Vector Tile Packages for S1 Mobile Mapper

ORWA BLM Mobile Team
8/26/2022

Contents

Purpose

The purpose of this document is to demonstrate what is needed to download (or side-load) a Vector Tile Package (VTPK) and how it functions in the S1 Mobile Mapper App offline out in the field. The S1 Mobile Mapper application can download standalone vtpk files shared to agol, download them as part of a webmap or sideload them from a local file location if they are too large a file size to reasonably share via agol. S1 categorizes vtpk's as basemaps in manage map layers. . So, you can download and display more than one basemap at a time (and adjust transparency) in the S1 main map view.
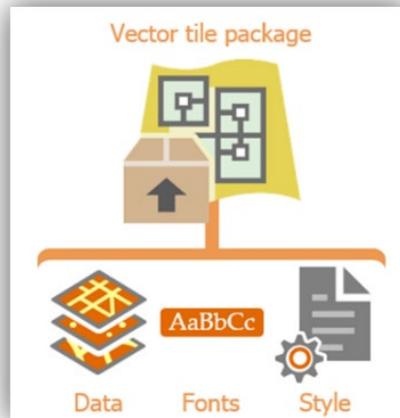
Vector Tile Packages (.vtpk)

Creating a Vector Tile Package generates vector tiles from a map or basemap and packages the tiles in a single Vector Tile Package, a .vtpk file. Vector Tile Packages are created in ArcGIS Pro using the **Create Vector Tile Package tool** or uploaded to ArcGIS Online (AGOL) as an item, depending on the size of the file ([see file size info](#)). VTPK's can be shared or published (unpackaged) as a vector tile layer (hosted) in ArcGIS Online and added to a web map. Larger files can be side-loaded to a mobile device and used with the S1 Mobile Mapper app for offline data collection. See S1 [Side-loading Document](#). Vector tile packages are supported in ArcGIS Pro and ESRI's ArcGIS Runtime SDK for Android.

There are several advantages for using VTPK's on mobile devices, which include:

Support for high-resolution displays

- Reduced file size
- Fast build and update times
- Dynamic label placement and rotation on the mobile device
- Optional end-user customization of content, color, and fonts

A vector tile package contains vector data,
fonts, and style configuration resources.

Esri Information on Creating VTPK's:

- ArcGIS Pro: Creating Vector Tiles - 2020 - Slide presentation - https://www.esri.com/content/dam/esrisites/en-us/events/conferences/2020/federal-gis/arcgis-pro-creating-vector-tile.pdf

- Create Vector Tile Package (Data Management) geoprocessing tool - https://pro.arcgis.com/en/pro-app/2.8/tool-reference/data-management/create-vector-tile-package.htm

- Share Vector Tile Packages - https://pro.arcgis.com/en/pro-app/2.8/help/sharing/overview/vector-tile-package.htm

- Author a Map for Vector Tile Creation - https://pro.arcgis.com/en/pro-app/2.8/help/mapping/map-authoring/author-a-map-for-vector-tile-creation.htm
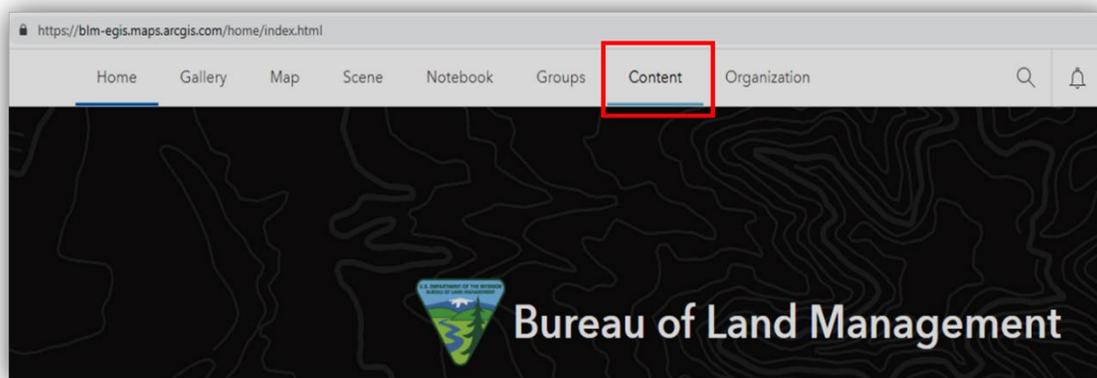
Vector Tile Package sharing in ArcGIS Online

A VTPK file can be downloaded directly from ArcGIS Online (AGOL) into the **S1 Mobile Mapper App** as a basemap and it can be overlaid with editable layers for collecting data.

Vector Tile Packages (.vtpk) like other packages, are not viewable in a map viewer on ArcGIS Online (AGOL). VTPKs are stored on the **Content** list as a package in AGOL, select the package to open the **Item Detail page,** and that is where you will get the option to download or share your package to a **group.**
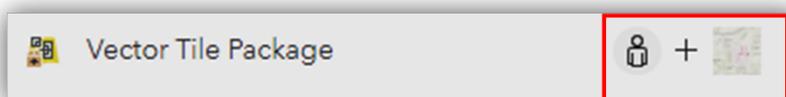
Note: You need an AGOL **User role of Creator** or above to Share content items with a group in ArcGIS Online. But any User Type can at least view to confirm if the vector tile package is shared with a group so it will be available for download in a mobile application.

- **Login** to your ArcGIS Online Organization account (ex. Bureau of Land Management Organization).

- Click on the **Content tab** to open the **My Content** page.
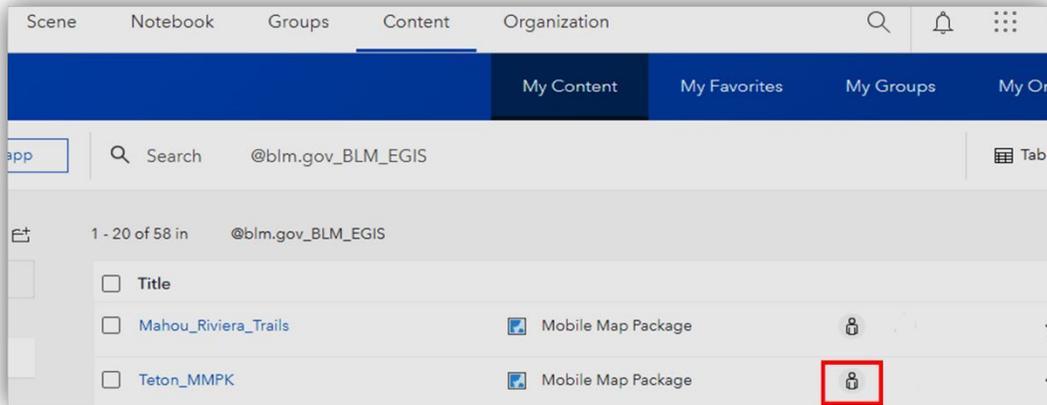

Content Tab in ArcGIS Online

- Find the Vector Tile Package (VTPK) that you want to work with and confirm if the VTPK has been shared with a group. You will know if the VTPK is shared with a group if the **person icon** has a **+ "Group Picture"** next to it.
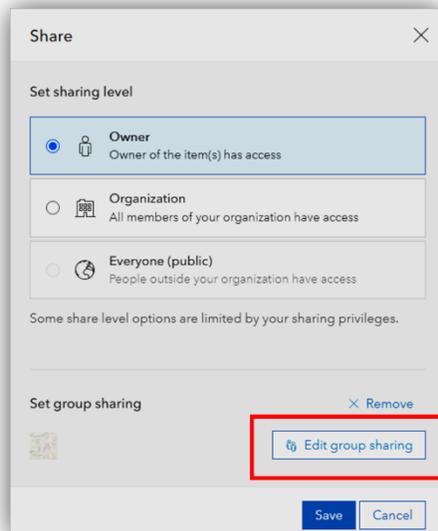

*Vector Tile Package **Shared** to a Group*

- If not shared with a group, then on the **Content** page, **click** on the person icon to the right of the **VTPK name** and **select an organization group to share with**.
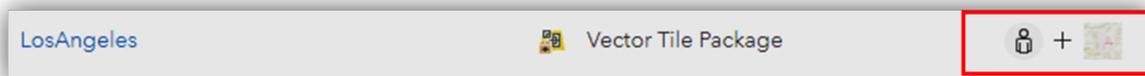
*Vector Tile Package **Not** Shared with a Group*

- When the **Share** window pops up, **Tap** the **Edit group sharing button** on the bottom Right.

Edit Group Sharing Button

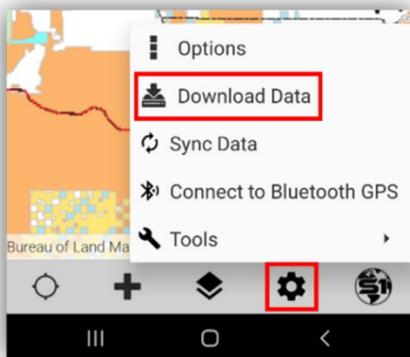- **Select** an organization group to share the vector tile package with and **click OK and Save.**

Shared Group Icon for the Vector Tile Package

- When you open the **S1 Mobile Mapper app,** you will see the vector tile package (.vtpk) within the Shared group.

Download Vector Tile Package to the S1 Mobile Mapper Directly
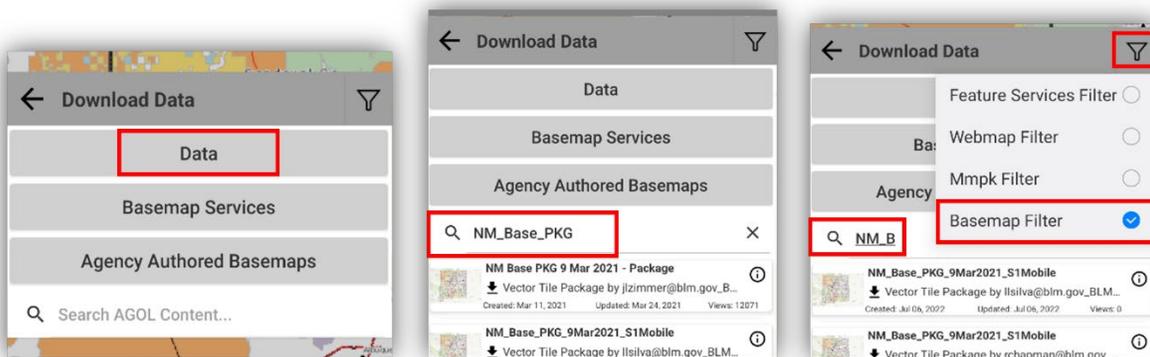
Open the S1 Mobile Mapper App.

Tap on the Options/Tools Icon on the Application toolbar and Select Download Data.

Download Data Option from the Options/Tools Button

Search Data Options:

1. Select the **Data** option on the Download Data pop-up list and select the VTPK from an ArcGIS Online (AGOL) group, **OR**

2. Use the **search** AGOL content window to find the VTPK file, **OR**

3. Could narrow the search down even further by also using the **Filter tool** set to the **Basemap Filter.**
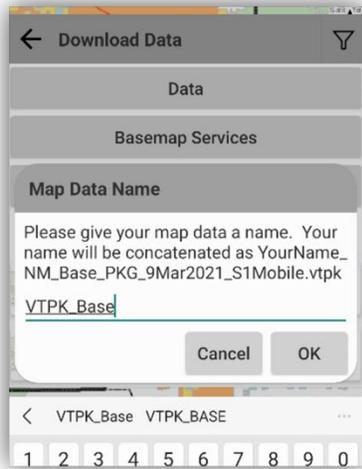

The Data Download Option

Use the AGOL Search Window

Filter Tool and Search Window

Give your Map Data a Name (can have multiple downloads of the same map data), click **OK**. The VTPK file will start downloading.

Note: To Cancel the download, click on the percent download icon.

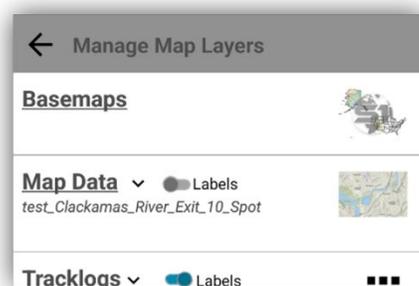*Adding a Map Data Name*

Percent Download Icon

The S1 Mobile Mapper will recognize the **VTPK as a basemap** and store the file in the Basemaps list.

The newly downloaded VTPK file is saved with the other basemaps in the S1 Mobile App. Now the VTPK file can be added to the map view as a basemap, and editable data layers can overlay on top for collecting data offline in the field.
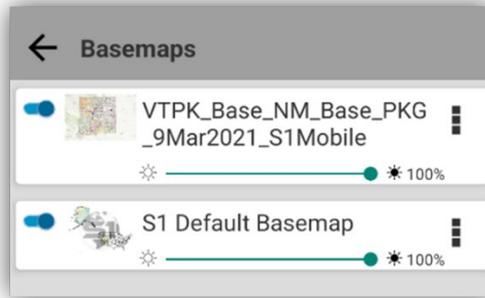
By default newly downloaded basemaps have visisbility toggled on at 100% opaque, To manage basemaps in S1; **Tap** on the **Manage Map Layers** button on the Application toolbar and click on the **Basemaps** option (thumbnail or text).
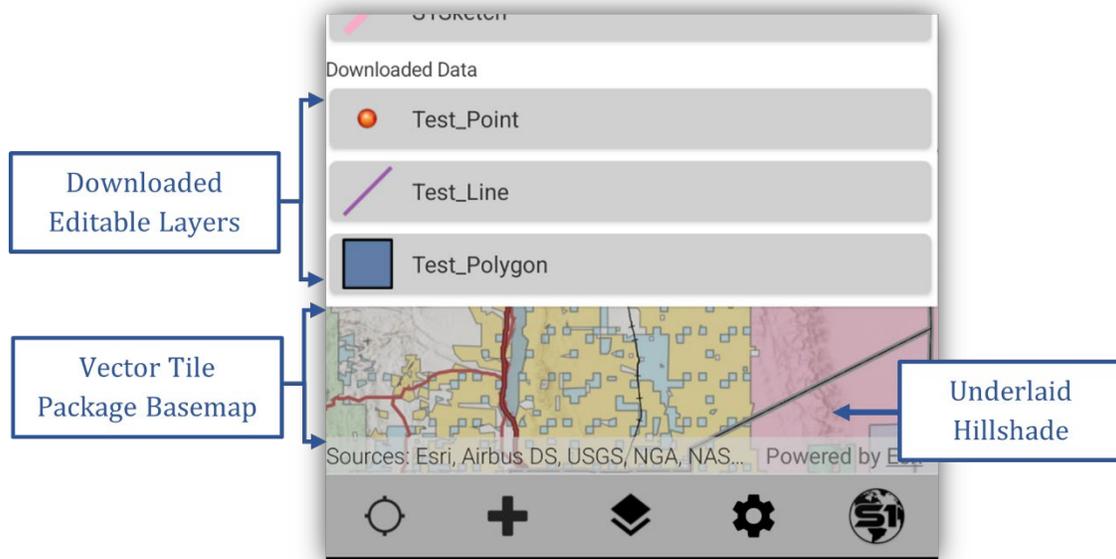

Manage Map Layers on the Application Toolbar

Basemap Option on Manage Map Layers Window

Available Basemap List

An example of a Vector Tile Package with a Hillshade basemap underlaying it and edible map data overlaying it.

Vector Tile Package in the S1 Mobile Mapper App

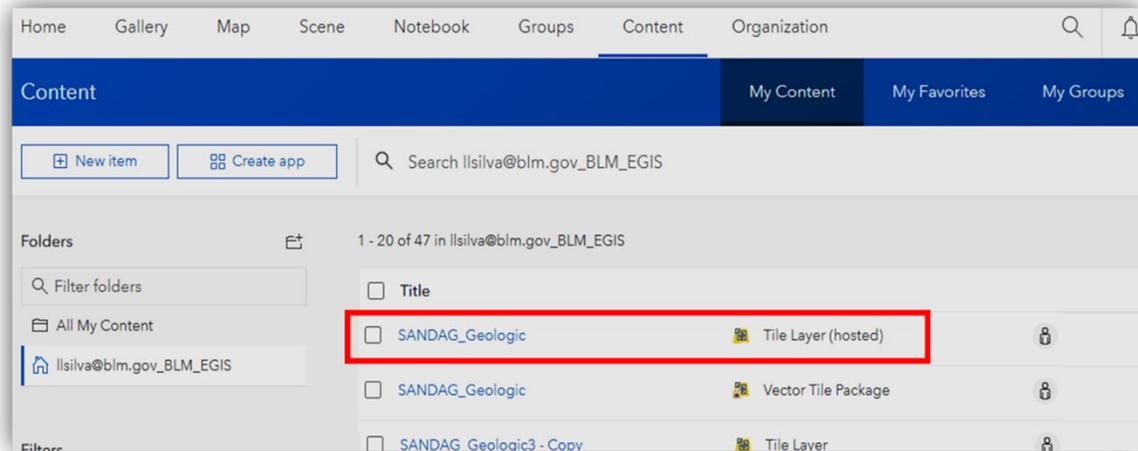**NOTE:** See the Agency User Guide on the S1 Mobile Mapper Website for more information.

- Some tips for working with data intended to be used offline: Enable the layers and map for offline use in ArcGIS Online

Vector Tile Layer Settings for Offline Web Maps

If the vector tile package was used to publish a hosted tile layer for use in AGOL webmaps then it can be added to a webmap and downloaded to S1 as part of the webmap. However, If using this option, the tile layer (hosted) **must be set as a basemap** in the web map and the tile layer must also be enabled to Take Offline. See tips for enabling offline use with different esri content types. Moving the tile layer to the basemap is done in the ArcGIS Online Map Viewer and is also described below.
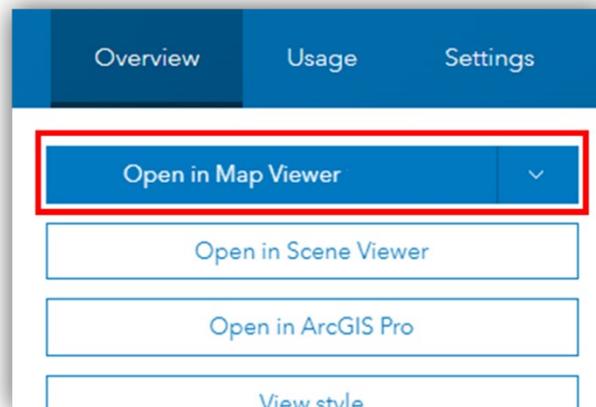
Open AGOL and go to the **content** page.

Click on the **Tile Layer (hosted) name** you want to use in a web map. This will open the **Item Details** page for that layer.

Layer Tile (hosted) Listed on the Contents Page in AGOL

On the Tile Layer (hosted) **Item Details** page, click the **Open in Map Viewer** option button.
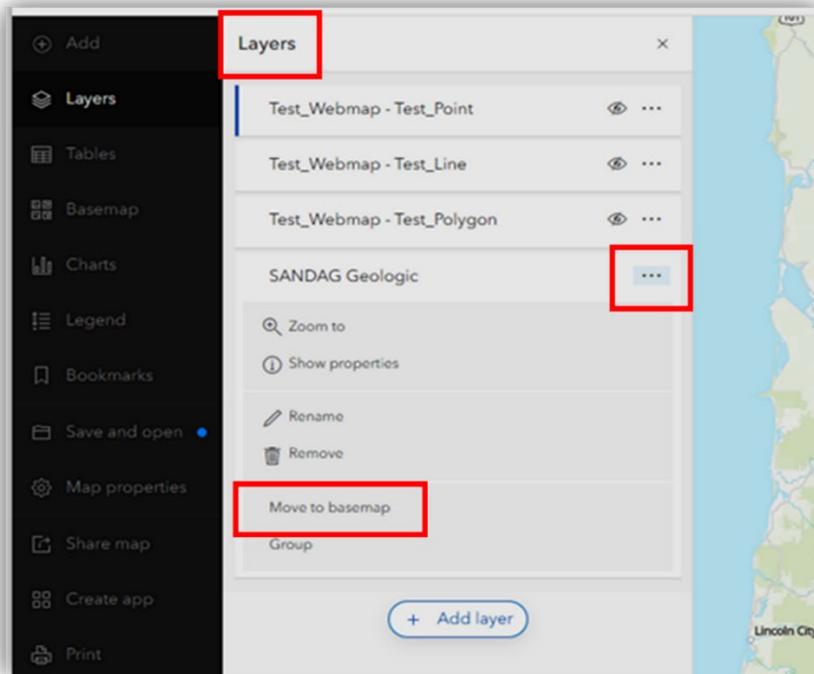
NOTE: Or you can add the hosted tile layer you would like to use to an existing webmap instead of building a new one. This is done using the **add layer** button shown in the map viewer screen caps below and then add the desired vector tile layer to that existing map then follow the instructions to **move to basemap and save**.

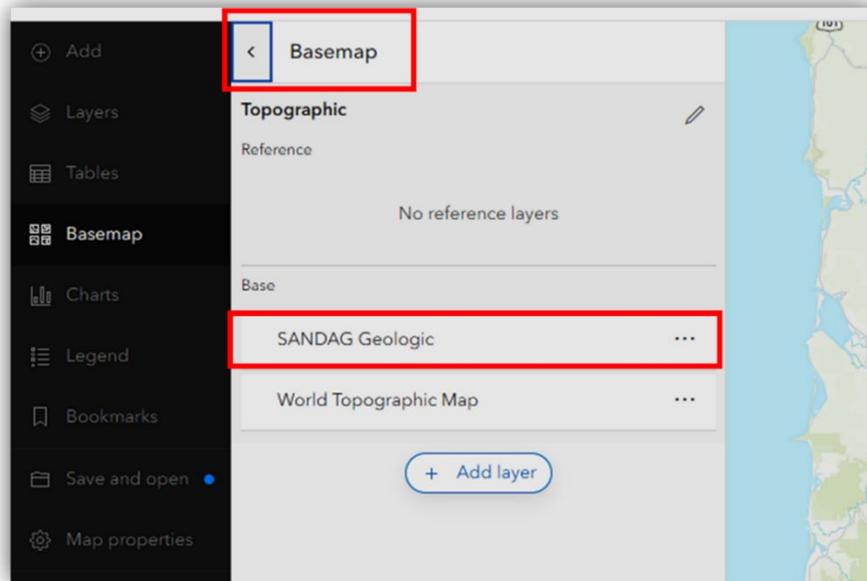*Open in Map View Option on the Layer's Item Detail Page*

The Map View will open listing your Tile Layer under the Layers group. You could build your web map by adding more layers, set map properties and so on (the image below shows three added layers).

Click on the three dots next to your Tile Layer (listed by name only) to open the layer options. Click on the **Move to Basemap** option.

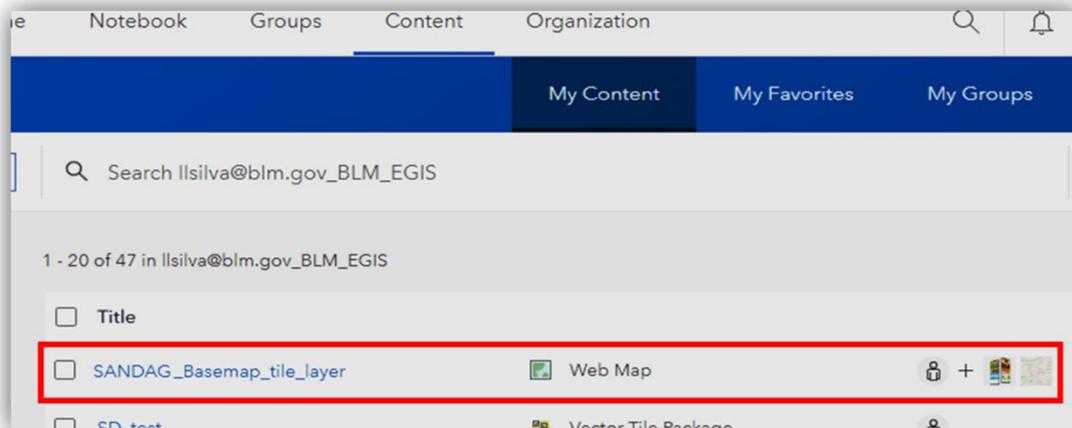*Move to Basemap Option Listed for Layers in the Map Viewer*

By clicking on the **Move to basemap** option, the tile layer will move to the basemap group and will be saved as a basemap in the web map.

The New Basemap Layer Listed in the Basemap Group in Map Viewer

When finished building your web map, save it. Your **web map** will be listed on the content page in AGOL.

Share your Webmap to a group. On the Content page in AGOL, click on the person icon to the right of the **web map name** and **select an organization group to share this web map to.**

Web Map Listed on the Content Page and Shared to a Group; Icon Listed

When you next open the **S1 Mobile Mapper app,** go to download map data, find the group you saved the web map in, and download the web map. Once the download is complete, the vector tile layer will show up as an available basemap in S1.

Side-loading Basemaps into the S1 Mobile Mapper Application

Large Vector Tile Packages (VTPK) can be side-loaded into the S1 Mobile Mapper basemap folder on your device. See the Side-Load Basemaps help doc on the S1 Mobile Mapper website for details on side-loading basemaps to S1.

More Esri Information:

- **Take your Web Maps Offline** - https://www.esri.com/content/dam/esrisites/en-us/media/pdf/implementation-guides/take-your-web-maps-offline-field-maps.pdf
- **Prepare maps for the field with the ArcGIS Field Maps web app** https://resource.esriuk.com/blog/prepare-maps-for-the-field-with-the-arcgis-field-maps-web-app/
- **Configure Maps for the Field** https://www.esri.com/arcgis-blog/products/field-maps/field-mobility/configure-maps-for-the-field/
- **Tutorial: Create an offline map in ArcGIS Pro 2.8** https://pro.arcgis.com/en/pro-app/2.8/help/sharing/overview/create-an-offline-map.htm

S1 Mobile Mapper website