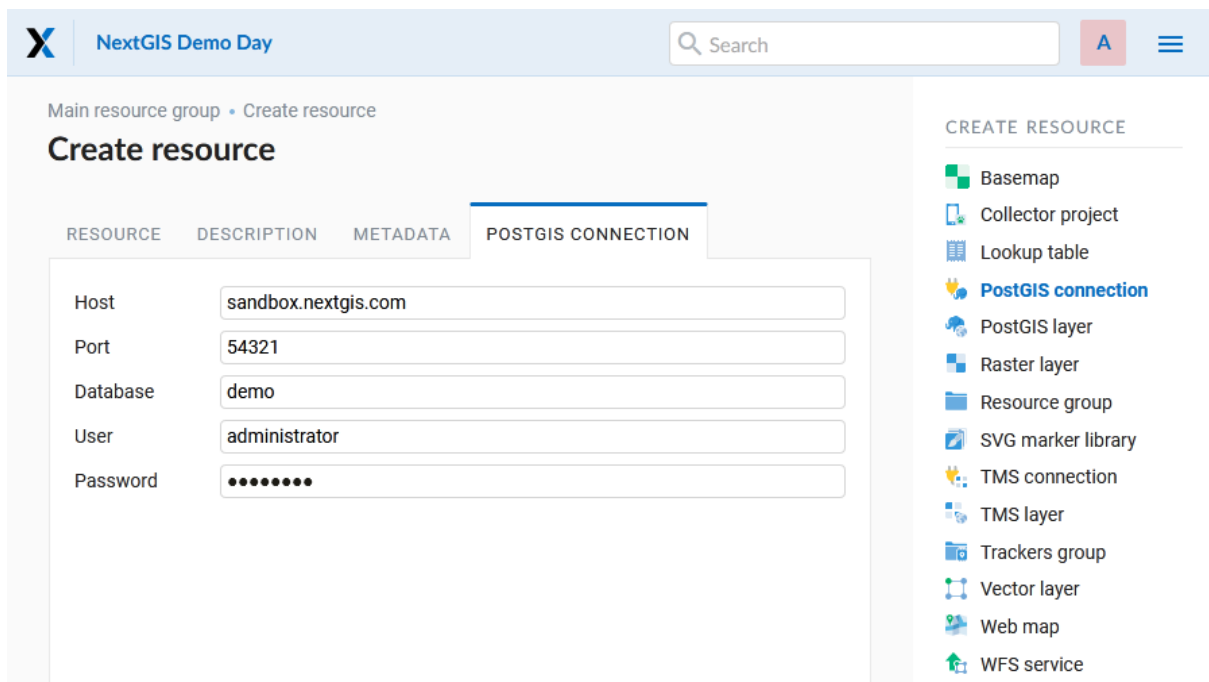


Fig. 5.23: PostGIS connection tab of Create resource dialog

5.6.2 Creating PostGIS layer

Now you can add individual PostGIS layers. Navigate to a group where you want to create layers and in the “Create resource” actions pane select **PostGIS layer** (see Fig. ??).

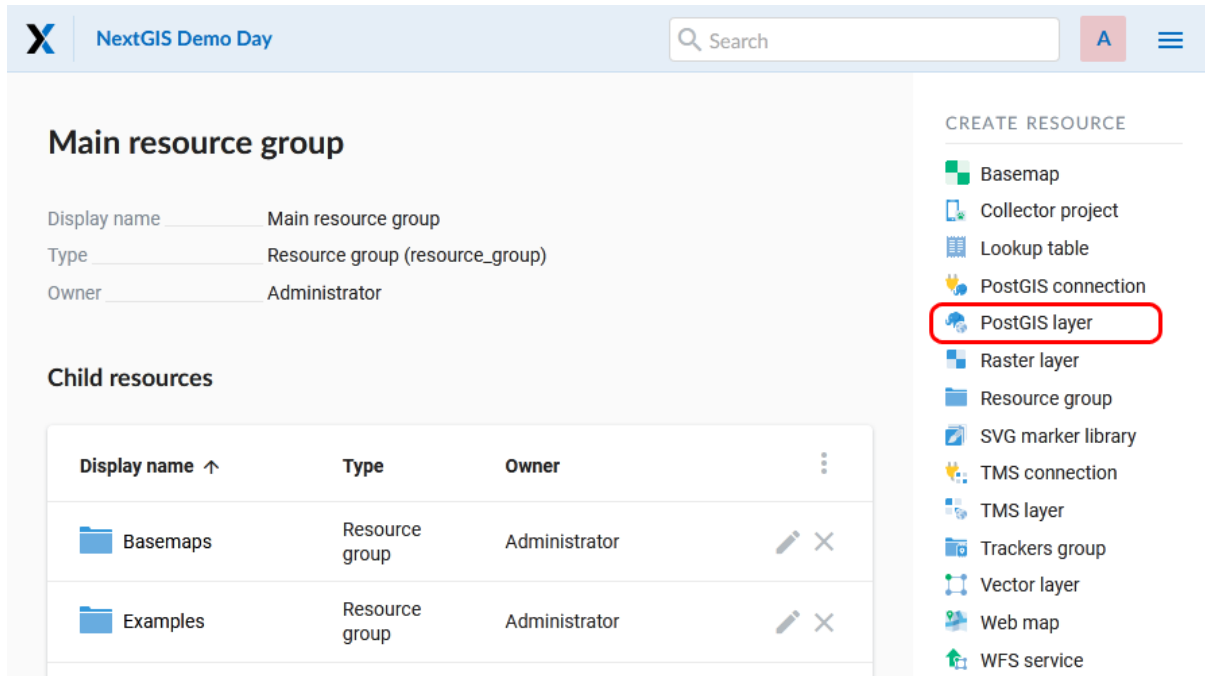


Fig. 5.24: Selection of “PostGIS layer” action

Enter a display name that will be visible in administrator interface and in the map layer tree.

“Keyname” field is optional.

You can also add resource description and metadata on the corresponding tabs.

Switch from “Resource” tab to “PostGIS layer” tab, which is presented on Fig. ??.

Then perform the following steps:

1. From a dropdown list select a database connection (creation of a connection is described above).
2. Select a schema of the database where layer data is stored. A single database can store multiple schemas. Each schema contains tables and views. If there is only one schema, it's called public. For more information see **PostgreSQL DBMS** manual.
3. Select the Table name (PostGIS layer). You need to know names of tables and columns in your database. Display of tables content is not a feature of NextGIS Web. You can view them using **NextGIS QGIS** or **pgAdmin** software.
4. Select an ID column. When data is loaded into PostGIS using **NextGIS QGIS** software, an `ogc_fid` column is created. If the data was loaded another way, the column name may be different. An ID column should follow rules for data type: the value type should be a number (**numeric**) and it should be a primary key.

experiments Search resources **A**

Main resource group

Create resource

RESOURCE POSTGIS LAYER DESCRIPTION METADATA

Display name:

Parent:

Owner:

Keyname:

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- OGC API Features service
- PostGIS connection
- PostGIS layer**
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer

Fig. 5.25: Create resource dialog for PostGIS layer

Main resource group

Create resource

RESOURCE POSTGIS LAYER DESCRIPTION METADATA

Key	Type	Value
level	Number	8
Type here to add a new key...		

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- OGC API Features service
- PostGIS connection
- PostGIS layer**
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer
- Web map

Fig. 5.26: PostGIS layer metadata

Fig. 5.27: PostGIS layer tab of create resource dialog

5. Select the Geometry column (if the data was loaded to PostGIS using **NextGIS QGIS** software, usually a geometry column called `wkb_geometry` is created. If the data was loaded some other way, the name of the column may be different).
6. Parameters “Geometry type”, “Attribute definitions” and “SRID” are not required, so you can use default values.

After specifying all the necessary parameters, click **Create**.

5.6.3 Details

NextGIS Web software supports tables with point, line and polygon geometries stored in a single geometry column. This is required for some specific datasets: e.g. if one table stores coordinates for parks as polygons and trash cans as points. In this case, in NextGIS Web you need to add three different layers, one for each type of geometry, and select the appropriate “Geometry type” parameter for each layer.

After a layer is created, you need to set a label attribute to display labels. Navigate to layer edit dialog and set a checkbox for the required field in the “Label attribute” column.

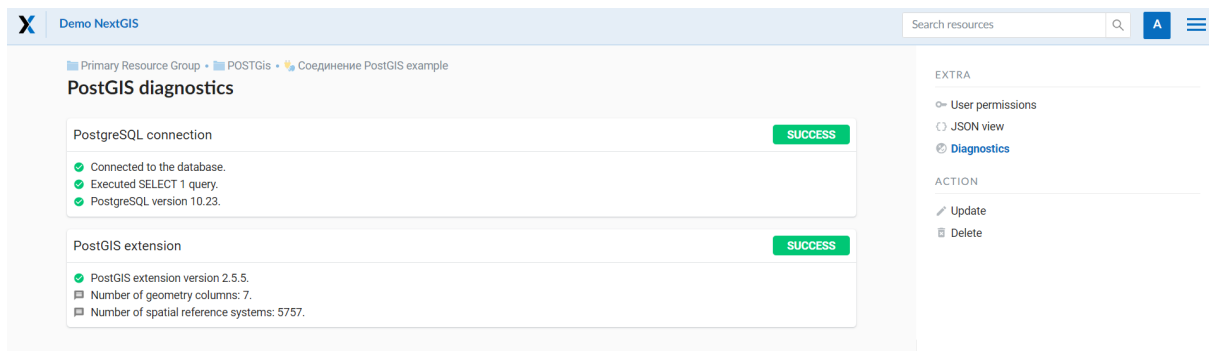
If the structure of the database changes (column names, column types, number of columns, table names etc.), you need to update the attribute definitions in the layer properties. Select “Update” in the actions pane and then on the “PostGIS layer” tab change “Attribute definitions” to “Reload” and click **Save**.

5.6.4 PostGIS diagnostics

You can check the correctness of the entered data when adding the **PostGIS Connection** resource using the **Diagnostics** tool. To do this, you need to click on the **Diagnostics** button on the panel on the right.



If all fields are filled in correctly when creating a connection to PostGIS - diagnostics will be successful.



If any of the entered data is not correct, an error message will appear.



5.6.5 PostGIS layer troubleshooting

You created a connection, but when you try to create a PostGIS layer based on it, you get errors.

If you get:

1. Cannot connect to the database!

Check the database: is it available, do you have the right credentials? You can do it using **pgAdmin** or **NextGIS QGIS**.

Note that databases may be down temporarily and credentials might change.



5.6.6 Create layers with conditions

In **NextGIS Web** you can not define queries using WHERE SQL clause. This provides additional security (prevention of SQL Injection attack). To provide query capability you need to create views with appropriate queries in the database.

To do this connect to PostgreSQL/PostGIS database using **pgAdmin**, then navigate to data schema where you want to create a view, right click tree item “Views” and select “New view” (see item 1 in Fig. ??). Also you can right click on schema name and select “New object” and then “New view”. In the opened dialog, enter the following information:

1. View name («Properties» tab).
2. Data schema where to create a view («Properties» tab).
3. SQL query («Definition» tab).

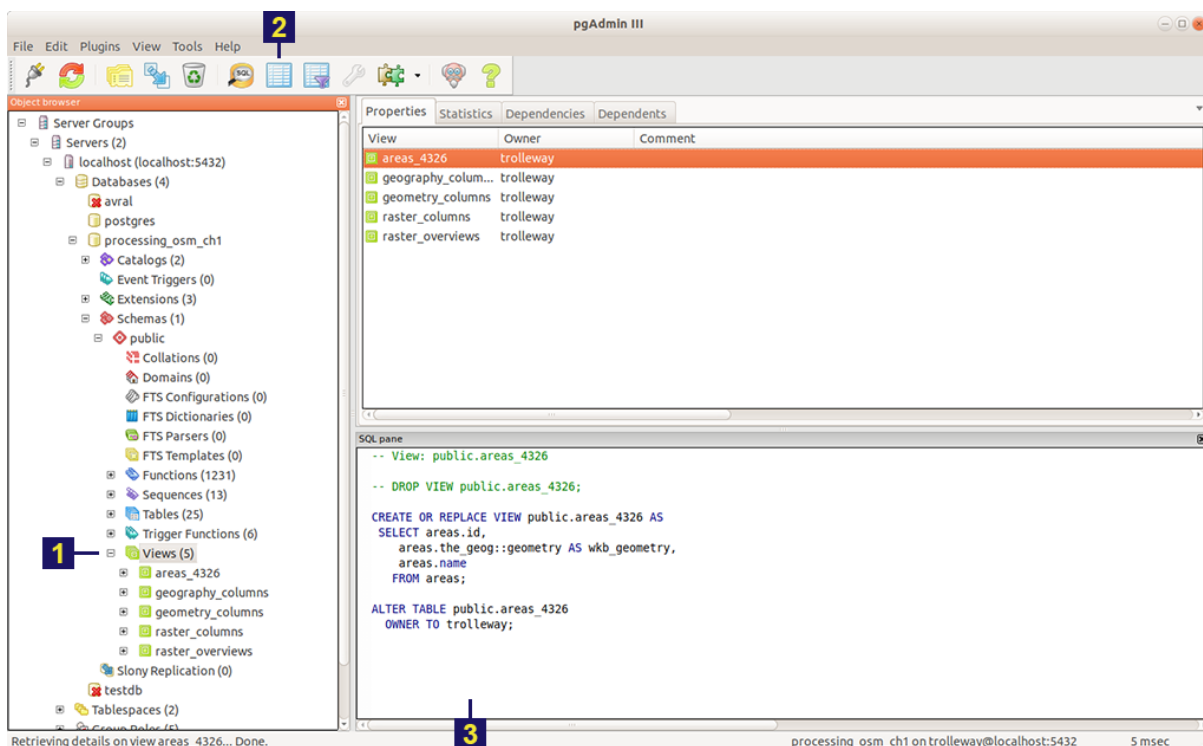


Fig. 5.28: Main dialog of **pgAdmin** software

The numbers indicate: 1. – Database items tree; 2 – a button for table open (is active if a table is selected in tree); 3 – SQL query for view.

After that you can display a view to check if the query is correct without closing **pgAdmin** (see item 2 in Fig. ??).

5.7 WMS layer

Note: Currently supported WMS versions 1.1.1 and 1.3.0.

NextGIS Web is a WMS client. To connect a WMS layer you need to know its address. WMS server should be able to serve it using a coordinate system EPSG:3857. You can check if this coordinate system is available for a particular layer by making a GetCapabilities request to a server and examining the response. For example a WMS layer provided by Geofabrik (GetCapabilities), responds in EPSG:4326 and EPSG:900913. While EPSG:900913 and EPSG:3857 are technically the same, NextGIS Web requests data in EPSG:3857 and this particular server does not support that coordinate system.

5.7.1 Creating WMS Connection

To add a WMS layer you need to create a resource called WMS connection. You may create a single connection for many layers. In the “Create resource” actions pane click **WMS connection** (see Fig. ??).

The screenshot shows the 'Main resource group • WMS' interface. On the left, the 'WMS' resource group is displayed with fields for 'Display name' (WMS), 'Type' (Resource group (resource_group)), and 'Owner' (Administrator). Below this is a 'User permissions' table. On the right, the 'CREATE RESOURCE' pane lists various actions, with 'WMS connection' highlighted by a red circle and a red arrow pointing to it.

Resource	resource	
Read	read	A
Create	create	A
Update	update	A
Delete	delete	A
Manage children	manage_children	A

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer
- Web map
- WFS service
- WMS connection**
- WMS layer

Fig. 5.29: Selection of “WMS connection” action

Create resource dialog for WMS connection is presented on Fig. ??.

Enter the name of the resource that will be displayed in the administrator interface. Not to be confused with layer name in a database. “Keyname” field is optional.

The screenshot shows the 'Create resource' dialog in the NextGIS Web interface. The 'RESOURCE' tab is selected, displaying the following fields:

- Display name:** FIRMS connection
- Parent:** Main resource group (selected from a dropdown)
- Owner:** Administrator (selected from a dropdown)
- Keyname:** Identifier for API integration (optional)

At the bottom of the dialog are two buttons: 'Create' and 'Create and edit'. To the right of the dialog is a sidebar titled 'CREATE RESOURCE' which lists various resource types with corresponding icons:

- Basemap
- Collector project
- Lookup table
- OGC API Features service
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer

Fig. 5.30: Create resource dialog for WMS connection

On the “Description” tab you can add any text describing the content of this connection.

On the “Metadata” tab you can enter information in the “key-value” format.

Switch to “WMS connection” tab, which is presented on Fig. ??.

Here enter the following WMS server connection parameters:

- URL
- Username
- Password
- Version of WMS protocol
- Capabilities (manages GetCapabilities queries to the WMS Server)

Supported versions of WMS protocol: 1.1.1, 1.3.0 After setting up all necessary parameters, click **Create**.

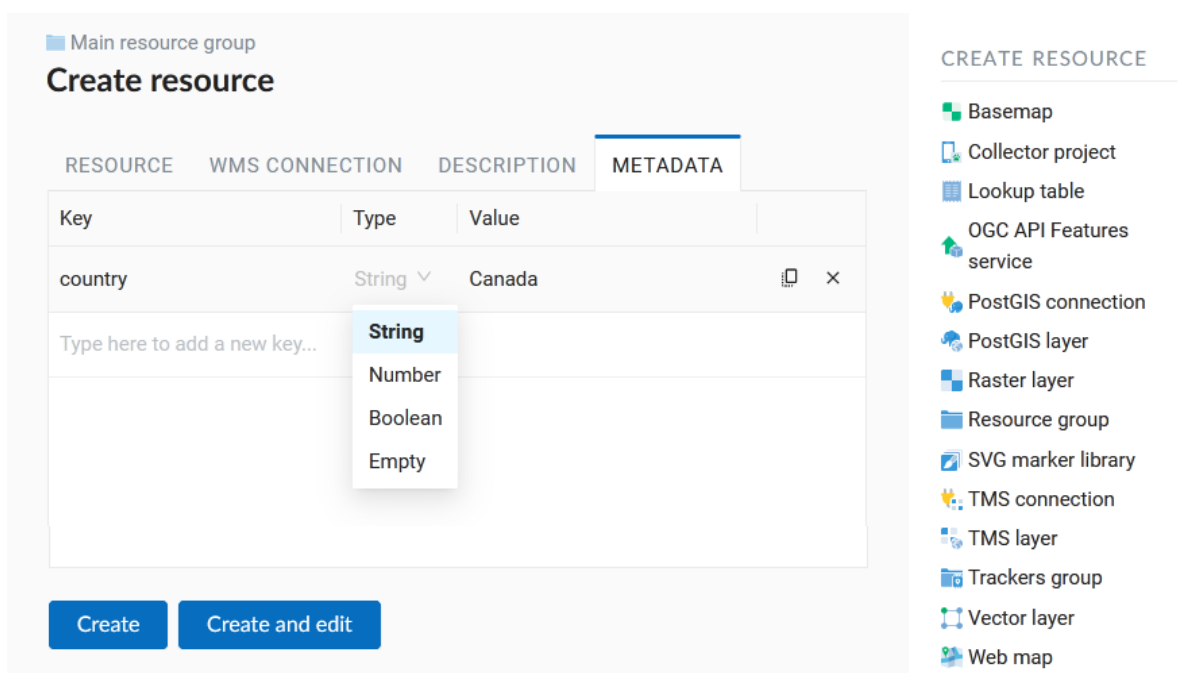
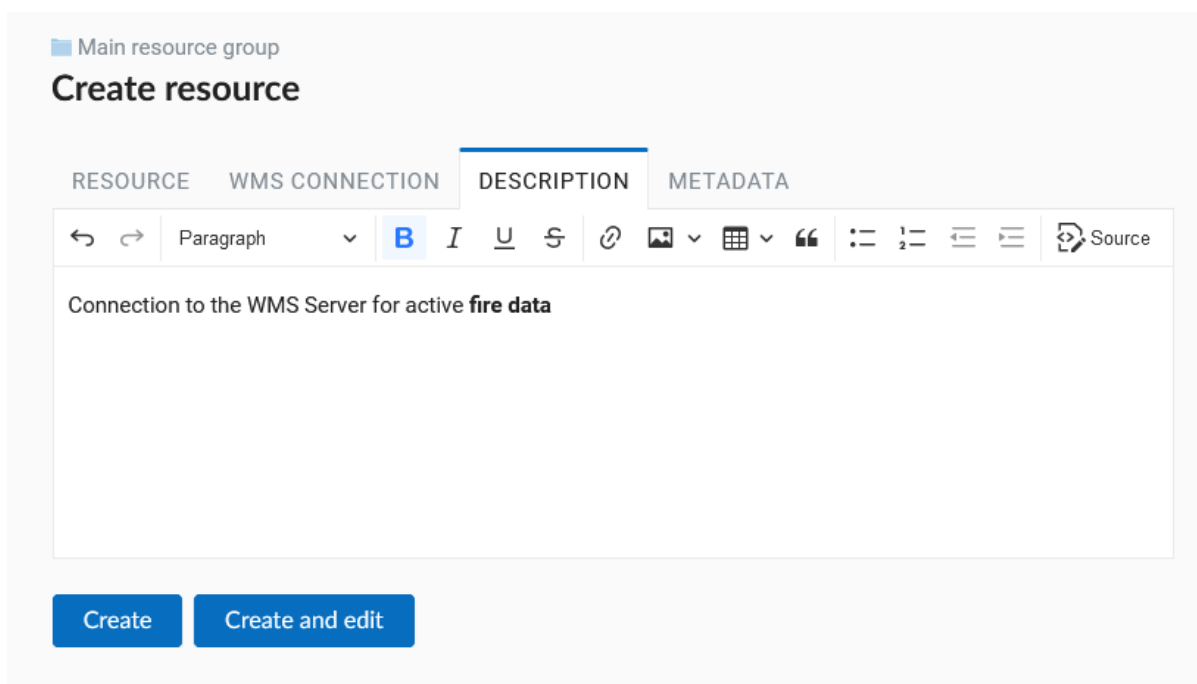
5.7.2 Creating WMS Layer

Now you can add individual WMS layers. Navigate to a group where you want to create WMS layers and in the “Create resource” actions pane select **WMS layer** (see Fig. ??).

Create resource dialog for WMS layer is presented on Fig. ??

Enter display name that will be visible in administrator interface and in the map layer tree.

“Keyname” field is optional.



Main resource group • WMS

Create resource

RESOURCE
DESCRIPTION
METADATA
WMS CONNECTION

URL

Username

Password

Version

Capabilities

Create

Create and edit

CREATE RESOURCE

Basemap

Collector project

Lookup table

PostGIS connection

PostGIS layer

Raster layer

Resource group

SVG marker library

TMS connection

TMS layer

Trackers group

Vector layer

Web map

WFS service

WMS connection

WMS layer

WMS service

EXTRA

JSON view

ACTION

Update

Delete

Fig. 5.33: WMS connection tab of Create resource dialog

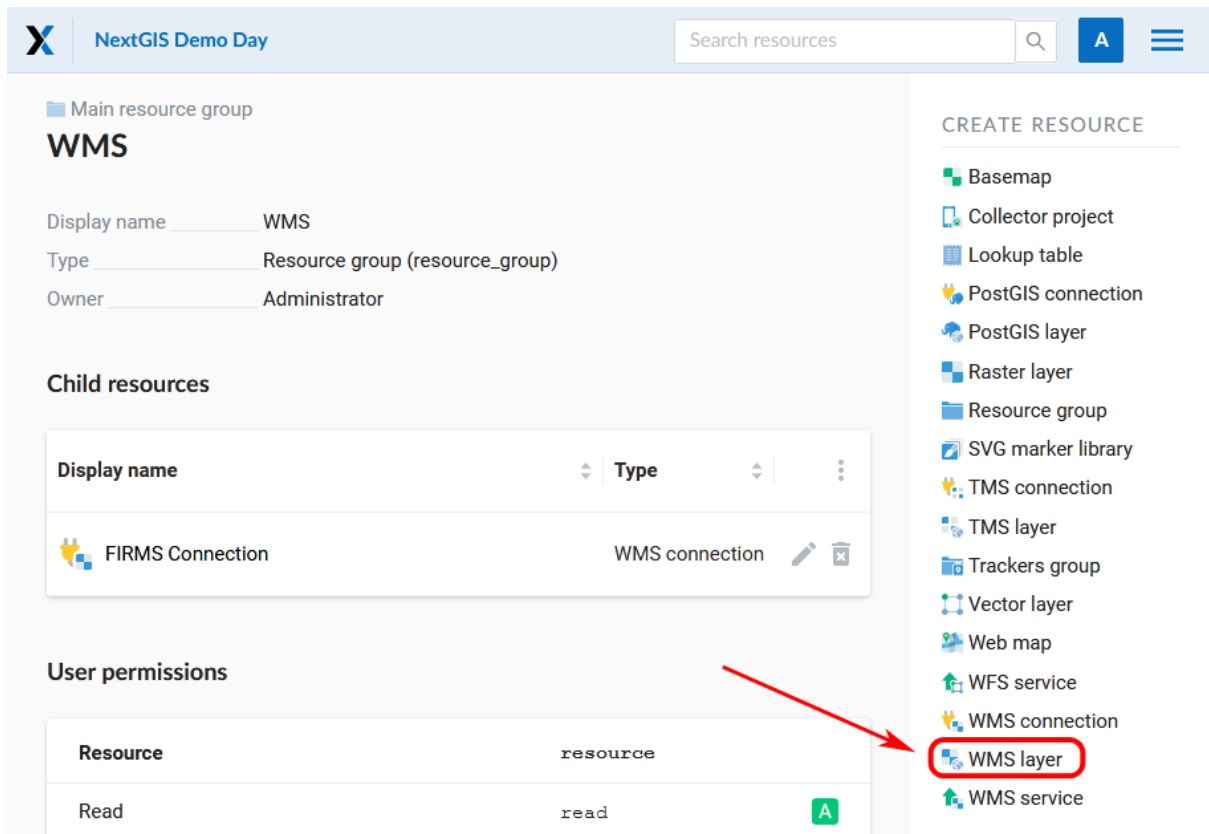


Fig. 5.34: Selection of “WMS layer” action

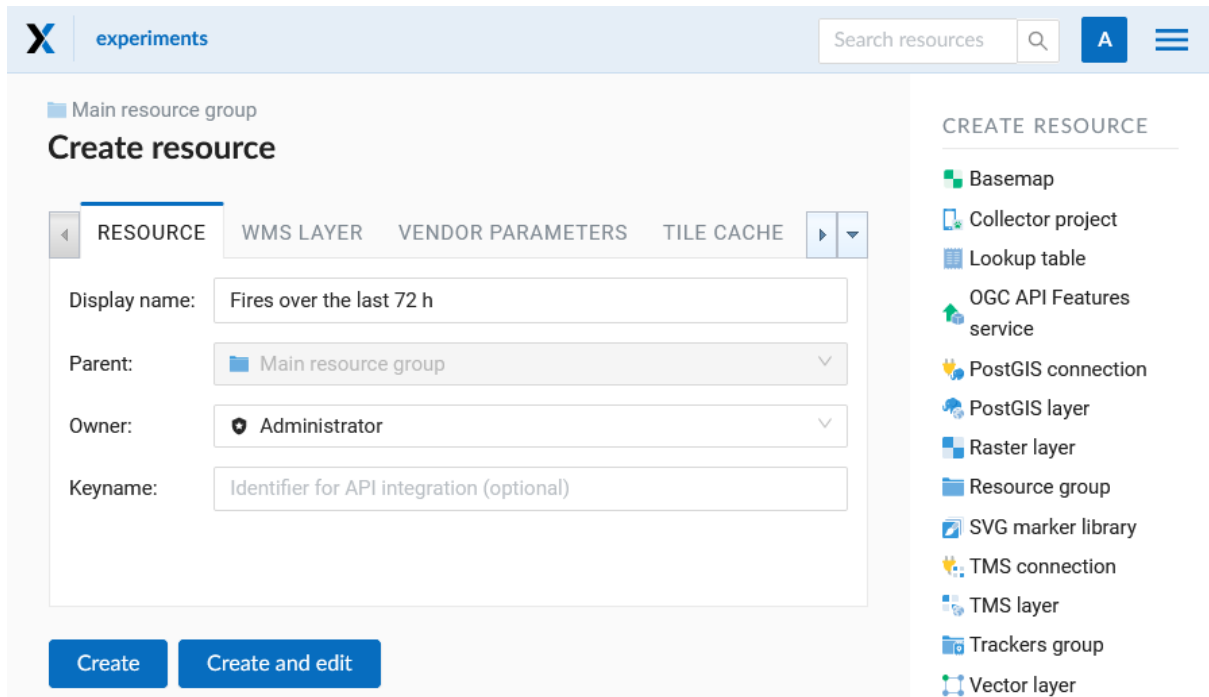


Fig. 5.35: Create resource dialog for WMS layer

Tile cache settings are described in detail in [this section](#)¹⁴.

On the “Description” tab you can add any text describing the content of this layer.

Main resource group

Create resource

RESOURCE WMS LAYER VENDOR PARAMETERS TILE CACHE DESCRIPTION MI

Paragraph B I U S Link Image Table Quote Bulleted list Numbered list Indent Outdent Source

WMS layer with **fire data**

Create Create and edit

Fig. 5.36: WMS layer description

In the “Metadata” tab you can enter information in the “key-value” format.

Switch to the “WMS layer” tab, which is presented on Fig. ?? and perform the following steps:

1. Select the WMS connection that was created earlier.
2. Select the appropriate MIME-type from the dropdown list.
3. Select the required layers from the list by clicking the underlined names. You can select several layers.

In the last tab you can add vendor parameters. These are special query settings for additional functions. They vary depending on the WMS provider.

After configuring all the parameters click **Create**.

Warning: Identification requests to external WMS layers from Web Maps are not supported yet.

¹⁴ https://docs.nextgis.com/docs_ngweb/source/mapstyles.html#tile-cache

Main resource group

Create resource

VENDOR PARAMETERS TILE CACHE DESCRIPTION METADATA

Key	Type	Value
step	Number	5
Type here to add a new key...		

String
Number
Boolean
Empty

Create Create and edit

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- OGC API Features service
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer
- Web map

Fig. 5.37: WMS layer metadata

5.8 WMS service

NextGIS Web software can perform as WMS server. This protocol is used to provide images with a requested extent.

To deploy a WMS service you need to add a resource. In the “Create resource” actions pane click **WMS service** (see Fig. ??).

Create resource dialog for WMS service is presented on Fig. ??.

Enter the name of the resource that will be displayed in the administrator interface. Do not confuse this name with a name of layers in a database.

“Keyname” field is optional.

On the “Description” tab you can add any text describing the content of this service.

On the “Metadata” tab you can enter information in the “key-value” format.

Switch to “WMS service” tab, which is presented on Fig. ?. Here add links to required layers or layer styles. You can also set the min and max scale for the data visualisation.

After the resource is created, you will see a message with the WMS service URL which you can use in other software, e.g. **NextGIS QGIS** or **JOSM**. Then you need to set access permissions for the WMS service (see *Access management* (page ??)).

NextGIS Web layer can be added to desktop, mobile and Web GIS in different ways.

Main resource group • WMS

Create resource

RESOURCEDESCRIPTIONTILE CACHEMETADATAWMS LAYERVENDOR PARAMETERS

WMS connection

FIRMS Connection

Image format

image/png

WMS layers

NASA FIRMS	NASA FIRMS WMS Service
fires_modis_24	MODIS Fires - Past 24 Hours
fires_modis_48	MODIS Fires - Past 48 Hours
fires_modis_72	MODIS Fires - Past 72 Hours
fires_modis_7	MODIS Fires - Past 7 Days
fires_aqua_24	MODIS-Aqua Fires - Past 24 Hours
fires_aqua_48	MODIS-Aqua Fires - Past 48 Hours
fires_aqua_72	MODIS-Aqua Fires - Past 72 Hours
fires_aqua_7	MODIS-Aqua Fires - Past 7 Days
fires_terra_24	MODIS-Terra Fires - Past 24 Hours
fires_terra_48	MODIS-Terra Fires - Past 48 Hours
fires_terra_72	MODIS Fires-Terra - Past 72 Hours
fires_terra_7	MODIS-Terra Fires - Past 7 Days
fires_viirs_24	VIIRS Fires - Past 24 Hours

Create

Create and edit

Fig. 5.38: WMS layer tab of Create resource dialog

Main resource group • WMS

Create resource

RESOURCE DESCRIPTION TILE CACHE METADATA WMS LAYER **VENDOR PARAMETERS**

✚ Add ✕ Delete

Key	Value
buffer	5

Create Create and edit

Fig. 5.39: Vendor parameters of the WMS layer

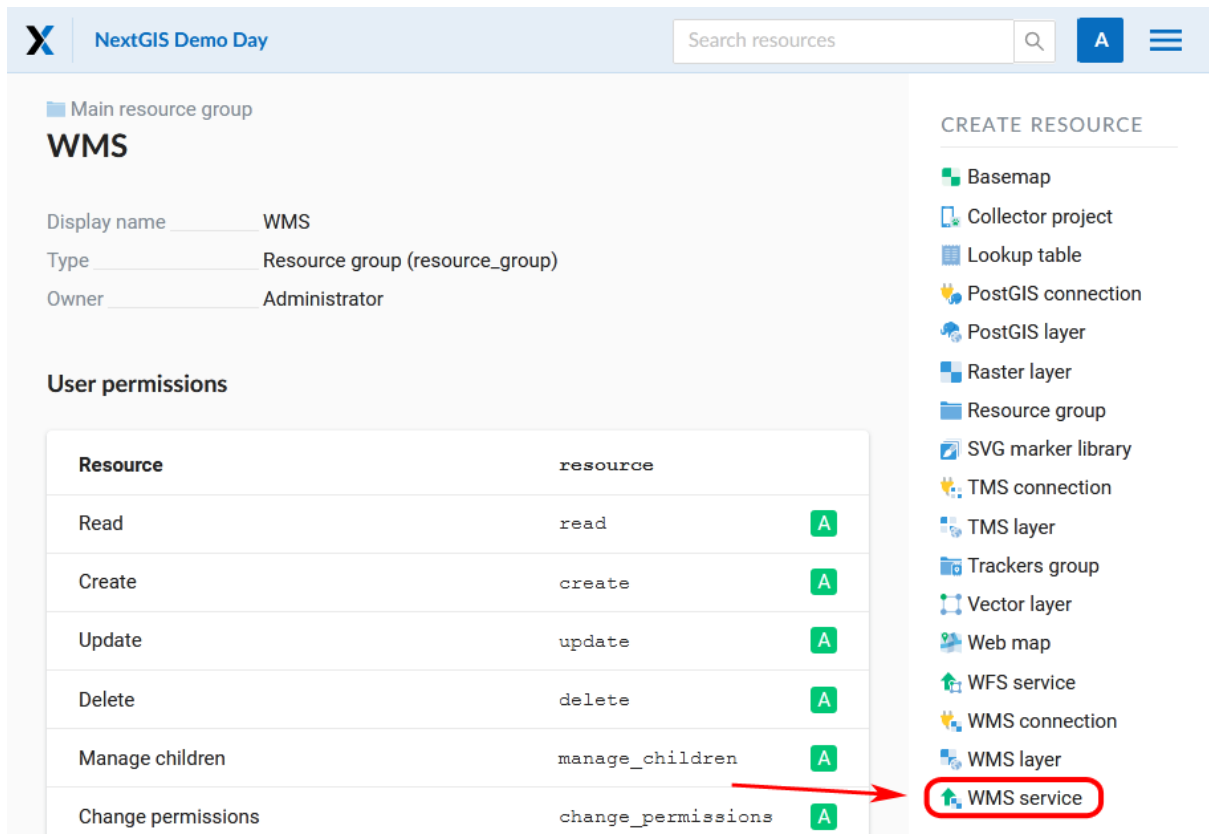


Fig. 5.40: Selection of “WMS service” action

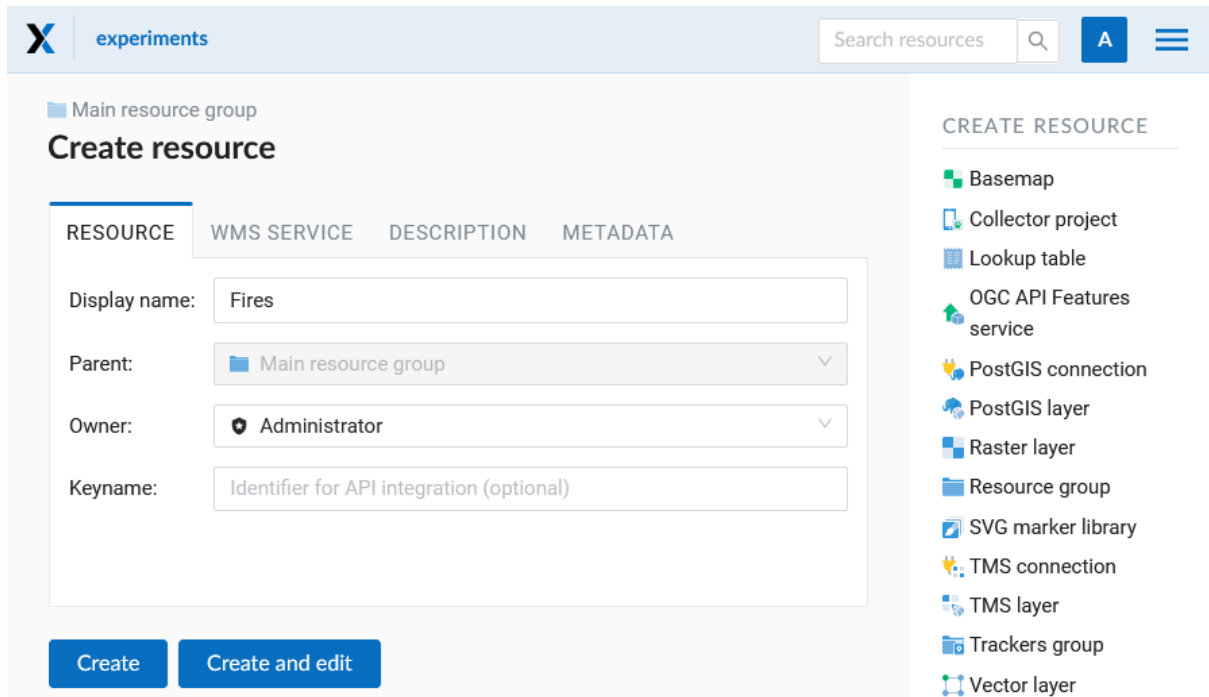


Fig. 5.41: Create resource dialog for WMS service

Main resource group

Create resource

RESOURCE WMS SERVICE DESCRIPTION METADATA

↶ ↷ Paragraph **B** *I* U ~~S~~ Source

Fire monitoring service

Create Create and edit

Fig. 5.42: WMS service description

Main resource group

Create resource

RESOURCE WMS SERVICE DESCRIPTION METADATA

Key	Type	Value
state	String	wisc
Type here to add a new key...		

String
Number
Boolean
Empty

Create Create and edit

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- OGC API Features service
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer
- Web map

Fig. 5.43: WMS service metadata

NextGIS Demo Day

A

Main resource group • Create resource

Create resource

RESOURCE
DESCRIPTION
METADATA
WMS SERVICE

Add
Remove

Boundary	Keyname	Buildings_style
Forest map	Display name	Buildings-style
Buildings-style	Min scale	
	Max scale	
	Resource	Buildings-style

Create
Create and edit

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer
- Web map
- WFS service
- WMS connection
- WMS layer
- WMS service**

EXTRA

- JSON view

ACTION

- Update

Fig. 5.44: WMS service tab of Create resource dialog

5.8.1 Using WMS service connection

NextGIS Web acts as a WMS server: WMS services created in NextGIS Web can be added to any software that supports WMS protocol. For that you need to know the WMS service URL. You can get it on the WMS service page. The link may look like this:

```
https://demo.nextgis.com/api/resource/4817/wms?
```

To use WMS service through GDAL utilities you need to create an XML file for the required layer. Enter these parameters to the ServerUrl string in example below. The rest remains unchanged.

```
<GDAL_WMS>
  <Service name="WMS">
    <Version>1.1.1</Version>
    <ServerUrl>https://demo.nextgis.com/api/resource/4817/wms?</
    ↪ServerUrl>
    <SRS>EPSG:3857</SRS>
    <ImageFormat>image/png</ImageFormat>
    <Layers>moscow_boundary_multipolygon</Layers>
    <Styles></Styles>
  </Service>
  <DataWindow>
    <UpperLeftX>-20037508.34</UpperLeftX>
    <UpperLeftY>20037508.34</UpperLeftY>
    <LowerRightX>20037508.34</LowerRightX>
    <LowerRightY>-20037508.34</LowerRightY>
    <SizeY>40075016</SizeY>
    <SizeX>40075016.857</SizeX>
  </DataWindow>
  <Projection>EPSG:3857</Projection>
  <BandsCount>3</BandsCount>
</GDAL_WMS>
```

If you need an image with transparency (alpha channel) set <BandsCount>4</BandsCount>.

Here is an example of a GDAL command. The utility gets an image by WMS from NextGIS Web and saves it to a GeoTIFF format.

```
$ gdal_translate -of "GTIFF" -outsize 1000 0 -projwin 4143247_
↪7497160 \
4190083 7468902 ngw.xml test.tiff
```

5.9 TMS layer

5.9.1 TMS Connection

Similarly to [WMS¹⁵](#), to add a TMS layer, you first need to create a TMS connection. Select **TMS connection** in the “Create resource” actions pane (see Fig. ??)

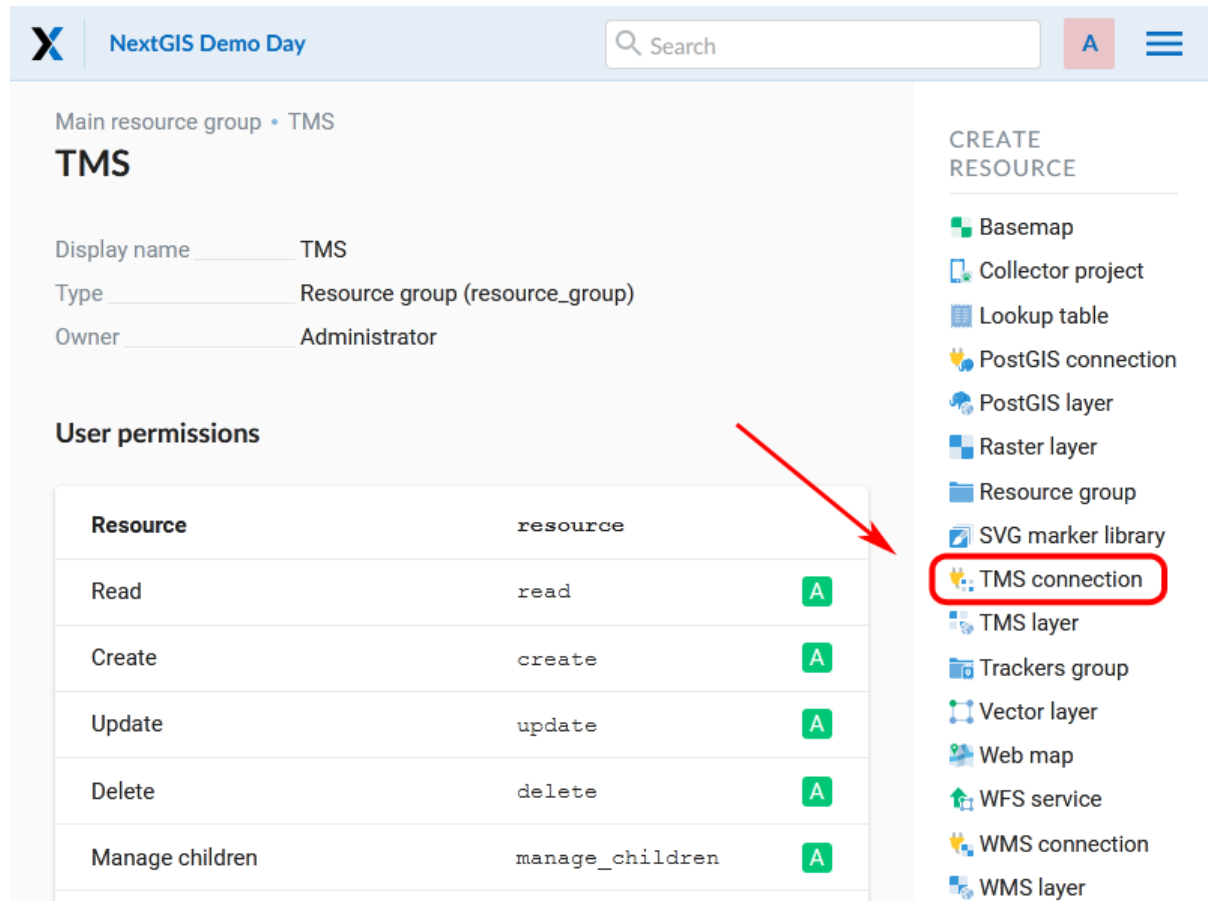


Fig. 5.45: Selecting a TMS Connection resource

Enter the connection name that will be displayed in the administrator interface (see Fig. ??).

The “Key” field is optional. If needed, you can also add a description and metadata. In the TMS connection tab you need to select the way to connect to the TMS server - custom or via NextGIS geoservices (see Fig. ??).

In the case of a custom connection method, the user must specify the URL template, API key parameters if needed and the tile scheme used. For NextGIS geoservices, only a custom API key is specified. After filling in all fields press Create to complete the process of creating a **TMS Connection** resource.

¹⁵ https://docs.nextgis.com/docs_ngweb/source/layers.html#wms-layer/

The screenshot shows the 'Create resource' interface. The main form has four tabs: 'RESOURCE', 'TMS CONNECTION', 'DESCRIPTION', and 'METADATA'. The 'RESOURCE' tab is selected. It contains the following fields:

- Display name:** A text input field containing 'TMS connection'.
- Parent:** A dropdown menu showing 'Main resource group'.
- Owner:** A dropdown menu showing 'Administrator'.
- Keyname:** A text input field with the placeholder text 'Identifier for API integration (optional)'.

At the bottom of the form are two buttons: 'Create' and 'Create and edit'.

On the right side, there is a sidebar titled 'CREATE RESOURCE' which lists various resource types with icons. The 'TMS connection' item is highlighted with a blue background.

Fig. 5.46: TMS Connection Resource Name

5.9.2 TMS layer

TMS layer resource is created using previously created **TMS Connection**. Select **TMS layer** in the “Create resource” actions pane (see Fig. ??).

Enter the name that will be displayed in the administrator interface (see Fig. ??).

Caching provides faster rendering of Web Map layers. Tile cache settings are described in details in [this section](#)¹⁶.

The main display settings are on the TMS layer tab (. Fig. ??):

- TMS connection - select a TMS connection resource that was created earlier
- Select coordinate system for data display
- The range of zoom levels for data display
- Extent in degrees
- Tile size in pixels

After creating a TMS layer, the user can add it to the Web Map to display. No style is needed.

¹⁶ https://docs.nextgis.com/docs_ngweb/source/mapstyles.html#tile-cache

Main resource group • TMS • Create resource

Create resource

RESOURCE DESCRIPTION METADATA **TMS CONNECTION**

Capmode Custom

URL template `https://storage.googleapis.com/earthenginepartners-hansen/tiles/gfc_v1.7/last_543/{z}/{x}/{y}.jpg`

API key

API key param

Username

Password

Scheme xyz

Skip SSL/TLS certificate verification ☐

Create Create and edit

Fig. 5.47: Configuring TMS Connection

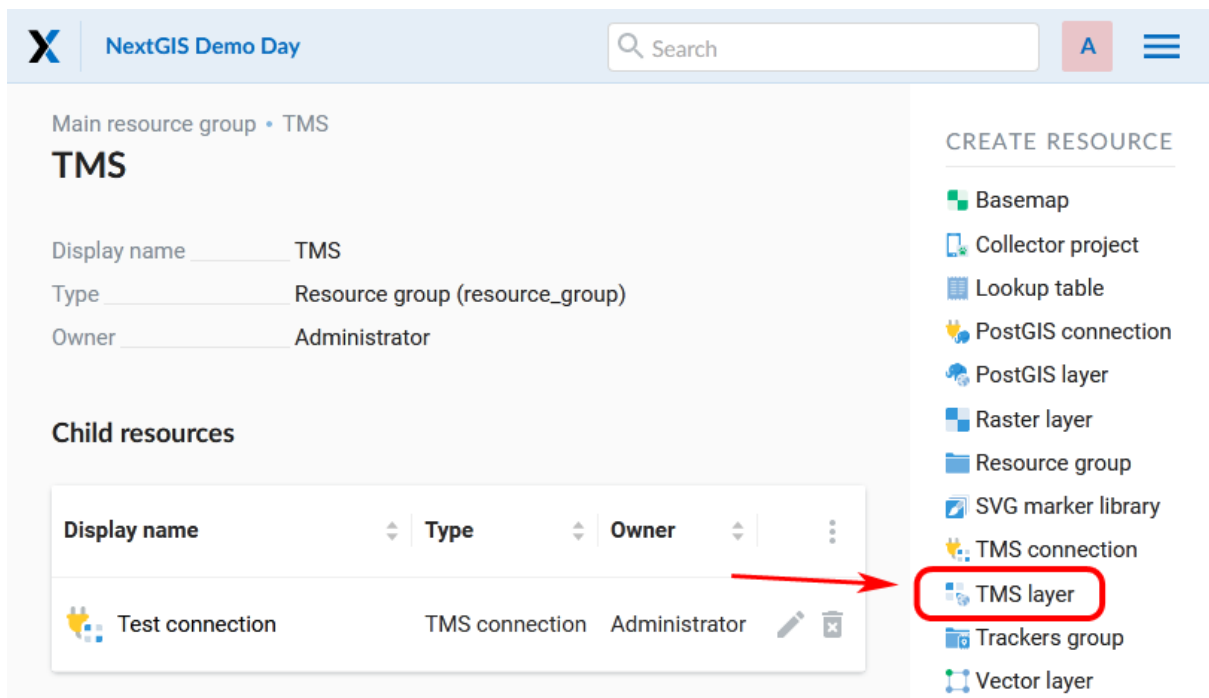


Fig. 5.48: Selecting of TMS layer action

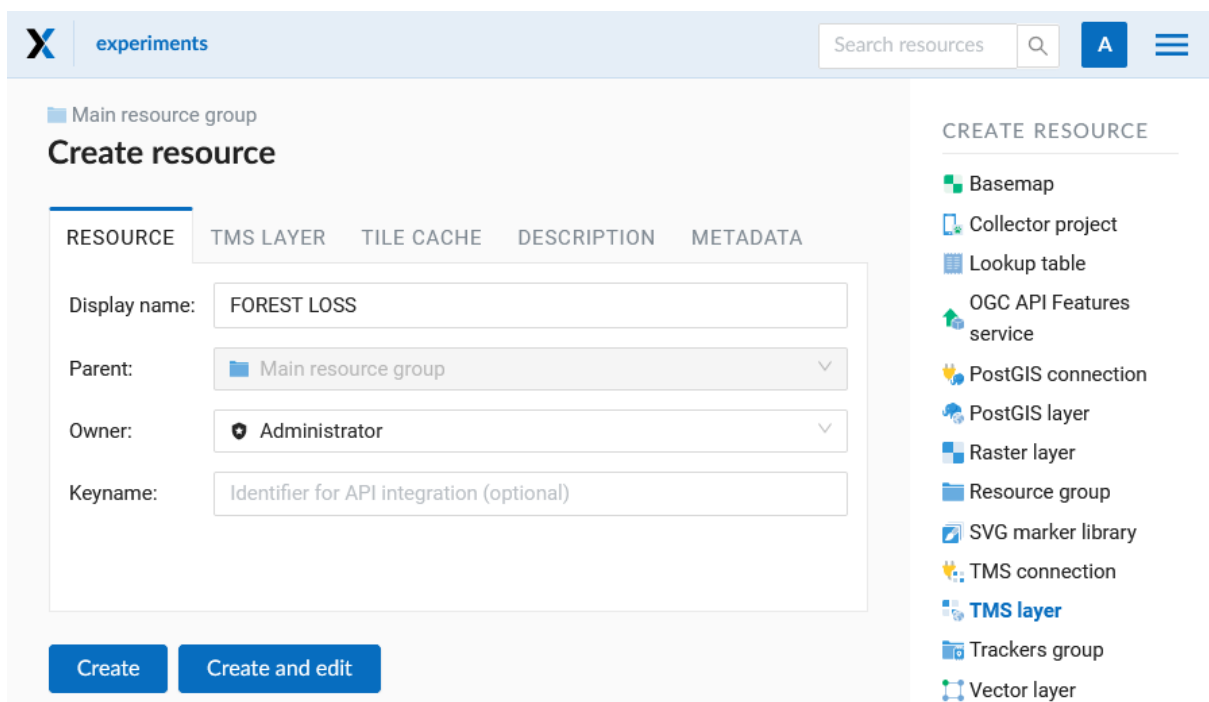




Fig. 5.49: TMS layer name


NextGIS Demo Day

A



Main resource group • TMS • Create resource

Create resource

RESOURCE
DESCRIPTION
TILE CACHE
METADATA
TMS LAYER

TMS connection

Test connection

Choose a layer


Coordinate system

WGS 84 / Pseudo-Mercator (EPSG:3857)

Min zoom level

Max zoom level

19

Left, deg.

Bottom, deg.

Right, deg.

Top, deg.

Tile size, px

Create

Create and edit

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer**
- Trackers group
- Vector layer
- Web map
- WFS service
- WMS connection
- WMS layer
- WMS service

EXTRA

- JSON view

ACTION

- Update
- Delete

Fig. 5.50: TMS layer settings

5.9.3 Using TMS service

NextGIS Web is a TMS server. Layers and styles created in it can be accessed via any software supporting TMS protocol. You will need the URL for the TMS service.

The link should look like this:

```
https://demo.nextgis.com/api/component/render/tile?z={z}&x={x}&y={y}
↪&resource=234
```

To use TMS service through GDAL utilities you need to create an XML file. You will need the TMS link. Enter these parameters to ServerUrl string in example below. The rest remains unchanged.

```
<GDAL_WMS>
  <Service name="TMS">
    <ServerUrl>https://demo.nextgis.com/api/component/render/tile?
↪z={z}&x={x}&y={y}&resource=234
    </ServerUrl>
  </Service>
  <DataWindow>
    <UpperLeftX>-20037508.34</UpperLeftX>
    <UpperLeftY>20037508.34</UpperLeftY>
    <LowerRightX>20037508.34</LowerRightX>
    <LowerRightY>-20037508.34</LowerRightY>
    <TileLevel>18</TileLevel>
    <TileCountX>1</TileCountX>
    <TileCountY>1</TileCountY>
    <YOrigin>top</YOrigin>
  </DataWindow>
  <Projection>EPSG:3857</Projection>
  <BlockSizeX>256</BlockSizeX>
  <BlockSizeY>256</BlockSizeY>
  <BandsCount>4</BandsCount>
  <Cache />
</GDAL_WMS>
```

5.10 Tileset

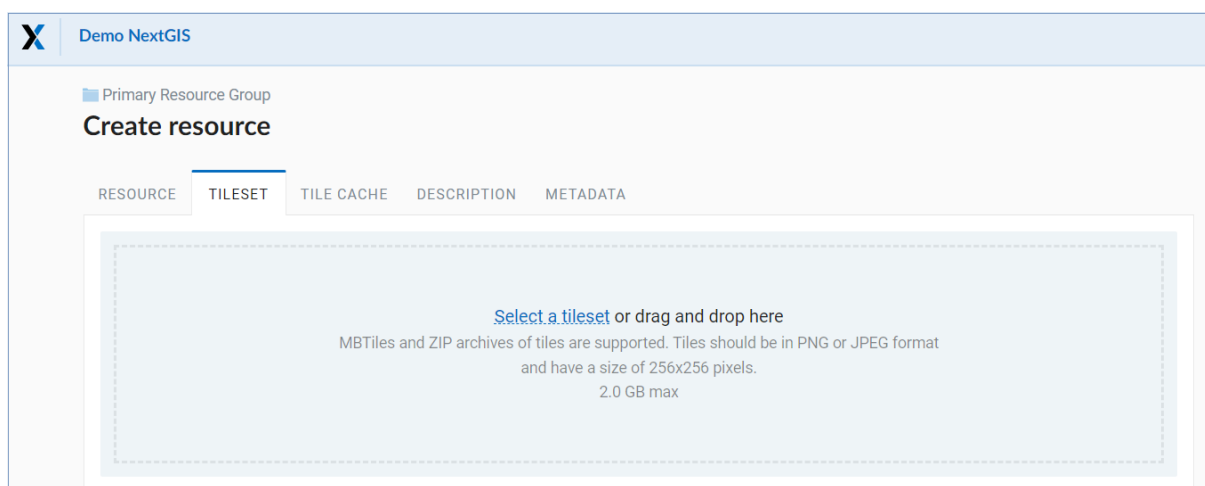
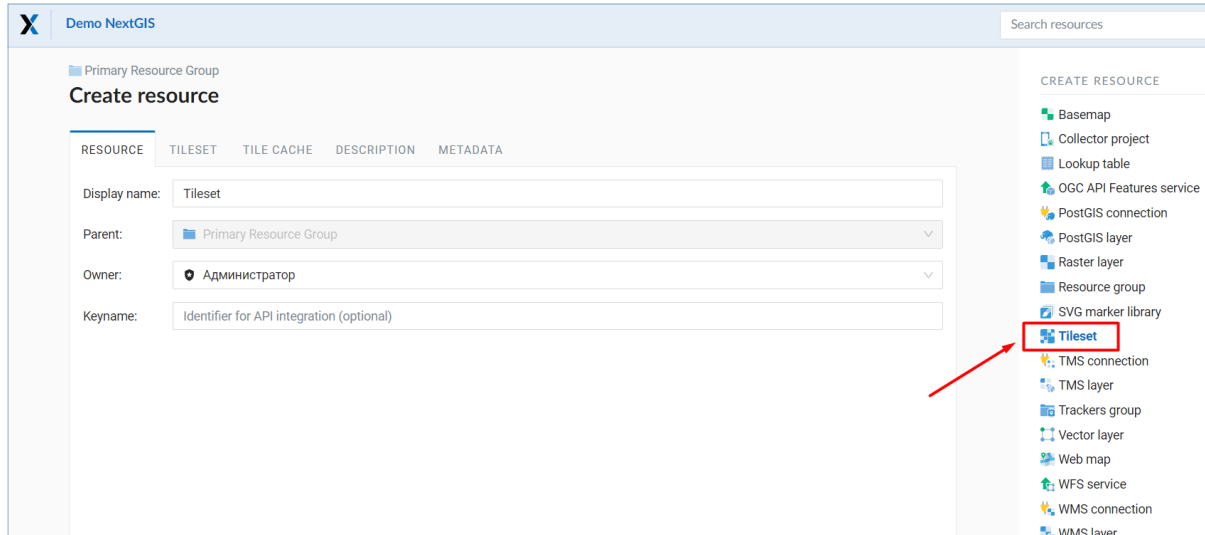
To add a **Tileset**, select a Tileset in the “Create Resource” block of operations.

Next, you need to enter the name of the tileset, which will be displayed in the administrative web interface.

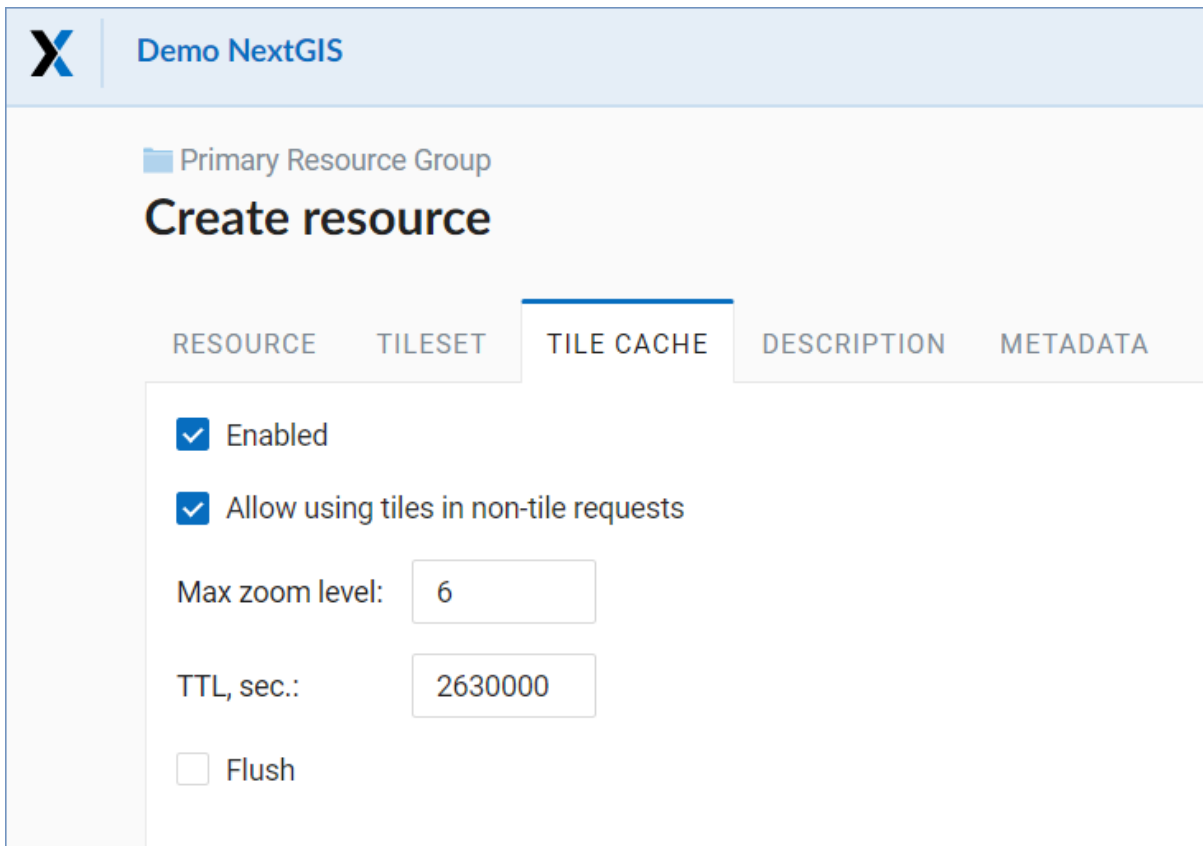
The “Key” field is optional. On the appropriate tabs, you can add a resource description and metadata. Typically, metadata is used to develop third-party applications using APIs.

In the “Tileset” tab, you need to upload a tileset in MBTiles format or a zip archive. Tiles must be in PNG or JPEG format and have a size of 256x256 pixels.

In the “Tile Cache” tab, the user can set the caching settings:



- Enable - enable/disable tile caching;
- Allow using tiles in non-tile requests - when requesting an image (not a tile), use cached tiles if available;
- Max zoom level - the threshold value above which the cache is not accessed, the map image is rendered on the fly;
- TTL, sec (Time to live) - “time to live” or storage of tiles on the server in seconds, after which the image will be re-formed at the next request. If TTL = 0, then the storage time of tiles is not limited;
- Flush - write only - clears the tile cache when saving the style.



Primary Resource Group

Create resource

RESOURCE TILESET **TILE CACHE** DESCRIPTION METADATA

☒ Enabled

☒ Allow using tiles in non-tile requests

Max zoom level:

TTL, sec.:

☐ Flush

After filling in all the fields, clicking the **Create button** completes the process of creating the resource **Tileset**.

5.11 WFS service

WFS layer setup is performed the same way as for WMS service but you add layers instead of styles.

Note: Currently supported filters are Intersects, ResourceId (ObjectId, FeatureId).

NextGIS Web acts as WFS server and publishes WFS services based on vector layers. Third party software can use these services to edit vector data on server.

Supported WFS protocol versions are 1.0, 1.1, 2.0, 2.0.2.

To deploy a WFS service click **WFS service** in the “Create resource” actions pane (see Fig. ??).

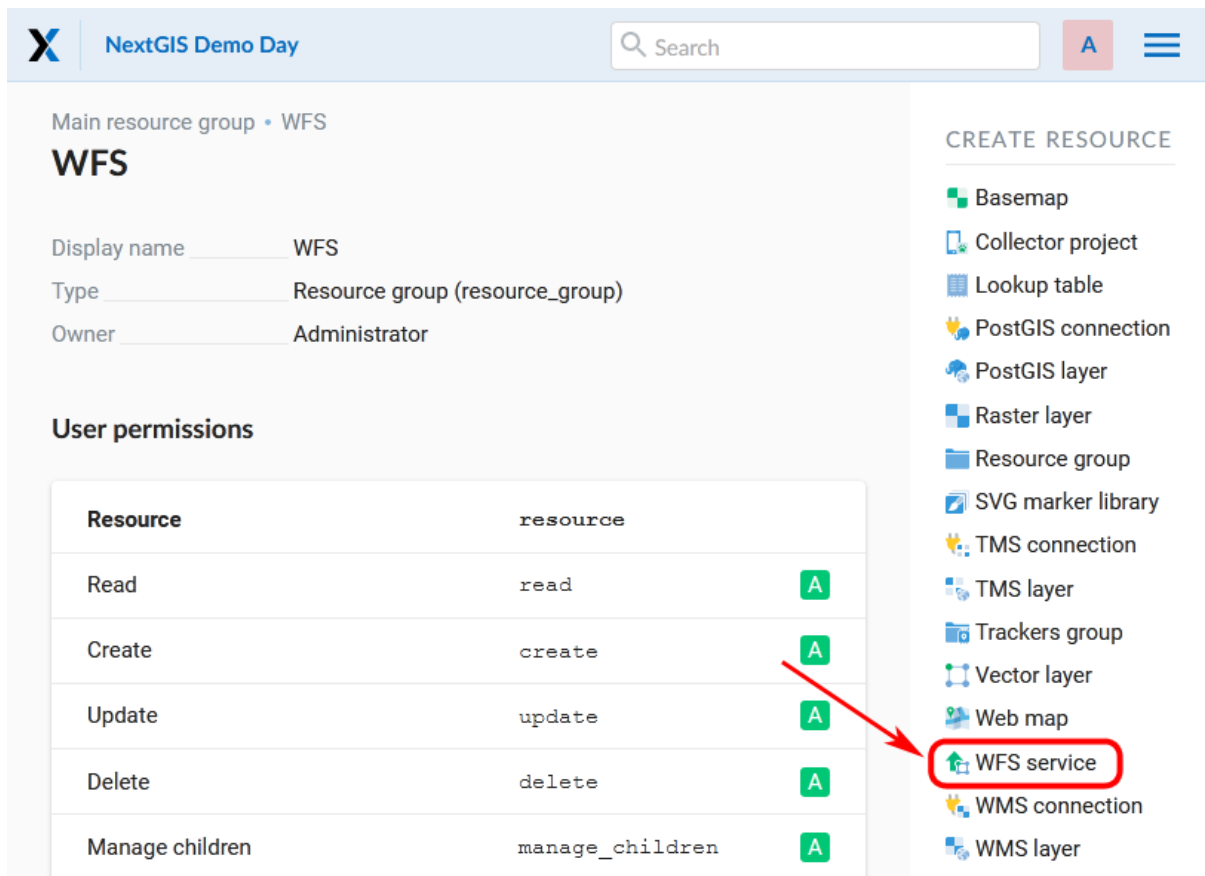


Fig. 5.51: Selection of “WFS service” action

Create resource dialog for WFS service is presented on Fig. ??.

Enter the name of the resource that will be displayed in the administrator interface. Do not confuse this name with a name of layers in a database.

“Keyname” field is optional.

On the “Description” tab you can add any text describing the content of this service.

On the “Metadata” tab you can enter information in the “key-value” format.

Switch to “WFS service” tab, which is presented on Fig. ?? and add required layers to a list (see Fig. ??). For each layer you can set a limit for the number of features returned from the vector layer. By default the value is 1000. If this parameter is set to empty, the limit will be disabled and all features will be returned to the client. This may result in high server load and significant timeouts in case of large data volume.

experiments Search resources

Main resource group

Create resource

RESOURCE WFS SERVICE DESCRIPTION METADATA

Display name:

Parent:

Owner:

Keyname:

Create Create and edit

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- OGC API Features service
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer

Fig. 5.52: Create resource dialog for WFS service

Main resource group

Create resource

RESOURCE WFS SERVICE DESCRIPTION METADATA

← → Paragraph **B** *I* U ~~S~~ Link Image

Quote **List** **Source**

City development WFS service

Create Create and edit

Fig. 5.53: WFS service description

Main resource group

Create resource

RESOURCE
WFS SERVICE
DESCRIPTION
METADATA

Key	Type	Value
area	Number	55
Type here to add a new key...		

String
Number
Boolean
Empty

Create
Create and edit

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- OGC API Features service
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer
- Web map

Fig. 5.54: WFS service metadata

NextGIS Demo Day
Search
A

Main resource group • WFS • Create resource

Create resource

RESOURCE
DESCRIPTION
METADATA
WFS SERVICE

Add
Remove

Buildings	Keyname	Buildings
Highways	Display name	Buildings
	Default count of returned features	1000
	Resource	Buildings

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer

Fig. 5.55: WFS service tab of Create resource dialog

5.11.1 Using WFS service

After the resource is created, a URL for the WFS service is available. You can use it in other software, for example **NextGIS QGIS**.

You can set access permissions for WFS service if needed. See section *Access management* (page ??).

WFS services can also be accessed with links of the following type ([basic auth](#)¹⁷ is supported):

```
https://mywebgis.nextgis.com/api/resource/2413/wfs?SERVICE=WFS&
→TYPENAME=ngw_id_2412&username=administrator&password=mypassword&
→srsname=EPSG:3857&VERSION=1.0.0&REQUEST=GetFeature
```

5.12 OGC API Features service

The OGC API Features service is configured in the same way as for a WFS service.

NextGIS Web acts as OGC API Features server and publishes OGC API Features services based on vector layers. Third party software can use these services to edit vector data on server. Supported OGC API Features protocol versions is 1.0.0.

To deploy a OGC API Features service click **OGC API Features service** in the “Create resource” actions pane (see Fig. ??).

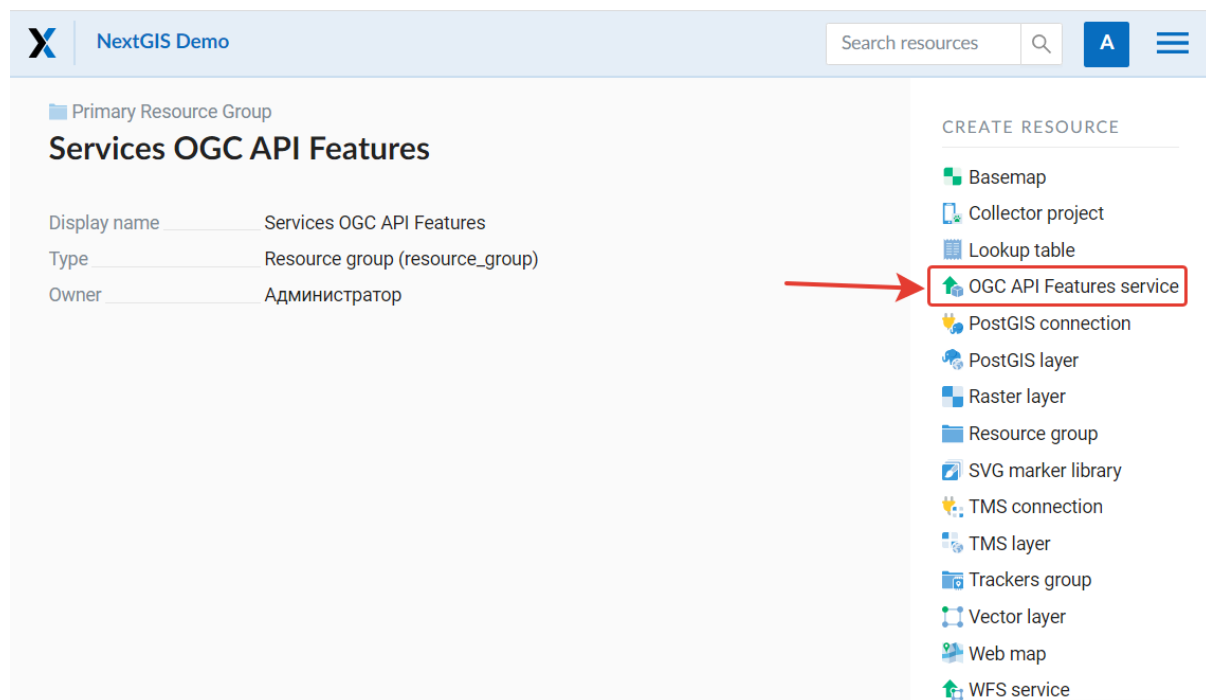


Fig. 5.56: Selection of “OGC API Features service” action

Create resource dialog for OGC API Features service is presented on Fig. ??.

¹⁷ https://docs.nextgis.com/docs_ngweb_dev/doc/developer/auth.html

experiments Search resources **A**

Main resource group

Create resource

RESOURCE OGC API FEATURES SERVICE DESCRIPTION METADATA

Display name: OGC API Features service

Parent: Main resource group

Owner: Administrator

Keyname: Identifier for API integration (optional)

Create Create and edit

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- OGC API Features service**
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer

Fig. 5.57: Create resource dialog for OGC API Features service

Enter the name of the resource that will be displayed in the administrator interface. Do not confuse this name with a name of layers in a database.

“Keyname” field is optional.

On the “Description” tab you can add any text describing the content of this service.

Primary Resource Group • Services OGC API Features

Create resource

RESOURCE OGC API FEATURES SERVICE DESCRIPTION METADATA

Paragraph B I U S Link Image Table Quote List

Example OGC API Features

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- OGC API Features service**
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection

Fig. 5.58: OGC API Features service description

On the “Metadata” tab you can enter information in the “key-value” format.

Switch to “OGC API Features service” tab, which is presented on Fig. ?? and add required layers to a list (see Fig. ??). For each layer you can set a limit for the number of features returned from the vector layer. By default the value is 1000. If this parameter is set to empty, the limit will be disabled and all features will be returned to the client. This may result in high server load and significant timeouts

Fig. 5.59: OGC API Features service metadata

in case of large data volume.

Fig. 5.60: OGC API Features service tab of Create resource dialog

5.12.1 Using OGC API Features service

After the resource is created, a URL for the OGC API Features service is available. You can use it in other software, for example **QGIS**.

You can set access permissions for OGC API Features service if needed. See section *Access management* (page ??).

OGC API Features services can also be accessed with links of the following type (**basic auth**¹⁸ is supported):

¹⁸ https://docs.nextgis.com/docs_ngweb_dev/doc/developer/auth.html

```
https://yourwebgis.nextgis.com/api/resource/208/ogcf
```

5.13 Creation of a Resource group

Resources can be arranged in groups. For example, you can have special groups for base layers, satellite images and topical data.

Groups help organize the layers in the Control panel and make it easier to manage access permissions.

To create a resource group navigate to the group, where you want to create a new one (root group or another), and in the “Create resource” actions pane click **Resource group** (see Fig. ??).

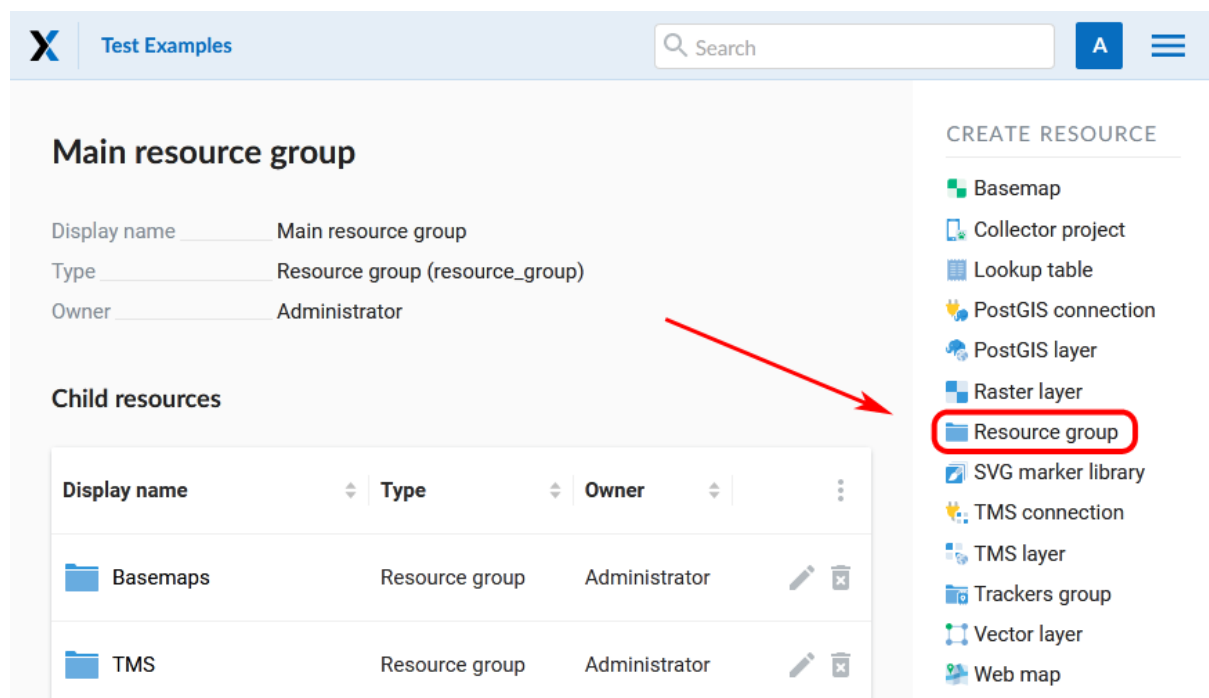


Fig. 5.61: Selection of “Resource group” action

Create resource dialog for resource group is presented on Fig. ??.

In the opened dialog enter the name of the resource that will be displayed in the administrator interface and in the map layer tree, and then click **Create**.

“Keyname” field is optional.

You can also add resource description and metadata on the corresponding tabs.

Fig. 5.62: Create resource dialog for resource group

5.14 Lookup table

To create a lookup table navigate to the group, where you want to create it (root group or another), and in the “Create resource” actions pane click **Lookup table** (see Fig. ??).

In the opened dialog enter a display name. “Keyname” field is optional.

You can also add resource description and metadata on the corresponding tabs.

Switch from “Resource” tab to the “Lookup table” tab, which is presented on Fig. ?. Add data in the “key-value” format. You can also import a pre-made lookup table from a CSV file.

Then click **Save**. The window will then look as on Fig. ?

To change anything in a lookup table click **Update** in the “Action” pane. The resource update dialog will open. Switch to “Lookup table” tab where you can change the table’s contents:

- add a new key-value pair
- change a current key-value pair
- delete a key-value pair

A lookup table can be exported to a CSV file.

You can also connect a lookup table to a field of a vector layer. This way while editing the layer you can choose attribute values from the list. To add a lookup table to the layer, open the Edit dialog for the layer and go to the Attributes tab. In the row of the attribute click on the downward arrow in the Lookup table column to select the table.

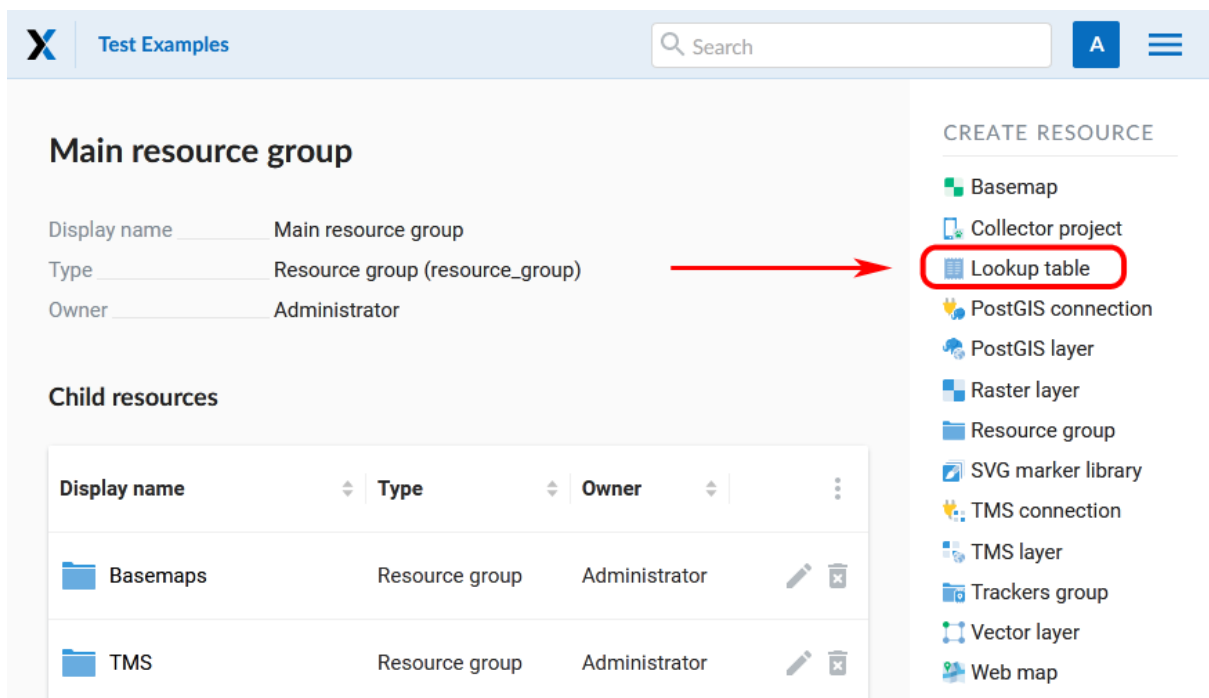


Fig. 5.63: Selection of “Lookup table” action

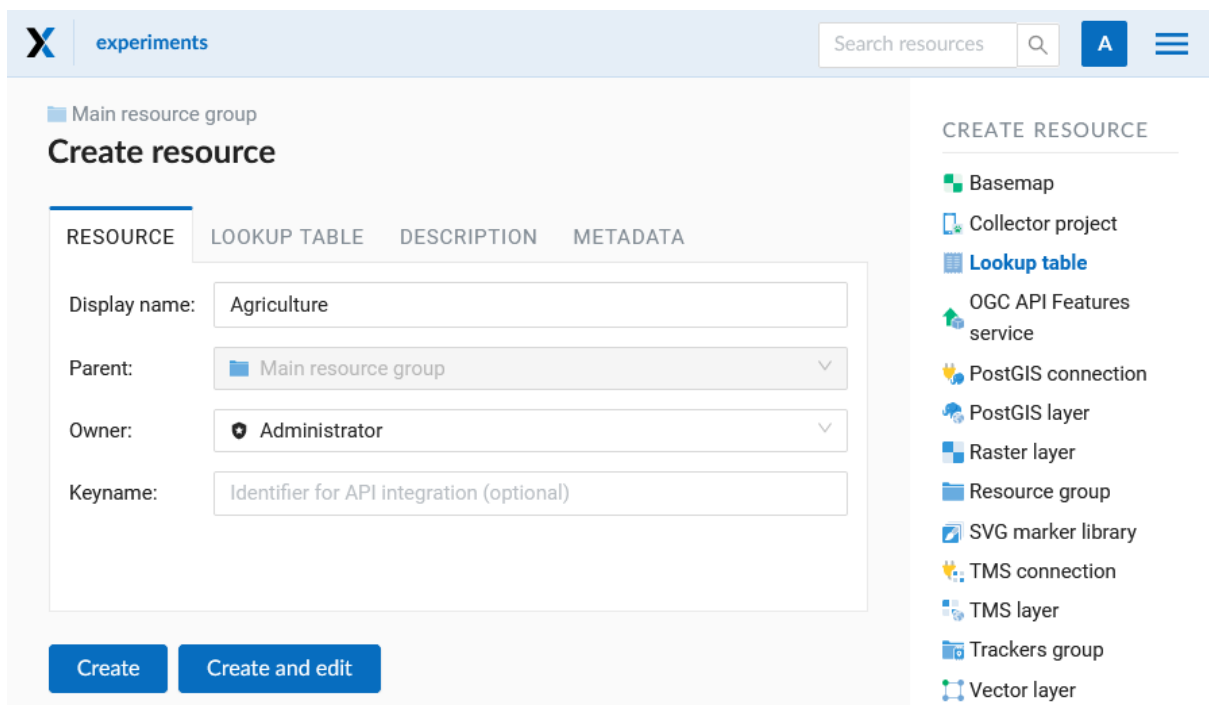


Fig. 5.64: Create resource dialog for lookup table

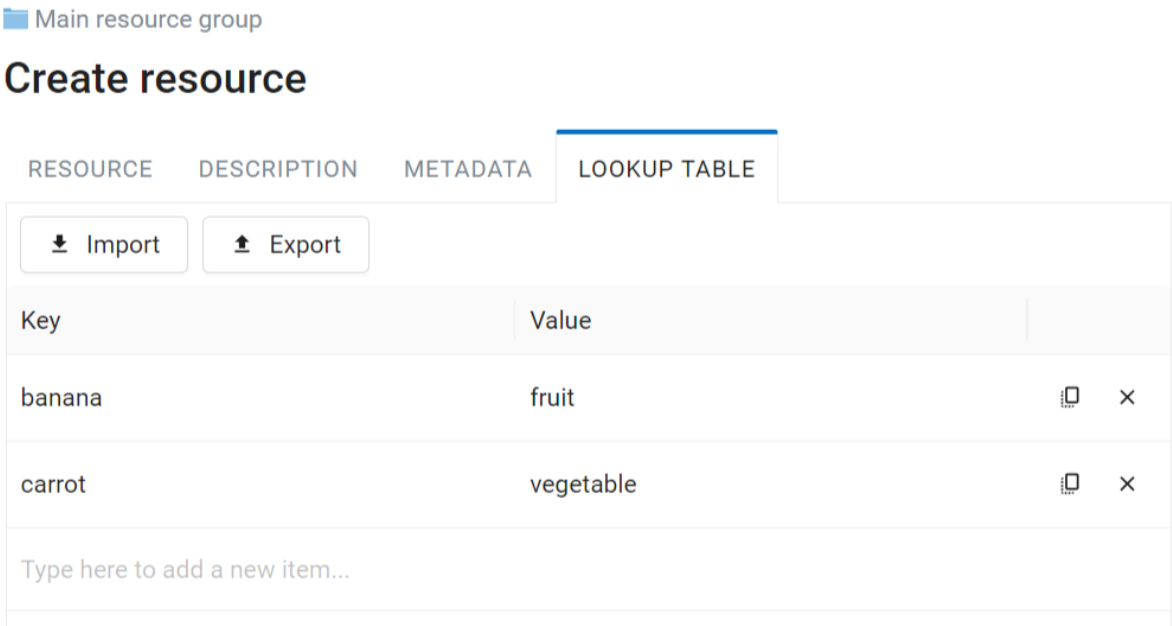


Fig. 5.65: Lookup table tab of Create resource dialog

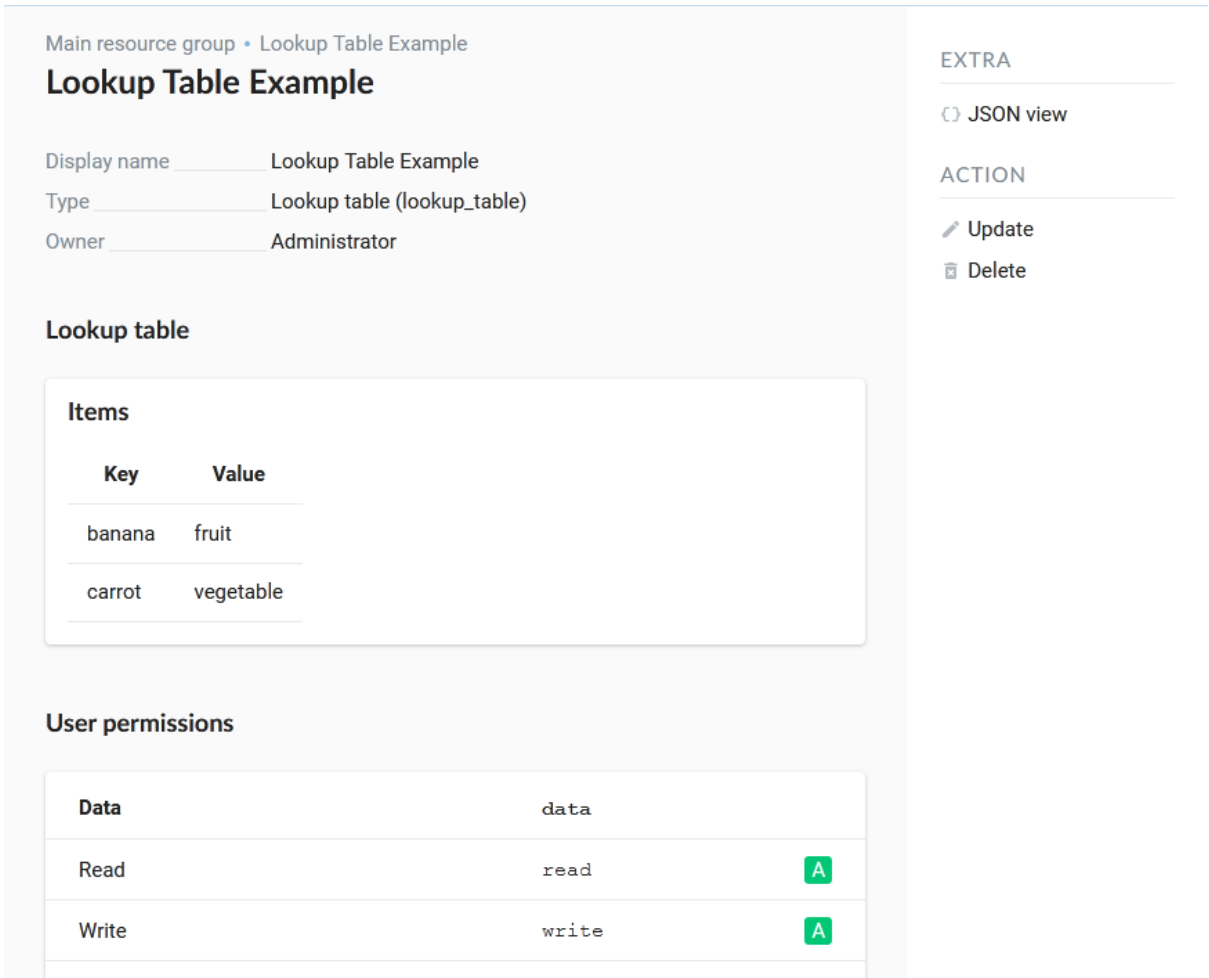


Fig. 5.66: Newly created lookup table

5.15 SVG Marker Library

In Web GIS you can create SVG marker libraries to be displayed using QGIS styles of vector layers. To create a library, select **SVG marker library** in the Create Resource actions pane on the right (see Fig. ??).

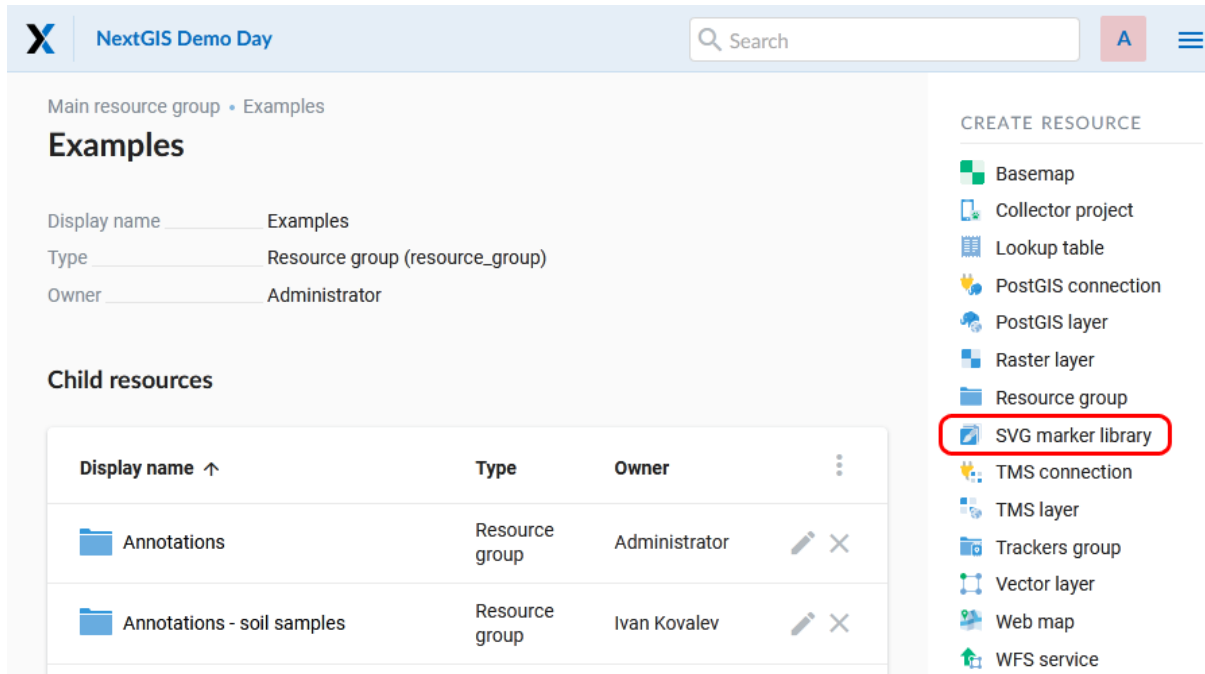


Fig. 5.67: Selecting SVG marker library

In the opened window, enter the name of the resource (see Fig. ??).

Add description and metadata on the corresponding tabs if you need them. In the SVG marker library tab you need to upload SVG markers from your device. You can upload markers as individual files or as a zip-archive. The archive must contain markers only. After all icons have been uploaded to the library, you will see the list of the file names. Click **Create** to complete the process (see Fig. ??).

The process of adding marker libraries to vector layer styles is described [here](#)¹⁹.

5.16 Typical structure

With NextGIS Web application experience we recommend the following typical structure for organizing resources.

Typical structure

```
Main resource group
  Web Maps
    Master Web Map
    Test Web Map
```

(continues on next page)

¹⁹ https://docs.nextgis.com/docs_ngweb/source/mapstyles.html#qgis-style

Fig. 5.68: SVG marker library name

(continued from previous page)

```

PostGIS connections
  PostGIS on server
Data layers
  Base data
    Borders
    Infrastructure - linear features
    Accounting area
  Thematic data
    Results of measurements on accounting area
    Results of measurements on accounting routes
    Observation points for rare species
  Relief
    ASTER DEM
      DEM
      Isolines
  Topographic data
    Openstreetmap
      Roads
      Administrative borders
      Hydrology
      Railway stations
      Railway roads
      Landuse
1 : 100000
M-37-015
M-37-016
  
```

(continues on next page)

The screenshot shows the 'Create resource' page in NextGIS Web. The breadcrumb trail is 'Main resource group > Examples > Create resource'. The page title is 'Create resource'. There are four tabs: 'RESOURCE', 'DESCRIPTION', 'SVG MARKER LIBRARY' (which is active), and 'METADATA'. In the 'SVG MARKER LIBRARY' tab, there are three buttons: 'Upload files' (highlighted with a blue border), 'Upload archive', and 'Delete'. Below these buttons is a 'File name' input field containing 'city_buildings.svg', which is highlighted with a red rectangle. A red arrow points from the bottom right of the input field towards the 'Create' button. At the bottom of the main form area are two blue buttons: 'Create' and 'Create and edit'. On the right side of the page, there is a sidebar with a 'CREATE RESOURCE' section containing a list of resource types with icons: Basemap, Collector project, Lookup table, PostGIS connection, PostGIS layer, Raster layer, Resource group, SVG marker library (highlighted in blue), TMS connection, TMS layer, Trackers group, Vector layer, Web map, WFS service, WMS connection, WMS layer, and WMS service. Below this is an 'EXTRA' section with a 'JSON view' link. At the bottom of the sidebar is an 'ACTION' section with 'Update' and 'Delete' links.

Fig. 5.69: Final steps of creating an SVG marker library

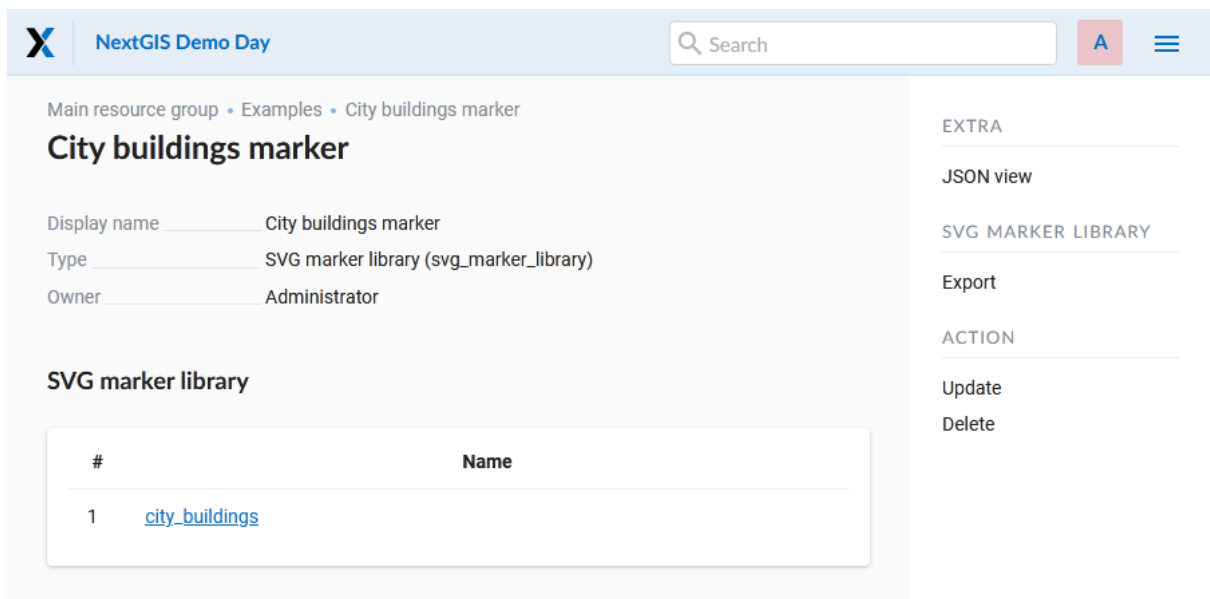


Fig. 5.70: List of SVG markers uploaded to the library

(continued from previous page)

	M-37-017
Satellite imagery	
Landsat-8	
Ikonos	

VECTOR LAYER STYLES

Style is a type of NextGIS resource that describes a way to render the geodata. Styles are necessary to display geodata on a Web Map.

Style is related to a single layer so there is no item “Style” in the main resources list. To create a style you need to open layer properties of the layer you want create style for.

6.1 Formats

By now NextGIS Web supports two rendering libraries: “QGIS” and “Mapserver” .

- QGIS style can be uploaded from a QML file or created in Web GIS, it has much more settings.
- You can write Mapserver style yourself as a text.

6.2 QGIS Style

Open the properties page of the layer you want create style for. To create a default QGIS style, just press the blue button on the resource page of the layer.

If you want to add a customized style, in the “Create resource” actions pane click “QGIS vector style” (see Fig. ??).

After the selection of “QGIS vector style” create resource dialog will open.

You can upload a file or create a simple vector style in the dialog.

6.2.1 QGIS style from file

To upload a pre-made style click “Select a style” or drag a file to this field (see in Fig. ??).

If you need to use specially-made markers, you can select the SVG marker library resource, which contains the icon to be displayed on the Web Map.

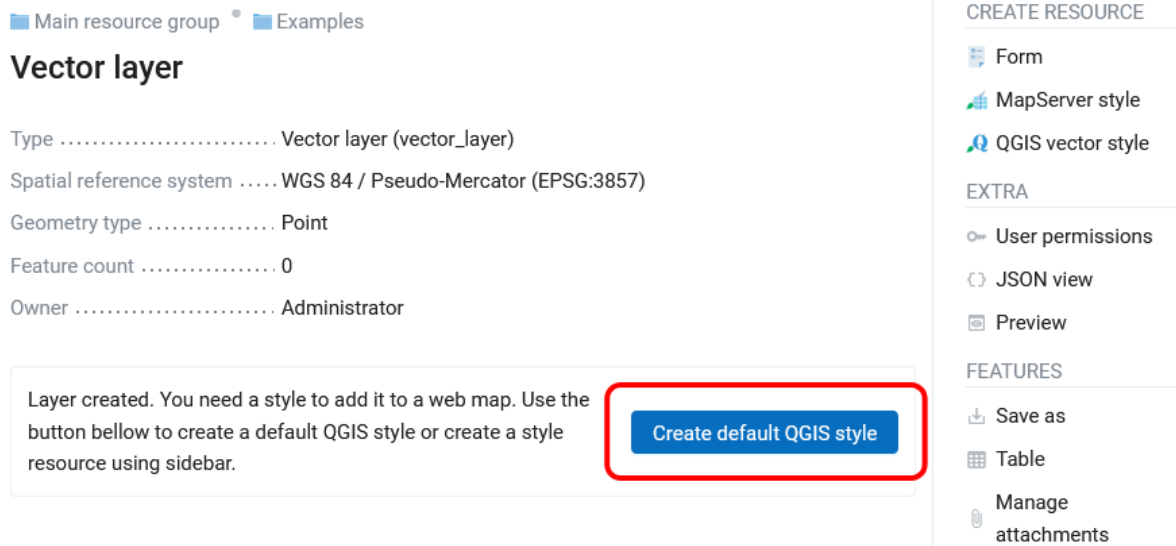


Fig. 6.1: Creating default QGIS style

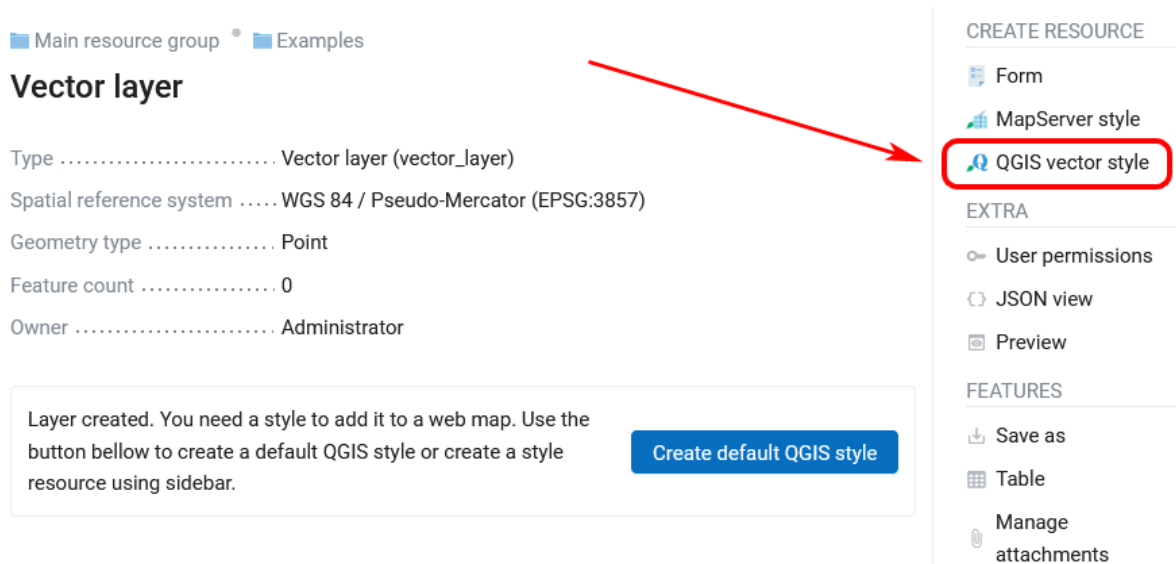


Fig. 6.2: Selecting QGIS style resource

Main resource group • Examples • Vector layer

Create resource

RESOURCE

QGIS STYLE

TILE CACHE

DESCRIPTION

METADATA

Style from file

[Select a style](#) or drag and drop here
QML or SLD formats are supported.

SVG marker library:

 Tree

Create

Create and edit

Fig. 6.3: Upload QML file

Warning: QML file to upload should be created in **NextGIS QGIS** and saved on the PC (Fig. ??). To create a style using SVG markers, you need to specify the **SVG marker** type in the layer properties and write the **full path to the file** on the local machine (Fig. ??). The file name must match the one loaded in the *SVG Marker Library* resource that the user selects when loading the QML file.

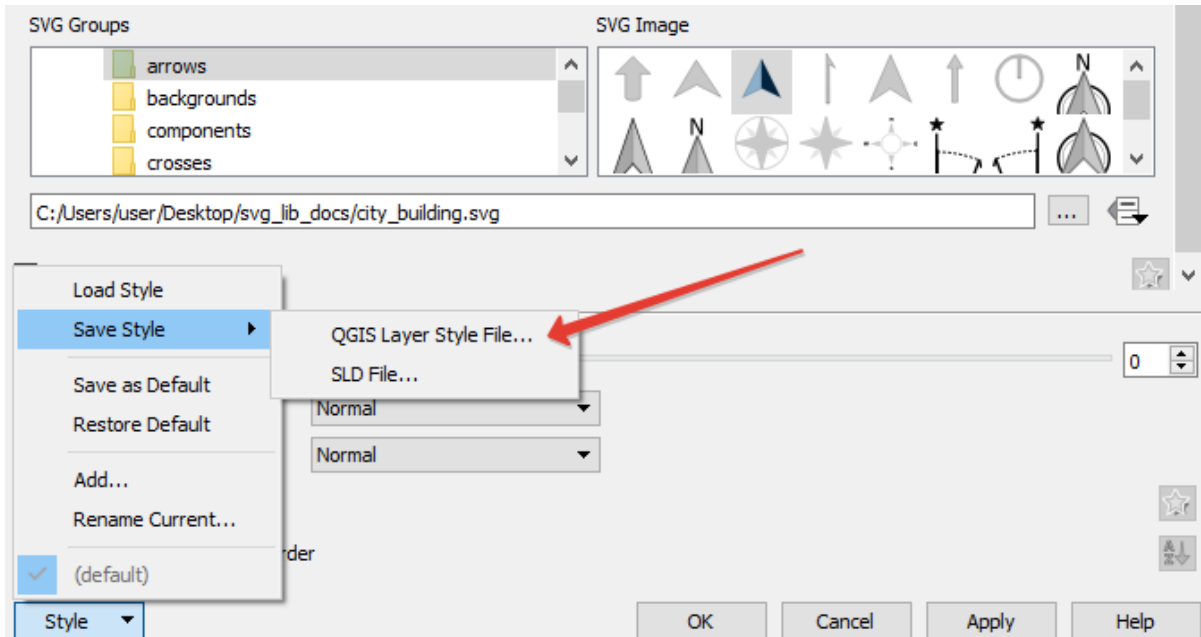


Fig. 6.4: Save QML file in NextGIS QGIS

You can type a custom display name for the new style in the *Resource* tab. You can also add resource description and metadata on the corresponding tabs. Tile cache settings are described in details [in this section](#)²⁰.

After QML file is uploaded click **Create**. Then the window of QGIS style will open and will look like Fig. ?. You can see here a TMS link to connect data to external applications.

6.2.2 Custom QGIS style

If you want to create a simple custom style, select “User-defined style” in the drop-down menu. You can set up:

- Marker shape
- Marker size and stroke width
- Fill color and stroke color and their opacity (by using sliders and eyedropper or entering values in HEX, HSB or RGB format)

You can type a custom display name for the new style in the *Resource* tab. You can also add resource description and metadata on the corresponding tabs.

²⁰ https://docs.nextgis.com/docs_ngweb/source/mapstyles.html#tile-cache

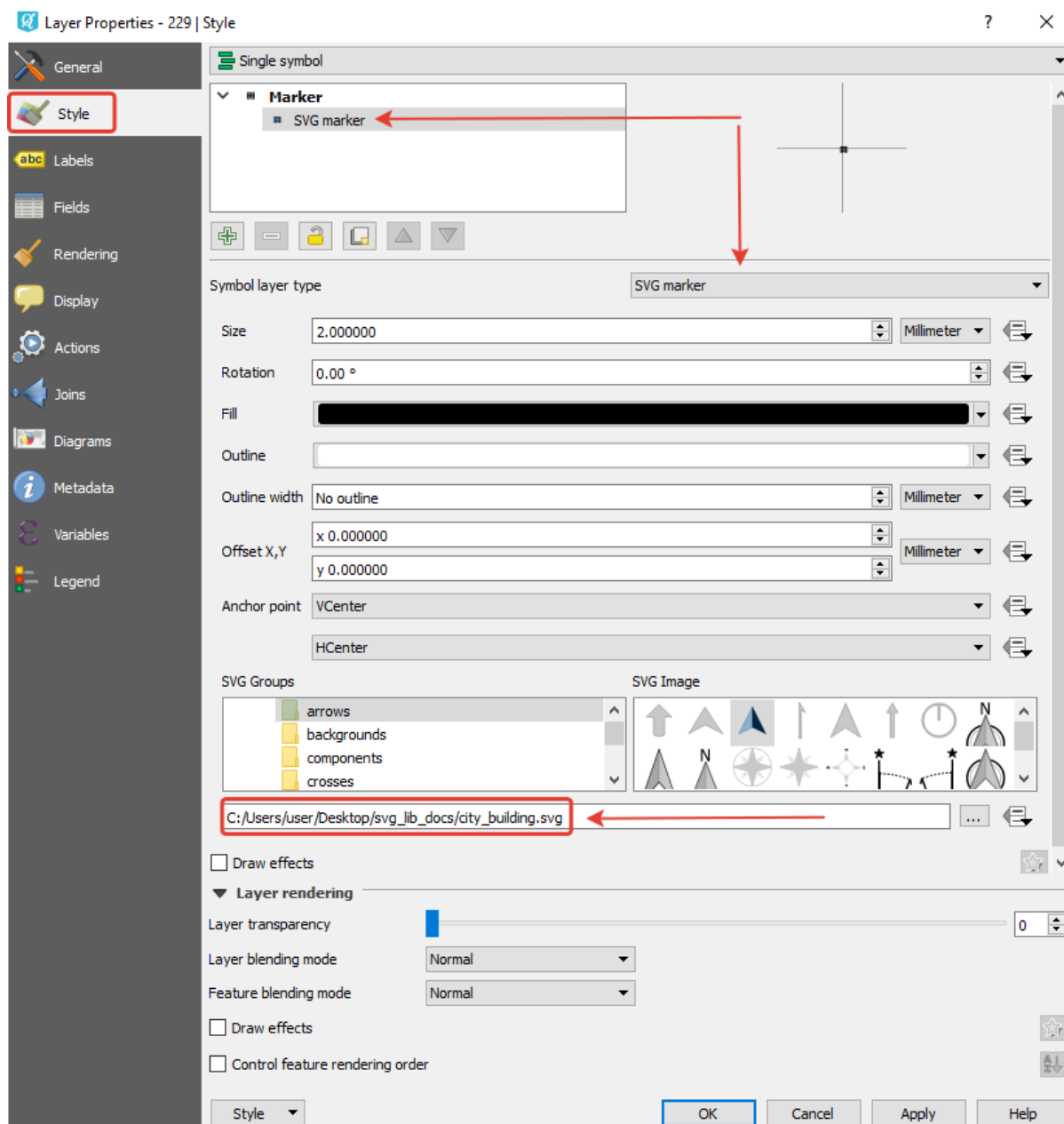


Fig. 6.5: Layer properties settings in NextGIS QGIS

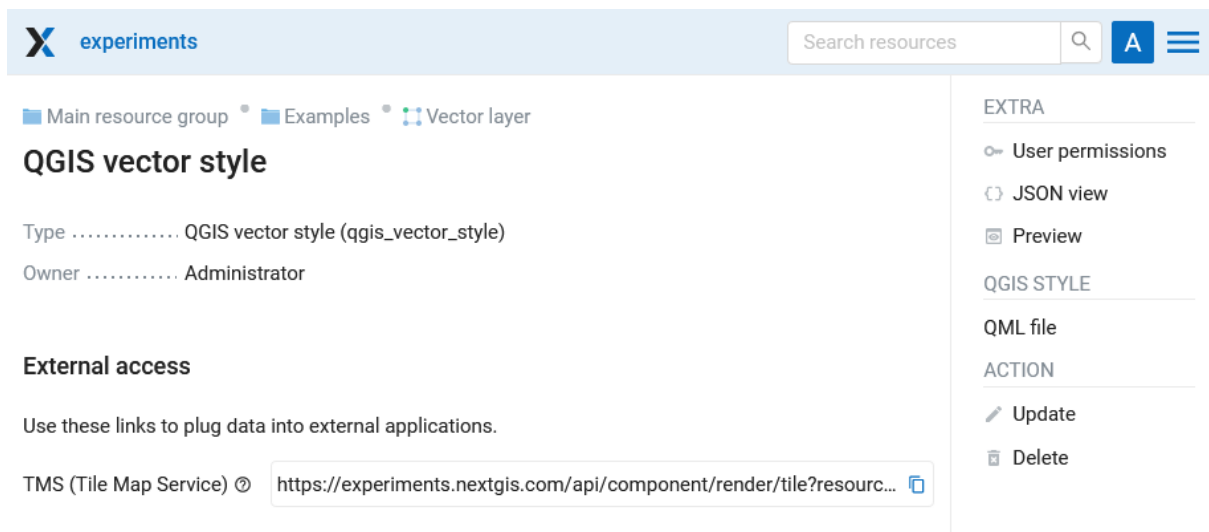


Fig. 6.6: QGIS style window

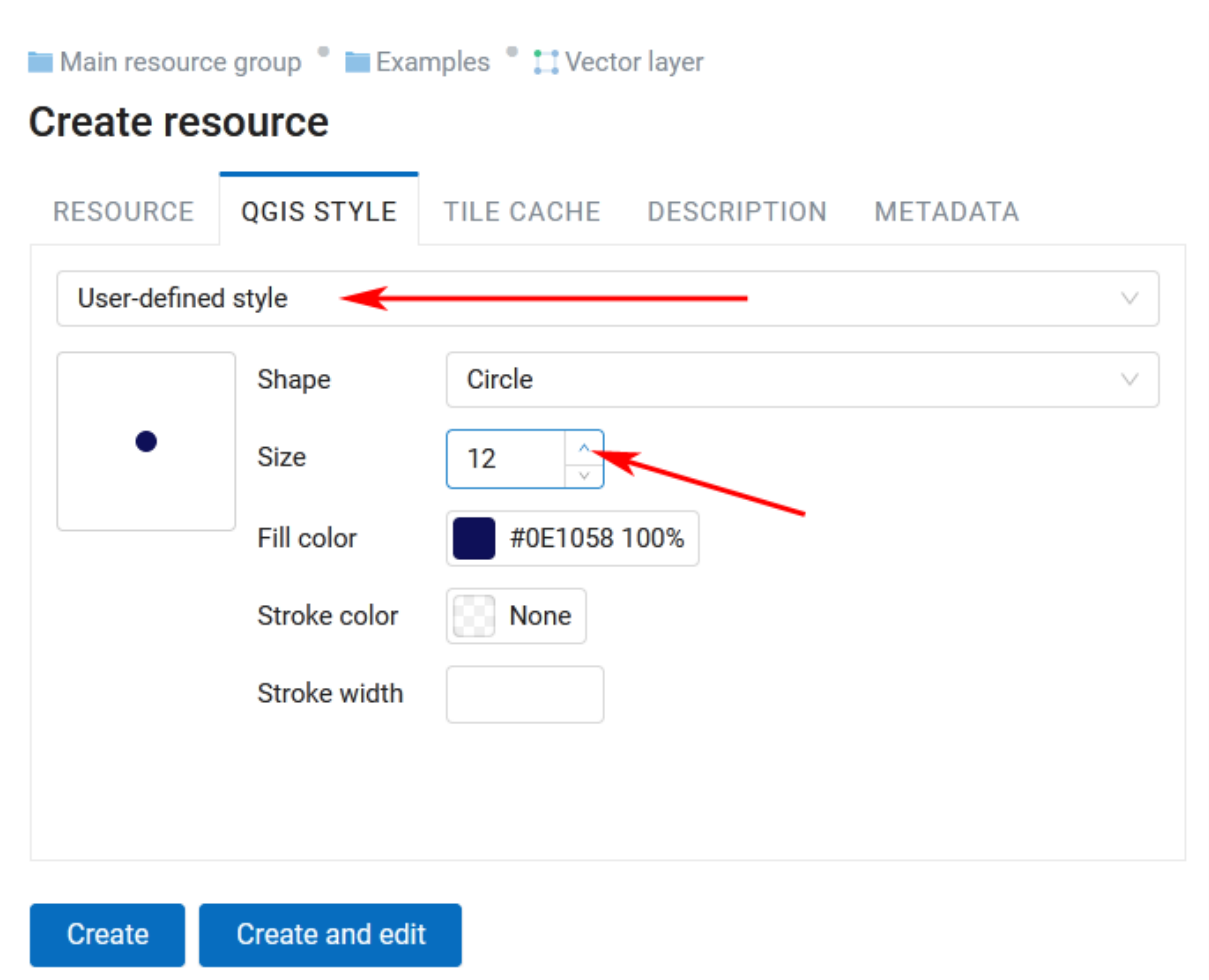


Fig. 6.7: Custom QGIS style for points

Main resource group • Examples • Transport • Highways

Create resource

RESOURCE QGIS STYLE TILE CACHE DESCRIPTION METADATA

User-defined style

Fill color #0E1058 100%

Width 3

Create Create and edit

Fig. 6.8: Custom QGIS style for lines

When all the parameters are set, click **Create**. Then the window of QGIS style will open.

Styles created this way can be edited directly in NextGIS Web.

6.3 Editing QGIS style

To edit a style click on the pencil icon by the style's name in the layer tree.

In the opened window you can **replace** the style by uploading a new file from your device. To do so, in the "QGIS style" tab select "Style from file" in the dropdown menu, then add a new QML file and click **Save**.

A simple QGIS vector style, the default style, for example, can be **edited** directly in NextGIS Web.

To do so, in the "QGIS style" tab select "User-defined style" in the dropdown menu. You can modify:

- Marker shape
- Marker size and stroke width (type it or use arrows in the field)
- Fill color and stroke color and their opacity (by using sliders and eyedropper or entering values in HEX, HSB or RGB format)

[Main resource group](#) •
 [Examples](#) •
 [Madison](#) •
 [Madison boundary](#)

Create resource

[RESOURCE](#)
[QGIS STYLE](#)
[TILE CACHE](#)
[DESCRIPTION](#)
[METADATA](#)

User-defined style

Fill color

#0E1058 7%

Stroke color

#0C36B8 100%

Stroke width

5

Create

Create and edit

Fig. 6.9: Custom QGIS style for polygons

[Main resource group](#) •
 [Examples](#) •
 [Madison](#)

Eat here

Type Vector layer (vector_layer)
 Spatial reference system WGS 84 / Pseudo-Mercator (EPSG:3857)
 Geometry type Point
 Feature count 1953
 Owner Administrator

Best places to eat in **Madison**.

Display name

Type

Update

Eat here style

QGIS vector style

CREATE RESOURCE

[Form](#)
[MapServer style](#)
[QGIS vector style](#)

EXTRA

[User permissions](#)
[JSON view](#)
[Preview](#)

FEATURES

[Save as](#)
[Table](#)
[Manage attachments](#)

ACTION

[Update](#)
[Delete](#)

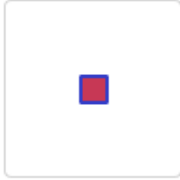
Fig. 6.10: Opening the Update resource dialog



Main resource group • Examples • Madison • Eat here • Eat here style

Update resource

◀ RESOURCE QGIS STYLE TILE CACHE PERMISSIONS DESCRIPTION ▶ ▼

User-defined style ←



Shape	Square ▼
Size	21
Fill color	 #C73855 100%
Stroke color	 #333DC8 100%
Stroke width	2

Save

Fig. 6.11: Editing vector style marker

6.4 Mapserver style

To create **MapServer** style open layer properties of the layer you want create style for. In the actions pane “Create resource” click “MapServer style” (see in Fig. ??).

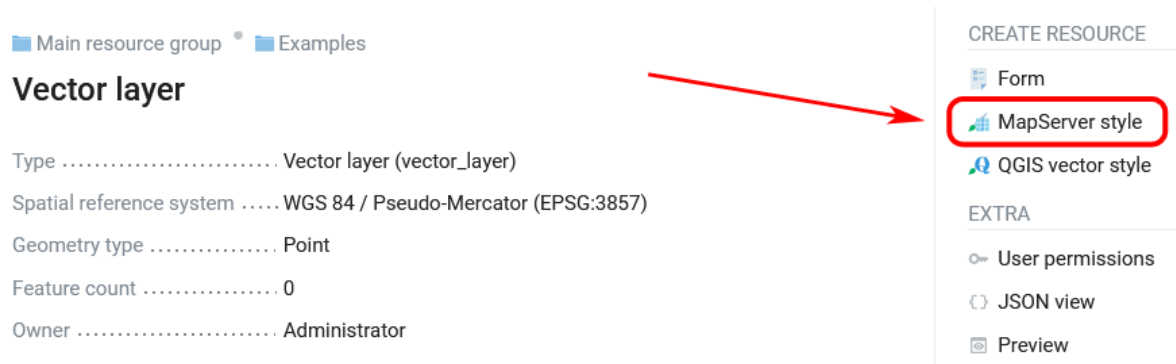


Fig. 6.12: Selecting MapServer style

You can type a custom display name for the new style in the *Resource* tab. You can also add resource description and metadata on the corresponding tabs.

Tile cache settings are described in details [in this section](#)²¹.

In the “MapServer style” tab you can write a style manually (see in Fig. ??). Otherwise default values are used.

Click **Create** to finish the process. The window of the created MapServer style will open (see in Fig. ??).

6.5 Tile cache

Caching provides faster rendering of Web Map layers. The **tile cache** settings tab while creating styles consists of the following settings (Fig. ??):

- *Enabled* checkbox;
- *Allow using tiles in non-tile requests* checkbox - the requested image (not a tile) will be prepared from previously cached tiles (if available);
- Input field *Maximum zoom level* - a threshold value, above which the cache is not accessed and the image is formed “on the fly”;
- Input field *TTL, sec* (Time to live) - a time of storage of tiles on the server in seconds, after which the image will be formed again on the next request. TTL = 0 means that the storage time is unlimited;
- *Flush* checkbox - write only - clears the tile cache when saving the style.

²¹ https://docs.nextgis.com/docs_ngweb/source/mapstyles.html#tile-cache

■ Main resource group • ■ Examples • ■ Vector layer

Create resource

RESOURCE MAPSERVER STYLE TILE CACHE DESCRIPTION METADATA

Display name:

Eat here

Parent:

■ Vector layer

Owner:

🛡 Administrator

Keyname:

Identifier for API integration (optional)

Create Create and edit

Fig. 6.13: Custom name for MapServer style

Main resource group • Docs • Styles • Parks • Create resource

Create resource

RESOURCE

DESCRIPTION

TILE CACHE

METADATA

MAPSERVER STYLE

```


1 <map>
2   <symbol>
3     <type>ellipse</type>
4     <name>circle</name>
5     <points>1 1</points>
6     <filled>true</filled>
7   </symbol>
8   <layer>
9     <class>
10      <style>
11        <color blue="179" green="255" red="255"/>
12        <outlinecolor blue="64" green="64" red="64"/>
13        <symbol>circle</symbol>
14        <size>6</size>
15      </style>
16    </class>
17  </layer>
18  <legend>
19    <keysize y="15" x="15"/>
20    <label>
21      <size>12</size>
22      <type>truetype</type>
23      <font>regular</font>
24    </label>
25  </legend>
26 </map>
27

```

Create

Create and edit

Fig. 6.14: “MapServer style” tab


experiments

Main resource group

Examples

Vector layer

MapServer style

Type MapServer style (mapserver_style)

Owner Administrator

External access

Use these links to plug data into external applications.

TMS (Tile Map Service) ©

EXTRA

User permissions

JSON view

Preview

ACTION

Update

Delete

Fig. 6.15: Mapserver style window



Create resource

RESOURCE DESCRIPTION **TILE CACHE** QGIS STYLE METADATA

Enabled ☒

Allow using tiles in non-tile requests ☒

Max zoom level

TTL, sec.

Flush ☐

Fig. 6.16: Tile cache settings

6.6 Adding a style on the map

To edit a Web Map click pencil icon near it or click the Web Map and in actions pane “Action” select “Update”. In “Update resource” layer select **Layers** tab (see in Fig. ??).

Here you can do the following actions:

1. Add layer
2. Add group
3. Remove layer or group
4. Modify the order of the layers on the map

Click “Add layer” and in opened window select the QGIS style of the layer, then click “OK”. After that click “Save”

In the “Web Map” actions pane of the Web Map properties window select “Display”. The map will open, layers tree will be on the left. To hide/display a layer place a tick near the layer .

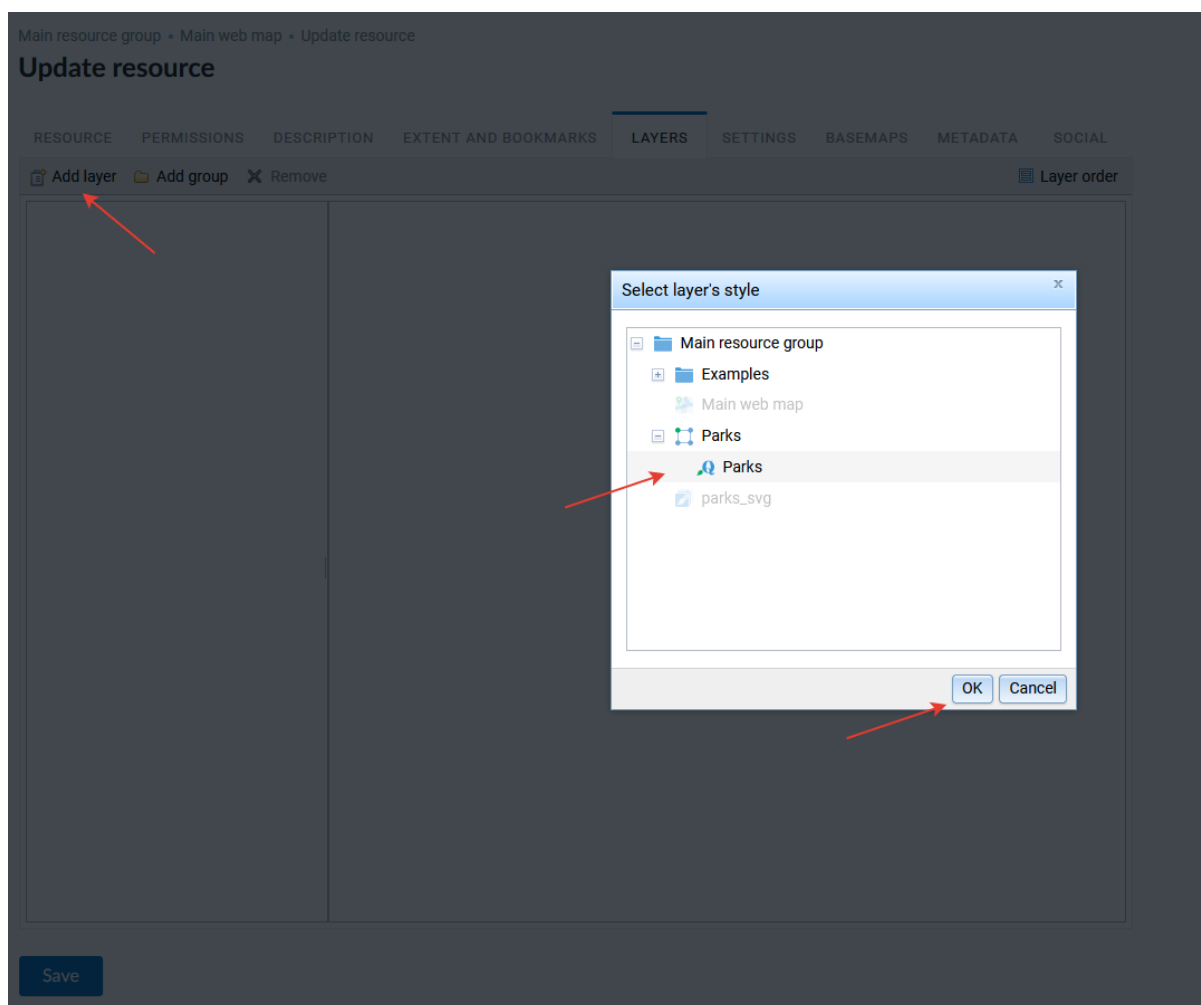


Fig. 6.17: Adding QGIS style on the map

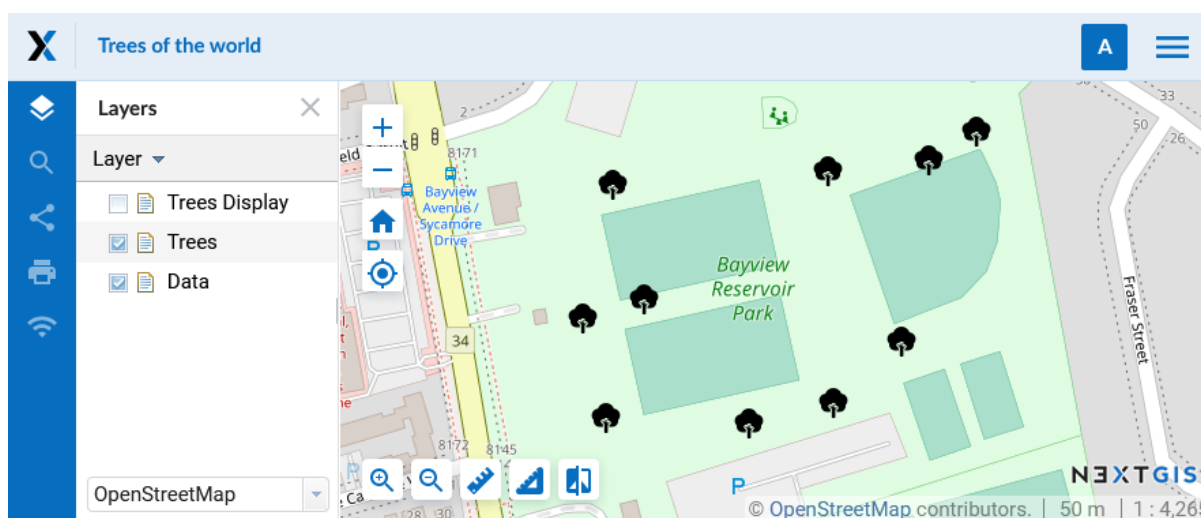


Fig. 6.18: Layer with special SVG markers in the QGIS style on a Web Map

6.7 Map style tags

To change a style or to create a new one it is recommended you take a code of some existing style and then modify it, so there is no need to start creating a style from scratch.

6.7.1 Common tags

- `<color red="255" green="170" blue="127"/>` - the color of a fill or a line
- `<outlinecolor red="106" green="106" blue="106"/>` - outline color
- `<width>0.5</width>` - a width of a line or an outline of the polygon.
- `<linewidth>3</linewidth>` - outline width
- `<minscaledenom>1</minscaledenom>` - do not display a feature if the map scale is larger than value
- `<maxscaledenom>100000</maxscaledenom>` - do not display a feature if the map scale is less than value

6.7.2 Markers

- `<symbol>std:circle</symbol>` - marker type
- `std:rectangle` - rectangle
- `std:circle` - circle
- `std:diamond` - diamond
- `std:triangle` - triangle with peak at the top
- `std:triangle-equilateral` - triangle with peak at the bottom
- `std:star` - five-pointed star
- `std:pentagon` - pentagon
- `std:arrow` - arrow (by default is top oriented. Rotation could be set using a tag `<angle>45</angle>`)
- `std:cross` - +
- `std:xcross` - x
- `std:line` - short line
- `std:hatch` - long line texture

These markers could be used to draw a line, to fill a polygon or to display points. Also they may be combined to a complex symbol:

```
<class>
  <expression>"industrial"</expression>
  <!-- Industrial areas -->
  <style> <!-- hatch with a right slope -->
```

(continues on next page)



Fig. 6.19: A demo for different hatches.

(continued from previous page)

```

        <color red="255" green="50" blue="50"/>
        <width>1.4</width>
        <symbol>std:hatch</symbol>
        <gap>10</gap>
        <size>5</size>
        <angle>45</angle>
    </style>
    <style> <!-- hatch with a left slope-->
        <color red="255" green="50" blue="50"/>
        <width>1.4</width>
        <symbol>std:hatch</symbol>
        <gap>10</gap>
        <size>5</size>
        <angle>-45</angle>
    </style>
    <style> <!-- Outline -->
        <outlinecolor red="255" green="50" blue="50"/>
        <width>0.5</width>
    </style>
</class>

```

- <size>2</size> - marker size in pixels

6.7.3 Line features

- <gap>10</gap> - a step size for dashed line (used with <symbol>std:circle</symbol>)
- <width>8</width> - width of line in pixels
- <classitem>PLACE</classitem> - filter by attribute PLACE. Also see example in #Filtering. The following operators are supported:
 - attribute name
 - !=
 - >=
 - <=
 - <
 - >
 - *= - case insensitive string comparison.
 - =
 - lt - less than
 - gt - greater than
 - ge - greater or equal
 - le - less or equal

- eq - equal
- ne - not equal
- and - AND
- && - AND
- or - OR
- || - OR
- `<linejoin>round</linejoin>` - line draw at corners
- `<linecap>round</linecap>` - line draw at the beginning and at the end

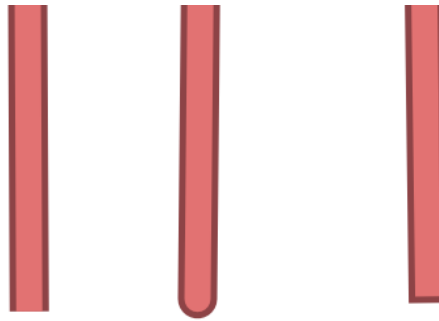


Fig. 6.20: `<linecap>butt</linecap>` / `<linecap>round</linecap>` / `<linecap>square</linecap>`

- `<pattern>2.5 4.5</pattern>` - dash template

Todo: check for numbers

- `<angle>` - marker rotation angle. Hatch could also be rotated.

6.7.4 Labels

- `<labelitem>a_hsnmbr</labelitem>` - attribute name for labelling.
- `<minscaledenom>100</minscaledenom>` - do not show a label if a scale is larger than 1:1000
- `<maxscaledenom>100000</maxscaledenom>` - do not show a label if a scale is smaller than 1:100000
- LABELCACHE [on|off] - specifies whether labels should be drawn as the features for this layer are drawn, or whether they should be cached and drawn after all layers have been drawn. Default is on. Label overlap removal, auto placement etc... are only available when the label cache is active.
- `<position>ur</position>` - label offset direction.

- ur - ↗ up and right (recommended).
- ul - ↖
- uc - ↑
- cl - ←
- cc - centered
- cr - →
- ll - ↙
- lc - ↓
- lr - ↘
- auto

6.7.5 Some other useful tags

- MAXGEOWIDTH - Maximum width, in the map's geographic units, at which this LAYER is drawn. If MAXSCALEDENOM is also specified then MAXSCALEDENOM will be used instead.
- MINGEOWIDTH - Minimum width, in the map's geographic units, at which this LAYER is drawn. If MINSCALEDENOM is also specified then MINSCALEDENOM will be used instead.
- OFFSITE - Sets the color index to treat as transparent for raster layers.
- OPACITY [integer|alpha] - opacity of the layer
- SIZEUNITS [feet|inches|kilometers|meters|miles|nauticalmiles|pixels] - Sets the unit of CLASS object SIZE values (default is pixels). Useful for simulating buffering.
- SYMBOLSCALEDENOM [double] - The scale at which symbols and/or text appear full size. This allows for dynamic scaling of objects based on the scale of the map. If not set then this layer will always appear at the same size. Scaling only takes place within the limits of MINSIZE and MAXSIZE as described above. Scale is given as the denominator of the actual scale fraction, for example for a map at a scale of 1:24,000 use 24000.
- TYPE [chart|circle|line|point|polygon|raster|query] - Specifies how the data should be drawn. Need not be the same as the feature geometry type. For example polygons or polylines may be drawn as a point layer.

See MapServer templates [here](https://docs.nextgis.com/docs_ngweb/source/mapservertemplates.html)²².

²² https://docs.nextgis.com/docs_ngweb/source/mapservertemplates.html

MAP STYLES EXAMPLES

7.1 Polygon layer with scale range and labels

```
<map>
  <layer>
    <labelitem>a_hsnmbr</labelitem>
    <class>
      <style>
        <color red="255" green="170" blue="127"/>
        <outlinecolor red="106" green="106" blue="106"/>
        <width>0.425196850394</width>
        <maxscaledenom>10000</maxscaledenom> <!-- Scale limit -->
      </style>
      <label>
        <type>truetype</type>
        <font>regular</font>
        <size>8.25</size>
        <color blue="0" green="0" red="0"/>
        <linewidth>3</linewidth>
        <outlinecolor blue="255" green="255" red="255"/>
        <position>ur</position>
        <maxscaledenom>10000</maxscaledenom>
      </label>
    </class>
  </layer>
</map>
```

7.2 White circle marker

```
<style>
  <color red="255" green="255" blue="255"/>
  <outlinecolor red="0" green="0" blue="0"/>
  <size>8.50393700787</size>
  <symbol>std:circle</symbol>
</style>
```

7.3 A line displayed with small black circles

```
<style>
  <angle>auto</angle>
  <gap>-10</gap>
  <color red="255" green="255" blue="255"/>
  <outlinecolor red="0" green="0" blue="0"/>
  <size>2</size>
  <symbol>std:circle</symbol>
</style>
```

7.4 Filtering

```
<map>
  <layer>
    <labelitem>NAME</labelitem>
    <classitem>PLACE</classitem>
    <class>
      <expression>"city"</expression>
      <style>
        <color red="255" green="170" blue="0"/>
        <outlinecolor red="0" green="0" blue="0"/>
        <size>11.3385826772</size>
        <symbol>std:circle</symbol>

      </style>
      <style>
        <color red="255" green="170" blue="0"/>
        <outlinecolor red="0" green="0" blue="0"/>
        <size>5.66929133858</size>
        <symbol>std:circle</symbol>

      </style>
      <label>
        <type>truetype</type>
        <font>regular</font>
        <size>18</size>
        <color blue="0" green="0" red="0"/>
        <linewidth>3</linewidth>
        <outlinecolor blue="255" green="255" red="255"/>
        <position>ur</position>
      </label>
    </class>
    <class>
      <expression>"town"</expression>
      <style>
        <color red="255" green="255" blue="255"/>
        <outlinecolor red="0" green="0" blue="0"/>
```

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```

    <size>11.3385826772</size>
    <symbol>std:circle</symbol>

</style>
<style>
  <color red="0" green="0" blue="0"/>
  <outlinecolor red="0" green="0" blue="0"/>
  <size>5.66929133858</size>
  <symbol>std:circle</symbol>

</style>
<label>
  <type>truetype</type>
  <font>regular</font>
  <size>14</size>
  <color blue="0" green="0" red="0"/>
  <linewidth>3</linewidth>
  <outlinecolor blue="255" green="255" red="255"/>
  <position>ur</position>
</label>
</class>
<class>
  <expression>"village"</expression>
  <style>
    <color red="255" green="255" blue="255"/>
    <outlinecolor red="0" green="0" blue="0"/>
    <size>6.8031496063</size>
    <symbol>std:circle</symbol>

  </style>
  <label>
    <type>truetype</type>
    <font>regular</font>
    <size>8.25</size>
    <color blue="0" green="0" red="0"/>
    <linewidth>3</linewidth>
    <outlinecolor blue="255" green="255" red="255"/>
    <position>ur</position>
  </label>
</class>
<class>
  <expression>"hamlet"</expression>
  <style>
    <color red="255" green="255" blue="255"/>
    <outlinecolor red="0" green="0" blue="0"/>
    <size>4.25196850394</size>
    <symbol>std:circle</symbol>

  </style>

```

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```

<label>
  <type>truetype</type>
  <font>regular</font>
  <size>8.25</size>
  <color blue="0" green="0" red="0"/>
  <linewidth>3</linewidth>
  <outlinecolor blue="255" green="255" red="255"/>
  <position>ur</position>
</label>
</class>
<class>
  <expression>"locality"</expression>
  <style>
    <color red="255" green="255" blue="255"/>
    <outlinecolor red="0" green="0" blue="0"/>
    <size>2.83464566929</size>
    <symbol>std:circle</symbol>

  </style>
  <label>
    <type>truetype</type>
    <font>regular</font>
    <size>6.5</size>
    <color blue="0" green="0" red="0"/>
    <linewidth>3</linewidth>
    <outlinecolor blue="255" green="255" red="255"/>
    <position>ur</position>
  </label>
</class>
<class>
  <expression>' '</expression>
  <style>
    <color red="255" green="255" blue="255"/>
    <outlinecolor red="0" green="0" blue="0"/>
    <size>2.83464566929</size>
    <symbol>std:circle</symbol>

  </style>
  <label>
    <type>truetype</type>
    <font>regular</font>
    <size>8.25</size>
    <color blue="0" green="0" red="0"/>
    <linewidth>3</linewidth>
    <outlinecolor blue="255" green="255" red="255"/>
    <position>ur</position>
  </label>
</class>
</layer>

```

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</map>

7.5 Polygon layer with a classification by field values and labels

```

<map>
<layer>
  <labelitem>NAME</labelitem>
  <class>
    <expression>([num] gt 18) and ([num] le 26.1)</expression>
    <style>
      <color red="255" green="255" blue="212"/>
      <outlinecolor blue="64" green="64" red="64"/>

    </style>
    <label>
      <type>truetype</type>
      <font>regular</font>
      <size>8.25</size>
      <color blue="0" green="0" red="0"/>
      <linewidth>3</linewidth>
      <outlinecolor blue="255" green="255" red="255"/>
      <position>ur</position>
      <maxscaledenom>7000000</maxscaledenom>
    </label>
  </class>

  <class>
    <expression>([num] gt 26.1) and ([num] le 28.1)</expression>
    <style>
      <color red="254" green="217" blue="142"/>
      <outlinecolor blue="64" green="64" red="64"/>

    </style>
    <label>
      <type>truetype</type>
      <font>regular</font>
      <size>8.25</size>
      <color blue="0" green="0" red="0"/>
      <linewidth>3</linewidth>
      <outlinecolor blue="255" green="255" red="255"/>
      <position>ur</position>
      <maxscaledenom>7000000</maxscaledenom>
    </label>
  </class>

```

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```

<class>
  <expression>(([num] gt 28.1) and ([num] le 30))</expression>
  <style>
    <color red="254" green="153" blue="41"/>
    <outlinecolor blue="64" green="64" red="64"/>

  </style>
  <label>
    <type>truetype</type>
    <font>regular</font>
    <size>8.25</size>
    <color blue="0" green="0" red="0"/>
    <linewidth>3</linewidth>
    <outlinecolor blue="255" green="255" red="255"/>
    <position>ur</position>
    <maxscaledenom>7000000</maxscaledenom>
  </label>
</class>

</layer>
</map>

```

7.6 OSM settlement-point

```

<!-- Style with different settings for different scales-->
<!-- Version 2015-07-24 -->
<map>
  <layer>
    <labelitem>NAME</labelitem>
    <classitem>PLACE</classitem>
    <class>
      <expression>"city"</expression> <!-- City -->
      <style>
        <color red="255" green="170" blue="0"/>
        <outlinecolor red="0" green="0" blue="0"/>
        <size>11.3385826772</size>
        <symbol>std:circle</symbol>

      </style>
      <style>
        <color red="255" green="170" blue="0"/>
        <outlinecolor red="0" green="0" blue="0"/>
        <size>5.66929133858</size>
        <symbol>std:circle</symbol>

      </style>
    </label>
  </layer>
</map>

```

(continues on next page)

(continued from previous page)

```

    <type>truetype</type>
    <font>regular</font>
    <size>18</size>
    <color blue="0" green="0" red="0"/>
    <linewidth>3</linewidth>
    <outlinecolor blue="255" green="255" red="255"/>
    <position>ur</position>
  </label>
</class>
<class>
  <expression>"town"</expression> <!-- Small city or town -->
  <style>
    <color red="255" green="255" blue="255"/>
    <outlinecolor red="0" green="0" blue="0"/>
    <size>11.3385826772</size>
    <symbol>std:circle</symbol>
    <maxscaledenom>6000000</maxscaledenom>

  </style>
  <style>
    <color red="0" green="0" blue="0"/>
    <outlinecolor red="0" green="0" blue="0"/>
    <size>5.66929133858</size>
    <symbol>std:circle</symbol>
    <maxscaledenom>6000000</maxscaledenom>

  </style>
  <label>
    <type>truetype</type>
    <font>regular</font>
    <size>14</size>
    <color blue="0" green="0" red="0"/>
    <linewidth>3</linewidth>
    <outlinecolor blue="255" green="255" red="255"/>
    <position>ur</position>
    <maxscaledenom>6000000</maxscaledenom>
  </label>
</class>
<class>
  <expression>"village"</expression> <!-- Village -->
  <style>
    <color red="255" green="255" blue="255"/>
    <outlinecolor red="0" green="0" blue="0"/>
    <size>6.8031496063</size>
    <symbol>std:circle</symbol>
    <maxscaledenom>1000000</maxscaledenom>

  </style>
  <label>

```

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```

    <type>truetype</type>
    <font>regular</font>
    <size>8.25</size>
    <color blue="0" green="0" red="0"/>
    <linewidth>3</linewidth>
    <outlinecolor blue="255" green="255" red="255"/>
    <position>ur</position>
    <maxscaledenom>1000000</maxscaledenom>
  </label>
</class>
<class>
  <expression>"hamlet"</expression> <!-- Hamlet -->
  <style>
    <color red="255" green="255" blue="255"/>
    <outlinecolor red="0" green="0" blue="0"/>
    <size>4.25196850394</size>
    <symbol>std:circle</symbol>
    <maxscaledenom>500000</maxscaledenom>

  </style>
  <label>
    <type>truetype</type>
    <font>regular</font>
    <size>8.25</size>
    <color blue="0" green="0" red="0"/>
    <linewidth>3</linewidth>
    <outlinecolor blue="255" green="255" red="255"/>
    <position>ur</position>
    <maxscaledenom>500000</maxscaledenom>
  </label>
</class>
<class>
  <expression>"locality"</expression> <!-- Non inhabited place -
↪ ->
  <style>
    <color red="255" green="255" blue="255"/>
    <outlinecolor red="0" green="0" blue="0"/>
    <size>2.83464566929</size>
    <symbol>std:circle</symbol>
    <maxscaledenom>500000</maxscaledenom>

  </style>
  <label>
    <type>truetype</type>
    <font>regular</font>
    <size>6.5</size>
    <color blue="0" green="0" red="0"/>
    <linewidth>3</linewidth>
    <outlinecolor blue="255" green="255" red="255"/>

```

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```

    <position>ur</position>
    <maxscaledenom>500000</maxscaledenom>
  </label>
</class>
<class>
  <expression>' '</expression>
  <style>
    <color red="255" green="255" blue="255"/>
    <outlinecolor red="0" green="0" blue="0"/>
    <size>2.83464566929</size>
    <symbol>std:circle</symbol>

  </style>
  <label>
    <type>truetype</type>
    <font>regular</font>
    <size>8.25</size>
    <color blue="0" green="0" red="0"/>
    <linewidth>3</linewidth>
    <outlinecolor blue="255" green="255" red="255"/>
    <position>ur</position>
  </label>
</class>
</layer>
</map>

```

7.7 OSM highway-lowzoom

Public roads (small roads are in a separate style). Colorscheme from openstreetmap.de

```

<map>
<!-- Highways for low-zoom from openstreetmap (from motorway to
→residential)
version 2015-11-06 -->
  <layer>
    <classitem>Highway</classitem>
    <labelitem>Name</labelitem>
    <class>
      <expression>"motorway"</expression>
      <style>
        <color red="185" green="49" blue="49" />
        <linejoin>round</linejoin>
        <width>8</width>
        <linecap>round</linecap>
      </style>
    <style>

```

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```

    </label>
  </class>
  <class>
    <expression>"motorway_link"</expression>
    <style>
      <color red="185" green="49" blue="49" />
      <linejoin>round</linejoin>
      <width>8</width>
      <linecap>round</linecap>
    </style>
    <style>
      <color red="226" green="114" blue="114" />
      <linejoin>round</linejoin>
      <width>4</width>
      <linecap>round</linecap>
    </style>
    <style>
      <color red="255" green="255" blue="255" />
      <linejoin>round</linejoin>
      <width>1</width>
      <linecap>round</linecap>
    </style>
  </class>
  <class>
    <expression>"trunk"</expression>
    <style>
      <color red="185" green="49" blue="49" />
      <linejoin>round</linejoin>
      <width>8</width>
      <linecap>round</linecap>
    </style>
    <style>
      <color red="226" green="114" blue="114" />
      <linejoin>round</linejoin>
      <width>4</width>
      <linecap>round</linecap>
    </style>
    <style>
      <color red="255" green="255" blue="255" />
      <linejoin>round</linejoin>
      <width>1</width>
      <linecap>round</linecap>
    </style>
  <label>
    <type>truetype</type>
    <font>regular</font>
    <size>7</size>
    <color blue="0" green="0" red="0" />
    <outlinewidth>1</outlinewidth>
  </label>

```

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```

        <outlinecolor blue="255" green="255" red="255" />
        <angle>follow</angle>
        <antialias>true</antialias>
        <repeatdistance>300</repeatdistance>
        <maxoverlapangle>20.0</maxoverlapangle>
    </label>
</class>
<class>
    <expression>"trunk_link"</expression>
    <style>
        <color red="185" green="49" blue="49" />
        <linejoin>round</linejoin>
        <width>8</width>
        <linecap>round</linecap>
    </style>
    <style>
        <color red="226" green="114" blue="114" />
        <linejoin>round</linejoin>
        <width>4</width>
        <linecap>round</linecap>
    </style>
    <style>
        <color red="255" green="255" blue="255" />
        <linejoin>round</linejoin>
        <width>1</width>
        <linecap>round</linecap>
    </style>
</class>
<class>
    <expression>"primary"</expression>
    <style>
        <color red="141" green="67" blue="70" />
        <linejoin>round</linejoin>
        <width>6.4062992126</width>
        <linecap>round</linecap>
    </style>
    <style>
        <color red="226" green="114" blue="114" />
        <linejoin>round</linejoin>
        <width>3.57165354331</width>
        <linecap>round</linecap>
    </style>
    <label>
        <type>truetype</type>
        <font>regular</font>
        <size>7</size>
        <color blue="0" green="0" red="0" />
        <linewidth>1</linewidth>
        <outlinecolor blue="255" green="255" red="255" />

```

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```

        <angle>follow</angle>
        <antialias>true</antialias>
        <repeatdistance>300</repeatdistance>
        <maxoverlapangle>20.0</maxoverlapangle>
    </label>
</class>
<class>
    <expression>"primary_link"</expression>
    <style>
        <color red="141" green="67" blue="70" />
        <linejoin>round</linejoin>
        <width>6.4062992126</width>
        <linecap>round</linecap>
    </style>
    <style>
        <color red="226" green="114" blue="114" />
        <linejoin>round</linejoin>
        <width>3.57165354331</width>
        <linecap>round</linecap>
    </style>
</class>
<class>
    <expression>"secondary"</expression>
    <style>
        <color red="163" green="123" blue="72" />
        <linejoin>round</linejoin>
        <width>4</width>
        <linecap>round</linecap>
    </style>
    <style>
        <color red="246" green="232" blue="86" />
        <linejoin>round</linejoin>
        <width>3</width>
        <linecap>round</linecap>
    </style>
    <label>
        <type>truetype</type>
        <font>regular</font>
        <size>7</size>
        <color blue="0" green="0" red="0" />
        <linewidth>1</linewidth>
        <outlinecolor blue="255" green="255" red="255" />
        <angle>follow</angle>
        <antialias>true</antialias>
        <repeatdistance>300</repeatdistance>
        <maxoverlapangle>20.0</maxoverlapangle>
    </label>
</class>
</class>

```

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```

<expression>"secondary_link"</expression>
<style>
  <color red="163" green="123" blue="72" />
  <linejoin>round</linejoin>
  <width>4</width>
  <linecap>round</linecap>
</style>
<style>
  <color red="246" green="232" blue="86" />
  <linejoin>round</linejoin>
  <width>3</width>
  <linecap>round</linecap>
</style>
</class>
<class>
  <expression>"tertiary"</expression>
  <style>
    <color red="187" green="187" blue="187" />
    <linejoin>round</linejoin>
    <width>4</width>
    <linecap>round</linecap>
  </style>
  <style>
    <color red="255" green="255" blue="179" />
    <linejoin>round</linejoin>
    <width>3</width>
    <linecap>round</linecap>
  </style>
  <label>
    <type>truetype</type>
    <font>regular</font>
    <size>7</size>
    <color blue="0" green="0" red="0" />
    <linewidth>1</linewidth>
    <outlinecolor blue="255" green="255" red="255" />
    <angle>follow</angle>
    <antialias>true</antialias>
    <repeatdistance>300</repeatdistance>
    <maxoverlapangle>20.0</maxoverlapangle>
  </label>
</class>
<class>
  <expression>"tertiary_link"</expression>
  <style>
    <color red="187" green="187" blue="187" />
    <linejoin>round</linejoin>
    <width>4</width>
    <linecap>round</linecap>
  </style>

```

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```

<style>
  <color red="255" green="255" blue="179" />
  <linejoin>round</linejoin>
  <width>3</width>
  <linecap>round</linecap>
</style>
</class>
<class>
  <expression>"unclassified"</expression>
  <style>
    <color red="187" green="187" blue="187" />
    <linejoin>round</linejoin>
    <width>4</width>
    <linecap>round</linecap>
  </style>
  <style>
    <color red="255" green="255" blue="179" />
    <linejoin>round</linejoin>
    <width>3</width>
    <linecap>round</linecap>
  </style>
  <label>
    <type>truetype</type>
    <font>regular</font>
    <size>7</size>
    <color blue="0" green="0" red="0" />
    <linewidth>1</linewidth>
    <outlinecolor blue="255" green="255" red="255" />
    <angle>follow</angle>
    <antialias>true</antialias>
    <repeatdistance>300</repeatdistance>
    <maxoverlapangle>20.0</maxoverlapangle>
    <minscaledenom>1</minscaledenom>
    <maxscaledenom>40000</maxscaledenom>
  </label>
</class>
<class>
  <expression>"residential"</expression>
  <style>
    <color red="187" green="187" blue="187" />
    <linejoin>round</linejoin>
    <width>2</width>
    <linecap>round</linecap>
  </style>
  <style>
    <color red="255" green="255" blue="179" />
    <linejoin>round</linejoin>
    <width>1</width>
    <linecap>round</linecap>
  </style>

```

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```

</style>
<label>
  <type>truetype</type>
  <font>regular</font>
  <size>7</size>
  <color blue="0" green="0" red="0" />
  <linewidth>1</linewidth>
  <outlinecolor blue="255" green="255" red="255" />
  <angle>follow</angle>
  <antialias>true</antialias>
  <repeatdistance>300</repeatdistance>
  <maxoverlapangle>20.0</maxoverlapangle>
  <minscaledenom>1</minscaledenom>
  <maxscaledenom>40000</maxscaledenom>
</label>
</class>
<class>
  <expression>"living_street"</expression>
  <style>
    <color red="187" green="187" blue="187" />
    <linejoin>round</linejoin>
    <width>2</width>
    <linecap>round</linecap>
  </style>
  <style>
    <color red="255" green="255" blue="179" />
    <linejoin>round</linejoin>
    <width>1</width>
    <linecap>round</linecap>
  </style>
  <label>
    <type>truetype</type>
    <font>regular</font>
    <size>7</size>
    <color blue="0" green="0" red="0" />
    <linewidth>1</linewidth>
    <outlinecolor blue="255" green="255" red="255" />
    <angle>follow</angle>
    <antialias>true</antialias>
    <repeatdistance>300</repeatdistance>
    <maxoverlapangle>20.0</maxoverlapangle>
    <minscaledenom>1</minscaledenom>
    <maxscaledenom>40000</maxscaledenom>
  </label>
</class>
</layer>
</map>

```

7.8 OSM highway-maxzoom

Access roads, service roads, dirt roads, pedestrian ways



Fig. 7.2: Fragment of road map.

```
<map>
  <!-- Highways for high-zoom from openstreetmap (from service to
  →track)
  version 2015-11-06 -->
    <layer>
      <classitem>Highway</classitem>
      <labelitem>Name</labelitem>
      <class>
        <expression>"service"</expression>
        <style>
          <color red="187" green="187" blue="187" />
          <linejoin>round</linejoin>
          <width>2</width>
          <linecap>round</linecap>
        </style>
        <style>
          <color red="255" green="255" blue="255" />
          <linejoin>round</linejoin>
          <width>1</width>
          <linecap>round</linecap>
        </style>
      </class>
      <class>
        <expression>"footway"</expression>
```

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```

<style>
  <color red="255" green="0" blue="0" />
  <linejoin>round</linejoin>
  <width>1</width>
  <linecap>round</linecap>
</style>
<label>
  <type>truetype</type>
  <font>regular</font>
  <size>7</size>
  <color blue="0" green="0" red="0" />
  <linewidth>1</linewidth>
  <outlinecolor blue="255" green="255" red="255" />
  <angle>follow</angle>
  <antialias>true</antialias>
  <repeatdistance>300</repeatdistance>
  <maxoverlapangle>20.0</maxoverlapangle>
</label>
</class>
<class>
  <expression>"pedestrian"</expression>
  <style>
    <color red="255" green="0" blue="0" />
    <linejoin>round</linejoin>
    <width>2</width>
    <linecap>round</linecap>
  </style>
</class>
<class>
  <expression>"path"</expression>
  <style>
    <color red="255" green="0" blue="0" />
    <linejoin>round</linejoin>
    <width>1</width>
    <linecap>round</linecap>
    <pattern>5 5</pattern>
  </style>
</class>
<class>
  <expression>"track"</expression>
  <style>
    <color red="153" green="116" blue="43" />
    <linejoin>round</linejoin>
    <width>2</width>
    <pattern>16 8</pattern>
    <linecap>round</linecap>
  </style>
</class>
</layer>

```

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</map>

7.9 OSM railway-line

```
<!-- railway-line style with different display for different scales
version 2015-07-24 -->
```

```
<map>
  <layer>
    <classitem>RAILWAY</classitem>
    <class>
      <expression>"abandoned"</expression>
      <style>
        <color red="255" green="255" blue="255"/>
        <linejoin>round</linejoin>
        <width>2.83464566929</width>
        <linecap>round</linecap>
      </style>
      <style>
        <pattern>2.35275590551 4.70551181102</pattern>
        <color red="165" green="165" blue="165"/>
        <linejoin>round</linejoin>
        <width>2.35275590551</width>
        <linecap>round</linecap>
      </style>
    </class>
    <class>
      <expression>"razed"</expression>
      <style>
        <color red="255" green="255" blue="255"/>
        <linejoin>round</linejoin>
        <width>2.83464566929</width>
        <linecap>round</linecap>
      </style>
      <style>
        <pattern>2.35275590551 4.70551181102</pattern>
        <color red="255" green="165" blue="210"/>
        <linejoin>round</linejoin>
        <width>2.35275590551</width>
        <linecap>round</linecap>
      </style>
    </class>
    <class>
      <expression>"construction"</expression>
      <style>
        <color red="255" green="255" blue="255"/>
        <linejoin>round</linejoin>
        <width>2.83464566929</width>
```

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```

    <linecap>round</linecap>
  </style>
  <style>
    <pattern>2.35275590551 4.70551181102</pattern>
    <color red="255" green="0" blue="127"/>
    <linejoin>round</linejoin>
    <width>2.35275590551</width>
    <linecap>round</linecap>
  </style>
</class>
<class>
  <expression>"crossing"</expression>
  <style>
    <color red="37" green="37" blue="255"/>
    <linejoin>bevel</linejoin>
    <width>0.737007874016</width>
    <linecap>square</linecap>
  </style>
</class>
<class>
  <expression>"light_rail"</expression>
  <style>
    <color red="0" green="0" blue="0"/>
    <linejoin>bevel</linejoin>
    <width>1.41732283465</width>
    <linecap>square</linecap>
  </style>
</class>
<class>
  <expression>"narrow_gauge"</expression>
  <style>
    <color red="150" green="150" blue="150"/>
    <linejoin>bevel</linejoin>
    <width>1.41732283465</width>
    <linecap>square</linecap>
  </style>
</class>
<class>
  <expression>"platform"</expression>
  <style>
    <color red="0" green="0" blue="0"/>
    <linejoin>bevel</linejoin>
    <width>4.25196850394</width>
    <linecap>square</linecap>
  </style>
</class>
<class>
  <expression>"rail"</expression>
  <style>

```

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```

    <color red="0" green="0" blue="0"/>
    <linejoin>bevel</linejoin>
    <width>2.83464566929</width>
    <linecap>square</linecap>
    <maxscaledenom>25000</maxscaledenom> <!-- Black and white
↪line at large
    scale -->
  </style>
  <style>
    <pattern>9.41102362205 14.1165354331</pattern>
    <color red="255" green="255" blue="255"/>
    <linejoin>bevel</linejoin>
    <width>2.35275590551</width>
    <linecap>square</linecap>
    <maxscaledenom>25000</maxscaledenom> <!-- Black and white
↪line at large
    scale -->
  </style>
  <style>

    <color red="0" green="0" blue="0"/>
    <linejoin>bevel</linejoin>
    <width>2</width>
    <linecap>square</linecap>
    <minscaledenom>25000</minscaledenom> <!-- Black line at
↪medium scale -->
  </style>
</class>
<class>
  <expression>"siding"</expression>
  <style>
    <color red="145" green="145" blue="145"/>
    <linejoin>bevel</linejoin>
    <width>1.41732283465</width>
    <linecap>square</linecap>
  </style>
</class>
<class>
  <expression>"subway"</expression>
  <style>
    <pattern>1.41732283465 2.83464566929</pattern>
    <color red="155" green="155" blue="155"/>
    <linejoin>round</linejoin>
    <width>1.41732283465</width>
    <linecap>round</linecap>
  </style>
</class>
<class>
  <expression>"tram"</expression>

```

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```

<style>
  <color red="0" green="0" blue="0"/>
  <linejoin>bevel</linejoin>
  <width>1.41732283465</width>
  <linecap>square</linecap>
</style>
</class>
</layer>
</map>

```

7.10 OSM water-line

```

<!-- water-line style with different display for different scales-->
<!-- Version 2015-07-24 -->
<map>
  <layer>
    <classitem>Waterway</classitem>
    <labelitem>name</labelitem>
    <class>
      <expression>"river"</expression>
      <style>
        <color red="102" green="153" blue="204"/>
        <linejoin>round</linejoin>
        <width>3</width>
        <linecap>round</linecap>
        <!-- Unprocessed attributes: width_unit, offset_unit,
↳ customdash_unit -->
      </style>
      <label>
        <type>truetype</type> <!-- Label -->
        <font>bold</font>
        <size>7</size>
        <color blue="255" green="255" red="255"/>
        <linewidth>1</linewidth>
        <outlinecolor red="102" green="153" blue="204"/>
        <angle>auto</angle>
        <repeatdistance>300</repeatdistance>
        <maxoverlapangle>90.0</maxoverlapangle>
        <maxscaledenom>500000</maxscaledenom>
      </label>
    </class>

    <class>
      <expression>"canal"</expression>
      <style><!-- vertical lines -->
        <angle>auto</angle>
        <gap>-8.50393700787</gap>

```

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```

<!-- unparsed attributes: interval_unit, placement,
offset_unit, offset -->
<color red="102" green="153" blue="204"/>
<outlinecolor red="0" green="0" blue="0"/>
<size>15.66929133858</size>
<symbol>std:line</symbol>
<!-- Unprocessed attributes: outline_width, offset_unit,
outline_width_unit, size_unit -->
</style>
<style>
  <color red="102" green="153" blue="204"/>
  <linejoin>round</linejoin>
  <width>3</width>
  <linecap>round</linecap>
  <!-- Unprocessed attributes: width_unit, offset_unit,
customdash_unit -->
</style>
<label>
  <type>truetype</type> <!-- Label -->
  <font>bold</font>
  <size>7</size>
  <color blue="255" green="255" red="255"/>
  <linewidth>1</linewidth>
  <outlinecolor red="102" green="153" blue="204"/>
  <angle>auto</angle>
  <repeatdistance>300</repeatdistance>
  <maxoverlapangle>90.0</maxoverlapangle>
  <maxscaledenom>500000</maxscaledenom>
</label>
</class>

<class>
<expression>"stream"</expression>
<style>
  <color red="102" green="153" blue="204"/>
  <linejoin>round</linejoin>
  <width>1.5</width>
  <linecap>round</linecap>
  <maxscaledenom>250000</maxscaledenom>
  <!-- Unprocessed attributes: width_unit, offset_unit,
customdash_unit -->
</style>
</class>

<class>
<expression>"drain"</expression>
<style>
  <color red="102" green="153" blue="204"/>
  <linejoin>round</linejoin>

```

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```

    <width>1</width>
    <linecap>round</linecap>
    <maxscaledenom>250000</maxscaledenom>
    <!-- Unprocessed attributes: width_unit, offset_unit,
    customdash_unit -->
  </style>
</class>
</layer>
</map>

```

7.11 OSM water-polygon

```

<!-- water-polygon style
version 2015-07-24
To add
-reservoirs
-swamp hatch
-->
<map>
  <layer>
    <labelitem>NAME</labelitem>
    <classitem>NATURAL</classitem>
    <class>
      <expression>"water"</expression> <!-- Water -->
      <style>
        <color red="102" green="153" blue="204"/>
        <outlinecolor red="102" green="153" blue="204"/>
      </style>
      <label>
        <type>truetype</type>
        <font>regular</font>
        <size>7</size>
        <color red="102" green="153" blue="204"/>
        <linewidth>2</linewidth>
        <outlinecolor red="255" green="255" blue="222"/>
        <!-- Label scale range-->
        <minscaledenom>1</minscaledenom>
        <maxscaledenom>100000</maxscaledenom>
      </label>
    </class>
    <class>
      <expression>"wetland"</expression> <!-- Wetland -->
      <style>
        <color red="102" green="153" blue="204"/>
        <outlinecolor red="102" green="153" blue="204"/>
      </style>
      <label>

```

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(continued from previous page)

```

<type>truetype</type>
<font>regular</font>
<size>7</size>
<color red="102" green="153" blue="204"/>
<linewidth>2</linewidth>
<outlinecolor red="255" green="255" blue="222"/>
<!-- Label scale range -->
<minscaledenom>1</minscaledenom>
<maxscaledenom>100000</maxscaledenom>
</label>
</class>
</layer>
</map>

```

7.12 OSM landuse-polygon

NextGIS Web styles support for different hatched (see Fig. ??).

```

<map> <!-- A demo of different hatched. Use with dark background.-->
  <layer>
    <labelitem>OSM_ID</labelitem>
    <classitem>LANDUSE</classitem>
    <class>
      <expression>"residential"</expression>
      <!-- Residential -->
      <style>
        <!-- hatch with right slope -->
        <color red="255" green="185" blue="33"/>
        <width>1.4</width>
        <symbol>std:line</symbol>
        <gap>3</gap>
        <size>1</size>
        <angle>90</angle>
      </style>
      <style>
        <!-- Outline -->
        <outlinecolor red="255" green="185" blue="33"/>
        <width>0.5</width>
      </style>
    </class>
    <class>
      <expression>"grass"</expression>
      <!-- Grass zones -->
      <style>
        <!-- Lines -->
        <color red="20" green="255" blue="33"/>
        <width>1</width>
      </style>
    </class>
  </layer>
</map>

```

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```

        <symbol>std:line</symbol>
        <gap>6</gap>
        <size>4</size>
        <angle>0</angle>
        <pattern>2.5 4.5</pattern>
    </style>
    <style>
        <!-- Outline -->
        <outlinecolor red="20" green="255" blue="33"/>
        <width>0.5</width>
    </style>
</class>
<class>
    <expression>"commercial"</expression>
    <!-- Residential -->
    <style>
        <!-- hatch with right slope -->
        <color red="133" green="33" blue="25"/>
        <width>1.4</width>
        <symbol>std:line</symbol>
        <gap>10</gap>
        <size>5</size>
        <angle>45</angle>
    </style>
    <style>
        <!-- Outline -->
        <outlinecolor red="133" green="33" blue="25"/>
        <width>0.5</width>
    </style>
</class>
<class>
    <expression>"industrial"</expression>
    <!-- Industrial zones -->
    <style>
        <!-- hatch with right slope -->
        <color red="255" green="50" blue="50"/>
        <width>0.4</width>
        <symbol>std:hatch</symbol>
        <gap>10</gap>
        <size>5</size>
        <angle>45</angle>
    </style>
    <style>
        <!-- hatch with left slope -->
        <color red="255" green="50" blue="50"/>
        <width>0.4</width>
        <symbol>std:hatch</symbol>
        <gap>10</gap>
        <size>5</size>

```

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```

        <angle>-45</angle>
    </style>
    <style>
        <!-- Outline -->
        <outlinecolor red="255" green="50" blue="50"/>
        <width>0.5</width>
    </style>
</class>
<class>
    <expression>"cemetery"</expression>
    <!-- Cemeteries -->
    <style>
        <!-- fences -->
        <color red="14" green="166" blue="0"/>
        <width>1.4</width>
        <symbol>std:rectangle</symbol>
        <gap>20</gap>
        <size>11</size>
        <angle>0</angle>
    </style>
    <style>
        <!-- fences -->
        <color red="0" green="0" blue="0"/>
        <width>1.2</width>
        <symbol>std:rectangle</symbol>
        <gap>20</gap>
        <size>10</size>
        <angle>0</angle>
    </style>
    <style>
        <!-- crosses -->
        <color red="14" green="166" blue="0"/>
        <width>1.4</width>
        <symbol>std:cross</symbol>
        <gap>20</gap>
        <size>9</size>
        <angle>0</angle>
    </style>
    <style>
        <!-- Outline -->
        <outlinecolor red="14" green="166" blue="0"/>
        <width>0.5</width>
    </style>
</class>
</layer>
</map>

```


7.13 Individual feature styles from field

It is possible to set up individual style for every vector feature. First create a field that contains style description in ORG Style format. For example,

```
ogr2ogr -f GeoJSON -sql "select *, OGR_STYLE from Australia" ↵  
→australia.geojson Australia.TAB
```

Learn more on ORG Style on the [Feature Style Specification²³](#) page.

Now that you have a vector layer with *OGR_STYLE* field containing the style for the feature, add the following NextGIS Web Mapserver:

```
<map>  
  <layer>  
    <styleitem>OGR_STYLE</styleitem>  
    <class>  
      <name>default</name>  
    </class>  
  </layer>  
</map>
```

²³ https://gdal.org/user/ogr_feature_style.html

VECTOR LAYER SETTINGS

8.1 Introduction

To edit a layer you need to navigate to a child resource group (see item 4 in Fig. ??), where would be displayed resource types. Then select from child resources a resource with type vector layer and press the “Pencil” icon opposite the resource or select the layer and then select an action called “Update” in actions pane (see Fig. ??). The window “Update resource” will open, where you can edit the layer properties, clear the layer or upload a new file for it, and modify attributes.

Web GIS also allows to edit objects and their attributes and to add descriptions of features and to them attachments (including photos). This works for Vector layers and PostGIS layers.

8.2 Allow editing

By default editing of a Web Map is disabled. To allow users to modify the layers of the map, enable editing in the Web Map settings. To find out how to open the “Update resource” dialog, see *this chapter* (page ??).

You can allow or deny editing of all map layers on the “Settings” tab by ticking or clearing a box next to “Enable layers editing” field (see Fig. ??)

Note: By default layer editing is turned off.

To forbid some users to edit layers add a rule to deny specified users or groups of users to write data (permission "Data:Write") on the “Permissions” tab of the “Update resource” dialog (see Fig. ??). For user without permission the edit mode is unavailable.

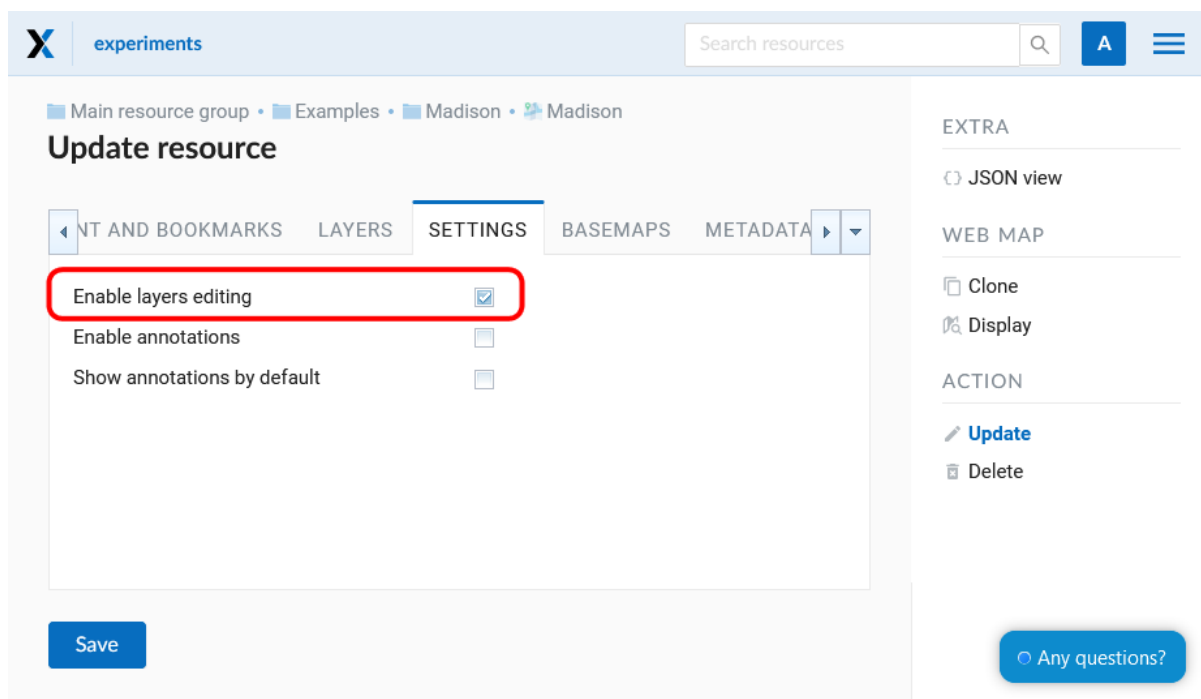


Fig. 8.1: “Enable layers editing” is turned on

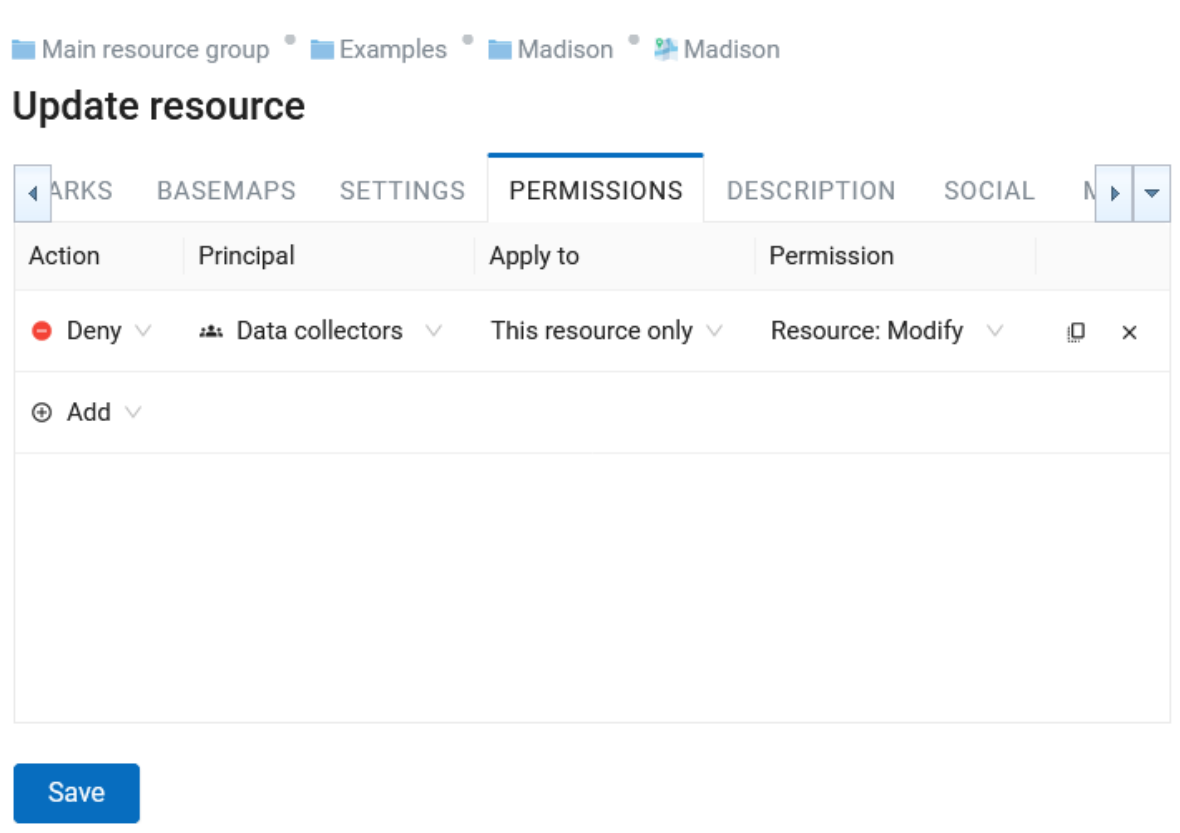


Fig. 8.2: Changes of editing permission for particular users

8.3 Delete or replace all features

NextGIS Web software allows to delete all features of a layer or replace them by uploading a new file.

Click on the pencil icon next to the layer.

In the “Vector layer” tab select the action from the dropdown menu.

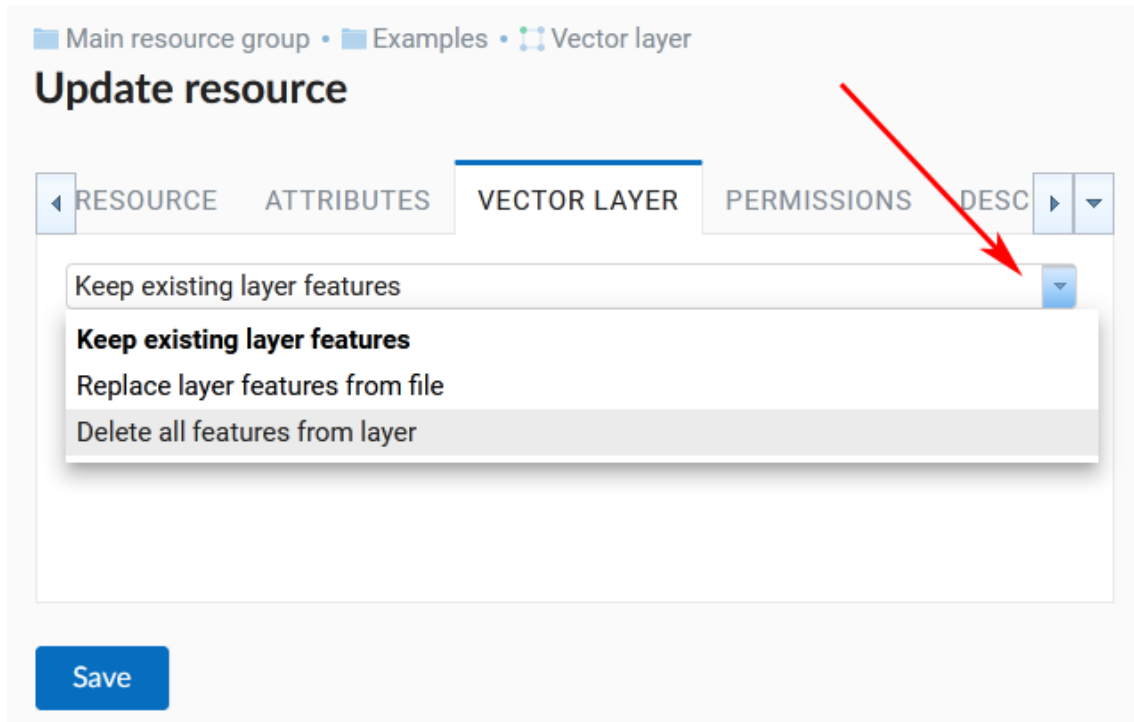


Fig. 8.3: Options to edit the layer file

You can delete all the features. This will result in an empty layer of the same structure that you can add new features to. To do so, select “Delete all features from layer”, tick to confirm and press **Save**.

You can replace all the features by uploading a previously prepared file. Select “Replace layer features from file”. Open the file or drag and drop it into the frame.

If the file has multiple layers, select the one you need in the “Source layer” field. You can also set up other properties, as while creating a new vector layer.

If you replace the file, not only the features, but the structure of the attributes and other properties will be changed to match the new file.

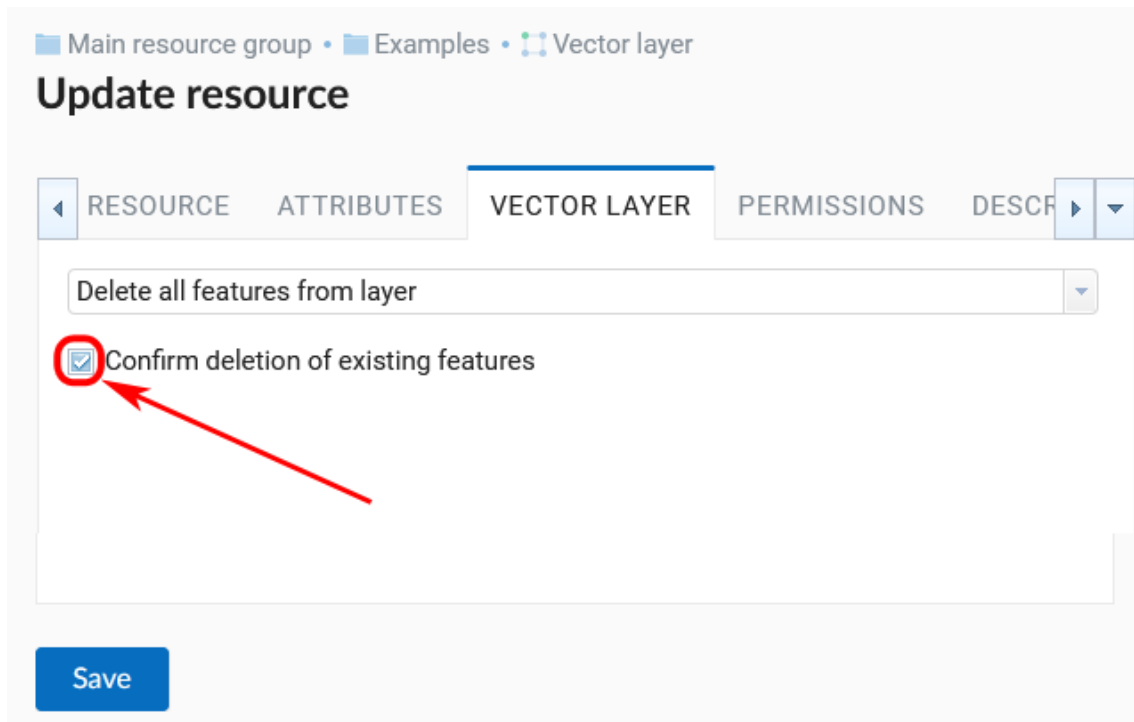


Fig. 8.4: Deleting all features from the layer

8.4 Edit vector feature on a Web Map

1. Open Web Map and select the layer with the feature you need to edit.
2. Open dropdown menu by pressing the three dots to the right of the layer name (see Fig. ??), then select “Edit”.
3. Editing toolbar will appear on the Web Map (see Fig. ??):

8.4.1 Create a new feature (point, line, polygon)

1. On the editing toolbar activate “Create features” button (see Fig. ??):
2. A blue circle will appear nearby a mouse pointer, with it you can add new features. Click on the map to create a new feature. You can add several new features one after another. While creating a line you need to indicate its start and end points by clicking on the map. While creating a polygon each new click on the map will indicate its new vertice, to finish a polygon you need to click on its start point. You can use adhesion while creating vertices.
3. To finish creation of the new feature press “Stop editing” in the layer menu.
4. In the opened dialog select “Save” to save changes, “Don’t save” to discard them, or “Cancel” to stay in the edit mode:

Main resource group
Examples
Vector layer

Update resource

RESOURCE
ATTRIBUTES
VECTOR LAYER
PERMISSIONS
DESC

Replace layer features from file

Select a dataset or drag and drop here.

ESRI Shapefile (zip), GeoPackage, GeoJSON, GML, KML, CSV or XLSX formats are supported. For CSV and XLSX only points are supported, coordinates must be put in lat and lot columns.

2.0 GB max

Source layer

Advanced options

Fix errors
Whatever possible

☒ Skip features with unfixable errors

Geometry type
Auto

☐ Only load features of the selected geometry type

Multi-geometry
Auto
Z-coordinate
Auto

FID source
Auto
FID field(s)
ngw_id,id

☒ Confirm deletion of existing features

Save

Fig. 8.5: Replacing layer file

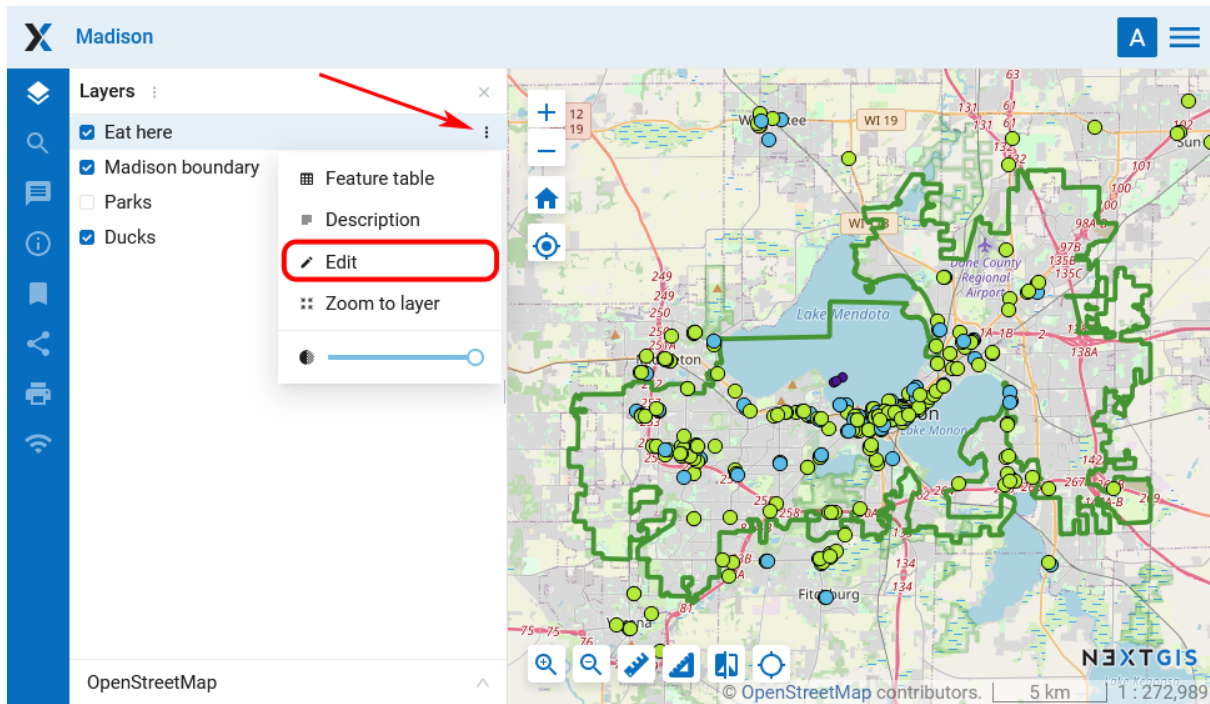


Fig. 8.6: Entering the editing mode

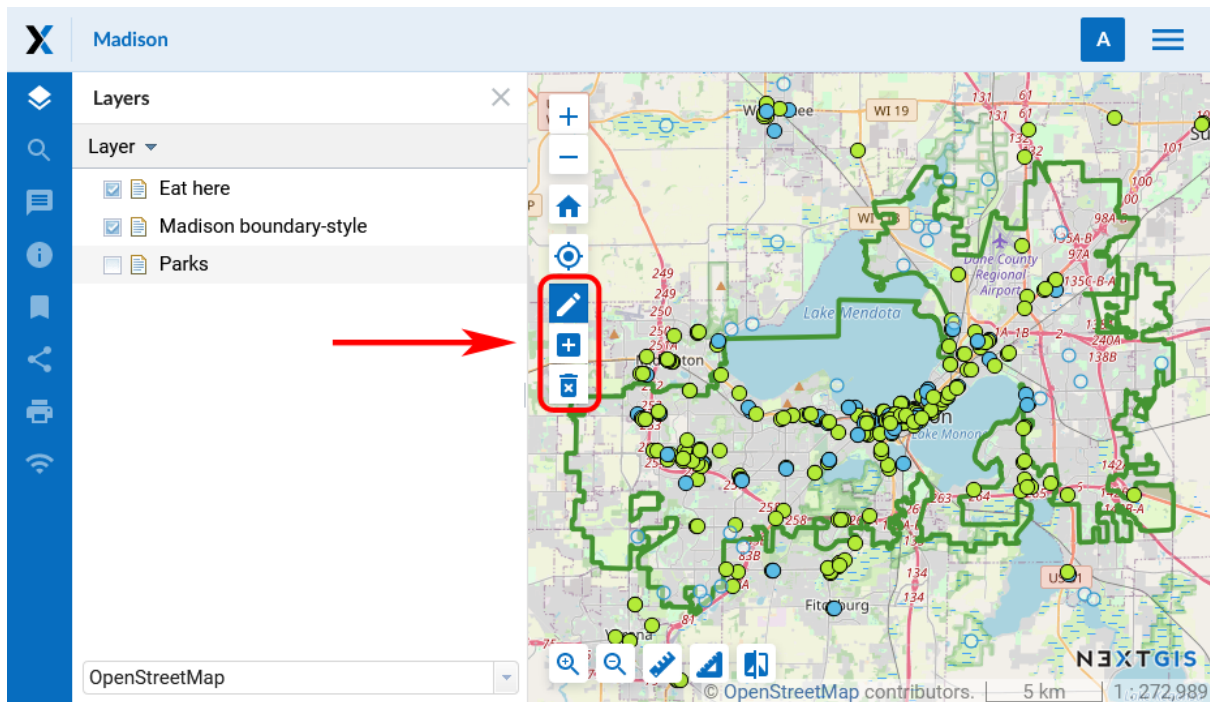


Fig. 8.7: Editing toolbar

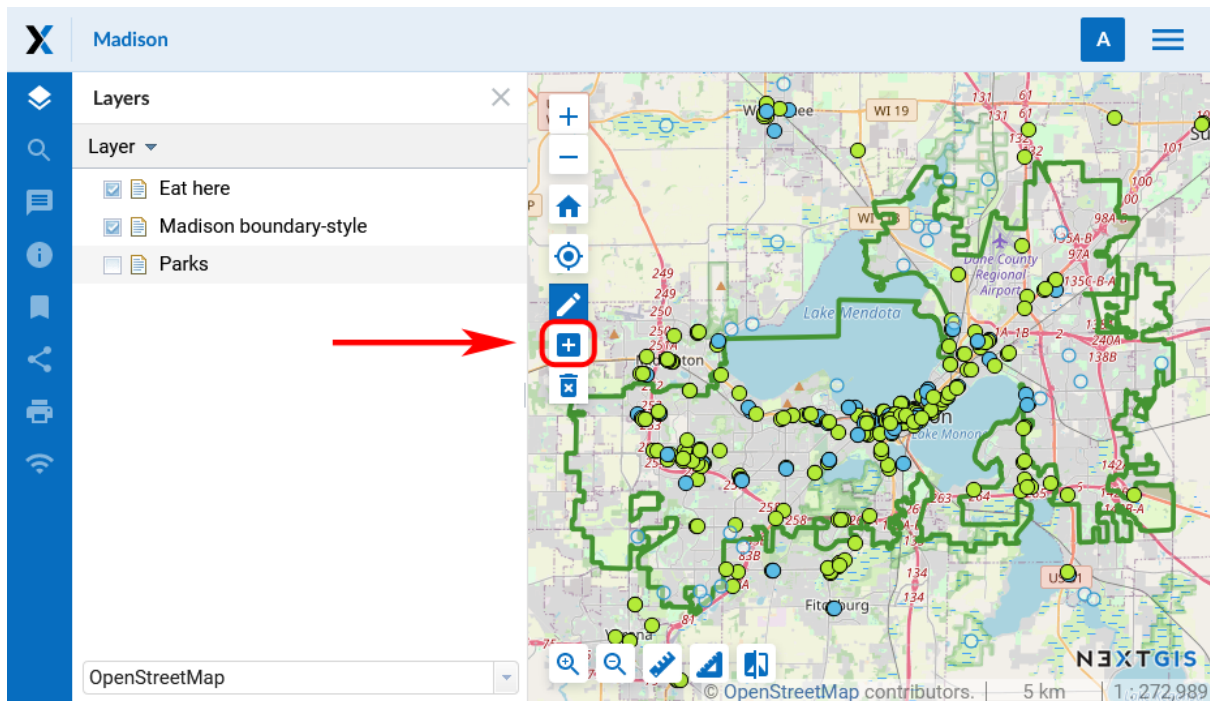


Fig. 8.8: “Create features” button on the editing toolbar

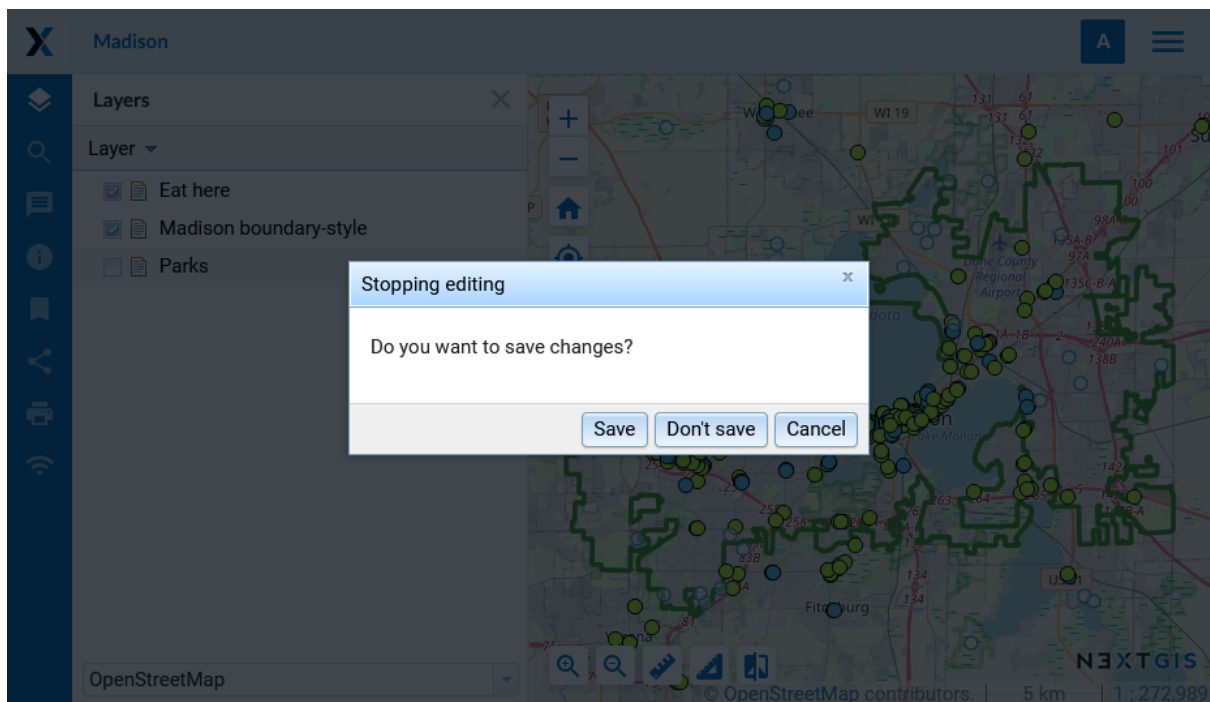


Fig. 8.9: Dialog window of finishing edits

8.4.2 Delete a feature

1. On the editing toolbar activate “Delete features” button (see Fig. ??):

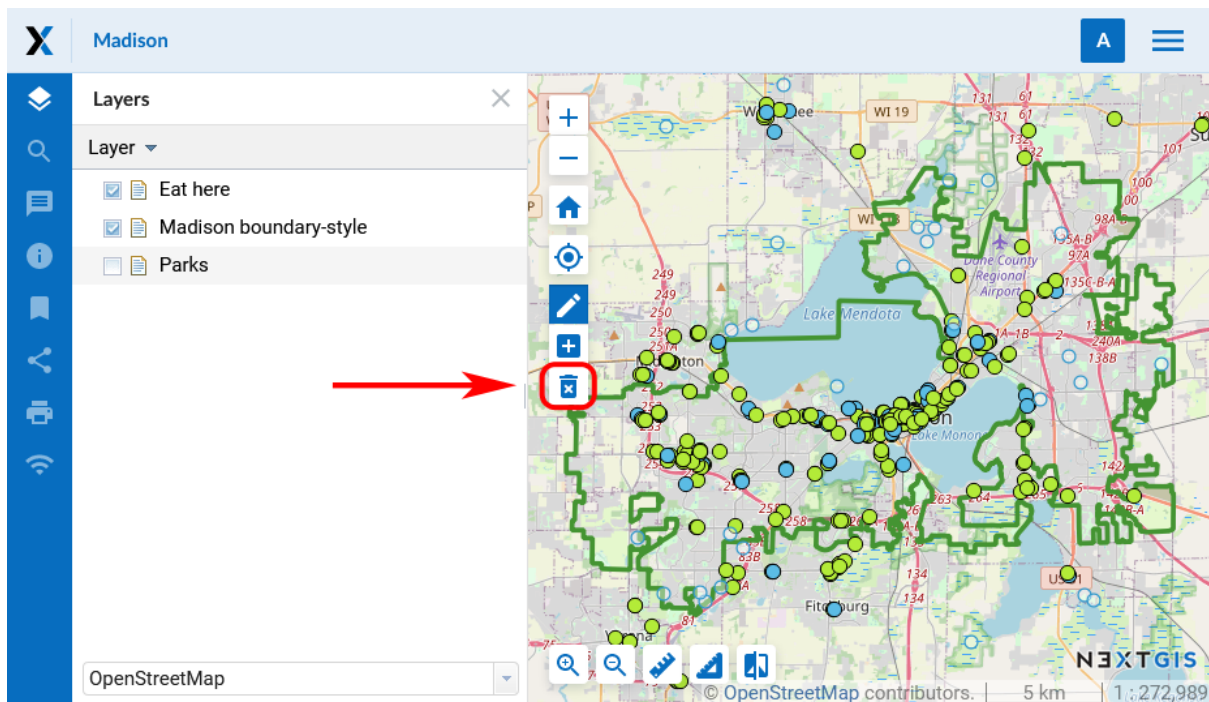


Fig. 8.10: “Delete features” button on the editing toolbar

2. Features you can modify will reduce their color intensity and have a blue outline. The pointer will become a black cross.
3. Left-click to select the features you would like to delete. Selected features will become dark again.
4. Select “Stop editing” in the layer dropdown menu.
5. In the opened dialog select “Save” (see Fig. ??).

8.4.3 Move a feature or its vertices

1. On the editing toolbar activate “Modify features” button (pencil icon, see Fig. ??):
2. Features you can modify will reduce their color intensity and have a blue outline.
3. Select a feature (point) or one of its vertices (line, polygon) with the pointer and drag it, then release on a new place. For vertices modifying an adhesion will work.
4. Select “Stop editing” in the layer dropdown menu.
5. In the opened dialog select “Save” (see Fig. ??).

Note: You can edit several layers simultaneously. To do it enter the edit mode in

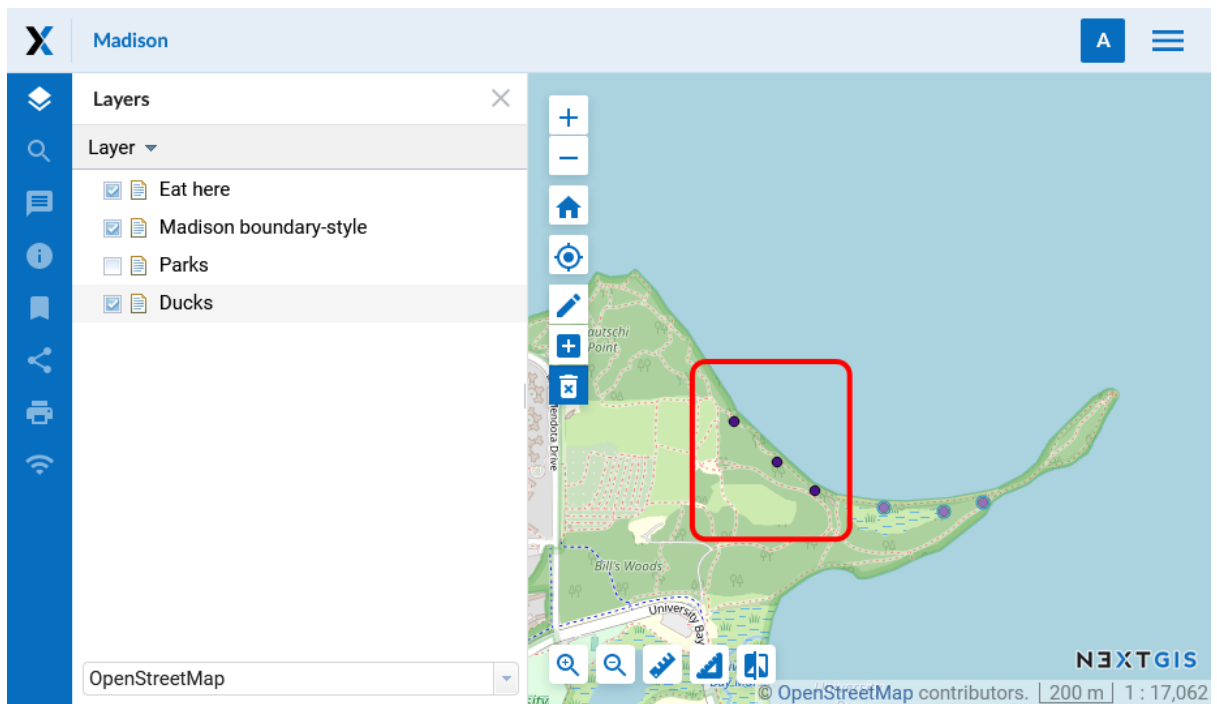


Fig. 8.11: The layer with the purple points is active. The marked points have been selected to be deleted

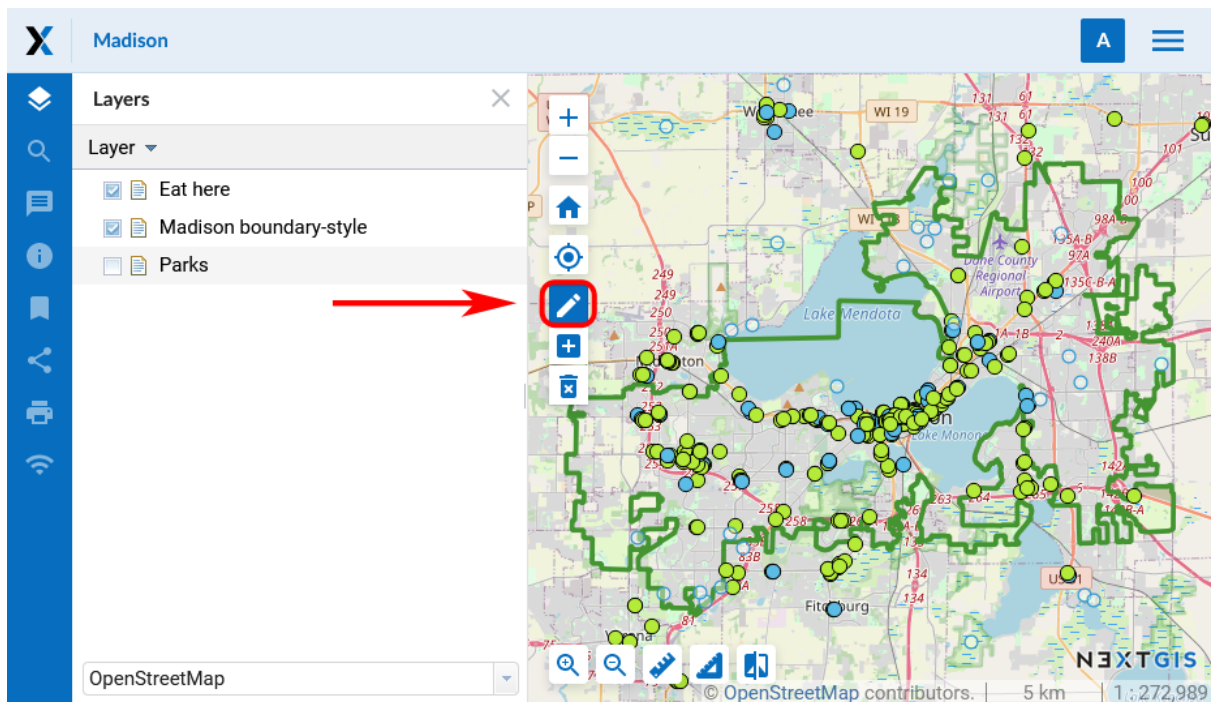


Fig. 8.12: “Modify features” button on the editing toolbar

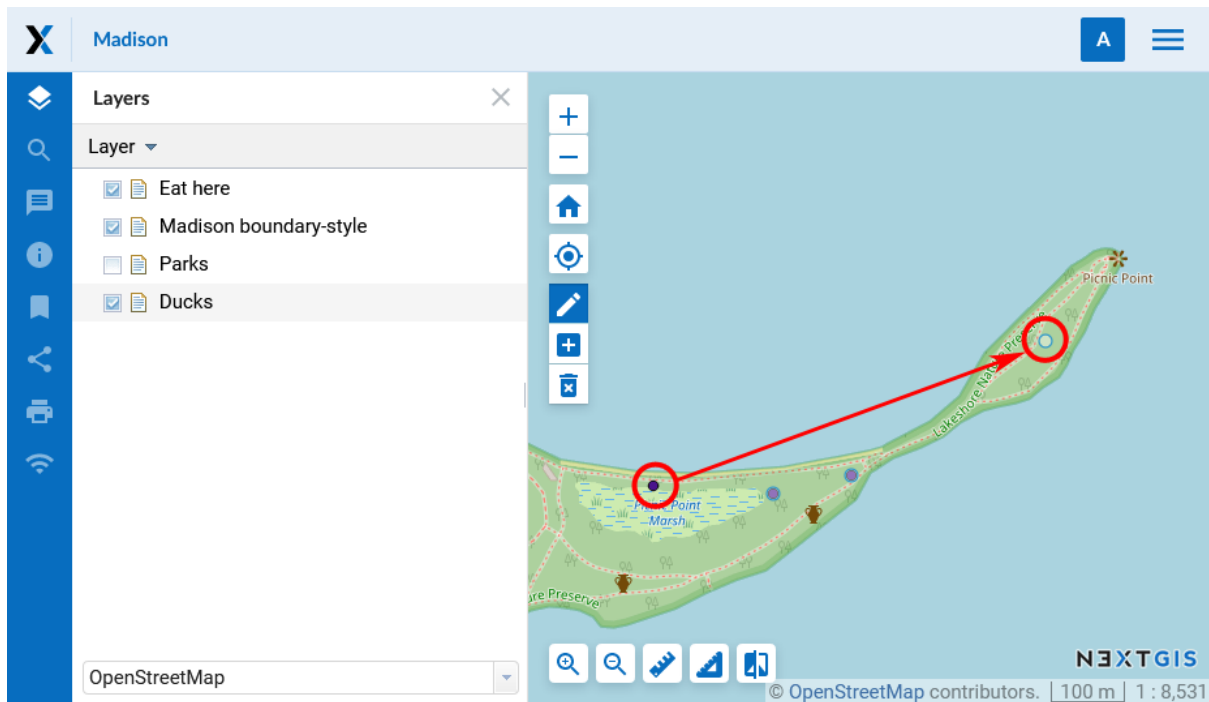


Fig. 8.13: Moving a point. Before you confirm the edit, both its initial and its final location will be visible on the map

every layer you want to edit. Adhesion will work for features of all these layers.

8.4.4 Add and delete vertices

To delete a vertice enter the editing mode, hold **Shift** and click on the vertice.

To add a vertice, click on the line between two existing vertices and drag it to the desired location.

8.5 Edit attribute values

NextGIS Web software allows to edit attributes for geographical features. Editing could be launched from the administrator interface or from the map display.

- Editing attributes from administrator interface:
 - Click the table icon opposite the resource or select an action for a vector layer called “Feature table” in the actions pane (see Fig. ??).
 - A feature table for the layer will open. Select the row you want to edit. It will be highlighted in yellow.
 - Click **Edit** button (see Fig. ??).
- Editing attributes from the map display:
 - Open a Web Map.
 - Click on the map with Identify tool active.

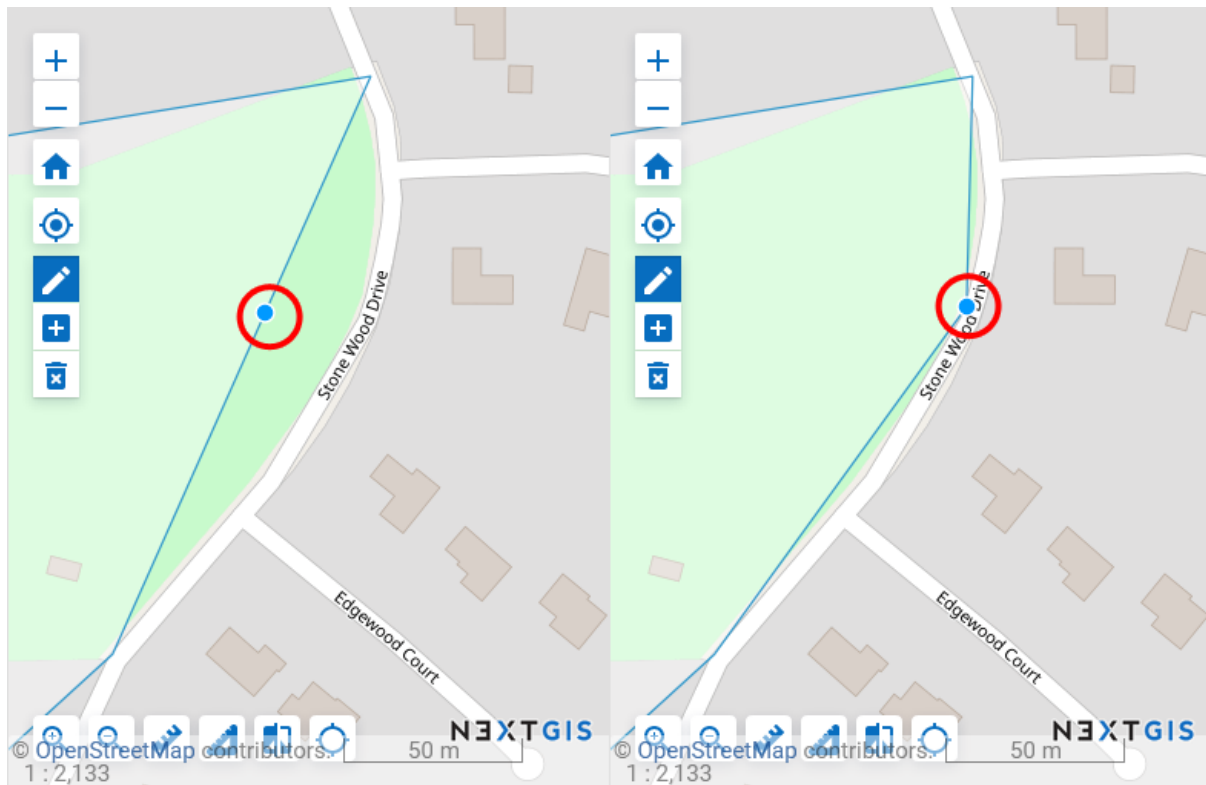


Fig. 8.14: Creating a new vertice

- Click edit button in the Identify window (the last tab, see Fig. ??).

You can change attribute values in the opened window. Description made on “Description” tab will be visible on the map display in the indentify window.

Editing page has following tabs:

- “Attributes” tab (see Fig. ??).

To edit an attribute click on the field.

Numbers can be typed in or modified with arrows that appear on the right end of the field.

Dates also can be typed in or selected in the calender. To open the calender click the icon on the right end of the field.

- “Description” tab (see Fig. ??).
- “Attachments” tab (see Fig. ??).

When editing a PostGIS layer attribute changes are saved to PostGIS database and descriptions are saved to a local database. When editing a layer based on a Shapefile attribute all changes are saved to a local database.

Geodata with changed attributes could be downloaded by link *Download as GeoJSON* or published as WFS service. Download of descriptions is currently unavailable.

Main resource group • Examples • Madison • Parks

Feature table

Open Edit Delete Save as Search...

#	NAME	SHOP	DATE VISITED	OSM_TYPE	OSM_ID	orig_ogc_f
	Dog Park					
7	La Pointe City Park			node	777099985	138
8	Windmill Oaks Park			node	767120494	149
9	Scheidegger Forest County Park			node	1116119727	150
10	Waltz Park			node	1143480497	153
11	BadFish Creek State Wildlife Area			node	1143295811	155
12	Ward-Swartz Decatur Woods State Natural Area			node	1117940572	159
13	Evansville			node	1141916935	162

Fig. 8.15: Editing attributes from administrator interface

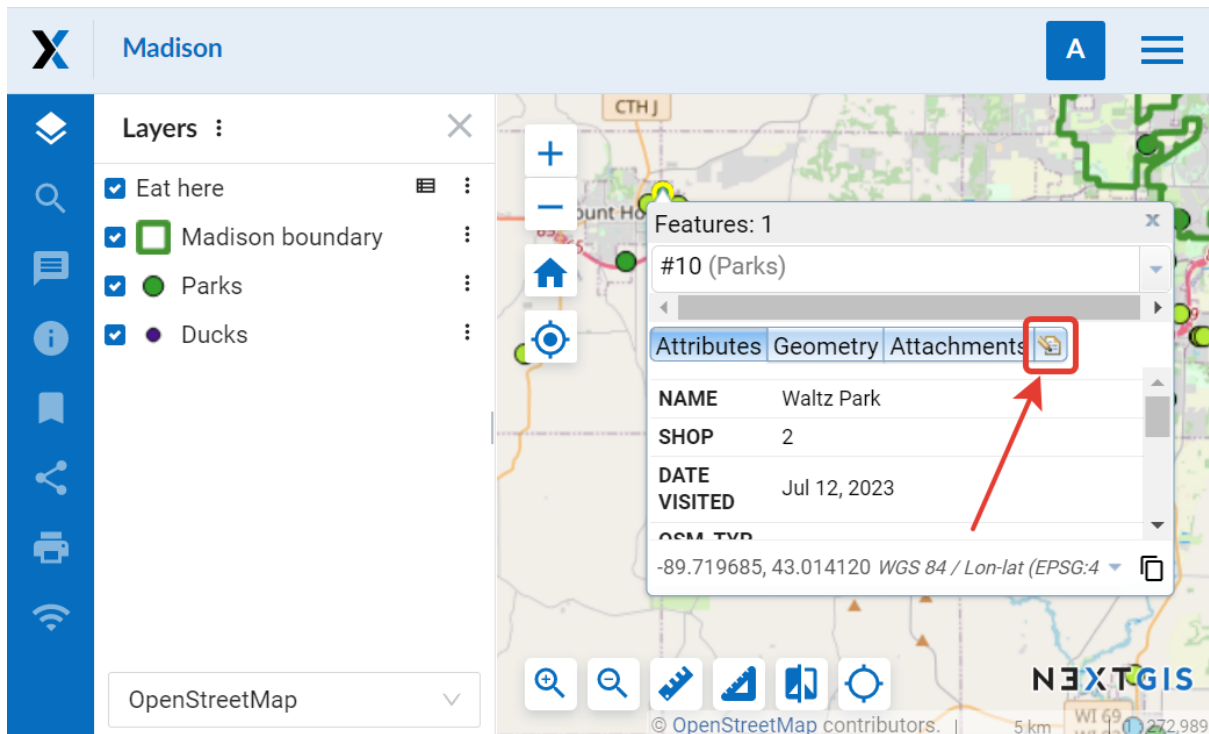


Fig. 8.16: Editing attributes from the map

8.6 Adding photos to geodata

NextGIS Web software supports adding photos to features. If a feature has attached photos, they will be shown along with description and attributes in the identify window (see Fig. ??).

You can add photos in a map display.

1. Click on a feature on the map with active Identify tool.
2. Click edit button in the Identify window (see Fig. ??).
3. In the edit tab navigate to "Attachments" tab (see Fig. ??).
4. Upload photos. JPEG and PNG formats are supported. GIF format is not supported (see Fig. ??).
5. Enter description for the image and click **Save**.

After uploading you can see previews of photos on the "Attachments" tab of the identify window (see Fig. ??).










After a click on a photo preview a lightbox window is open (a javascript powered window in browser). Photo size is adjusted to fit the window. Photos have descriptions and user can navigate through them using left and right arrow keys on the keyboard (see Fig. ??).

Note: By default photos could be added by any user but there is an option to limit number of users who can upload photos (see *Access management* (page ??)).

Main resource group • Examples • Madison • Parks

Feature #8

ATTRIBUTES DESCRIPTION ATTACHMENTS

NAME	Windmill Oaks Park	
MAN_MADE	NULL	
SHOP	2	 
DATE VISITED	2023-07-12	 
OSM_TYPE	node	
OSM_ID	767120494	
orig_ogc_f	149	








Save

Fig. 8.17: “Attributes” tab

[Main resource group](#) • [Examples](#) • [Madison](#) • [Parks](#)

Feature #10

ATTRIBUTES DESCRIPTION ATTACHMENTS

↶ ↷ Paragraph ▾ **B** *I* U ~~S~~ [Link](#)  ▾  ▾ “ ”      Source

Save



Fig. 8.18: “Description” tab

Main resource group • Examples • Madison • Parks

Feature #8

ATTRIBUTES DESCRIPTION ATTACHMENTS

Upload

Preview	File name	Size	MIME type	Description	
	waltz_1	318.8 KB	image/png	sign	

Save

Fig. 8.19: “Attachments” tab

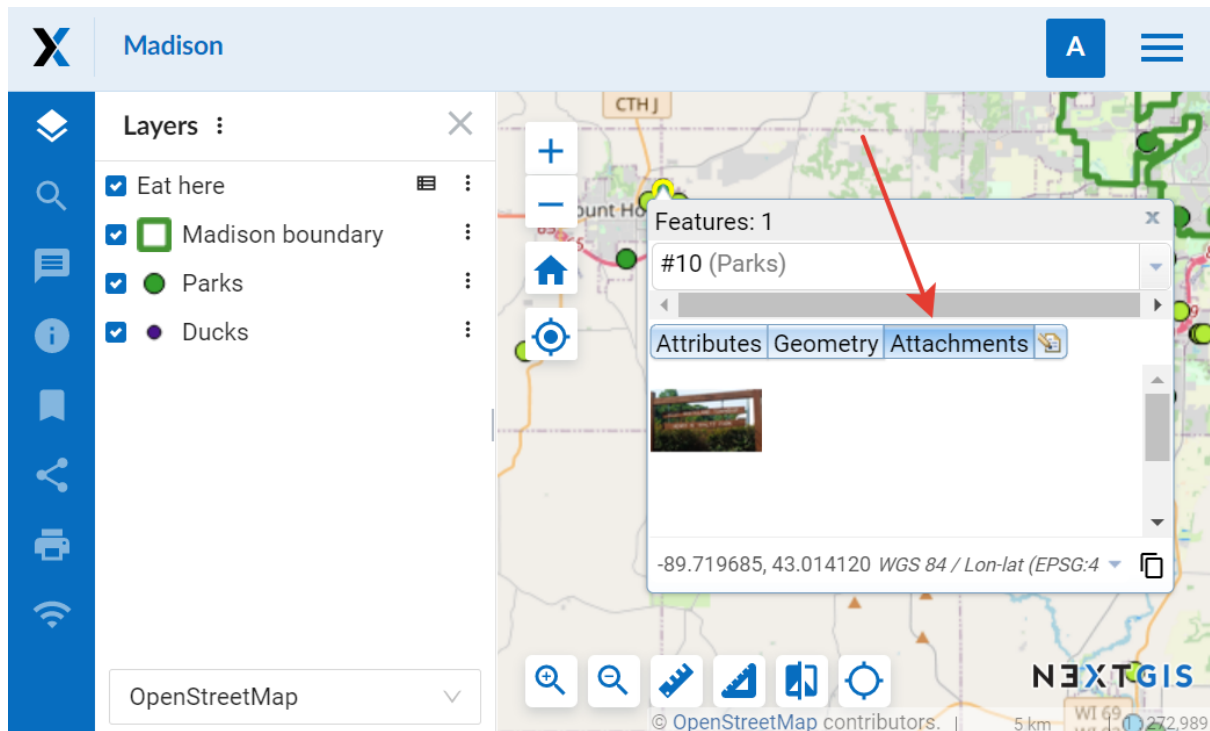


Fig. 8.20: Identify window for a feature with attached photos

To delete a photo select it on “Attachments” tab of editing attributes window and click “Delete”, and then click **Save** button.

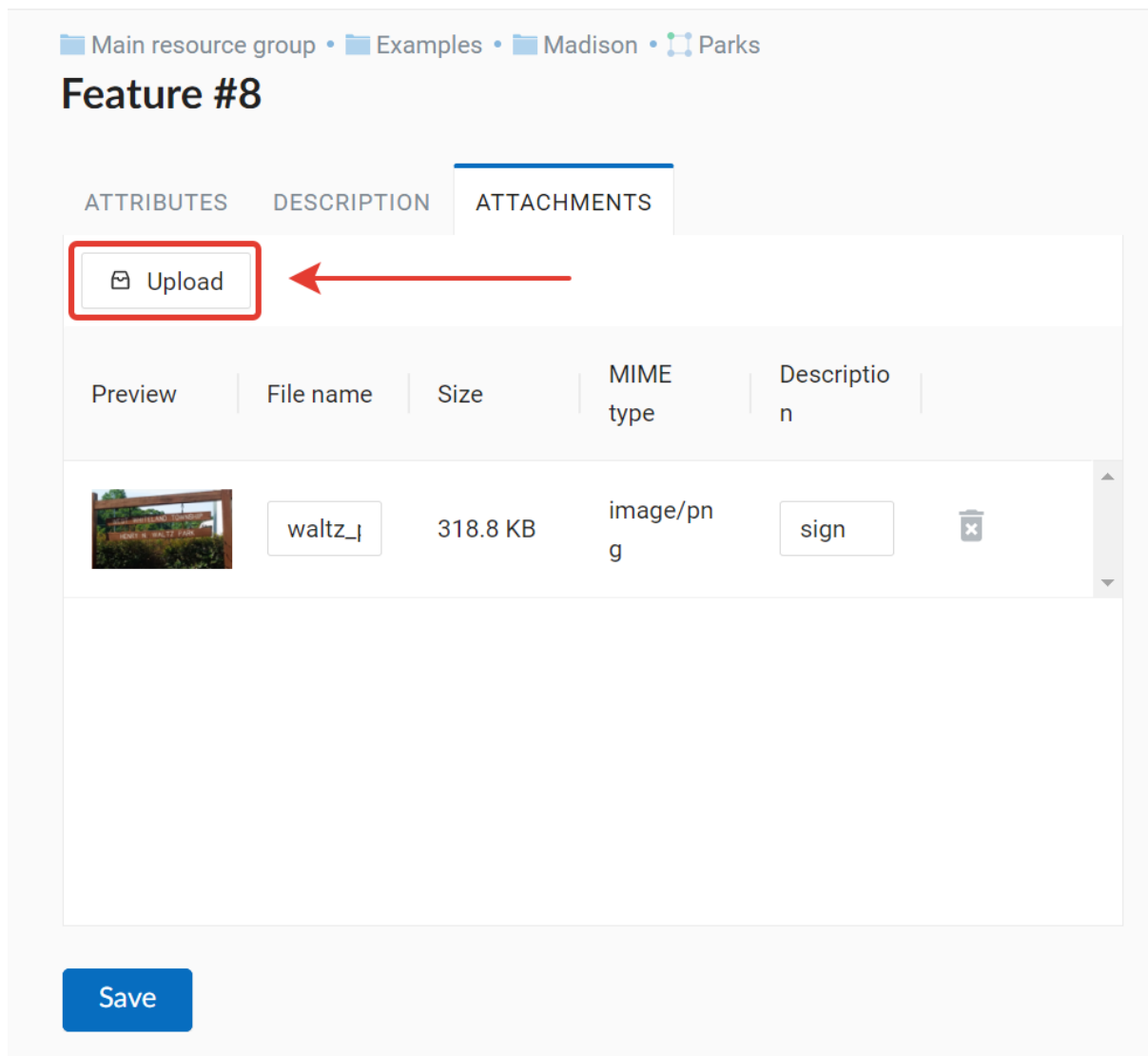


Fig. 8.21: Uploading photos in the “Attachments” tab



Fig. 8.22: A lightbox with uploaded photos for the identified feature

HOW TO ADMINISTRATE WEB MAPS

There could be several Web Maps in NextGIS Web. For example one map is for work, another is for public access and third is for testing of layer styles.

Each Web Map has its own URL address. Different access permissions for Web Map viewing can be set for users and groups.

Web Map displays layers. They can be turned on or off by the user. You can set the order of the layers, default layer visibility and create layer groups. Groups on a map do not relate to resource groups in the Control Panel. There is no option to transfer layers between groups. Groups may be nested.

9.1 Creating a Web Map

To create a Web Map, open the resource group where you want to add it, then in the actions pane “Create resource” select “Web Map”. (see Fig. ??).

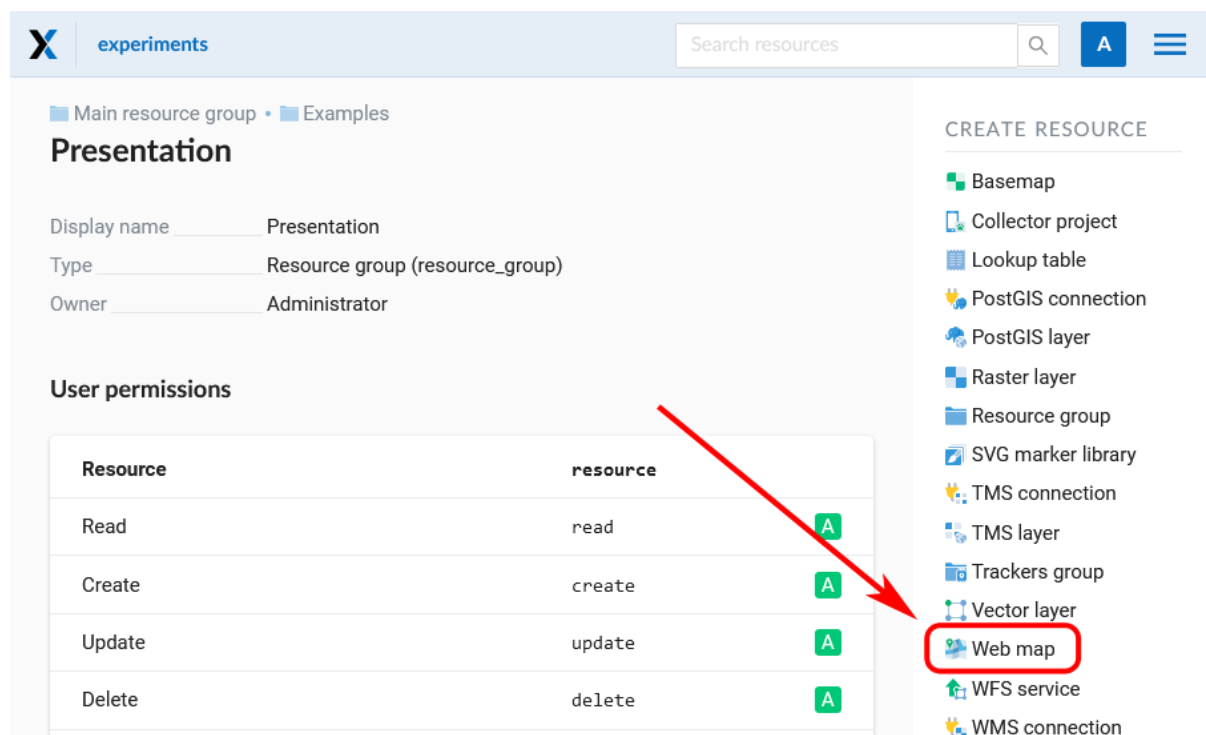


Fig. 9.1: Selection of “Web Map” action

Create resource dialog for a Web Map will open, see Fig. ??.

Fig. 9.2: “Create resource” dialog for Web Map

Enter Web Map display name that will be visible in the administrator interface and in the Web Map viewer.

“Keyname” field is optional.

You can also add resource description and metadata on the corresponding tabs.

9.1.1 Extent

Switch from “Resource” tab to “Extent and bookmarks” tab, presented on Fig. ??.

In this tab you can set up:

- Initial extent - part of the Web Map that is shown upon its opening
- Constraining extent - users will not be able to zoom out or scroll past this extent

Use the four fields to set the extent measured in degrees.

Extent from layer button allows to set Web Map extent from the layer’s extent. Click it to open the “Select layer” window, where you can select a layer to use for setting the Web Map extent (see Fig. ??). The four fields for the extent coordinates will be filled in.

Tip: Extent coordinates could be generated using third-party services, for example <http://boundingbox.klokantech.com/> (select csv in a list).

Main resource group • Examples • Presentation

Create resource

RESOURCE LAYERS **EXTENT AND BOOKMARKS** BASEMAPS SETTINGS

Bookmark resource

Initial extent ⓘ

Left, deg.	<input type="text" value="-89.567"/>	Bottom, deg.	<input type="text" value="42.998"/>
Right, deg.	<input type="text" value="-89.247"/>	Top, deg.	<input type="text" value="43.172"/>

Constraining extent ⓘ

Left, deg.	<input type="text" value="-92.803"/>	Bottom, deg.	<input type="text" value="42.496"/>
Right, deg.	<input type="text" value="-86.908"/>	Top, deg.	<input type="text" value="46.793"/>

Fig. 9.3: “Extent and bookmarks” tab

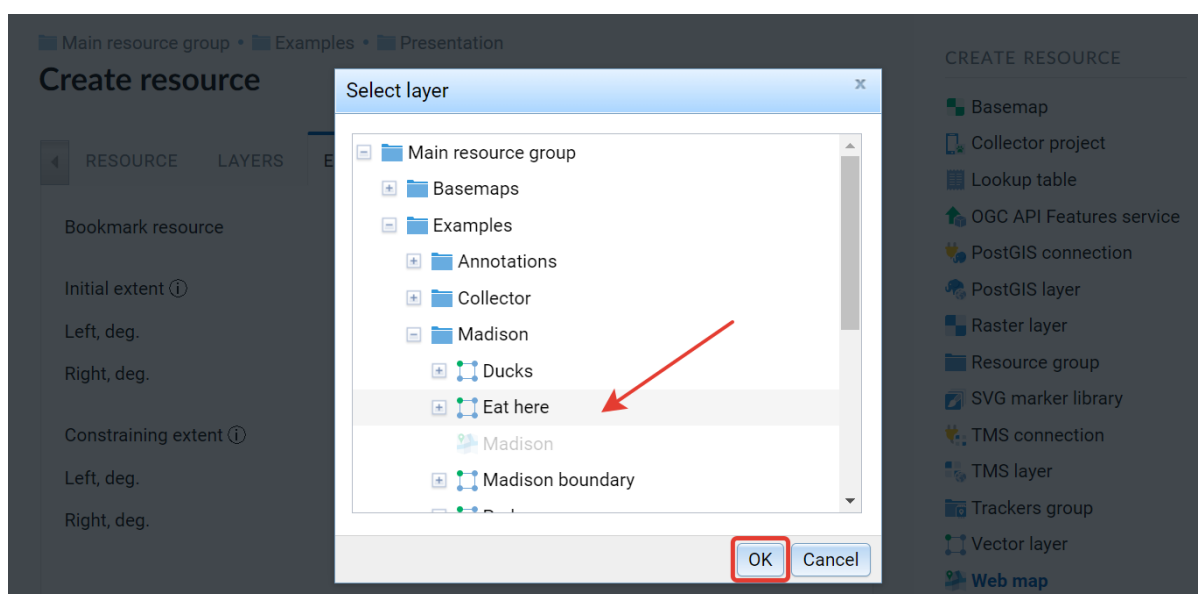


Fig. 9.4: “Select layer” window

9.1.2 Bookmarks

In the “Bookmark resource” field you can select a vector layer with any type of geometry to use for bookmarks. The Web Map will show bookmarks panel (see Fig. ??) with names defined by “Label attribute” if it is set (see Fig. ??).

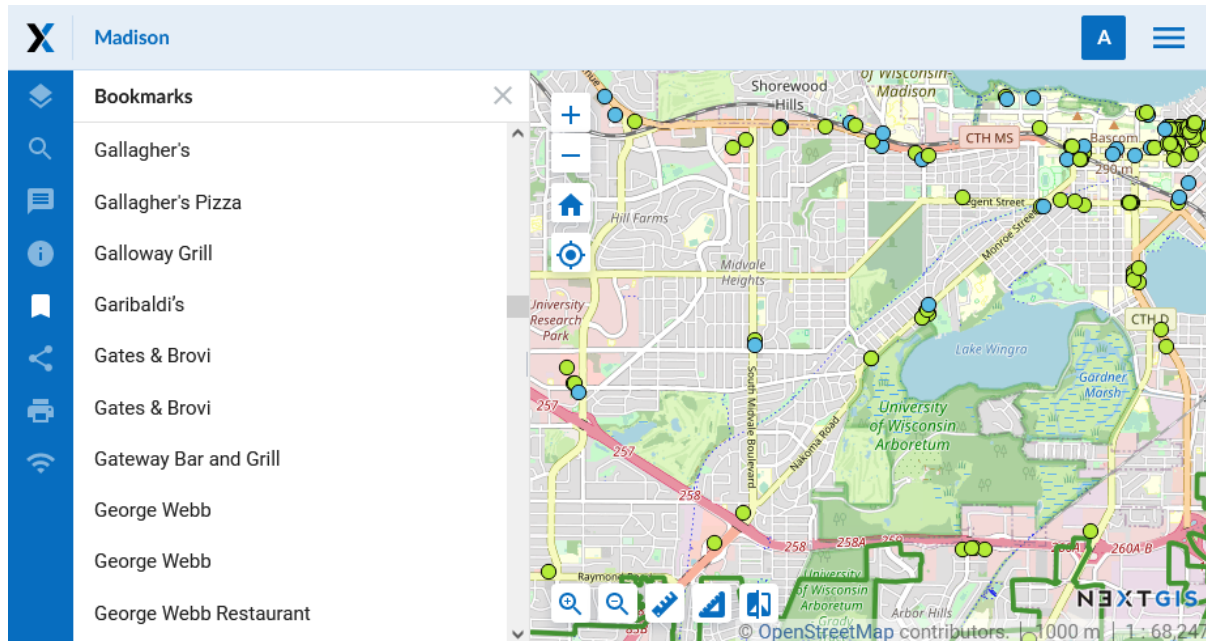


Fig. 9.5: “Bookmarks” tab and the bookmarks viewed on the map

9.1.3 Web Map Layers

In the “Layers” tab you can add, group or remove layers and change their order using the buttons “Add layer”, “Add group”, “Remove” and “Layer order” respectively (see Fig. ??).

To view the data of the layer on a map, you need to create at least one layer style. More on creating styles for different layer types [here](#).

Layers of a particular map have several settings, see Fig. ??.

“Enabled” checkbox sets default visibility of a layer.

The “Transparency” field sets the layer transparency on a map between 0% (opaque) and 100% (completely transparent).

We recommend setting the “Adapter” field to “Image” (a single image for the entire map), unless there are some special requirements. Alternatively, you can choose “Tiles” (images of 256 x 256 pixels).

You can also set up a scale range. Min scale corresponds to the smaller image, max scale - to the larger, more detailed image. For example, if you want a layer to be displayed in scales between 1 : 250,000 and 1 : 5,000, the higher number (250,000) is the minimal scale.

Note: Max and min scale can be set not only using the Web Map’s Layers tab,

Main resource group • Examples • Madison • Eat here

Update resource

RESOURCE PERMISSIONS DESCRIPTION ATTRIBUTES METADATA

Add Remove ↑ ↓

#	Key	Type	Display name	FT	LA
1	NA	STRING	Name	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	M/	STRING	MAN_MADE	<input type="checkbox"/>	<input type="checkbox"/>
3	LE	STRING	LEISURE	<input type="checkbox"/>	<input type="checkbox"/>
4	AN	STRING	Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	OF	STRING	OFFICE	<input type="checkbox"/>	<input type="checkbox"/>
6	SH	STRING	SHOP	<input type="checkbox"/>	<input type="checkbox"/>
7	TO	STRING	TOURISM	<input type="checkbox"/>	<input type="checkbox"/>
8	SP	STRING	SPORT	<input type="checkbox"/>	<input type="checkbox"/>
9	OS	STRING	OSM_TYPE	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Save

CREATE RESOURCE

- Form
- MapServer style
- QGIS style

EXTRA

- JSON view
- Preview

FEATURES

- Save as
- Table

ACTION

- Update
- Delete

Any questions?

Fig. 9.6: Setting attributes for the vector layer containing boundaries

Main resource group • Examples • Presentation

Create resource

EXTENT AND BOOKMARKS LAYERS SETTINGS BASEMAPS

Add layer Add group Remove Layer order

- Madison boundary
- Eat here style

CREATE RESOURCE

- Basemap
- Collector project
- Lookup table
- PostGIS connection
- PostGIS layer
- Raster layer
- Resource group
- SVG marker library
- TMS connection
- TMS layer
- Trackers group
- Vector layer
- Web map
- WFS service
- WMS connection

Fig. 9.7: “Layers” tab

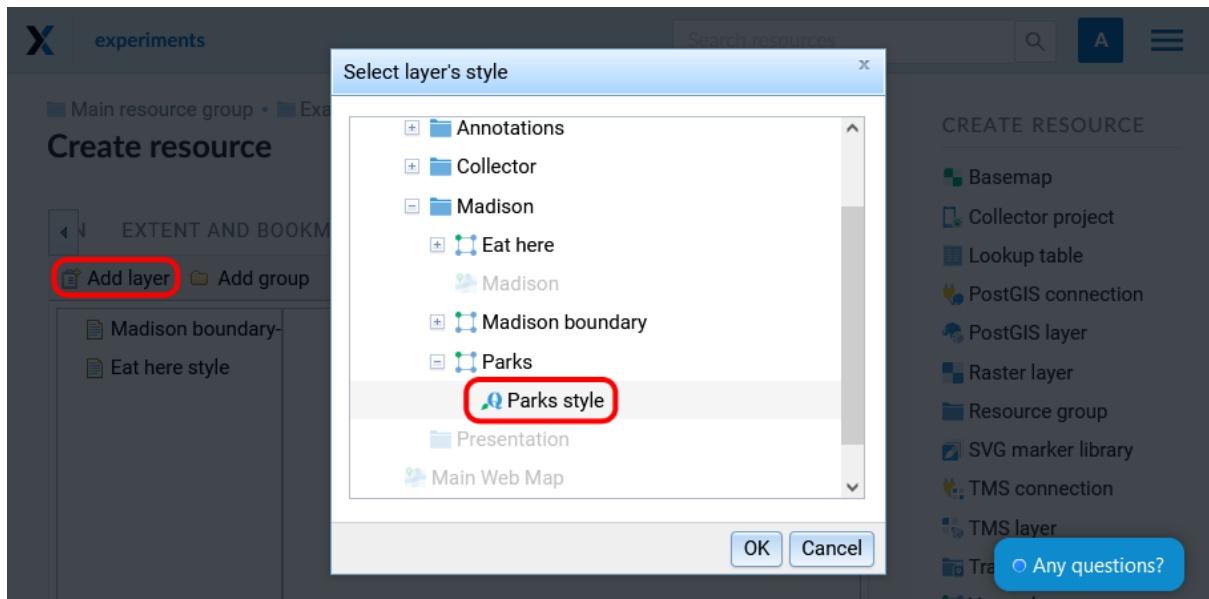


Fig. 9.8: Using style to add a layer to the Web Map

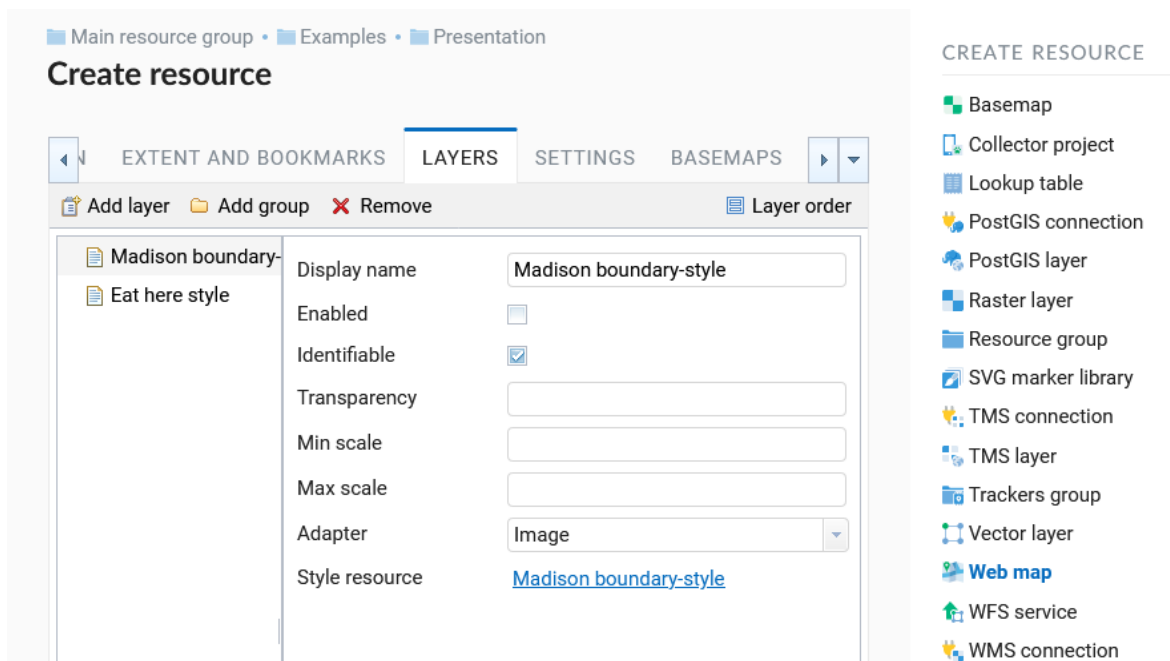


Fig. 9.9: “Layers” tab of the “Create Resource” dialog

but also in the layer style itself (See an [example](#)²⁴). If the layer should not be displayed in a certain range of scales, we recommend to mark it in the Web Map's layer settings. If the scale limit is only set within the style, empty tiles will be generated in other scales, which is less efficient.

The order of the layers on a map can be different from the order in which they appear in the tree. Click "Layer order" in the "Layers" tab of the map settings. It allows to choose the order of the displayed layers without affecting the groups.

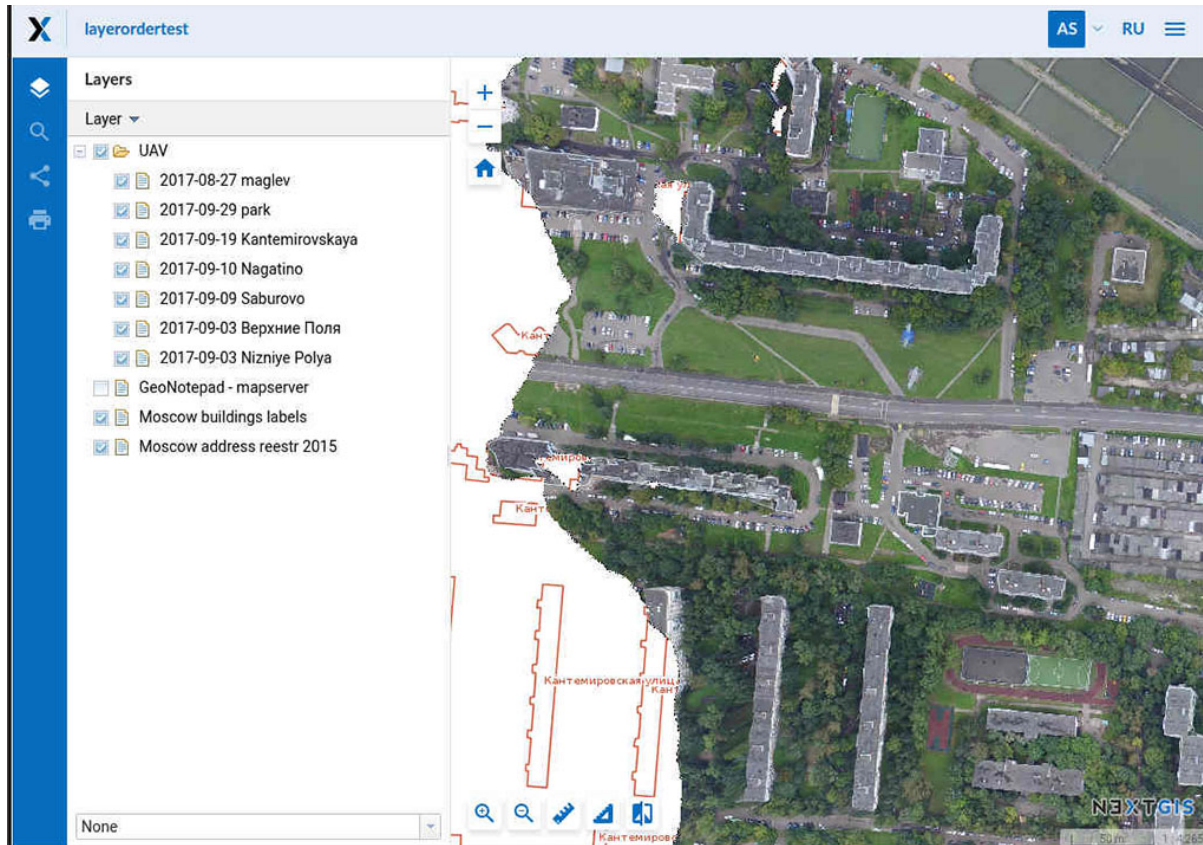


Fig. 9.10: Layer order as is: satellite images obscure the layer where the buildings are marked

9.1.4 Settings

The "Settings" tab is used to allow layer editing and enable annotations (more on annotations see [here](#)).

²⁴ https://docs.nextgis.com/docs_ngweb/source/mapstyles.html#osm-water-line

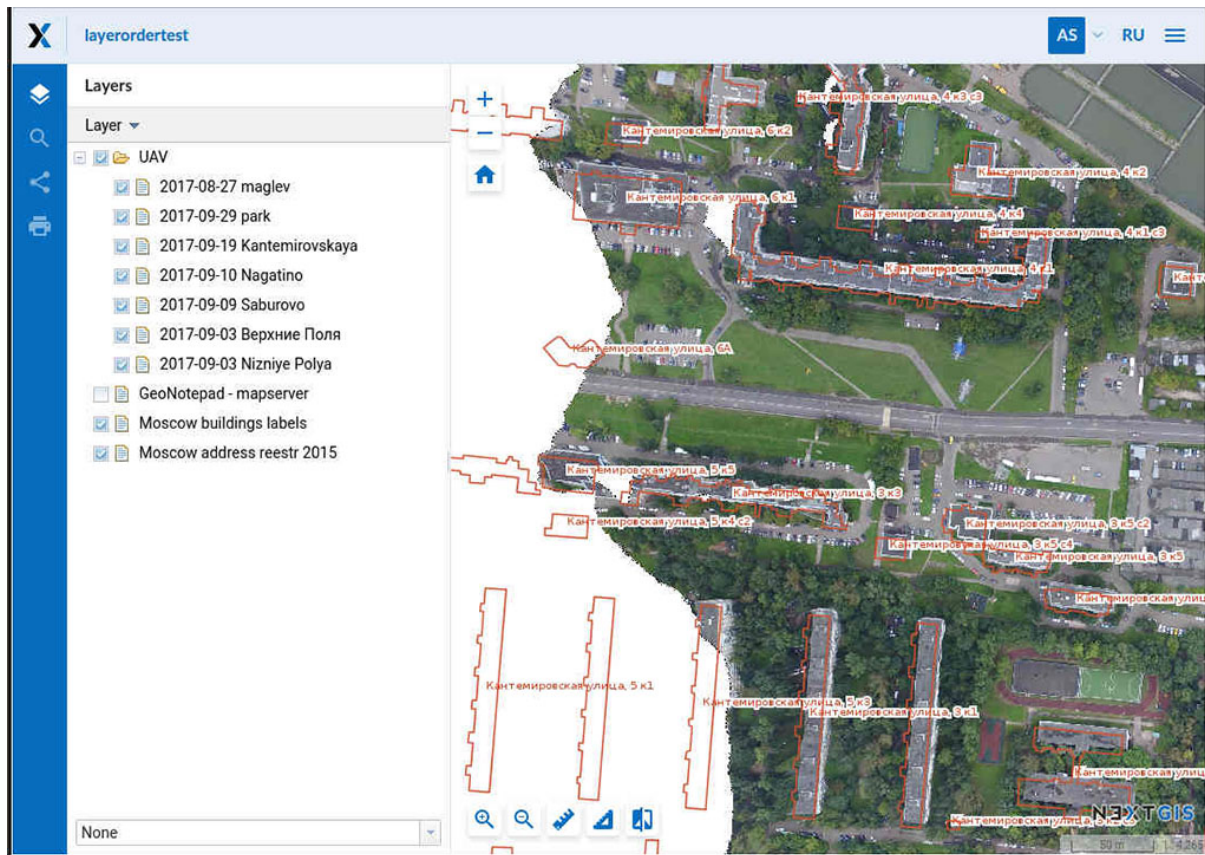


Fig. 9.11: Different layer arrangement: the layer marking the buildings is above the satellite images, while the layer groups on the left remain unchanged

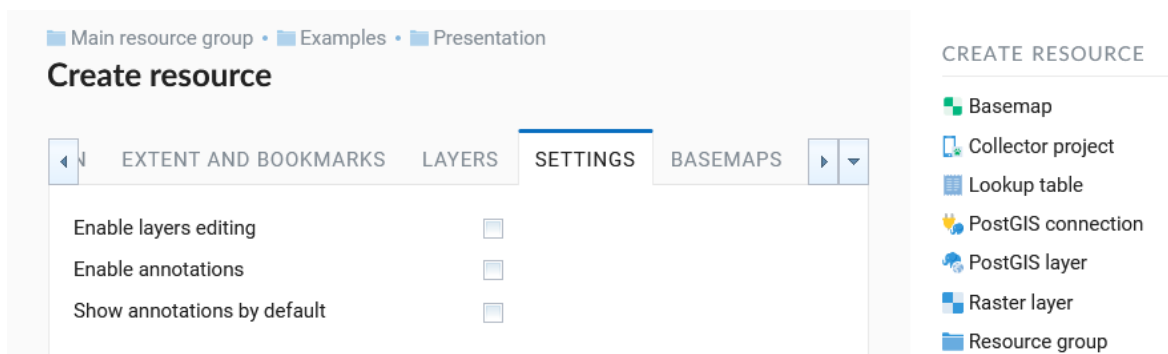


Fig. 9.12: “Settings” tab

9.1.5 Basemaps

“Basemaps” tab allows to add and remove basemaps using corresponding buttons “Add” and “Remove” (see Fig. ??).

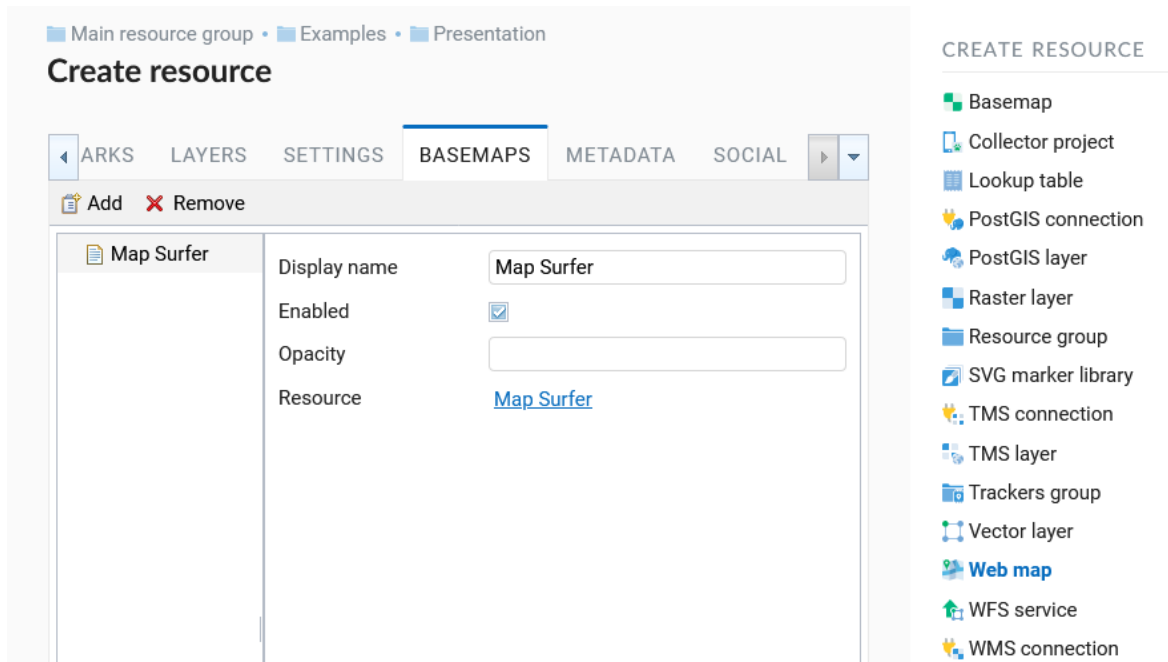


Fig. 9.13: “Basemaps” tab

“Enabled” checkbox sets default visibility of a basemap.

“Opacity” field sets basemap transparency on a map in a range between 0 (transparent) and 1 (opaque) with decimals comma separated (ex. 0.2).

9.1.6 Web Map with no basemap

By default a Web Map is created with OpenStreetMap basemap. If you need a map without a basemap: create a new basemap, put ‘blank’ in name and URL fields, and add it to your Web Map. Then turn this newly created basemap off.

9.1.7 Social

The “Social” tab is used to upload an image to be used as preview in social media.

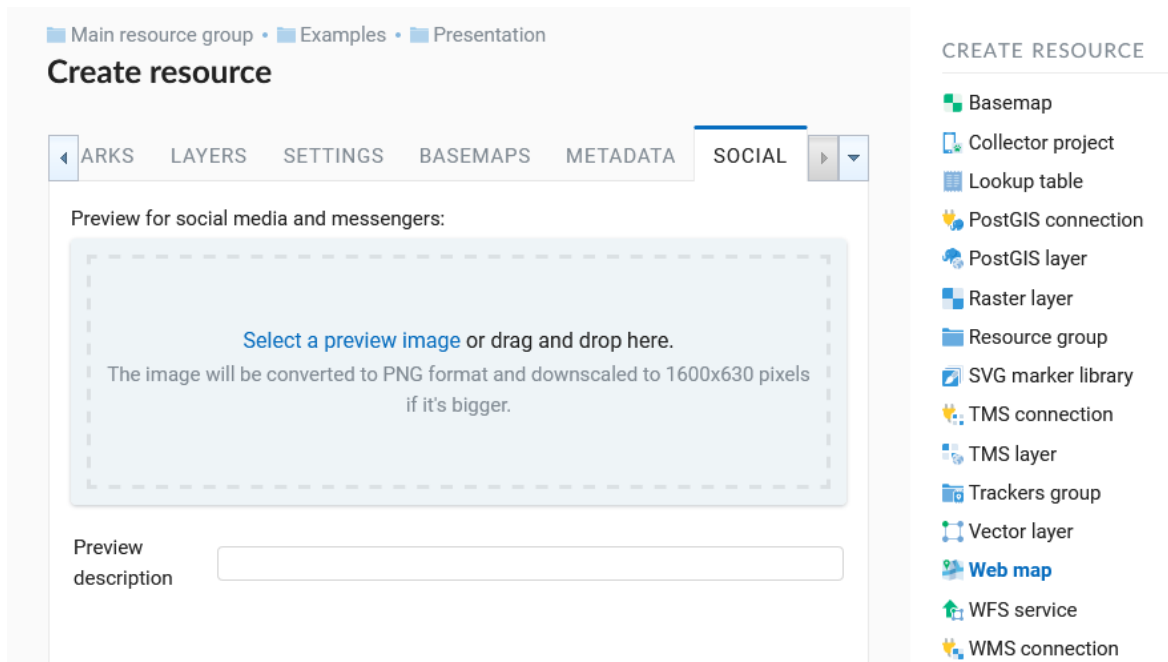


Fig. 9.14: “Social” tab

9.1.8 Final steps

After creating the map content and adjusting settings for all the layers, click “Save” button. A saved map will be shown in the list of maps. Click an icon with a map in the list of Web Maps or select “Display” action in the tab on the Web Map properties page to open it in the viewer. While the Web Map resource page is open, you can also open the map by clicking the “View” button on the right. Web Maps viewer is described *here* (page ??). A Web Map URL displayed in the viewer may be shared with other users because it is static.

Warning: After a map is deleted, its URL will no longer be available.

9.2 Web Map Cloning

With NextGIS Web you can create a copy of an existing Web Map by cloning it. To copy a Web Map, select “Clone” in the actions pane of its resource page. You will be redirected to “Clone Web Map” page to set up the location of the copy in the resource tree and the name for it.

A magnifying glass icon in the right end of the “Resource group” field opens the group selection pop-up window.

This window contains the following elements:

1. Search bar and path to the resource the copy will be created in
2. Return to the initial folder (the one containing the original Web Map), refresh the resource tree state and close the window



Main resource group • Examples • Madison • Madison

Clone Web Map

* Resource group 🔍

* Display name

 Clone

EXTRA

 JSON view

WEB MAP

 Clone

 Display

ACTION

 Update

 Delete

Fig. 9.15: “Clone Web Map” page

3. Option button to select a group (folder)
4. Open the selected group (folder)
5. Create new resource group (folder)
6. Clear selection
7. Button that completes group selection. If a group (folder) is selected, the button reads “Clone to selected group”. If no group is selected, it reads “Clone to this folder”, in this case the copy will be created in the group currently open (the path to it is indicated in the top panel of the pop-up window).

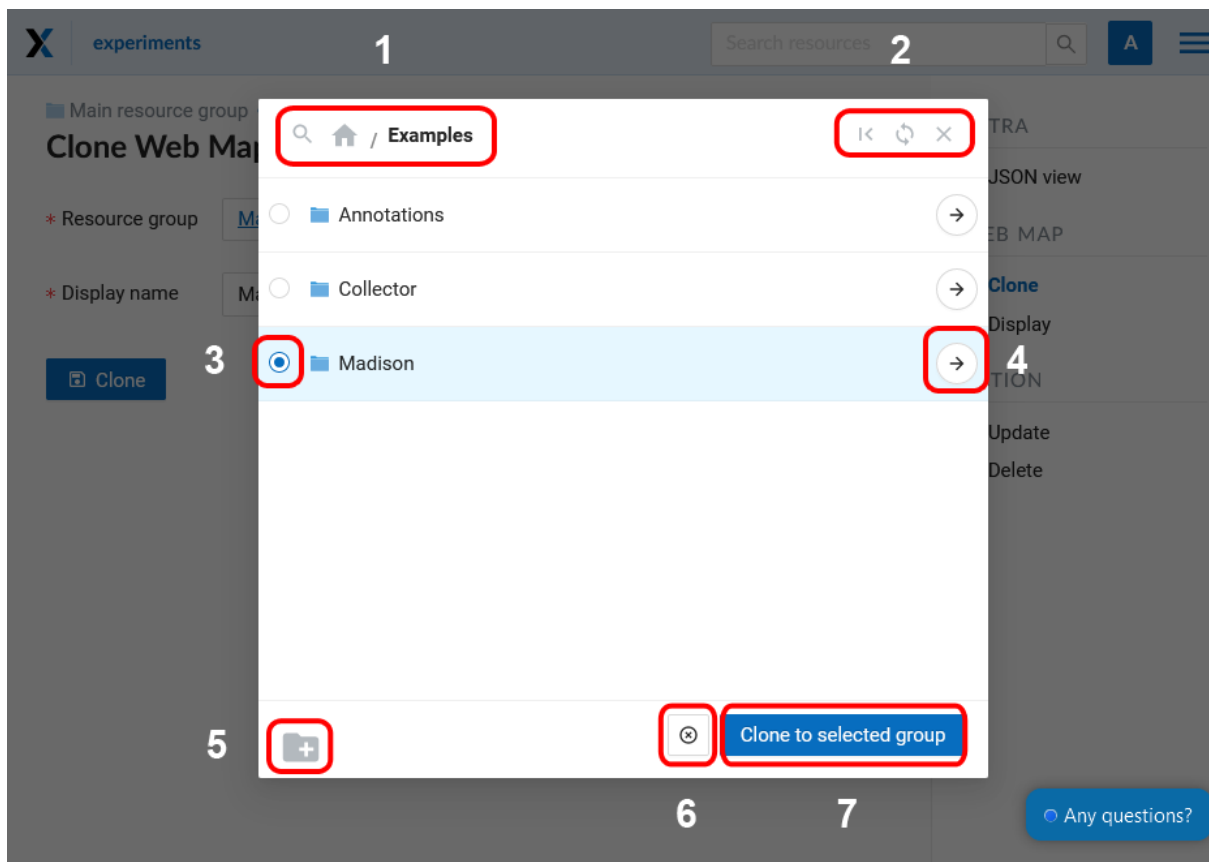


Fig. 9.16: Group selection window

A VIEWER FOR WEB MAPS

A special web application for viewing Web Maps is included with NextGIS Web (see Fig. ??).

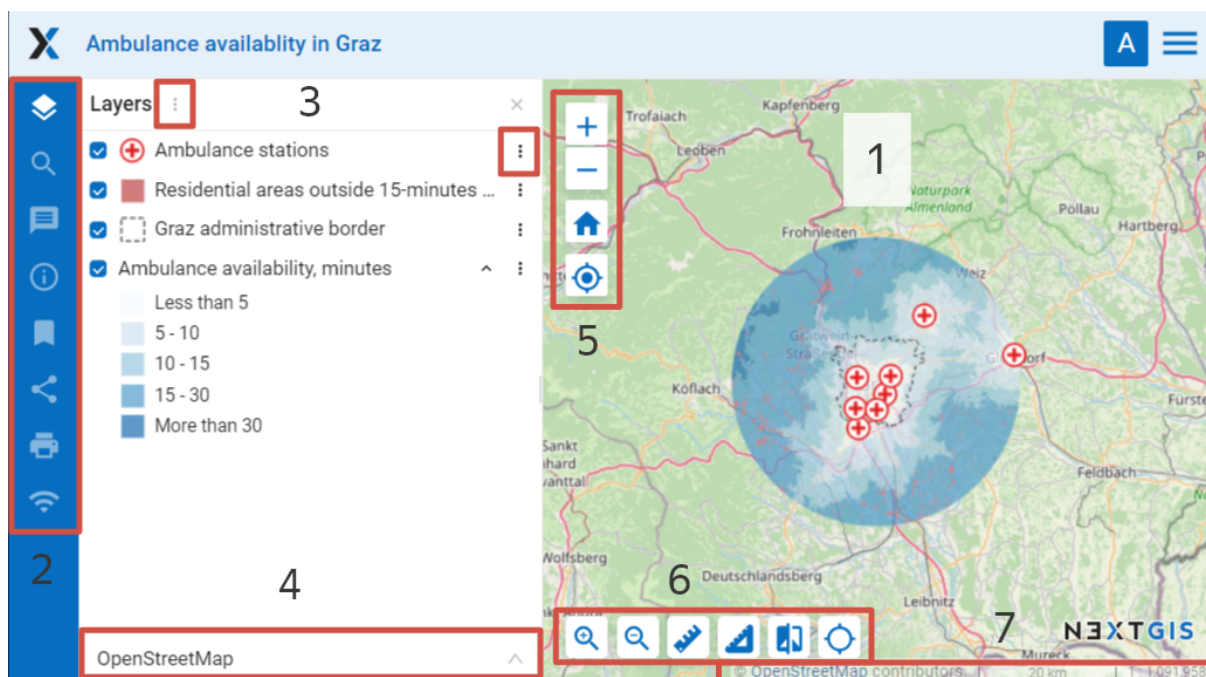


Fig. 10.1: The interface of viewer client application

Numbers indicate: 1 – map; 2 – map panels; 3 – layer tree with layer menu buttons; 4 – dropdown list of basemaps; 5 – zoom tools; 6 – map tools; 7 – status bar and copyright.

Web client includes three main components: a map, [panels](https://docs.nextgis.com/docs_ngweb/source/webmaps_client.html#panels)²⁵, [map tools](https://docs.nextgis.com/docs_ngweb/source/webmaps_client.html#map-tools)²⁶.

²⁵ https://docs.nextgis.com/docs_ngweb/source/webmaps_client.html#panels

²⁶ https://docs.nextgis.com/docs_ngweb/source/webmaps_client.html#map-tools

10.1 Zoom and rotation

The status bar (see Fig. ??) displays the current scale of the map. If you use the identify tool to click on the map, a pop-up window will show the coordinates of the point you clicked on and list map features if present in this point of the map.

You can change the scale of the map using zoom tools (see item 5 in Fig. ??). To reset the map to its initial extent, press the house icon.

There are some options to work with map:

- if you click on `alt + shift` simultaneously and execute round cursor movements around a monitor, a map will turn for a certain degrees to the right or to the left,
- if you simultaneously click on `shift` and select of the necessary part of a map on a monitor by a cursor, you will highlight this part and zoom in it on the map.

10.2 Panels

On the left side of the workspace are the functional panels:

-  Layers
-  Search²⁷
-  Annotations²⁸
-  Description²⁹
-  Bookmarks³⁰
-  Share
-  Print
-  Trackers³¹

²⁷ https://docs.nextgis.com/docs_ngcom/source/address_search.html

²⁸ https://docs.nextgis.com/docs_ngcom/source/annotation.html

²⁹ https://docs.nextgis.com/docs_ngcom/source/webmap_create.html#add-a-description-and-map-legend

³⁰ https://docs.nextgis.com/docs_ngweb/source/webmaps_admin.html#bookmarks

³¹ https://docs.nextgis.com/docs_ngcom/source/tracking.html

The **layer tree** contains a list of all layer styles added to the web map. The panel allows:

- Disable/Enable style visibility
- Open layer attribute table
- Zoom map to layer
- Open layer description

Search is performed using three sources:

1. Coordinates.
2. Attributes of layers added to a map.
3. Address database (OpenStreetMap or Yandex.Maps, depending on [address search settings](#)³²).

Results are shown as user inputs text and are sorted in this order: points on the map matching the coordinates, then feature numbers for attribute search and finally full addresses. After a click on a search result map changes extent to show selected feature.

Note: To find a point using the coordinates, enter the latitude and longitude in degrees, minutes and second, degrees and decimal minutes or decimal degrees (make sure to use straight single and double quotes), for example:

```
79 W 43 N
W 79 N 43
-79 43 (the results will contain two points: 79 W, 43 N and 43 E, ↪
↪ 79 S)
79- 43
-79 W 43 N
79°4'14.08" W 43°4'59.37" N
-79°4'14.08" 43°4'59.37"
-79 4.25 W 43 4.95 N
-79 4.25 43 4.95
79.068493 43.079920
79.068 W 43.08 N
```

When the feature table is opened on the Web Map, you can filter features by area ([read more](#)³³).

To share a link to a map use the function **“Share”** (see item 9 in Fig. ??), to print a map use the function **“Print map”** (see item 10 in Fig. ??).

³² https://docs.nextgis.com/docs_ngweb/source/admin_tasks.html#address-search

³³ https://docs.nextgis.com/docs_ngweb/source/admin_interface.html#ngw-feature-table-filter-area

10.3 Layer menu

To change the transparency of the layer use the slider in the dropdown menu of the layer.

Choose **Edit** to modify the selected layer. To complete the process, open the dropdown menu again and select **Stop editing** ([read more here](#)³⁴).

Using **“Description”** option you can view the description of the selected layer, added during creation or editing of the layer.

“Zoom to layer” option allows you to zoom a map so that the selected layer takes up all the visible map area.

After a click on **“Feature table”** option you will see feature table of the selected layer under the map.

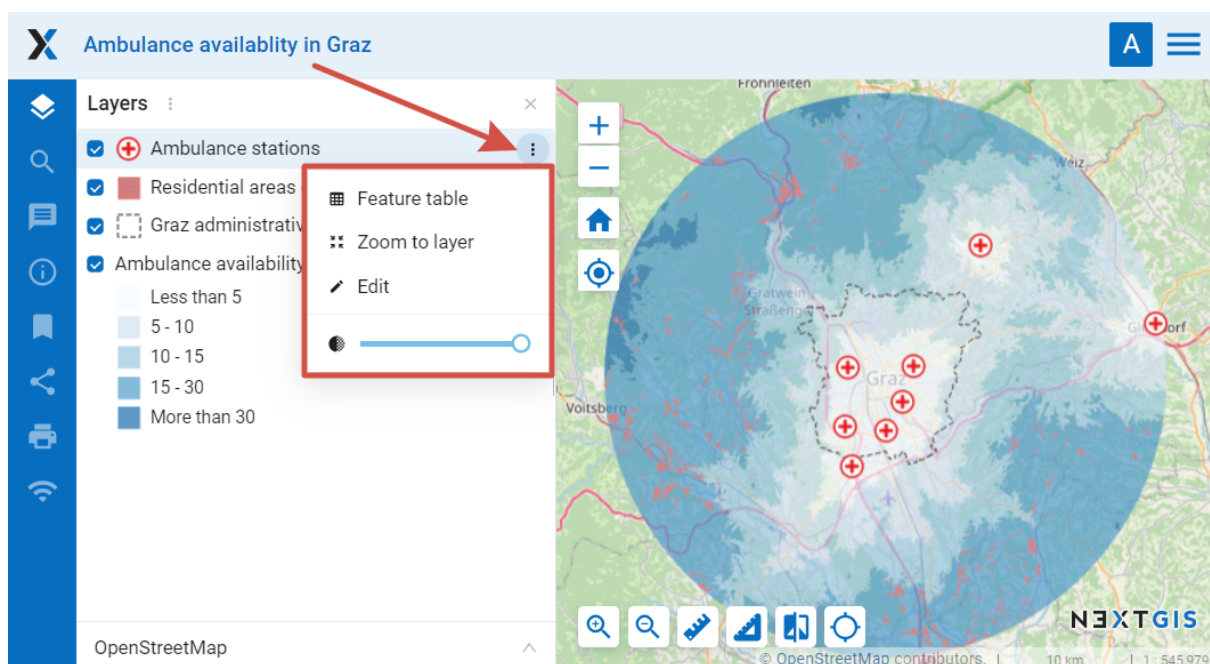


Fig. 10.2: Layer menu on the Web Map

Select a row in feature table to navigate to the feature on a map, it will be highlighted (see Fig. ??). For the selected feature you can open a window with its properties, edit it or delete it. **“Go to”** button allows you to zoom a map to display the selected feature on the whole visible map area (see Fig. ??). In feature table tab you have an option to dynamically filter records. When user types a text the contents of the window are filtered leaving only the records that match the search text. Filter by area option is also available ([more on how to use it](#)³⁵).

³⁴ https://docs.nextgis.com/docs_ngweb/source/layers_settings.html#ngw-edit-objects

³⁵ https://docs.nextgis.com/docs_ngweb/source/admin_interface.html#ngw-feature-table-filter-area

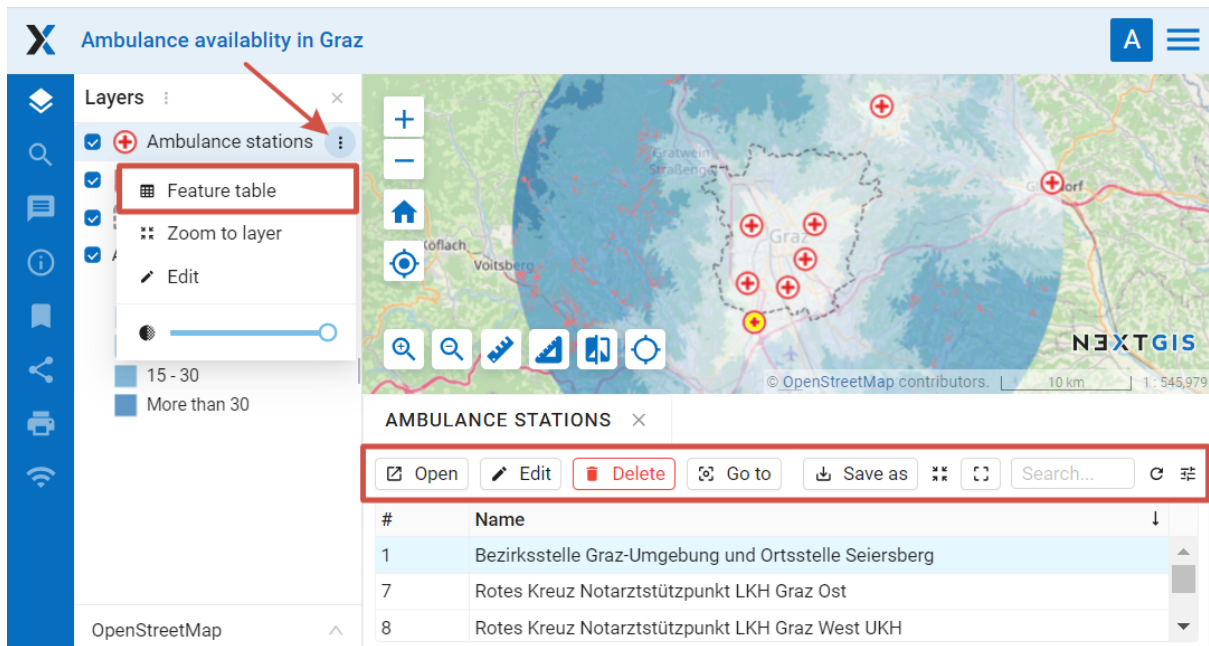


Fig. 10.3: Feature table of the selected layer on a Web Map

10.4 Basemap

To change a basemap use the dropdown list (see Fig. ??). By default there are the following basemaps:

- None
- OpenStreetMap

Basemap is a map image that is shared by third-party services in the Internet. Users can not influence their content. You can disable the basemap so that a white background is shown instead. If the Internet access is expected to be poor or if the Web GIS is deployed in local network without access to the Internet, it is possible to work without a basemap adding base data as WebGIS layers.

You can add other basemaps, see the instructions in [Adding resources](#)³⁶.

Note: If the Web Map is supposed to work without Internet access, edit the file with [basemap settings](#)³⁷ and delete records about Google basemaps.

³⁶ https://docs.nextgis.com/docs_ngweb/source/layers.html#ngw-create-basemap

³⁷ <https://github.com/nextgis/nextgisweb/blob/3/nextgisweb/webmap/basemaps.json>

10.5 Map tools

Tools to work with the Web Map (see Fig. ?? item 6) named from left to the right:

- Zoom in
- Zoom out
- Measure distance
- Measure area
- Vertical swipe
- Show cursor coordinates/extent



Fig. 10.4: Map tools

10.5.1 Vertical swipe



Vertical swipe makes the selected layer transparent to the right of it (see `ngweb_webmap_full_swipe_en`).

To select a layer click on it in the layer tree (it will be highlighted in blue) (see Fig. ??).

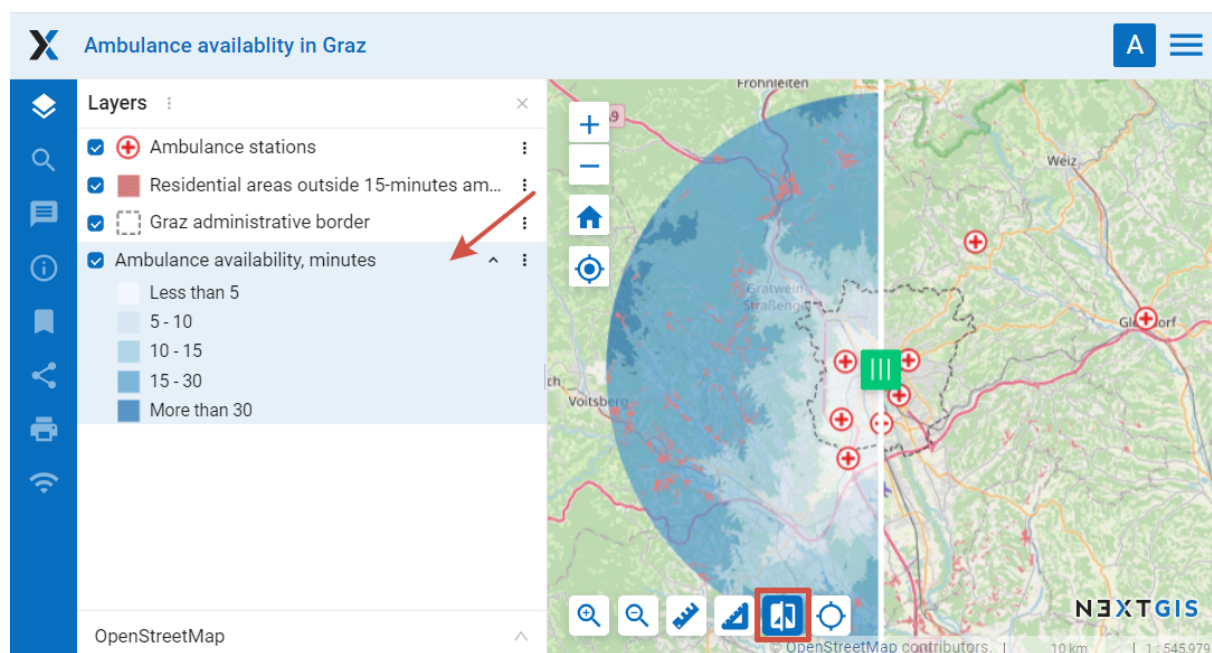


Fig. 10.5: Selecting layer to use the vertical swipe on

This makes it possible to “peek” under the selected layer and compare it with the substrate or another layer on the map (see `ngweb_webmap_swiped`). For example, the tool will be useful if we want to compare changes in the terrain by satellite images for different dates (for example, to identify forest felling or floods).

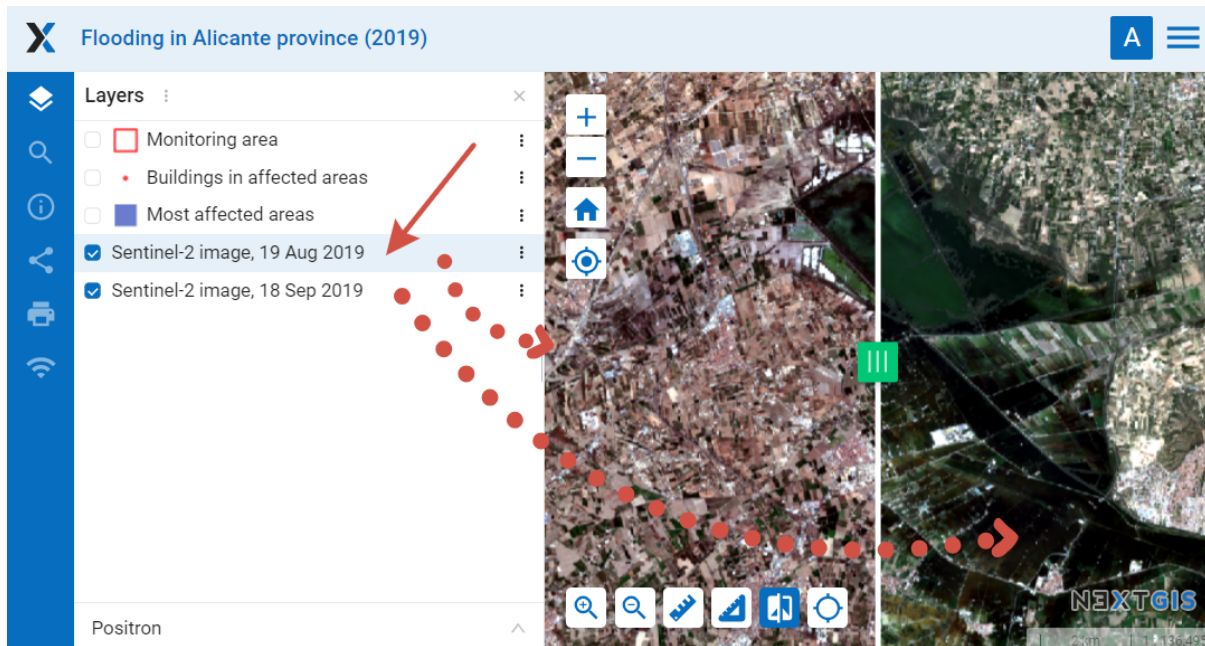


Fig. 10.6: Satellite image after applying the vertical swipe

10.5.2 Show extent or cursor coordinates

A field can be added to the Web Map interface to show the coordinates of the current cursor position or the extent of the visible map area. To activate it, press



the button in the map tools panel.

The icon on the right indicates what is displayed. Click on it to switch between modes.

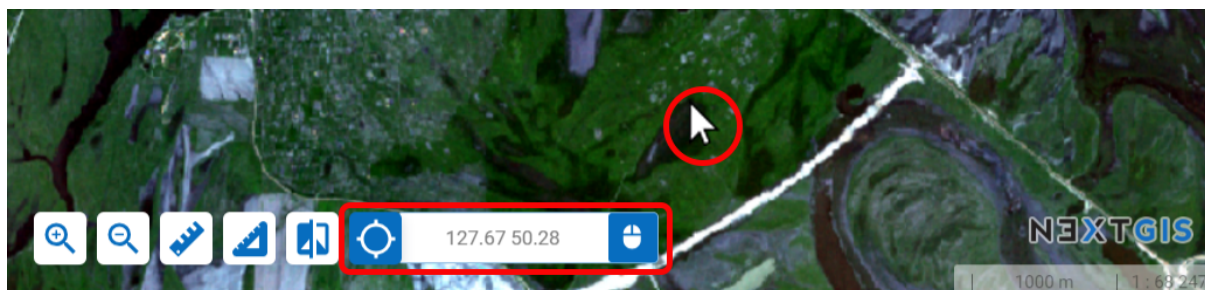


Fig. 10.7: Cursor coordinates mode

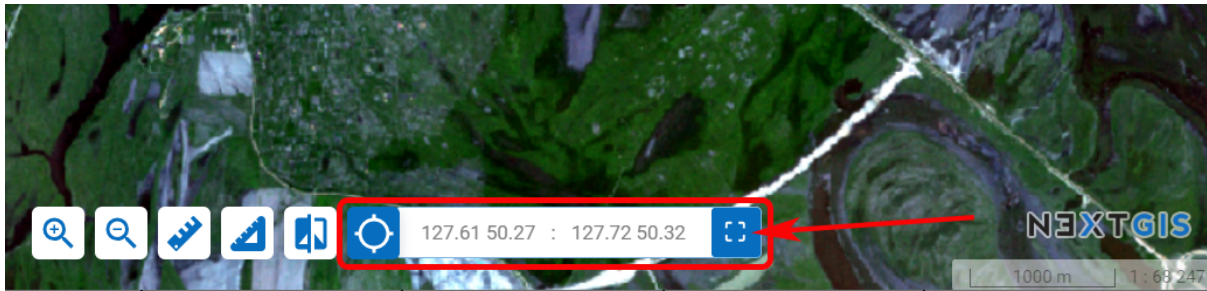


Fig. 10.8: Extent mode

10.6 Link to a Web Map feature

The easiest way is to zoom in on the area and copy the link via the **Share** panel (Fig. ??)

Using specially generated GET queries you can share a link to a particular feature of a layer. The link will open with the geographical context that you can select in the Web Map settings.

All you need to do is create links in the information systems. By clicking on them users will be directed to the map with the selected feature and context.

Such links can be automatically generated by your system integrated with NextGIS Web.

Example:

https://demo.nextgis.com/resource/7023/display?panel=layers&hl_lid=7021&hl_attr=OSM_ID&hl_val=135456188&zoom=18

You can make such a link **manually**. Here's what you need:

- Link to the Web Map: <https://demo.nextgis.com/resource/7023/display?panel=layers>

For the feature:

- hl_lid - layer ID (open the layer resource page and see the number in the URL, for example <https://demo.nextgis.com/resource/7018>, here hl_lid=7018)
- hl_attr - the name of the ID attribute field;
- hl_val - the value of the ID field.

You can also add:

- zoom - value in numbers with 1 being the minimum.

Here's the resulting link:

https://demo.nextgis.com/resource/7023/display?panel=layers&hl_lid=7018&hl_attr=ngw_id&hl_val=5&zoom=14

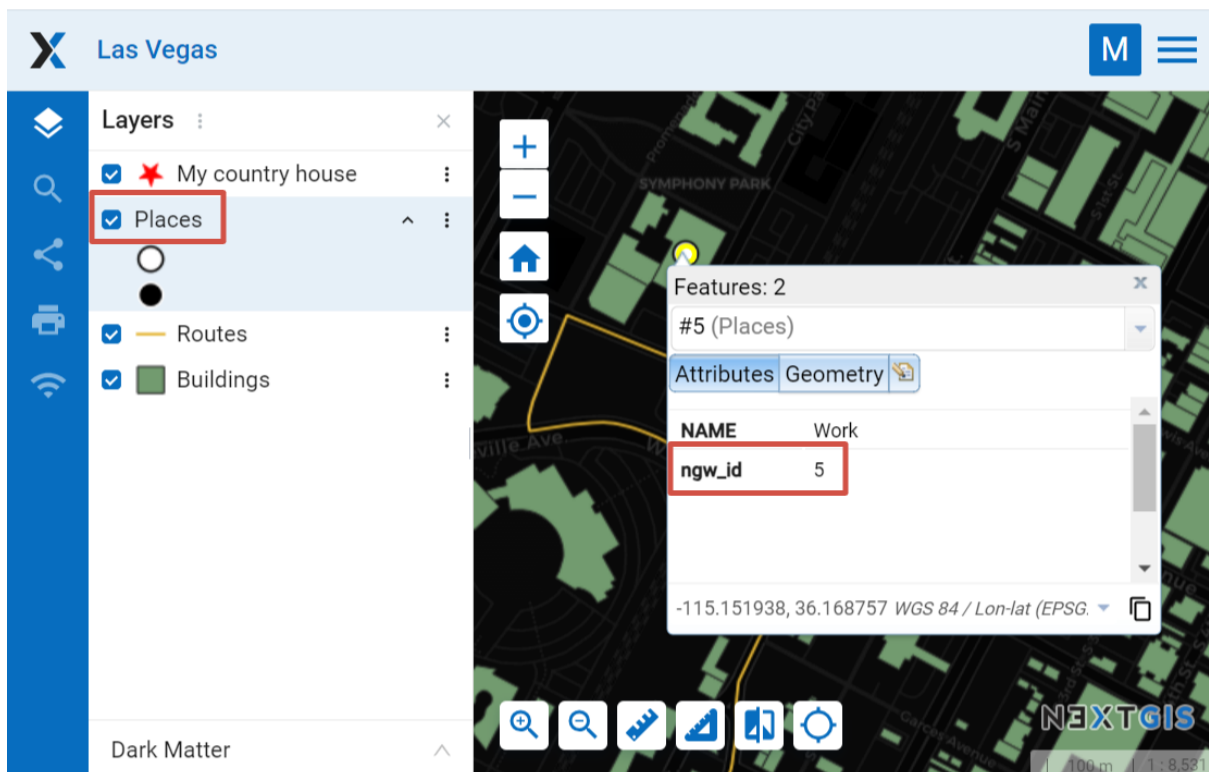



Fig. 10.9: Web Map opened via the link. The link contains the ID of the layer and the ID field name and value for the selected feature

ADVANCED OPTIONS FOR UPLOADING VECTOR LAYER FROM A FILE

Advanced settings are available when uploading a vector layer from a file (Fig. ??).

RESOURCEDESCRIPTIONMETADATAVECTOR LAYER

ModeFrom file



Select a dataset or drag and drop here.
Dataset should be in ESRI Shapefile (zip), GeoJSON, GML or KML format.
8.0 GB max

▼ Advanced options

Fix errors

Whatever possible

☒ Skip features with unfixable errors

Geometry type

Auto

☐ Only load features of the selected geometry type

Multi-geometry

Auto

Z-coordinate

Auto

FID source

Auto

FID field

ngw_id

Encoding

UTF-8

Fig. 11.1: Advanced vector layer uploading options

11.1 General Settings processing of possible errors

Fix errors

Possible values:

- **None** - no error will be corrected;
- **Without losing data** - errors will be corrected without data loss. Correctable errors:
 - Extraction of geometries from Geometry Collection and Multigeometries if one geometry is contained inside;
 - Closing the rings of polygons;
- **Whatever possible** - errors will be corrected to the maximum with possible data loss. In this mode all errors from the *Without losing data* mode will be corrected, as well as:
 - When extracting geometries from a Geometry Collection and Multigeometries the first matching geometry will be taken, the rest will be discarded.

Skip features with unfixable errors

If errors cannot be corrected using the *Fix errors* mode, then when this function is selected, objects will be skipped. If the function is not selected, then the layer will not upload and the first 10 errors that led to this will appear.

11.2 Geometry type definition settings

In NextGIS Web vector layers must have a certain type of geometry. If the source file contains different types of geometries, you must either set the filtering settings or convert the geometries to a specific type.

Geometry type

Possible values:

- Auto
- Point
- Linesrting
- Polygon

This setting specifies the geometry class. For example, the POINT class includes geometries such as POINT, MULTIPOINT, POINTZ, MULTIPOINTZ.

If a geometry class is selected and the original layer contains geometries from other classes, this will be considered an error. If you set a checkbox **Only load features of the selected geometry type**, then geometries of other classes will be skipped.

Geometry type can be specified by settings **Multi-geometry** and **Z-Coordinate**.

Possible values:

- Auto
- Yes
- No

11.3 Object ID detection settings (FID)

FID source

Possible value:

- **Sequence** - FID starts with 1
- **Field** - FID is taken from the *integer* field, it is not loaded into the layer's attributes. The field name is specified in the **FID Field** setting. For example, if a layer was exported to a file from NextGIS Web, a field *ngw_id* is created in it by default in which the FID is written. To upload a layer in NextGIS Web with the same set of fields and FID values, you need to set *FID source* = *FIELD* and *FID field* = *ngw_id*.
- **Auto** - FID is taken from the field if it exists. Otherwise, it starts with 1.

PERMISSION SYSTEM IN NEXTGIS WEB

Mechanism of permission management is one of the key options of NextGIS Web. Resources are the main entities in NextGIS Web and access permissions are managed at its level.

Mechanism of permission management of resources is similar to the principle of the file system access permissions.

12.1 Permissions and its types (scopes)

Permission - the ability to make various actions with resources. For example, 'Read' permission allows you to get man information about resources (e.g. name). 'Update' permission allows you to update this info.

For convenience permissions are grouped by **types (permission scope)**. Listed above Read and Update permission examples are related to the main permission scope - 'Resource'. But there are some other types such as 'Metadata', 'Data structure' or 'Data'.

12.2 Access control list and the rules

Permission management is carried out through **access control list (ACL)** changes which are linked to the resources. In many ways, this is similar to Windows and Unix (POSIX ACL) OS permission management. However NGW has much more features and actions on resources than filesystems. Therefore there are more permissions and they are grouped into categories.

Access control list consists of the **rules** which have the following attributes:

- Action - allow or deny
- Principal - user or group of users to which this rule applies
- Permission - permission or permission scope that is prohibited or allowed by the rule
- Propagate - yes/no checkbox
- Resource - type of resource to which this rule applies

Regardless of rule's placement (at the beginning or end of the list) - first, the rules with the action "Allow" are applied, and then the rules "Deny". In other words

- **‘Deny’ has a higher priority than ‘Allow’**. The position of the rule doesn’t matter.

You can set a group of users as a principal (e.g. ‘editors’ group) - in the result this rule will be applied to such users who are in this group. Also as a principal you can set a specific user. In this case the rule will be applied to this user.

In addition to the groups created by the administrator, the system has special system user groups:

- Administrators - group whose users have administrative rights
- Editors - a group whose users do not have access to the control panel, but can create and edit data

Adding users to these groups is a convenient way to quickly assign the necessary permissions throughout the system. These groups cannot be deleted.

Also, a specific user can be specified as a principal, in which case the rule will apply only to him.

Also NextGIS Web has multiple virtual system users to be used in access control lists:

- Authenticated - the rule will be applied to any authenticated user (logged in NGW)
- Guest - the rule will be applied to not authenticated user
- Everyone - the rule will be applied to any user (authenticated or not)
- Owner - the rule will be applied to user who created a resource

If the **‘Propagate’** checkbox is enabled then the rule applies not only to the current resource but to child resources. **‘Resource’** attribute allows you to set rules limitations to specific resource categories. In practice, it only makes sense if the ‘Propagate’ checkbox is enabled.

12.3 Permissions dependencies

Such a situation, if a user may change resource name but has no opportunity to read this name, is so weird and leads to inconsistent system behavior in general. To avoid this problem NextGIS Web has permission dependencies.

For example, ‘Update’ permission depends on ‘Read’ permission. Even if a user has a rule which allows him to ‘Update’ a resource but has not a rule to ‘Read’ it - then ‘Update’ permission will not take effect, ‘Update’ will be masked by ‘Read’. In practice most permissions depend on ‘Read’ at least

Also there are dependencies between permissions of related resources. Let’s consider the example of the file system hierarchy. Suppose there is a hierarchy in the file system: **directory 1 > directory 2 > file**.

Here a user can be given the permission to read the file. But if he does not have the opportunity to go to directory 1, and then to directory 2, he will not be able to read the file.

Similar behavior is implemented using the dependence of the “Read” permission of the child resource on the “Read” permission of the parent resource.

Warning: Thus, if you set the resource ‘Read’ permission then it doesn’t matter what permissions you assign to resources inside this folder, they won’t take effect.

12.4 Computing Effective Permissions

Suppose the user is going to perform some operation on a resource, for example, read its name. When accessed, for example via API, NextGIS Web calculates **effective permissions** - the set of permissions that the user has in relation to a particular resource. The computing is performed in the following sequence:

1. By default user does not have any permissions - the rule is **‘everything is deny except what is not explicitly allowed’**
2. Applied current resource and parent resources permissions with ‘Propagate’ checkbox.
3. First the ‘Allow’ rules are applied - permissions from them are added to the computed set of permissions.
4. After that, ‘Deny’ rules are applied - the permissions from them are subtracted from the calculated set of permissions.
5. Dependencies are checked, permissions with unsatisfied dependencies are marked as masked.

In the result you have an effective set of user permissions - permissions which are allowed, not denied and not masked by dependencies. Based on this set NextGIS Web makes a decision about performing an action both in the API and in the web interface.

12.5 Assigning permissions to users before their first sign in

In NextGIS Web, users have the ability to sign in both as an internal NextGIS Web user and as a global account on my.nextgis.com. In the second case, the administrator must add the global user account to [the team](#)³⁸ in its profile on my.nextgis.com or NextGIS ID on-premise server.

After sign in, a global user becomes a NextGIS Web user and is counted in the limit on their number. However, by default, it does not have any permissions in NextGIS Web.

Therefore, we advise you to pre-set the permission type for a global user before its first auth. There are two ways how you can do this:

³⁸ https://docs.nextgis.com/docs_ngcom/source/create.html#team-management

- Preferred method: Assign permissions to some **user group**³⁹ by checking the “New Users” flag. The user will be included in this group the first time they log in to NextGIS Web.
- Alternative way: assign resource permissions for the principal “Authenticated”.

³⁹ https://docs.nextgis.com/docs_ngweb/source/admin_tasks.html#ngw-create-group

ADMINISTRATIVE TASKS

13.1 Language change

Any authorized user can switch the interface language. To do this, in the upper right corner on the user icon, go to the “Settings” section (Fig. ??).

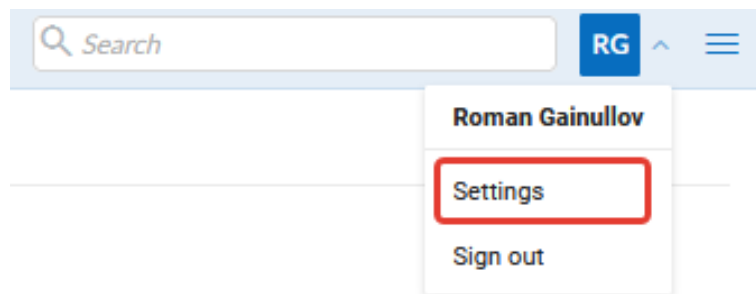


Fig. 13.1: Go to Settings bar

The following languages are available for selection (Fig. ??)

- Default browser
- Russian
- English
- Bulgarian
- Chinese
- Czech
- French
- German
- Italian
- Spanish
- Portuguese

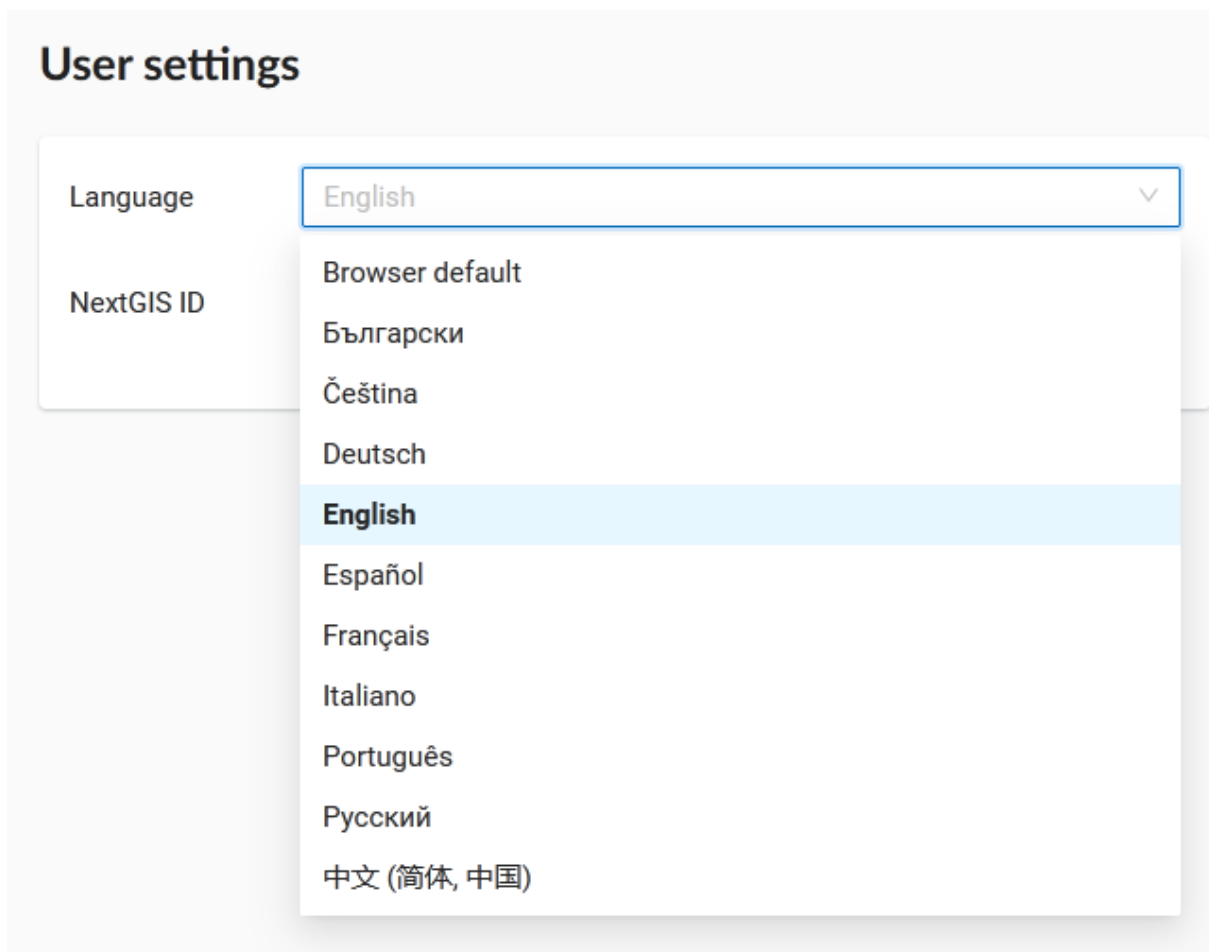


Fig. 13.2: Selecting language

13.2 Resource search

For easy search for resources and navigation, there is a search bar in the top bar (Fig. ??). The search is carried out in the entire existing database, regardless of which directory the user is currently in.

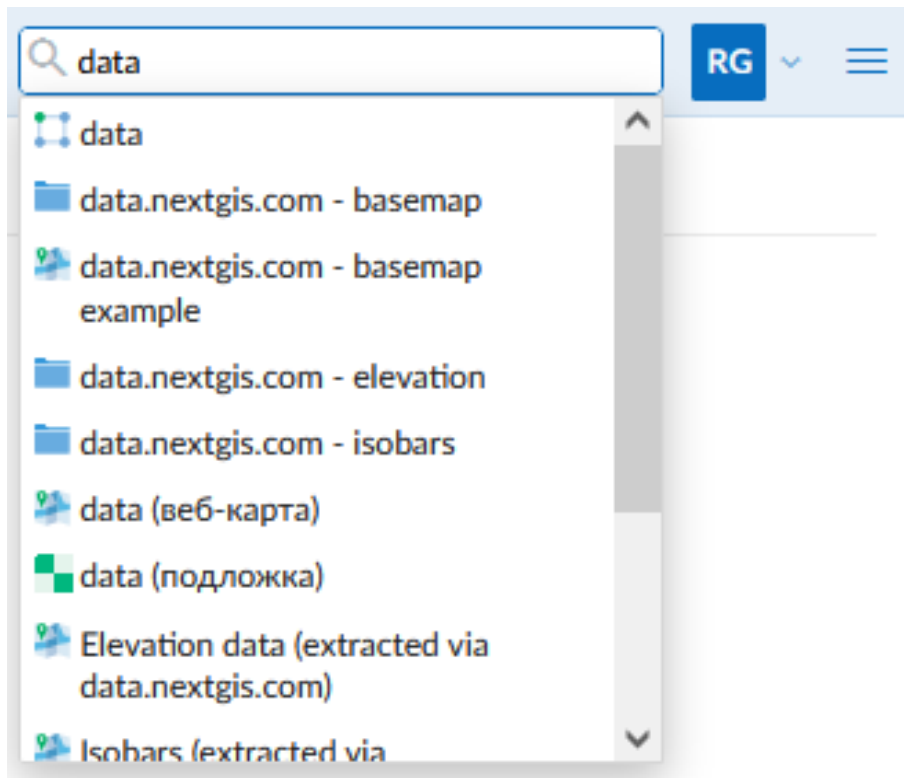


Fig. 13.3: Finding Resources in Web GIS

13.3 User activity log

User requests to the Web GIS are logged in a journal. It can be found in the **Info** section of the Control panel of the Web GIS (Fig. ??).

The log is presented in a form of a table that has a set of filters above it (Fig. ??). Every user action is registered in the journal. The entry contains the following details:

- Timestamp
- Request (includes [response status codes](https://developer.mozilla.org/en-US/docs/Web/HTTP/Status)⁴⁰ and [request method](https://developer.mozilla.org/en-US/docs/Web/HTTP/Methods)⁴¹)
- IP address
- User
- Route name
- Context (type and ID of the resource)

⁴⁰ <https://developer.mozilla.org/en-US/docs/Web/HTTP/Status>

⁴¹ <https://developer.mozilla.org/en-US/docs/Web/HTTP/Methods>

Control panel

GROUPS AND USERS

Groups

Users

INFO

Backups

Journal

System information

SETTINGS

Cadaster services

Collector projects

Web GIS name

Cross-origin resource sharing (CORS)

Fig. 13.4: Request journal in the Web GIS Control panel

Journal

Start date

→

End date

📅

Filter by user

Export CSV

Timestamp	Request	IP address	User	Route name	Context
2023-11-30 13:24:45.841537	302 GET /	172.24.38.88		home	
2023-11-30 13:24:46.320794	200 GET /resource/0	172.24.38.88	administrator	resource.show	resource_group:0
2023-11-30 13:24:46.461284	200 GET /api/component/pyramid/custom_css	172.24.38.88		pyramid.custom_css	
2023-11-30 13:24:47.144003	200 GET /api/component/pyramid/route	172.24.38.88		pyramid.route	
2023-11-30 13:24:47.213216	200 GET /api/component/pyramid/settings	172.24.38.88		pyramid.settings	
2023-11-30 13:24:47.311011	200 GET /api/component/pyramid/settings	172.24.38.88		pyramid.settings	
2023-11-30 13:24:54.119832	200 GET /resource/33	172.24.38.88	administrator	resource.show	resource_group:33
2023-11-30 13:24:54.236167	200 GET /api/component/pyramid/custom_css	172.24.38.88		pyramid.custom_css	

Fig. 13.5: Activity journal

You can filter the journal entries by time period and user performing the action (Fig. ??). The table, filtered or otherwise, can be exported as a CSV file.

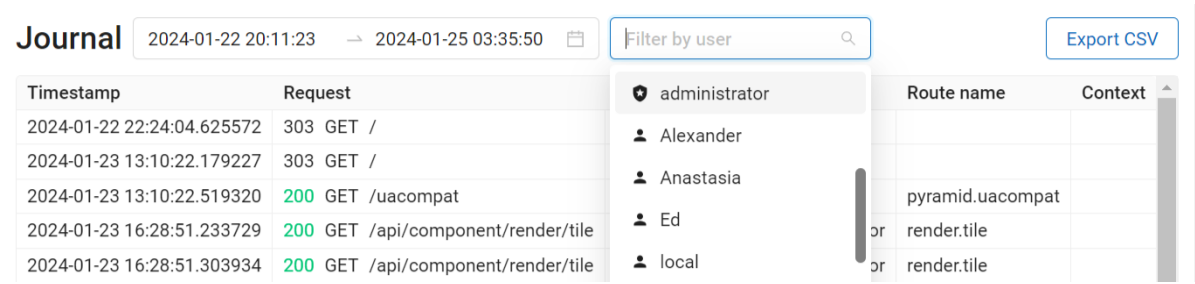


Fig. 13.6: Filtering by timestamp and user

To view the complete text of the request click on the corresponding entry (Fig. ??).

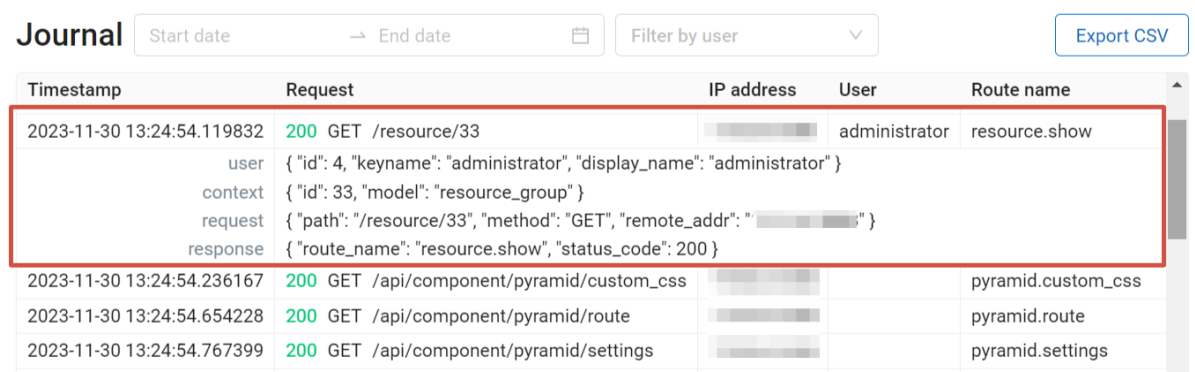


Fig. 13.7: Log entry

13.4 Create new user group

A dialog for creation of a new user group presented on Fig. ?? To open this window select “Control panel” (see Fig. ??) in the main menu (see item 1 in Fig. ??). From the control panel (see Fig. ??) go to the “Groups” page and click **Create**.

In “Create new group” dialog enter full name and group name (short name), if necessary enter a group description, set group members and click “**Create**”. Set “New users” flag for a group to automatically assign new user to it.

Note: A name for a group should contain only letters and numbers.

Create new group

* Full name	<input type="text" value="Data collectors"/>
* Group name	<input type="text" value="Collectors"/>
Users	<input type="text" value="Administrator x Collector Admin x"/>
New users	<input type="checkbox"/>
Description	<div><div></div></div>
<input type="button" value="Create"/>	

Fig. 13.8: “Create new group” dialog

13.5 Create new user

A dialog for creation of a new user is presented on Fig. ???. To open this window select “Control panel” (see Fig. ??) in the main menu (see item 1 in Fig. ??). From the control panel (see Fig. ??) go to the “Users” page and click **Create**.

Create new user

Consider adding NextGIS ID user to your team instead of creating a new user with a password. [Manage team](#)

* Full name

* Login

* Password

Disabled ☐

Groups

Language

Description

Create

Fig. 13.9: “Create new user” dialog

In “Create new user” dialog enter the following information:

- Full user name (e.g. John Smith)
- Login – user login (e.g. smith)
- Password
- Group(-s) user belongs to (select from a dropdown menu. If the required group is absent you need to create a new one (see *Create new user group*

(page ??)).

- Interface language for the user

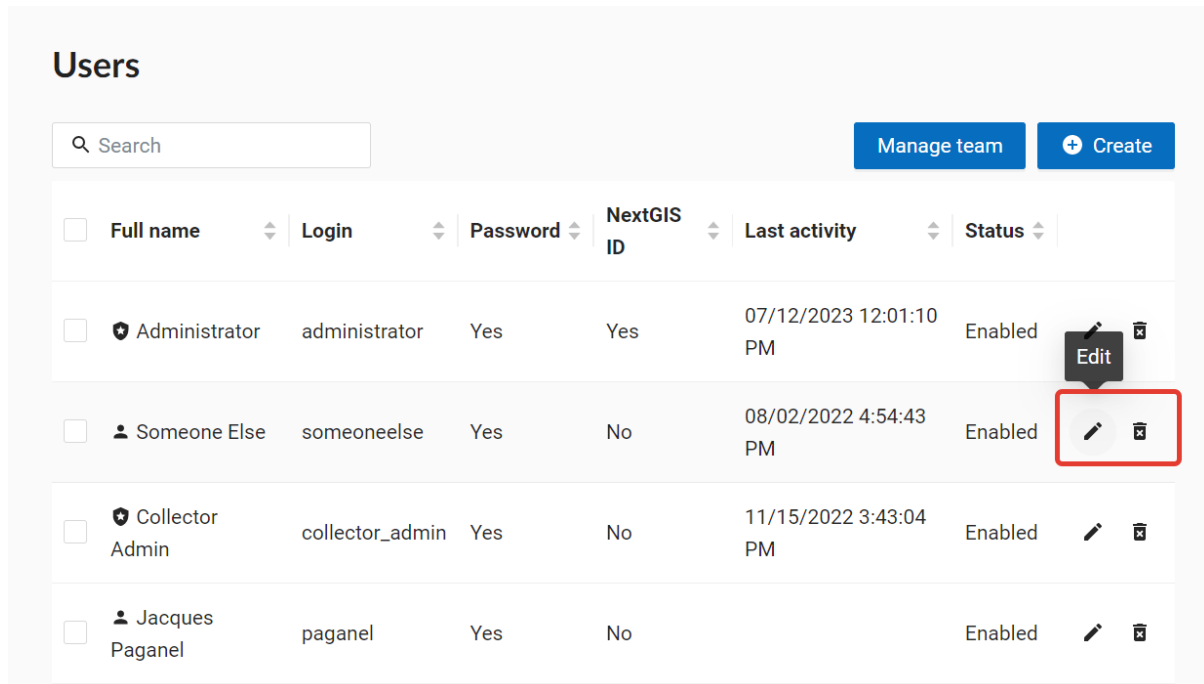
You can add some more information about the user in the “Description” field.

Then click **“Create”**.

Note: The password is limited in length in the range of 5-25 characters. Login can have symbols of the Latin alphabet, numbers and an underscore, but must begin necessarily with a letter.

13.6 Disable or delete users

In the main menu (see item 1 in Fig. ??) open the Control panel (see Fig. ??) and select “Users”. Each user has “Edit” and “Delete” icons on the right end of the line.











<input type="checkbox"/>	Full name	Login	Password	NextGIS ID	Last activity	Status	
<input type="checkbox"/>	Administrator	administrator	Yes	Yes	07/12/2023 12:01:10 PM	Enabled	 
<input type="checkbox"/>	Someone Else	someoneelse	Yes	No	08/02/2022 4:54:43 PM	Enabled	 
<input type="checkbox"/>	Collector Admin	collector_admin	Yes	No	11/15/2022 3:43:04 PM	Enabled	 
<input type="checkbox"/>	Jacques Paganel	paganel	Yes	No		Enabled	 

Fig. 13.10: User list

On the editing page you can modify properties of the user and **disable** the user. Tick “Disabled” and press **Save**.

Users that are turned off in this fashion do not count in the user limit of your plan. It allows you to enable various users as needed, all within the limits of your current plan.

If you need to **delete a user permanently**, you can do so by pressing the “Delete” icon in the user list (see Fig. ??) and confirming the action in the pop-up window.

Alternatively, you can open the editing page and press **Delete**.

Someone Else


Full name	<input type="text" value="Someone Else"/>
Login	<input type="text" value="someoneelse"/>
* Password	<input type="text" value="Keep existing"/>
NextGIS ID	<input type="text"/>
Disabled	<input checked="" type="checkbox"/> 
Groups	<input type="text"/>
Language	<input type="text" value="English"/> Improve or add new translation
Description	<input type="text"/>

Fig. 13.11: Disabling the user

13.7 Access management

NextGIS Web is resource based so each component (layer, group, service) is a resource. NextGIS Web provides extended settings for resource access permissions.

Permissions could be set during resource creation (see. *Adding resources* (page ??)), or using resource update (see. *Vector layer settings* (page ??)) To manage permissions use a “Permissions” tab in create/update resource dialog (see. Fig. ??)

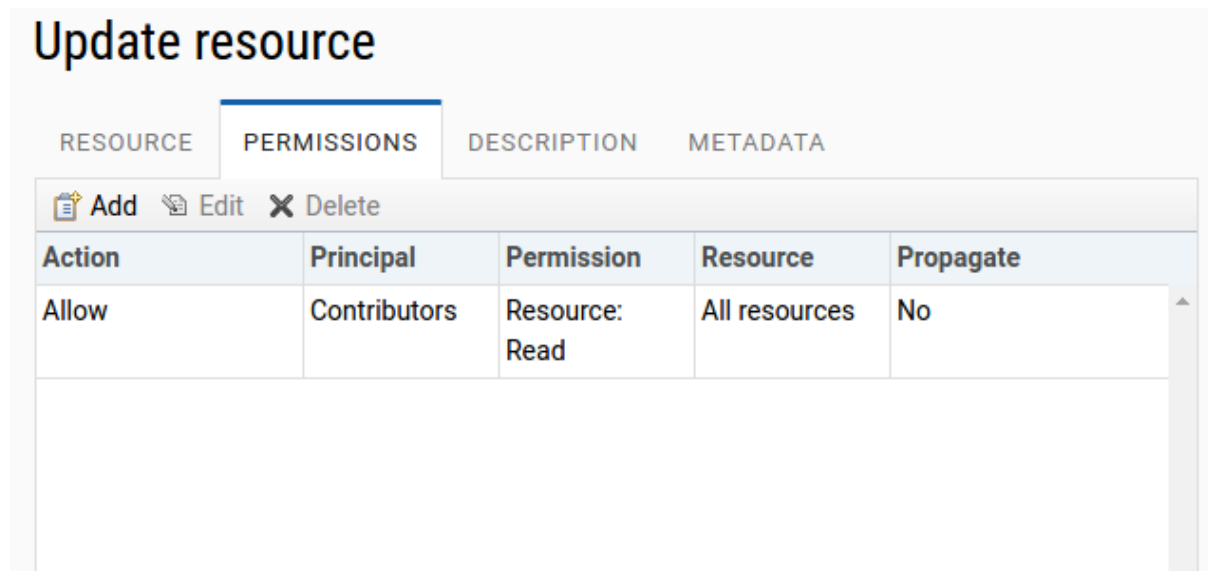


Fig. 13.12: Permissions tab for resource

You can grant, revoke and update permissions using this tab. You can grant different permissions to a single resource for different users and/or groups. A dialog with permission item settings is presented on fig. Fig. ??.

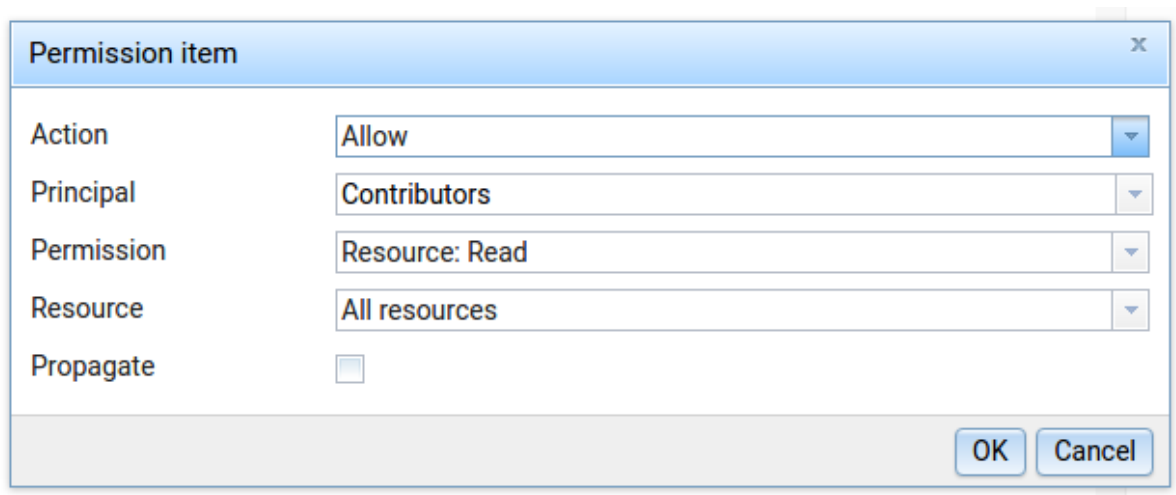


Fig. 13.13: Permission item settings dialog

A dialog has the following elements:

- Action

- Principal
- Permission
- Resource
- Propagate

Action defines the kind of the rule - allow or deny.

Note: By default everything is denied.

Principal - a user or a user group who is subject to a rule.

Besides standard users created by administrator, system has special system users:

- administrator - Web GIS user which has administrative rights
- owner - Web GIS user which created a particular resource
- guest - Web GIS user which is accessing a particular resource without being authenticated (not logged in)
- authenticated - authenticated Web GIS user under any account (but not guest)
- everyone - all users including guests and authenticated

Besides standard groups created by administrator, system has special system user groups:

- Administrators - a group whose users have administrative rights
- Editors - a group, whose users do not have access to the control panel, but can create, edit and manage data

Adding users to this groups is a convenient way to set appropriate permissions across the whole system. These groups can't be removed.

Permission - defines allowed or denied action with the resource. There are the following types of permissions:

- All resources: All permissions
- Resource: All permissions
- Resource: Manage children
- Resource: Change permissions
- Resource: Read
- Resource: Create
- Resource: Update
- Resource: Delete
- Service: All permissions
- Service: Connect
- Service: Configure
- Data structure: All permissions

- Data structure: Write
- Data structure: Read
- Connection: All permissions
- Connection: Write
- Connection: Read
- Connection: Connect
- Web map: All permissions
- Web map: Edit annotations
- Web map: View annotations
- Web map: Display
- Collector: All permissions
- Collector: Read
- Data: All permissions
- Data: Write
- Data: Read
- Metadata: All permissions
- Metadata: Write
- Metadata: Read

Resource - type of resource the rule created for. This setting is important for resource groups where it is required to grant permissions only to some types of resources. If there is no need to grant different permissions to different types of resources, select “All resources” for this setting.

Propagate checkbox defines if permission rules need to be applied to resources in sub-groups or not. Note, that setting permissions for lower level resource and propagating doesn’t cancel the need to set them for upward resources. For example, if you gave read access to a resource group that is contained by other groups, but you didn’t give appropriate permissions for higher level resources (up to root) the user will not get access to current resource group.

Permissions could be assigned to resources indirectly. For example permission “Web map: Display” could be assigned for a resource group and if a “Propagate” checkbox is checked this rule will be applied to every web map inside this resource group and inside all the subgroups.

Here is a description for available permission types.

All resources: All permissions - allows or denies any actions with resources.

Resource: All permissions - allows or denies any actions with resources excluding resource groups.

Resource: Manage children - allows or denies update of child resources settings.

Resource: Change permissions - allows or denies access permissions management for a resource.

Resource: Read - allows or denies reading of resources.

Resource: Create - allows or denies creation of resources.

Resource: Update - allows or denies modification of resources.

Resource: Delete - allows or denies deletion of resources.

Service: All permissions - allows or denies any actions with a service.

Service: Connect - allows or denies connections to a service.

Service: Configure - allows or denies modification of service settings.

Data structure: All permissions - allows or denies any actions with data structure.

Data structure: Write - allows or denies modification of data structure.

Data structure: Read - allows or denies reading of the data structure.

Connection: All permissions - allows or denies any actions with connections.

Connection: Write - allows or denies modification of connections.

Connection: Read - allows or denies reading of connection parameters.

Connection: Connect - allows or denies usage of connection (defines if layers and data from the connection will be available for a user).

Web Map: All permissions - allows or denies any actions with a Web Map.

Web Map: Display - allows or denies display of a Web Map.

Data: All permissions - allows or denies any actions with data.

Data: Write - allows or denies data modification.

Data: Read - allows or denies reading of data.

Metadata: All permissions - allows or denies any actions with metadata.

Metadata: Write - allows or denies modification of metadata.

Metadata: Read - allows or denies reading of metadata.

When you assign rights to a particular resource take into account the rights of its constituent resources. For example to provide access to a WMS service you should grant the following permissions:

- **Service: Connect** - to a connection itself.
- **Resource: Read** - to all resources (vector and raster layers) published with WMS service.
- **Data structure: Read** - to all resources (vector and raster layers) published with WMS service.
- **Data: Read** - to all resources (vector and raster layers) published with WMS service.

If you have a complex system with several maps and different users who should work with these maps you can create user groups. You can assign different permissions to every group.

13.8 Example: Assigning permissions

13.8.1 Close a group for guests, open it for the user

Action	Principal	Permission	Resource	Propagate
Allow	Fire Bot	All resources: All permissions	All resources	Yes
Deny	Guest	All resources: All permissions	All resources	Yes

Fig. 13.14: Settings for resource group

Action	Principal	Permission	Resource	Propagate
Allow	Fire Bot	Resource: Read	All resources	Yes

Fig. 13.15: Settings for root resource group

You can also allow the user reading all higher resource groups as alternative.

13.8.2 Grant guest user resource display permission

Note: Guest users will be able to see administrative interface and view all folders excluding especially closed ones.

Add

Edit

Delete

Action	Principal	Permission	Resource	Propagate
Allow	Guest	Resource: Read	All resources	Yes
Allow	Guest	Data: Read	All resources	Yes
Allow	Guest	Data structure: Read	All resources	Yes
Allow	Guest	Metadata: Read	All resources	Yes

Fig. 13.16: Settings for root resource group

Add Edit Delete				
Action	Principal	Permission	Resource	Propagate
Allow	Guest	Web map: Display	Web map	Yes
Allow	Guest	Resource: Read	All resources	Yes

Fig. 13.17: Settings for resource group with maps

Add Edit Delete				
Action	Principal	Permission	Resource	Propagate
Allow	Guest	Data: Read	All resources	Yes
Allow	Guest	Resource: Read	All resources	Yes

Fig. 13.18: Settings for resource group with geodata

13.8.3 Grant guest user Web Map display permission

Note: Guest users will be able to see only a Web Map with layers

Main resource group
Update resource

Update resource

RESOURCE

PERMISSIONS

DESCRIPTION

METADATA

Add
Edit
Delete

Action	Principal	Permission	Resource	Propagate
Allow	Administrators	All resources: All permissions	All resources	Yes
Allow	Guest	Resource: Read	All resources	No

Fig. 13.19: Settings for main resource group

It is important to note that parent resources (if any) also need read permissions for the guest (see. Fig. ??) If there aren't rights to 'read' resource, then the data propagated to it will also be impossible to read.

13.8.4 Grant a single user permissions to a single resource group




13.8.5 Grant a permission to input data using a mobile application to a group of users

Create a separate group of users ("Contributors" in this example) and a separate resource group.

Main resource group • Permissions • Case 2. Webmap and data in different folders for guest • webmap • Update resource

Update resource

RESOURCE PERMISSIONS DESCRIPTION METADATA

 Add
  Edit
  Delete




Action	Principal	Permission	Resource	Propagate
Allow	Guest	Web map: Display	All resources	Yes
Allow	Guest	Resource: Read	All resources	Yes

Fig. 13.20: Settings for resource group with maps

Main resource group • Permissions • Case 2. Webmap and data in different folders for guest • data • Update resource

Update resource

RESOURCE PERMISSIONS DESCRIPTION METADATA

 Add
  Edit
  Delete



Action	Principal	Permission	Resource	Propagate
Allow	Guest	Resource: Read	All resources	Yes
Allow	Guest	Data structure: Read	All resources	Yes
Allow	Guest	Data: Read	All resources	Yes

Fig. 13.21: Settings for resource group with geodata

Main resource group • Permissions • Update resource

Update resource

RESOURCE PERMISSIONS DESCRIPTION METADATA

 Add
  Edit
  Delete

Action	Principal	Permission	Resource	Propagate
Allow	Guest	Resource: Read	All resources	No

Fig. 13.22: Set in other resource groups

Action	Principal	Permission	Resource	Propagate
Allow	Tracker	All resources: All permissions	All resources	Yes

Fig. 13.23: Settings for a resource group

Action	Principal	Permission	Resource	Propagate
Allow	Administrators	All resources: All permissions	All resources	Yes
Deny	Everyone	Resource: Delete	All resources	No
Allow	Tracker	Resource: Read	Resource group	No

Fig. 13.24: Settings for root resource group

Action	Principal	Permission	Resource	Propagate
Allow	Contributors	Resource: Read	All resources	Yes
Allow	Contributors	Data structure: Read	All resources	Yes
Allow	Contributors	Web map: Display	All resources	Yes
Allow	Contributors	Data: All permissions	All resources	Yes
Allow	Contributors	Metadata: Read	All resources	Yes

Fig. 13.25: Settings for a resource group

Action	Principal	Permission	Resource	Propagate
Allow	Contributors	Resource: Read	All resources	No

Fig. 13.26: Settings for root resource group

13.8.6 Disallow view of Web Map to all not authenticated users, grant view to authenticated users

Action	Principal	Permission	Resource	Propagate
Deny	Guest	Web map: Display	All resources	No
Allow	John Smith	Web map: Display	All resources	No

13.8.7 Disallow all access for guest users (without password)

13.9 Update user password

To update user password you can use administrative interface. To do it select “Control panel” (see Fig. ??) in the main menu (see item 1 in Fig. ??). In control panel (see Fig. ??) select “List” option in “Users” block and click pencil icon near the user you want to update password for (see Fig. ??). In opened window in “Password” field select “Assign new” in the dropdown menu, fill in a new password and click **Save** button.

Also there is an option to change user password using command line:

Warning: Setting a password using a command line is not safe.

```
env/bin/nextgisweb --config config.ini change_password user password
env/bin/nextgisweb --config config.ini change_password user password
```

Note: The password is limited in length in the range of 5-25 characters.

Action	Principal	Permission	Resource	Propagate
Deny	Guest	All resources: All permissions	All resources	Yes

Someone Else

Full name

Someone Else

Login

someoneelse

* Password

Assign new ▾

.....

NextGIS ID

Disabled

☐

Groups

Language

English ▾

[Improve or add new translation](#)

Description

Save

Delete

Fig. 13.27: User editing window

13.10 Storage

The “Storage” section contains information about the volume of data loaded into Web GIS depending on their type. The space usage estimate is located below the main table. The administrator can forcibly recalculate the amount of storage (for example - immediately after loading big data, if the system has not yet recalculated the occupied space on its own).

Storage

Kind of data	Volume
Rasters and pyramids	3.1 GiB
Feature attachments	1.2 GiB
Vector layer features	895.6 MiB
Total	5.1 GiB

Storage usage was fully estimated at 2021-11-09 06:54:05.
Some changes may be reflected only after full estimation.

[Estimate storage](#)

GROUPS

- List
- Create

USERS

- List
- Create

INFO

- Storage**
- System information

SETTINGS

- Cadaster services
- Collector projects
- Web GIS name
- Cross-origin resource sharing (CORS)
- Custom CSS
- Home path
- Custom logo
- Resource export
- Trackers

SPATIAL REFERENCE SYSTEMS

- List
- Create

WEB MAP

- Web map settings

Fig. 13.28: Storage section

13.11 Backups

In this section you can see a list of available NextGIS Web backups, as well as download any of them. The process of creating backups and restoring for developers is described in [this section](#)⁴².

13.12 System information

Through the control panel, the administrator can view information about the system and the current version of the platform (see Fig. ??). Using the icon in the upper right corner, you can copy all this data to the clipboard.

⁴² https://docs.nextgis.ru/docs_ngweb_dev/doc/admin/backup_restore.html

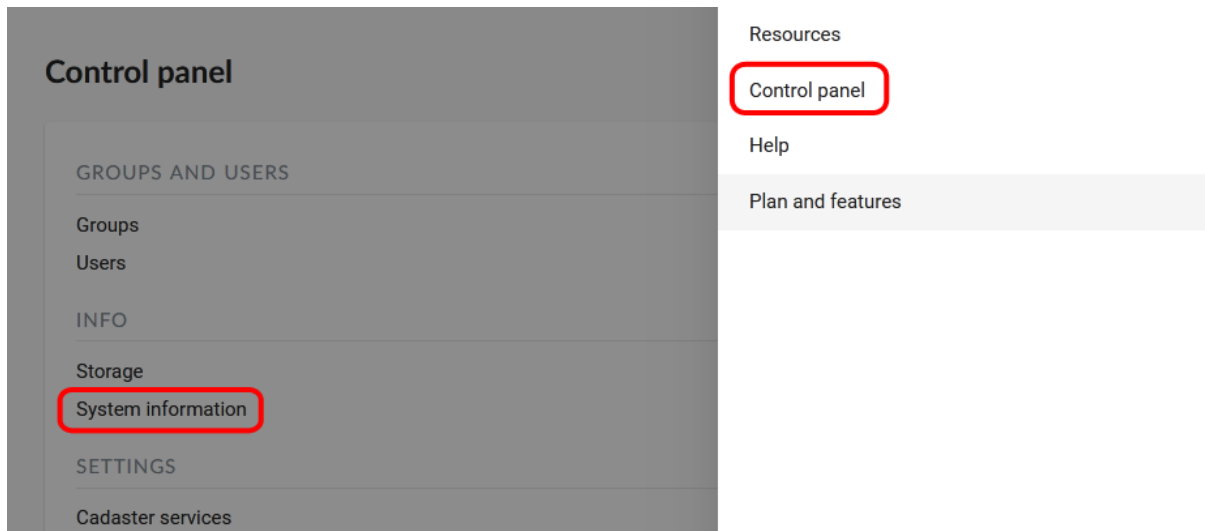


Fig. 13.29: System information section in the control panel

13.13 Resource export

This function shows in the Web GIS interface the ability to export (save) data only for those categories of users that are selected from the list below.

The Data Export function can be seen either only by administrators or by users with the right to:

- Reading data
- Writing data

All other users will not be able to save data from the Web GIS interface.

Note: This setting does not in any way affect the ability to receive data through the [REST API](#)⁴³ in accordance with the set [permissions](#)⁴⁴ to them.

13.14 Web Map Settings

Using the control panel administrator can set a number of general settings for all Web Maps in NextGIS Web:

- Visibility of the navigation menu for guests;
- Identification popup parameters;
- Measurement units;
- Address search parameters;
- Legend visibility.

⁴³ https://docs.nextgis.com/docs_ngweb_dev/doc/developer/toc.html

⁴⁴ https://docs.nextgis.com/docs_ngweb/source/admin_tasks.html#access-management

System information



NextGIS Web Cloud 9 (2021-11-04)

Package	Version	
nextgisweb	4.0.0.dev9	3d11ac826
nextgisweb_basemap	1.4.0.dev1	a3a98f5
nextgisweb_cadaster	1.4.0.dev0	4521f78
nextgisweb_collector	1.3.0.dev0	a260138
nextgisweb_formbuilder	1.4.0.dev0	4d6c008
nextgisweb_mapserver	1.6.0.dev1	7995856
nextgisweb_ngwcluster	2.0.0.dev0	e9018c6
nextgisweb_qgis	2.4.0.dev1	ea9a3d7
nextgisweb_tracker	1.2.0.dev0	299560

Platform

Linux kernel	5.4.0-88-generic
OS distribution	Ubuntu 20.04.3 LTS
CPU	8 × Intel Xeon Gold 6240R CPU @ 2.40GHz
RAM	32116 MB
Python	3.8.10
PostgreSQL	12.8
PostGIS	3.1.4
GDAL	3.0.4
QGIS	3.16.12-Hannover
MapServer	7.6.1

Fig. 13.30: System and platform information

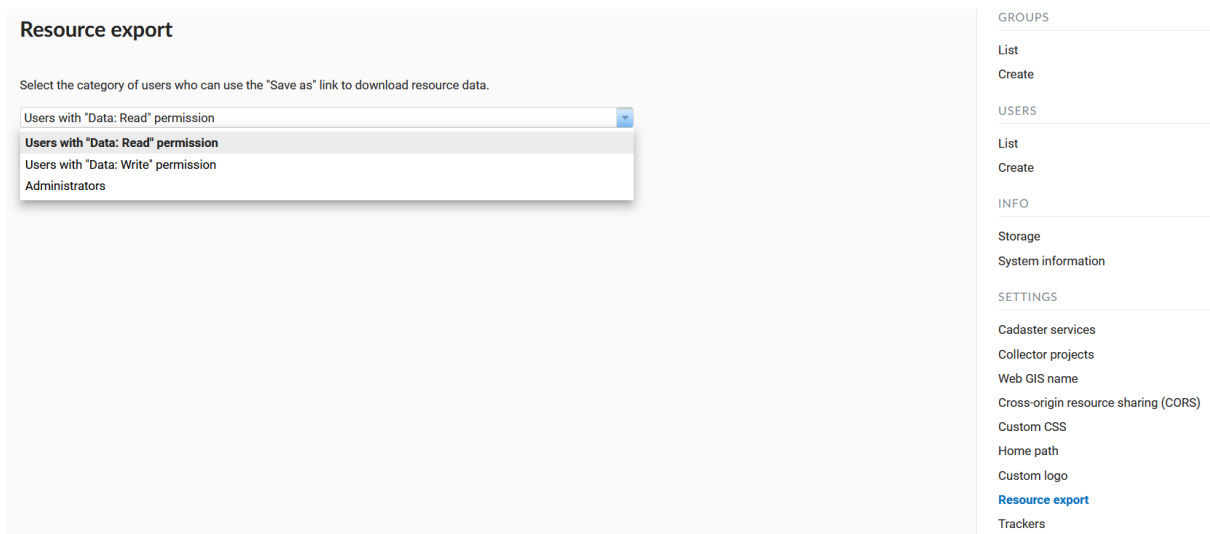


Fig. 13.31: Selecting a category of users entitled to export data

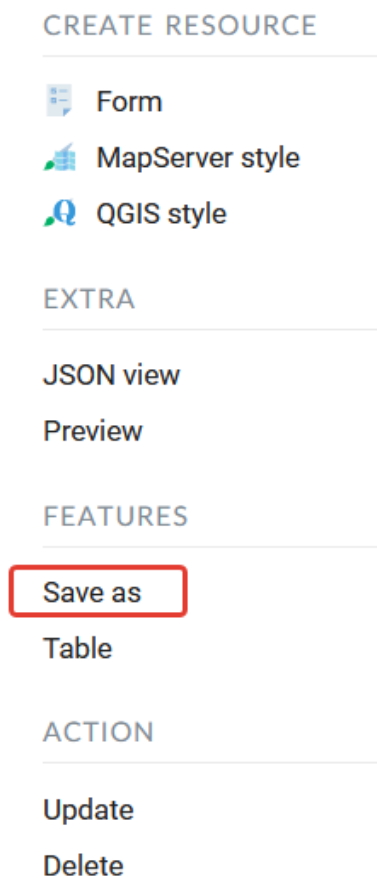


Fig. 13.32: Data export

Web map settings

General

☐ Hide navigation menu for guest

Identify popup

* Width, px

300

* Height, px

200

* Radius, px

3

☒ Show feature attributes

☒ Show geometry info

Measurement

Length units

Meters

Area units

Sq. meters

Degree format

Decimal degrees

Measurement SRID

WGS 84 / Lon-lat (EPSG:4326)

Address search

☒ Enable

☐ Limit by web map initial extent

Provider

Nominatim (OSM)

Limit search results to countries

Legend

Visibility

Default

Fig. 13.33: Web Map Settings Page

13.14.1 Navigation menu vizibility

You can hide the navigation menu for guests. While veiwing your Web Maps, guests will not have access to the main dropdown menu in the top right corner that has link to the main resource group.

In the Control panel of your Web GIS go to the Web Map settings (Fig. ??) and enable the option *Hide navigation menu for guest*.

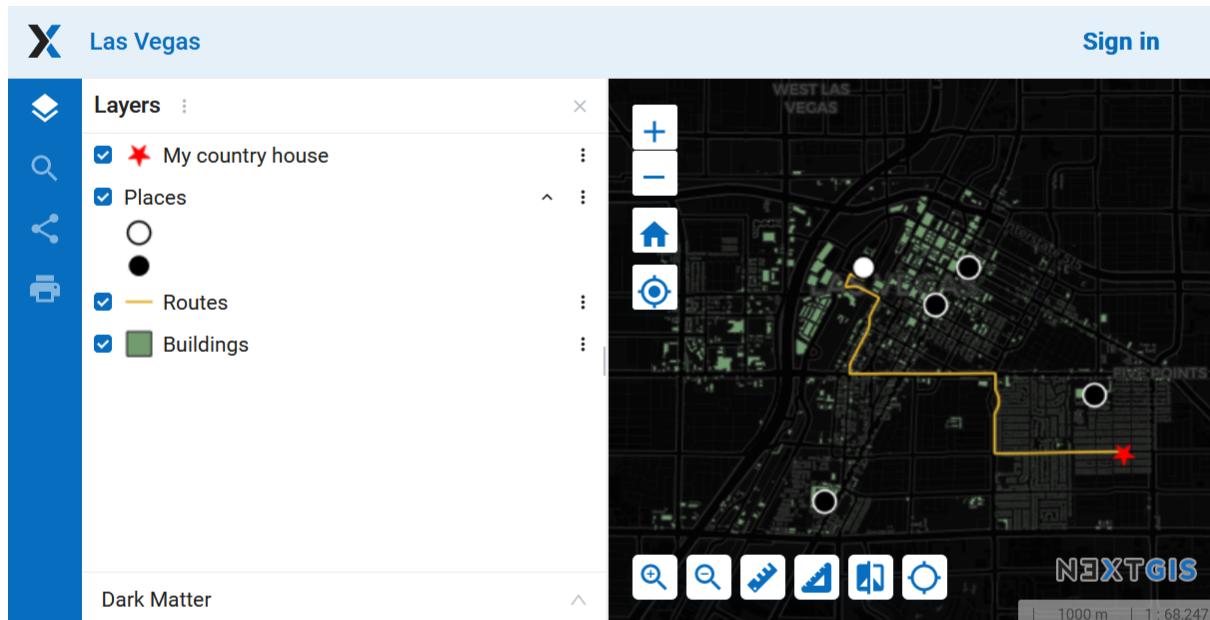


Fig. 13.34: Web Map without the navigation menu icon

13.14.2 Identify popup

The section regulates two parameters:

- Size of the pop-up window when identifying objects on the Web Map;
- The radius of the area around the object within which the identification works.

Dimensions are in pixels.

At the same time you can turn on/off the display of feature attributes.

13.14.3 Measurement

The section sets the parameters responsible for various measurements on the Web Map:

- Units of length measurement (according to the selected SRS)
- Units of measurement of areas (in accordance with the selected SRS)
- Degree format
- Coordinate system for calculating measurements

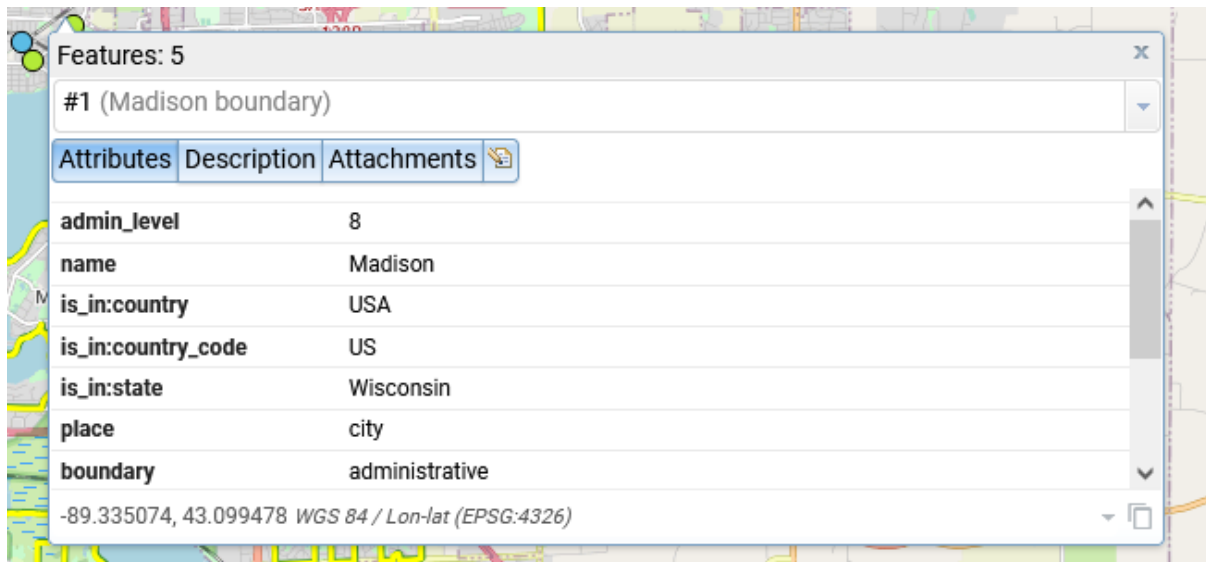


Fig. 13.35: Object identification on the Web Map

13.14.4 Address search

NextGIS Web address search is performed through one of the two data bases (providers):

- Nominatim (OpenStreetMap) - used by default
- Yandex.Maps - an external geocoder with API key

The following parameters can be set up:

- “Enable” - the search results on the Web Map will include not only the attribute data but also the address base if there are matches
- “Limit by Web Map initial extent” - the search will be performed within the extent set in the Web Map settings
- “Provider” - defines the geocoder used for address search. OpenStreetMap by default, can be changed to Yandex.Maps
- “Limit search results to countries” - while using OSM, if a country code is specified (de, fr, gb etc), the search results will only include matches from the selected country’s territory
- “Yandex.Maps API Geocoder Key” - when Yandex.Maps is selected as provider, this is the field to enter the API key. Users obtain the keys independently by signing up on <https://developer.tech.yandex.ru>.

Address search

☒ Enable ☐ Limit by web map initial extent

Provider Yandex.Maps API Geocoder Key

Yandex.Maps API Geocoder


 Save

Fig. 13.36: Address search settings for Web Map



Fig. 13.37: Web Map search

13.15 Customize the design with CSS

You can modify the look of NextGIS Web using CSS. From the main menu (see Fig. ??) open the Control Panel (see Fig. ??). In the Control Panel (see Fig. ??) select **Custom CSS** in the Settings section. Here you can enter your own CSS rules. They will be used throughout your Web GIS on all its pages.

13.16 Custom CSS examples

13.16.1 Change main Web GIS color

Affects header, symbols in the header, buttons, field contours, links highlighted on hover etc.

```
:root {  
  --primary: red  
}
```

13.16.2 Change main font color

Affects menu, name and parameters of displayed resource group etc.

```
:root {  
  --text-base: #ff6600  
}
```

13.16.3 Change additional font color

Affects paths for the displayed resource, parameters etc.

```
:root {  
  --text-secondary: rgb(40 200 40 / .8)  
}
```

13.17 Customize NextGIS UI Elements (White label)

White label is a special module that allows you to remove or replace NextGIS logos and names with your company logos and names. The module is purchased and installed separately. The module adds a new section to the Control Panel (Fig. ??), which allows you to disable or override various interface elements mentioning NextGIS.

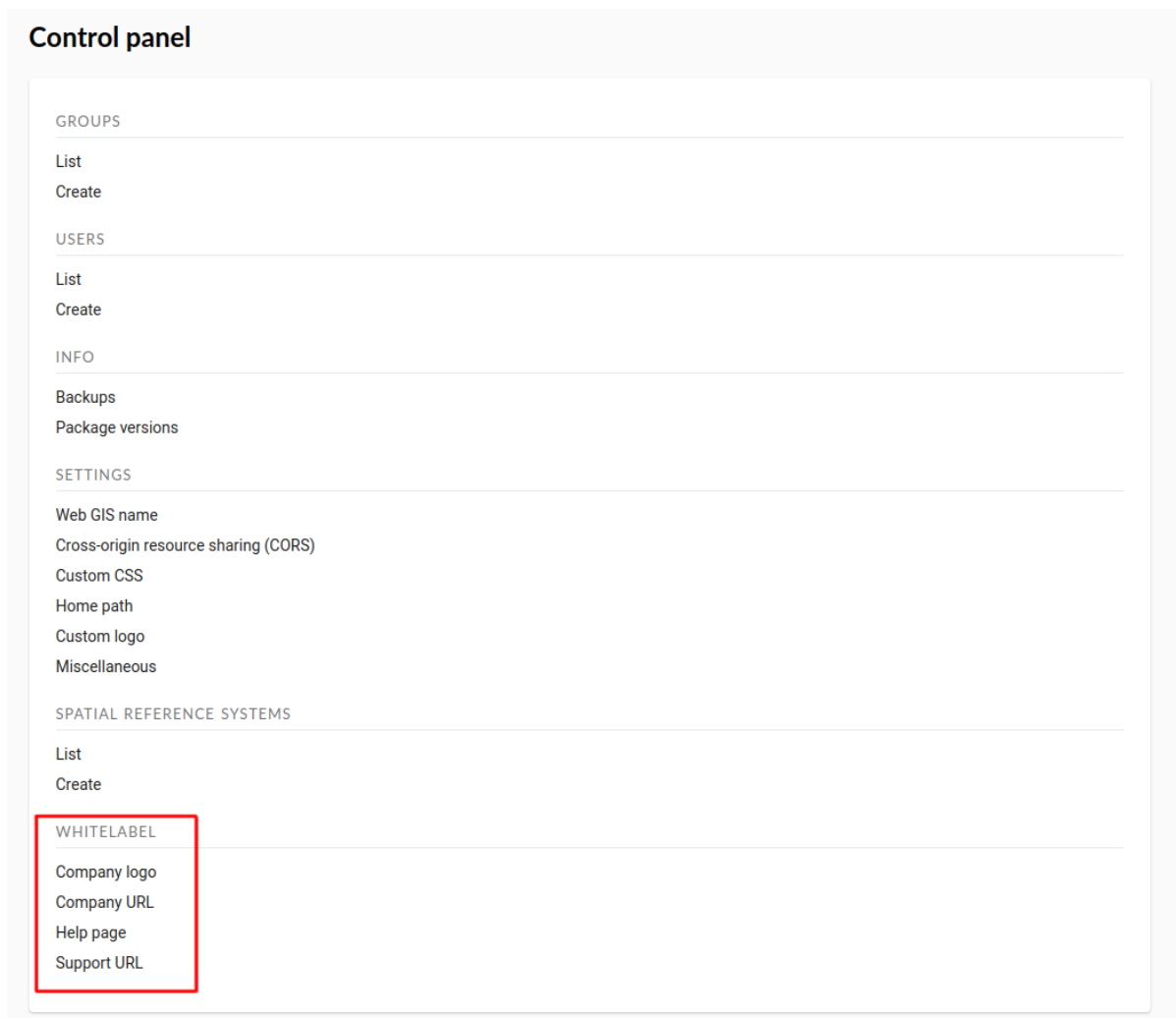



Fig. 13.38: 'White label' module in control panel

13.17.1 Company logo on Web Map

In Control Panel, you can upload your logo in PNG format (see `in:numref:logo_whitelabel_en`) to display in the lower right corner of the map.

Company logo



Upload a PNG logo or use drag and drop.

Save
Remove

Fig. 13.39: Upload company logo file

If the file is not loaded, there is no logo (see `in:numref:web-map_logo`).



Fig. 13.40: Web Map with NextGIS logo (left) and without logo (right)

13.17.2 Company URL

You can assigned a new hyperlink for a company website to a just added logo (. Fig. ??)

Company URL

Save

Fig. 13.41: Company URL

13.17.3 Help page

By default, help leads to <http://nextgis.com/help/>. You can set a different hyperlink (see in :numref: *help_whitelabel_en*) to 'Help' (see in Fig. ??).

Help page

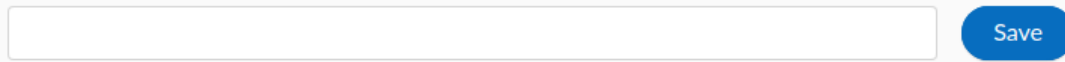


Fig. 13.42: Reroute a link to 'help'

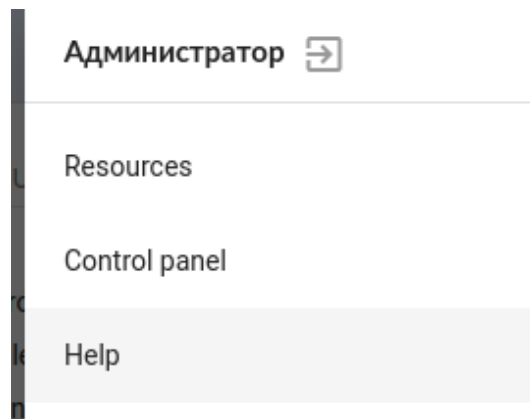


Fig. 13.43: 'Help' in the menu

13.17.4 Support URL

Also you can set URL for the technical support page (see in Fig. ??).

This link will appear on error messages:

404 — Resource not found

Resource with id = 3486 was not found.

The resource may have been deleted or an error in the address. Correct the address or go to the home page and try to find the desired resource.

Technical information ▼

[Contact support](#)

[Back to home](#)

Fig. 13.44: Support URL in the interface

13.17.5 Other items

- The default Web GIS name is specified without mentioning NextGIS.
- In WMS and WFS services resources, **NextGIS QGIS** is replaced with ****QGIS****(. Fig. ??).

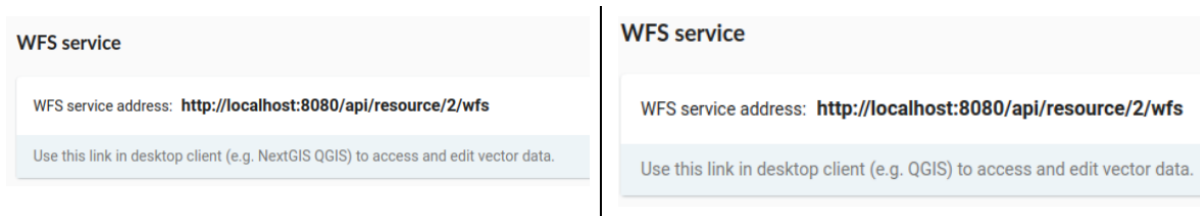


Fig. 13.45: Replacing *NextGIS QGIS* (left) with *QGIS* (right) in WMS and WFS services

- The social networks preview mentioning NextGIS is removed (. Fig. ??).

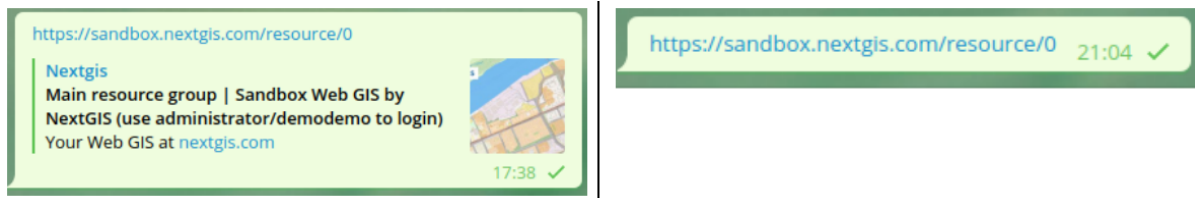


Fig. 13.46: Hiding the mention of *NextGIS QGIS* in web GIS links

SPACIAL REFERENCE SYSTEMS

You can manage spacial reference systems using Control panel. It allows browsing the list of added SRS, importing SRS from the catalog and creating your own.

To see which SRS are already added, select “List”. In this list there are two SRS by default: «WGS 84 / Lon-lat (EPSG:4326)» and «WGS 84 / Pseudo-Mercator (EPSG:3857)».

14.1 Custom Spatial Reference Systems

Note: Custom SRS functionality is available on [Premium](#)⁴⁵ and while using the product [On-premise](#)⁴⁶.

Note: Only users with administrative permissions can add and modify SRS.

If needed, you can import additional SRS from the catalog or create your own.

14.1.1 Import SRS from catalog

To add an SRS from the catalog, go to the Control panel and in the Spatial reference system section press **Catalog** (or, if you are viewing the SRS list, press **Import from catalog**). You will be redirected to the catalog page. Start typing the name of the SRS in the search bar. When you find the desired SRS in the search results, press the icon with the arrow next to it.

You will be redirected to the import page. Here you can modify the name of SRS to be displayed in your WebGIS.

On the next page, press **Save** to complete the import.

⁴⁵ <http://nextgis.com/pricing/#premium/>

⁴⁶ <https://nextgis.com/pricing/>

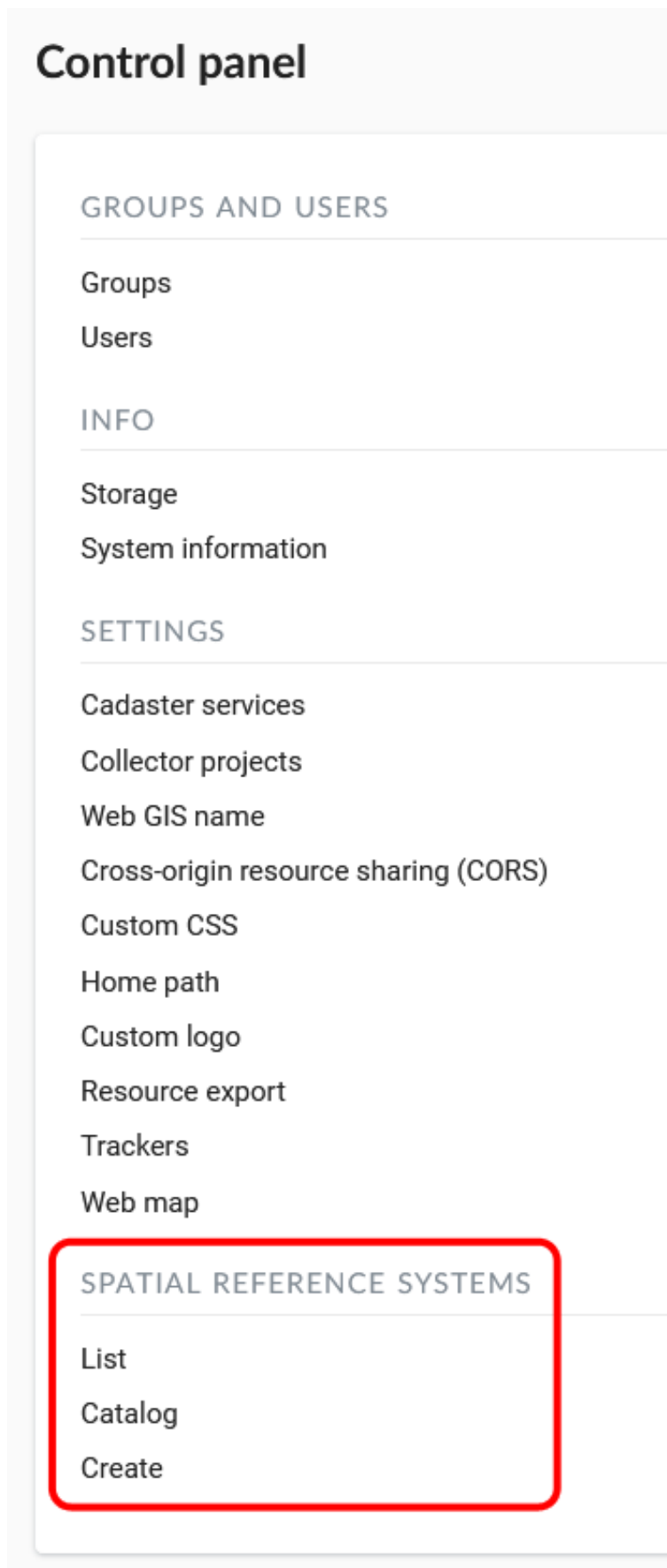


Fig. 14.1: Spatial reference systems in the Control panel

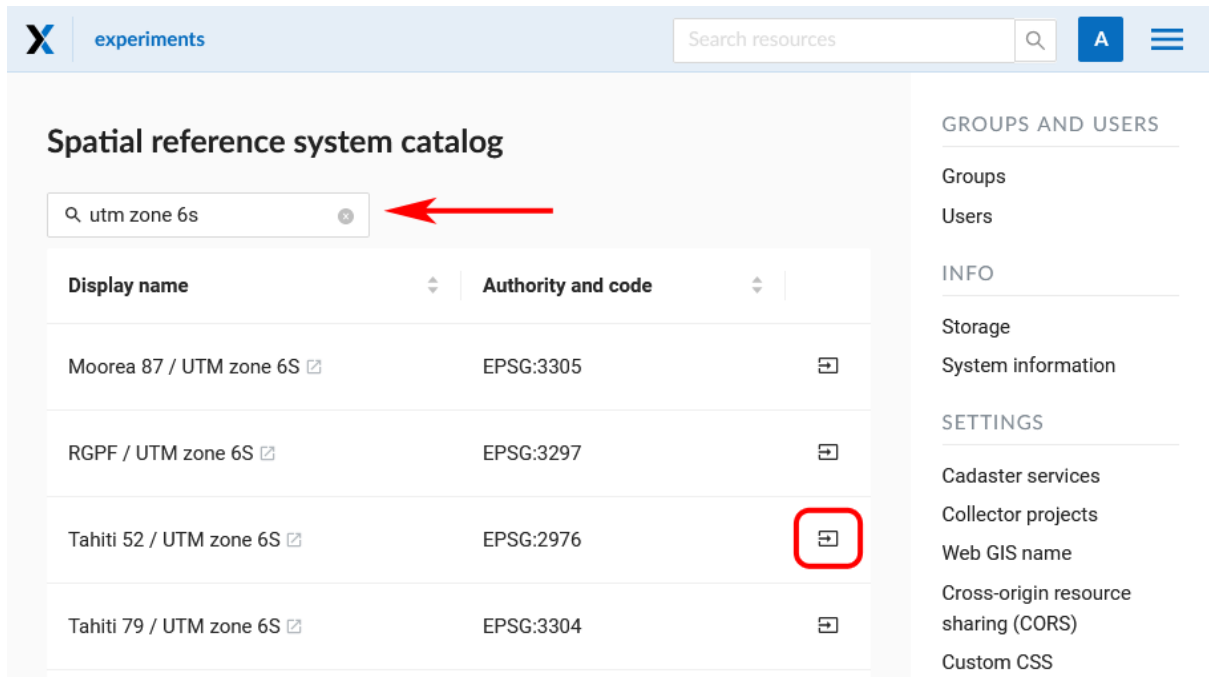


Fig. 14.2: Search results in the catalog

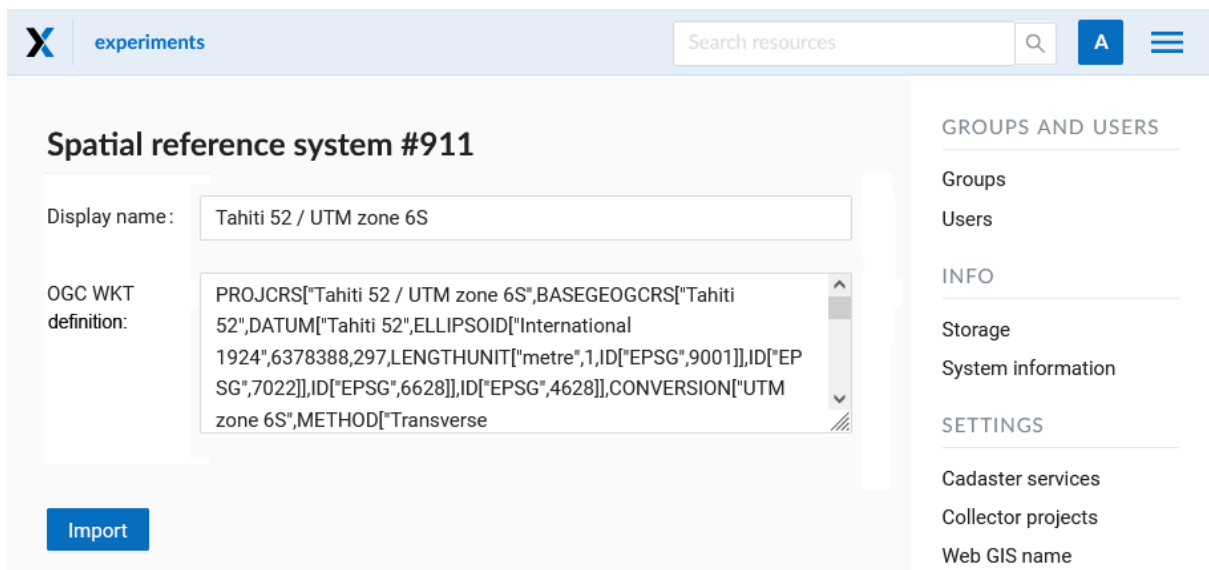


Fig. 14.3: Adding SRS from catalog

Tahiti 52 / UTM zone 6S

* Display name:

Authority and code:

* OGC WKT definition:

```
PROJCRS["Tahiti 52 / UTM zone 6S",BASEGEOGCRS["Tahiti 52",DATUM["Tahiti 52",ELLIPSOID["International 1924",6378388,297,LENGTHUNIT["metre",1,ID["EPSG",9001]],ID["EPSG",7022]],ID["EPSG",6628]],ID["EPSG",4628]],CONVERSION["UTM zone 6S",METHOD["Transverse
```

GROUPS AND USERS

Groups

Users

INFO

Storage

System information

SETTINGS

Cadaster services

Collector projects

Web GIS name

Cross-origin resource sharing (CORS)

Custom CSS

Fig. 14.4: Completing import

14.1.2 Creating new SRS

To create a new SRS open “Control panel” in the main menu and press **Create** in “Spatial reference systems” (or press **Create** while on the SRS list page).

You can give an SRS display name and enter its definition in OGC WKT format. You can also import definitions from common formats as PROJ, MapInfo and EPSG, after the import they will get converted to OGC WKT format. Then press “**Create**”. The new SRS will appear in the list.

14.2 How to edit or delete SRS

You can change the *display name* of any SRS by clicking the pencil icon in the corresponding row of the list. If you created an SRS yourself, you can also modify its *OGC WKT definition*.

To *delete* an SRS, press the trash can icon in the corresponding row of the list. A small dialog window will appear. Confirm that you want to delete the SRS by pressing **OK**.

After the operation is completed, a message will appear announcing “SRS deleted”. The two default SRS, «WGS 84 / Lon-lat (EPSG:4326)» and «WGS 84 / Pseudo-Mercator (EPSG:3857)», can’t be removed.

The screenshot shows the 'Create new Spatial reference system' form. At the top, there is a header with the 'X experiments' logo, a search bar labeled 'Search resources', and a user profile icon 'A' with a menu icon. The main form area has a title 'Create new Spatial reference system'. It contains two required fields: '* Display name:' with a text input box, and '* OGC WKT definition:' with a larger text area. Below the WKT area is an 'Import definition' button. At the bottom left of the form is a blue 'Create' button. To the right of the form is a sidebar menu with sections: 'GROUPS AND USERS' (containing 'Groups' and 'Users'), 'INFO' (containing 'Storage' and 'System information'), and 'SETTINGS' (containing 'Cadafter services', 'Collector projects', 'Web GIS name', 'Cross-origin resource sharing (CORS)', and 'Custom CSS').

Fig. 14.5: Creation of a new SRS

The screenshot shows the 'Spatial reference systems' list. At the top, there is a search bar labeled 'Search', an 'Import from catalog' button, and a blue '+ Create' button. Below is a table with the following rows:

<input type="checkbox"/> Display name	
<input type="checkbox"/> WGS 84 / Lon-lat (EPSG:4326)	
<input type="checkbox"/> WGS 84 / Pseudo-Mercator (EPSG:3857)	
<input type="checkbox"/> Tahiti 52 / UTM zone 6S	
<input type="checkbox"/> Cape / UTM zone 34S	
<input type="checkbox"/> Tokyo / UTM zone 53N	
<input type="checkbox"/> WGS 84 / UTM zone 15N	

A red arrow points from the 'Tokyo / UTM zone 53N' row to the edit icon, which is circled in red.

Fig. 14.6: Editing icon in the SRS list

WGS 84 / Delhi

* Display name

Main: WGS 84 / Delhi

* OGC WKT definition

```
PROJCRS["WGS 84 / Delhi",BASEGEOGCRS["WGS 84",ENSEMBLE["World Geodetic System 1984 ensemble",MEMBER["World Geodetic System 1984 (Transit)",ID["EPSG",1166]],MEMBER["World Geodetic System 1984 (G730)",ID["EPSG",1152]],MEMBER["World Geodetic System
```

Import definition

Save

Delete

Fig. 14.7: Editing SRS

☐ Cape / UTM zone 34S

✎ 🗑️

☐ Tokyo / UTM zone 53N

✎ 🗑️

☐ WGS 84 / UTM zone 15N

✎ 🗑️

☐ Main: WGS 84 / Delhi

✎ 🗑️

Delete SRS?

Cancel OK

Web GIS name

Cross-origin resource sharing (CORS)

Custom CSS

Home path

Custom logo

Resource export

Trackers

Web map

SPATIAL REFERENCE SYSTEMS

Fig. 14.8: Deleting custom SRS

14.3 Usage of additional SRS

The added SRS can be used for various purposes:

1. To capture coordinates on Web maps. If you have set up additional SRS (one or several), you can now conveniently capture coordinates in this SRS from anywhere on the map:
2. To export vector layers. All custom SRS are also available for data export. See [this section](#)⁴⁷ for details.
3. To extend API requests. Support for custom SRS is gradually added to NextGIS Web API too. For example, this request will return a feature in a required SRS:

```
/api/resource/{id}/feature/{fid}?srs=990002
```

Custom SRS identifier (990002 in this example) can be known by editing a created SRS, for example:

```
/srs/990002/edit
```

⁴⁷ https://docs.nextgis.com/docs_ngweb/source/admin_interface.html#data-export-to-csv-and-geojson-formats

LATEST CHANGES

This section describes the latest changes to the software.

4.6.1 released on 27 Dec 2023 and 29 Dec 2023

- Fix styles for WFS layers.

4.6.0 released on 27 Dec 2023 and 29 Dec 2023

- Support for lookup tables for feature layer attributes.
- Print to TIFF format in addition to PDF, JPEG and PNG.
- Geometry-based filtering of feature tables on webmaps.
- Autodetection of minimum and maximum scales for webmap and WMS layers.
- Refresh feature tables after saving layer changes on webmaps.
- Improved handling of id and fid attributes of vector layers.
- Improved handling of date and time inputs.
- Passing a zoom level to webmaps via zoom attribute.
- Support for OpenID Connect UserInfo endpoint.
- Extraction of scale ranges from QML styles.
- Fix NextGIS ID configuration issue.
- Support for PostgreSQL 12.

4.5.1 released on 17 Nov 2023

- Fix print to TIFF format in addition to PDF, JPEG and PNG.

4.5.0 released on 29 Sep 2023

- New tileset resource for storing and serving prerendered tiles.
- New OGC API Features service with read and write support.
- Up to 2x speed-up of loading vector layer data.
- Differentiate webmap initial and constraining extents.
- Support for Google Analytics metrics.
- Support for basic user-defined styles.
- Save to PDF from the webmap printing panel.

- Check effective permissions of other users for a resource.
- Legends for webmaps is enabled by default.
- Lots of improvements in feature editing widgets.
- OutputFormat declaration in WFS for better compatibility.
- Store audit journal in PostgreSQL database instead of ElasticSearch.
- React library upgraded to 18.
- Ant Design library upgraded to 5.

4.4.0 released on 30 Jun 2023

- Auto-generated and configurable legends for webmaps.
- Reordering layers via drag-and-drop while viewing webmaps.
- Changing layer opacity while viewing webmaps.
- Creation of an empty vector layer without uploading a file.
- Ability to replace existing vector layer features and fields from a file.
- Brand-new feature table based on React.
- Resource and feature description editors updated to CKEditor 5.
- Improved handling of resource descriptions on webmaps.
- Zoom to a filtered set of features on webmaps.
- Geometry properties in the identification popup.
- Show the cursor location and the current extent on webmaps.
- Zoom to all layers on webmaps.
- Support for linear and polygonal annotations.
- Default display names for resources during creation.
- Deletion of all features and changing geometry type for vector layers.
- Limit by extent while exporting feature layers.
- Ability to export a filtered set of features.
- MapInfo formats support when creating a vector layer.
- TMS client: parallel fetching of tiles and HTTP/2.
- Reasonable resource tabs ordering and auto-activation.
- Improved usability of the layers tree on webmaps.
- Fast PNG compression for rendering.
- Chrome 102+, Safari 15+, Edge 109+ or Firefox 102+ is required.
- User permissions section is moved to a separate page.
- OAuth-based automatic group assignment.

4.3.1 released on 14 Dec 2022

- Fix resource group selection issue while cloning webmaps

4.3.0 released on 21 Nov 2022

- Support for webmap cloning via UI.
- Search by coordinates on web maps.
- CSV and XLSX support when creating a vector layer.
- Export and import feature layer attachments.
- Vector layer export to KML and KMZ formats.
- Fields selection while exporting feature layer.
- Assign default groups while creating users via UI.
- Experimental support for authorization links.
- Use resource SRS by default while exporting raster and vector layers.
- Support for booleans and nulls in resource metadata.
- Support for fixed length character columns in PostGIS layers.
- Support for materialized views and 25D geometries in PostGIS layers.
- Ability to turn off user password and keep only OAuth authentication.
- Check for disk free space in the healthcheck.
- Ability to search through resources recursively in REST API.
- OpenLayers library upgraded to 6.15.1.

4.2.0 released on 18 Jul 2022

- “Locate me” tool on web maps.
- Identifiable setting for web map layers.
- Batch deletion and moving of resources.
- Ability to download raster layers as an internal representation.
- PostGIS connection and layer diagnostic tool.
- Support for quad-key basemaps on web maps.
- OAuth improvements: NextGIS ID integration, simultaneous authorization code and password grant types.
- Improved management of spatial reference systems and catalog integration.
- Better support for 25D geometries on web maps and PostGIS layers.
- Improved handling of URLs in descriptions and feature layer fields.
- Cloud-optimized GeoTIFF (COG) enabled by default.
- In-place conversion between COG and non-COG rasters.
- Hide empty groups and groups with no accessible layers on web maps.
- M dimension stripping while creating vector layers in LOSSY mode.
- Selecting features on web maps via hl_* URL parameters.

- Ability to inject some HTML into the base template for metrics and counters.
- Fast JSON serialization and deserialization based on orjson library.
- Completed control panel migration to Antd and React.

4.1.0 released on 16 Feb 2022

- Cloud-optimized GeoTIFF (COG) support for raster layers.
- Browser compatibility test and Internet Explorer deprecation.
- Experimental support for long-running requests for raster and vector layers creation using lunkwill extension.
- Private annotations on web maps, visible only for authors.
- Wrapping around the dateline for tile-based layers on web maps.
- A lot of improvements for the control panel: filters, batch operations, etc.
- Improved handling of vector layer sources with id and geom fields.
- Reprojection into different coordinate systems in WMS and WFS services.
- Export feature layer using field display names (aliases) instead of keynames.
- Support for CORS domain wildcards (like https://*.csb.app).
- WFS client and server simple filters support.
- Improved handling of coordinates outside boundaries of coordinate systems.
- Support for 25D geometries in PostGIS layers.
- Ability to filter NULL values in feature REST API.
- Unknown fields in REST API filters return an error.
- Improved handling of external services errors and timeouts.
- Upgraded dependencies: Pyramid 2.0, SQLAlchemy 1.4, and OpenLayers 6.10

4.0.0 released on 18 Nov 2021

- Source layer selection while creating vector layers from multi-layer sources, such as ZIP-archives or Mapinfo TABs.
- On-the-fly reprojection for WMS and WFS services.
- Ability to restrict address search by a country if using Nominatim.
- Hide inaccessible layers while displaying web maps.
- Highlight feature when selecting from search results.
- Display emails as active mailto: links in the webmap popup.
- Ability to delete users and groups from the control panel.
- Ability to change resource owner in UI and REST API.
- Automatic generation of keynames for WMS and WFS services.
- Improved support for Unicode field names for WFS services.

- Granular control setting for resource export availability.
- ISO-8601 date and time formatting in feature layer REST API via `dt_format=iso` option.
- Drop Python 2.7 support, NextGIS Web now requires Python 3.8+.
- PostgreSQL 10+, PostGIS 2.5+ and GDAL 3.0+ are required now.
- Synchronization of translations with POEditor.
- Yandex Maps-based address search on the webmap.

3.9.0 released on 11 Aug 2021

- Simple tool for previewing resources on the map.
- Resource quick search tool in the page header.
- Disable/enable address search via settings in the control panel.
- Ability to constraint address search area by web map initial extent.
- Zoom to a better extent from address search and bookmark panel.
- Language autodetection, per-user language setting, and support for the external translation files.
- Automatic downsampling of a social preview image to 1600x630 pixels.
- Better support for KML: LIBKML GDAL driver is used when available.
- Filtering features by ID in feature REST API.
- Layers with an “id” field can be loaded if the field has an integer type.
- Information about available distribution versions in the control panel.
- Experimental storage accounting and estimation subsystem.

3.8.0 released on 12 May 2021

- Ability to constraint a web map to the default extent.
- More length and area units in web map settings.
- Automatic correction of errors during the creation of a vector layer.
- Support for creation of vector layers from GML and KML files.
- User login is case insensitive when logging in.
- Configuration option for disabling social networks sharing buttons.
- Performance improvements in geometry handling and rendering, especially when converting between WKT and WKB formats.
- Performance improvements in tile cache component.
- Improved word wrapping in web map identification popup.
- Minimum and maximum scale restrictions in WMS server.
- Experimental integration of modern JavaScript and Webpack.
- Quota for the maximum number of enabled users.

- OpenLayers library upgraded to 6.5.0.
- OAuth server logout support via logout redirect endpoint.

3.7.0

- Add database migrations framework and automatic migrations applying.
- External access links for styles, web maps (TMS), and feature layers (MVT).
- Experimental WFS client and raster mosaic, which is disabled by default.
- Add support of 1.1.0 version in WFS server implementation.
- Improved handling of NODATA values in raster layer and raster style.
- Compression level of PNG images is set to 3, which is much faster.
- Performance improvements and better concurrency for tile cache.
- New “CSV for Microsoft Excel” export format for better Excel compatibility.
- Fix infinite wait of database lock, including during vector layer deletion.
- Improved handling of invalid JSON bodies in RESP API, now the correct error message is returned.
- Vector layer export to MapInfo MIF/MID format.
- Vector layer export to Panorama SXF format.

3.6.0

- Major improvements and bug fixes in WFS protocol implementation.
- Permission model changes: now any action on resource requires read permission from scope resource on the resource and its parent.
- PostGIS layer extent calculation and improved extent calculation in vector layer.
- Vector layer export to GeoPackage format.
- Faster processing of empty tiles and images.
- Tile cache and webmap annotations are enabled by default.
- Command to delete orphaned vector layer tables.
- HTTP API with resource permissions explanation.
- Support for like, geom and extensions in feature layer REST API.
- Support for GeoJSON files in ZIP-archive and faster ZIP-archive unpacking.
- Clickable resource links in webmap, WMS and WFS services.
- Ability to disable SSL certificate check for TMS connection.
- Lookup table component is part of nextgisweb core package nextgisweb.
- Fix TMS layer tile composition in case of extent outside the bounds.
- Fix GDAL > 3 compability issues, including axis orientation.
- SVG marker library resource available to renderers.

3.5.0

- Raster layer export to GeoTIFF, ERDAS IMAGINE and Panorama RMF formats.
- Customizable link preview for resources.
- Improved resource picker: inappropriate resources are disabled now.
- New implementation of WFS server which fixes many bugs.
- Quad-key support in TMS connection and layer.
- Support for `geom_format` and `srs` in feature layer REST API (POST / PUT requests).
- Session-based OAuth authentication with token refresh support.
- Delete users and groups via REST API.
- Track timestamps of user's last activity.
- Customization of web map identify popup via control panel.
- Speedup cleanup of file storage maintenance and cleanup.
- Fix bulk feature deletion API when passing an empty list.
- Fix bug in CORS implementation for requests returning errors.
- Fix coordinates display format in web map identification popup.
- Fix tile distortion issue for raster styles

3.4.2

- Fix WMS layer creation.

3.4.1

- Fix layout scroll bug in vector layer fields editing.

3.4.0

- New tus-based file uploader. Check for size limits before starting an upload.
- Server-side TMS-client. New resource types: TMS connection and TMS layer.
- Create, delete and reorder fields for existing vector layer.
- Improved Sentry integration.
- WMS service layer ordering.
- Stay on the same page after login.
- Error messages improvements on trying to: render non-existing layer, access non-existing attachment or write a geometry to a layer with a different geometry type.

2020-06-30 release

- General. Add/remove fields of attributes table.
- General. Reorder fields of attributes table.

2020-06-24 release

- General. Support raster pyramids for QGIS style for raster layers.

2020-06-05 release

- General. New data uploader. Check for size limits before starting an upload.
- General. Stay on the same page on login to the same page.
- General. Human readable error on trying to access non-existing attachment.
- General. Human readable error on trying to render non-existing layer.
- General. Human readable error on trying to write a geometry to a layer with a different geometry type.
- General. Improve handling rasters with huge size.
- Extensions. Whitelabel - new extension to set corporate interface elements (logos, links, company mentions etc.).

2020-04-16 release

- For developers. Single feature extent endpoint. Example: <https://demo.nextgis.com/api/resource/1735/feature/1/extent>
- For developers. Ordering for data filtering. Reverse ordering and two and more field ordering are supported. Example: https://demo.nextgis.com/api/resource/1731/feature/?limit=10&order_by=NAME,-LEISURE
- Admin GUI. Prohibit blocking of the last (the only) administrator in the system.

2020-03-03 release

- Services. Fix declared CRS for WMS containing raster layers.
- Services. Fix RGBA conversion to JPG on WMS requests.

2020-02-12 release

- Storage. Support for storing Z-type geometries, PolygonZ etc.
- For developers. API can accept and provide Z-type geometries.

2019-11-18 release

- Storage. Support for numeric-type fields on layers added from external PostgreSQL/PostGIS
- Search. Improve address search (uses Nominatim)
- For developers. In addition to style IDs Web Map API now provides layer IDs.

2019-11-06 release

- Printing. Zooming with the box now correctly fit the zoomed area with chosen paper format (A4 etc.)

2019-10-17 release

- CRS. Import from ESRI WKT (in addition to OGC WKT)
- CRS. Unicode in CRS names is now supported.

- CRS. Identification doesn't crash anymore if CRS transformation was not possible.

2019-08-12 release

- Web Map. Search for integer values in added to the embedded feature table.
- Web Map. Improved zooming on a point from the embedded feature table.
- Web Map. While editing the embedded feature table is correctly updated to show newly added features.

EXTENSIONS

16.1 General Information

The following extensions are available to increase the functionality of the software:

1. **Basemaps** - adding and managing basemaps.
2. **File buckets** - file sets, adds ability to upload any files, including non-geospatial ones.
3. **QGIS** - map rendering with QGIS.
4. **MapServer** - map rendering with MapServer.
5. **Audit** - logging user events such as log in/out, resource addition or removal etc.
6. **NextGIS ID on premise** - enterprise authentication and authorization features, such as LDAP or OAuth.

Specific extensions may require installation of additional software components.

GLOSSARY

coordinate system

A way for description of point location relative to selected axes.

data

Information represented in a way it can be processed with automatic tools with possible participation of an operator. [GOST 15971-90, article 1]

ESRI Shape

Shapefile

Popular format for geodata files. Is developed and supported by Esri company for interoperability between products of Esri and other software.

geodata

geospatial data

spatial data

Data about spatial features and sets of features.

geographical feature

spatial feature

geofeature

Digital model for material or abstract feature of real or virtual world with assigned identifier, coordinates and attributes.

geographical information system

Information system that operates with geographical data (geodata). [GOST R 52438-2005 "Geographical information systems. Terms and definitions"]

GeoJSON

Open standard for representation of simple geographical features with their non-spatial attributes using a JavaScript Object notation.

GeoTIFF

Open geodata format for raster data representation in a TIFF format with metadata about georeferencing. Uses TIFF 6.0 specification, and adds some types of geotags that defines a type of cartographic projection, geographical coordinate system, geoid, datum and all other information required for precise spatial orientation of satellite image.

GLONASS

Global navigation satellite system

Soviet/Russian satellite navigation system initially developed for Ministry of defence of USSR. One of the two currently functioning systems for global

satellite navigation (Chinese satellite navigation system BeiDou currently functions as regional).

GPS

Global positioning system

information support for geographic information system

A set of knowledge about information resources, information services, classifiers, rules for digital description, data formats and documentation, that is presented to the user or a developer of geographical information system for it's creation, maintenance and usage.

information system

1. System for storage, processing, search, distribution, transfer and representation of information. [GOST 7.0-99, article 3.1.30] 2. A set of information contained in databases and tools and technologies for information processing . [Federal law "About information, information technologies and information security" 27 July 2006 N 149-FL]

Mapnik

Open source map renderer. Written on C++ and Python. Uses a AGG library and has a function of smoothing of features with high accuracy. It can read from ESRI formats, PostGIS, TIFF, .osm files, and also supports for any GDAL or OGR formats.

MapServer

Server geographical information system with open source that is launched through CGI interface.

Open Source

Software with open source code. Source code of such software is available for view, study and update. This allows a user to participate in a process of development of open source software, to use a code for creation of new software and debugging — through borrowing of source code if that is allowed by license compatibility, or to study of used algorithms, data structures, technologies, methods and interfaces (as source code could essentially complete documentation or be a kind of documentation if there is no one).

PostGIS

Extension for relational DBMS PostgreSQL for storage of geodata in a database. PostGIS has a support for spatial indexes R-Tree/GiST and geodata processing functions.

QGIS

A user-friendly geographical information system with open source code, distributed under GNU General Public License. QGIS is a project of Open Source Geospatial Foundation. It works on Linux, Unix, Mac OSX, Windows and Android, supports for various vector, raster formats, databases and has a variety of functions.

TMS

Tile map service

OSGeo⁴⁸ standard that describes an access to representation of geodata through the Internet/Intranet without an access to geodata itself.

⁴⁸ <http://www.osgeo.org/>

WFS**Web Feature Service**

A web service that represents data in a vector GML format. Client gets both attributes and geometry. There are standard extensions:

- Transactional (WFS-T) - allows clients to send to WFS server new and updated data;
- Gazetteer (WFS-G) - a draft of a standard that adds a search and a query of items by dictionary of geographical names. Initially developed by USGS;
- Temporal - a draft of a standard that adds a temporal measurement;
- Versioning (WFS-V, WFSV) - allows to work with different versions of data (particular development of GeoServer project, not standardized by OGC).

WMS**Web Map Service**

A standard protocol for serving of georeferenced images through the Internet that are generated on server on a basis of data from a gis database. Standard was developed and initially published by international organization [OGC](http://www.opengeospatial.org/)⁴⁹ (Open Geospatial Consortium) in 1999.

⁴⁹ <http://www.opengeospatial.org/>

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