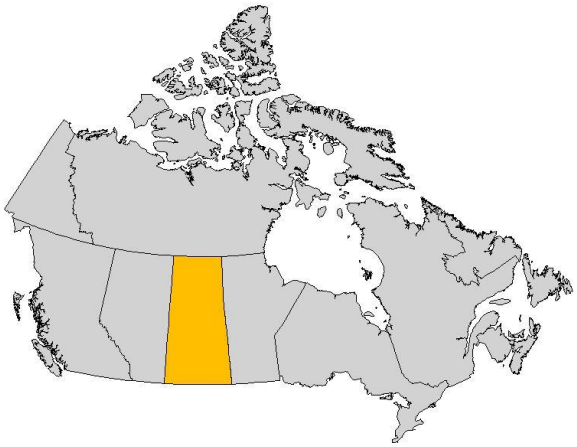
Saskatchewan Geospatial Imagery Collaborative



Downloading Imagery Guide

Version 1.0

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Introduction

The Saskatchewan Geospatial Imagery Collaborative

The Saskatchewan Geospatial Imagery Collaborative (SGIC) is a partnership of organizations sharing knowledge and costs relating to acquisition and use of remotely sensed imagery for mutual and public benefit. The collaborative operates servers providing a web mapping client and an OGC-standard Web Map Service (WMS) for sharing geospatial imagery. Members of the public are welcome to use a limited set of the SGIC's geospatial imagery holdings, while SGIC members gain access to an expanded set of imagery products.

What This Manual Covers

This manual covers using of the SGIC Web Mapping Client to download geospatial imagery, and is only applicable to SGIC members-only access to the system. It describes the following concepts:

- selecting imagery using the catalogue control;
- selecting a download extent;
- choosing an output file format;
- selecting an output projection;
- verifying output options, such as image size;
- previewing the image to be prepared; and,
- preparing and downloading an image from the SGIC web server.

Additional Documentation

Additional documentation is available to SGIC members and covers the following topics:

- Basic usage of the SGIC Web Mapping Client and OGC Web Map Service;
- Administering users through the SGIC Web Mapping Client; and,
- Administering data through the SGIC Web Mapping Client.

Chapter 1
Selecting Imagery for Download

Introduction

The SGIC web mapping client provides a web browser-based interface for choosing from the SGIC's catalogue of imagery for downloading. It uses the capabilities document provided by the OGC Web map Service to retrieve information such as titles, abstracts, and available metadata for each layer of imagery.

The Catalogue Tool

The catalogue tool, located in the menu panel on the left side of the screen, allows the user to select layers from the current map for display in the map window. Layers are added or removed by selecting the check box next to the layer name. Note that layers can be grouped into themes, and all layers in a theme can be added to the map display by selecting the check box next to the theme name. The catalogue tool panel is shown in Figure 1.

Figure 1. Catalogue Tool Panel

Layers chosen in the catalogue tool will be used by the download tool for downloading. In this way, it is possible to create a mosaic of two or more imagery sets in your downloaded image.

Imagery Abstract and Metadata

In addition to the title displayed in the catalogue control, the abstract information provided in the capabilities document generated by the WMS server is available for viewing as a tooltip by hovering the mouse over a layer name. This abstract information can contain details of the imagery set such as the date of acquisition, native resolution, type of sensor used, and positional accuracy.

More detailed information on a layer may be provided by the WMS server in the form of a metadata document. The metadata document is often available in a format such as an FGDC XML document, an HTML document, or a PDF file. If a metadata document is available for the data set, it can be retrieved and displayed in a web browser window by clicking on the document icon next to the title of the layer.

The abstract and metadata features are dependent on how a layer was set up by the SGIC data administrators in the Data Administration tool. For more details on how to implement these features, please refer to the Data Administration Guide.

Limitations on Selecting Layers

The catalogue tool displays both vector and raster / imagery data layers. Vector layers will always be superimposed over raster layers in the web mapping client. However, only raster layers will be used to prepare an image for downloading.

Performance Tips

The response time of the web mapping client may slow down if a large number of raster layers are selected at once in the catalogue control. This occurs because each layer must be re-projected by the server and superimposed on the others before the map image is sent over the internet to the web mapping client running in your web browser. In order to improve performance, select a smaller number of layers for viewing – in particular, if any layers are entirely obscured, such as the “Blue Marble Next Generation” layer which is used to provide an overview map by default in the web mapping client, turning them off will improve performance.

The response time of the web mapping client may also slow down if a high resolution raster layer is displayed over a very large extent; for example, if SPOT 2.5m imagery is displayed over the extent of the province of Saskatchewan. In order to improve response time, zoom in to a smaller extent using the search or zoom controls of the web mapping client before turning on a high resolution imagery layer.

Rendering performance of imagery layers in general is a function of the format the imagery data is stored in. Imagery processing operations such as storing imagery in GeoTIFF format, storing overview images, and tiling the image in files has a significant impact on performance. For ideas on how to improve rendering performance of imagery, refer to the Data Administration Guide.

Chapter 2
Selecting a Download Extent

Introduction

With the desired imagery layers displayed in the SGIC web mapping client, and imagery extent must be specified for downloading. The web mapping client offers three ways to do this.

Visible Extent Method

The easiest way to specify a download extent is to use the extent of the currently displayed map. Zoom and pan the map panel of the web mapping client to the area you are interested in, then open the Download tool and click the “Download” button. The current map extent will be used as the download extent by default. If you desire more details on the current map scale and extent, this information is available in the Location tool. These values are repeated in the “Extent” tab of the Download dialog, and you can adjust them there for fine tuning if you are interested in selecting a specific set of geographic co-ordinates. All extents are expressed in decimal degrees, and longitude values will be negative in North America.

Bounding Box Method

The second way to specify a download extent is with a bounding box drawn on the map window over the feature you are interested in creating an image of. This feature is turned on by clicking the “Set Download Extent” button in the Download Tool. Your next click and drag on the map window will draw a bounding box instead of panning the map. After you release the left mouse button, clicking the “Download” button will bring up a dialog with the extent of the bounding box you selected.

Search Method

The third way to specify a download extent is by searching for a feature such as an urban community of first nations reservation. If the feature you search for is found in the database, the map window of the web mapping client will be centered on the center of the feature, and the map will be zoomed to an extent that encompasses all of the feature. You can then click the “Download” button in the Download tool to bring up a Download dialog for this extent, or use the bounding box method described above to achieve a more precise extent.

Chapter 3
Setting Output File Properties

Introduction

Properties of the image file that will be generated are set in the Download dialog. You can set all properties and preview the result before committing to the server processing job that will create your file for downloading.

Extent Tab

The “Extent” tab of the Download dialog shows the geographic extent that your image will be clipped to, in decimal degrees. If you know the geographic extent you are interested in, you can alter the values in this tab before processing the image. Note that longitudes in North America are negative values, representing degrees west of the Greenwich prime meridian.

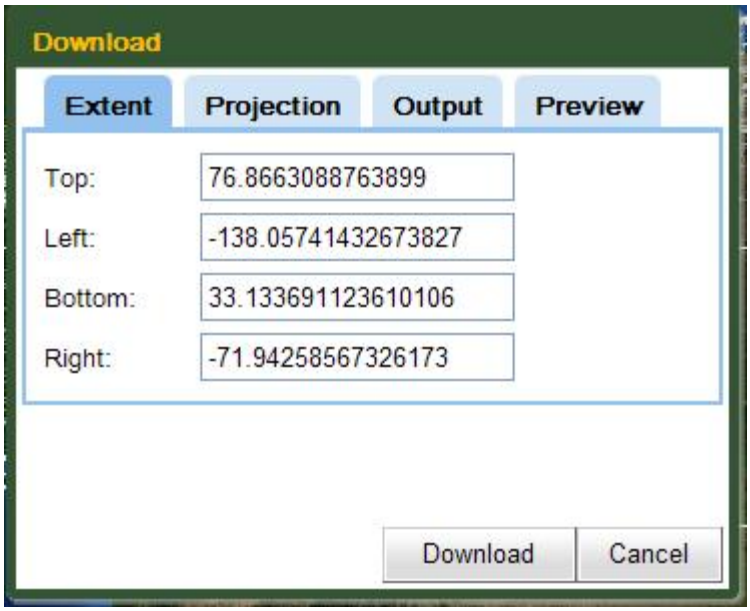

Figure 2. Extent Tab

Projection Tab

The “Projection” tab of the Download dialog shows the projection that the output file will be projected to. All mosaics in the system start as unprojected / geographic with a WGS84 datum (EPSG code 4326) and are re-projected to your desired output projection.

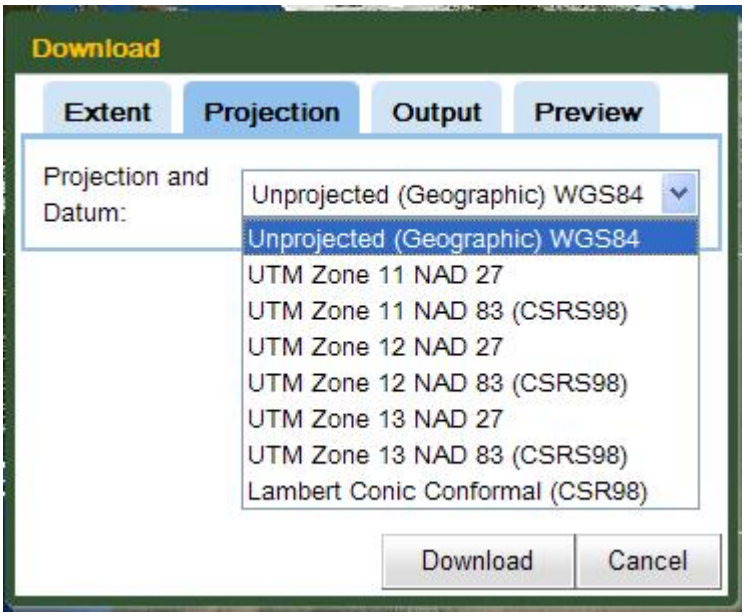

Figure 3. Projection Tab

Output Tab

There are several options on the output tab that will affect the format of your download file:

- Imagery Sets – For information purposes, this field shows the names of the raster layers that will be included in the mosaic.

- Download Original Files – If this radio button is selected, the original imagery files that intersect with your download extent will be copied to your download directory. They will be provided in their native format as provided by the imagery vendor. This option is provided for “power users,” who desire access to the original imagery files for their own processing uses.

- Download a Mosaic – If this radio button is selected, a mosaic will be created, clipped to the extent you specified and in the output format and projection you specified.

- File Format – This drop-down allows you to select an output file format for a mosaic. For file formats that do not include geographic extents, such as PNG and JPEG, an ESRI-standard world file will also be generated.

- Convert to Greyscale – This check box will create a grayscale image from colour images. Note that the method used for creating the grayscale is to select the first band provided in the image files.

- Full Resolution – This check box causes the image height and wdith to be calculated so as to create an image that matches the full native resolution of the imagery as much as possible. If this check box is turned off, you will be able to set custom height and width values to match your requirements.

- Image Width – The width of the output image, in pixels.
- Image Height – The height of the output image, in pixels.

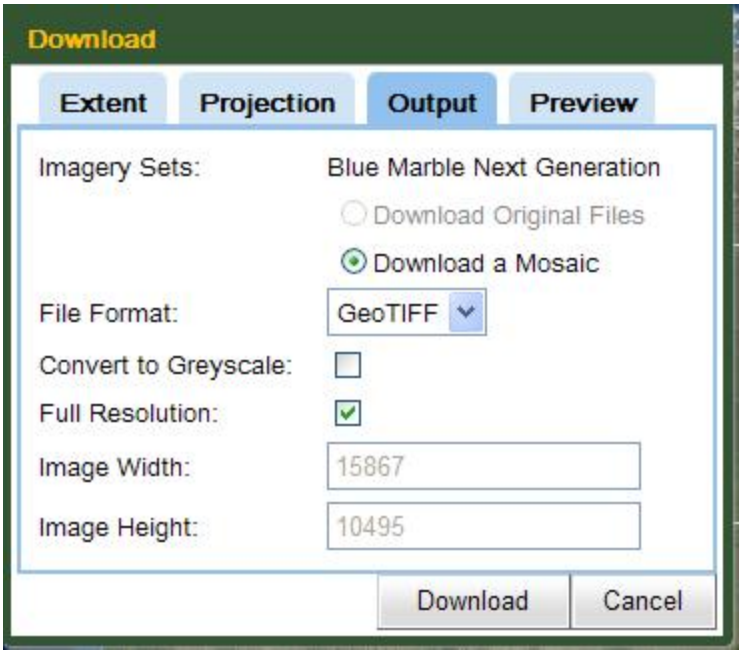

Figure 4. Output Tab

Preview Tab

The preview tab provides a preview of the image you will be downloading. It uses the parameters you selected in the other tabs to generate a small preview image that is scaled to fit in the dialog box.

Initiating the Download

Click the download button to start running an image processing job on the SGIC web server that will create your files for downloading. A new browser window will open, and when the image processing job is complete it will display links to the files for downloading.

Appendix A – Image Processing Functionality

Introduction

The SGIC web server runs a variety of image processing tools to create imagery for viewing and downloading. This appendix summarizes the tools used in the project.

UMN MapServer

UMN MapServer is used to create a geotiff for the geographic extent and image size you you request in the Download dialog. MapServer executes its image processing on a mapfile created with the Data Administration tool in the web mapping client. It uses routines in the GDAL library to carry out image processing.

GDAL Utilities

Utilities provided with the GDAL library are used to warp the downloaded image to the projection you request, and to convert it to the format you request in the download dialog. These tools use the Proj.4 library to perform the geometric transformations.

Links

UMN MapServer - http://mapserver.gis.umn.edu/
GDAL - http://www.gdal.org/
Proj.4 - http://trac.osgeo.org/proj