OFFLINE MAPS
for your phone or tablet

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For PATACS + OPCUG
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Why is this topic useful to you?

- If you use your smart phone for navigation in a car, instead of a car GPS receiver.

- If you like to visit national parks or other mountainous rural areas where cell towers are blocked by mountain ridges.

- If cell tower signals are weak, or cell towers are overwhelmed with demand, and you want to speed up response time of a map app.

Gabe Goldberg provided help

- I was not able to identify any map apps providing access to offline maps for iOS.

- I asked Gabe for help to find some, and find some he did!

Agenda

- How smart phone map applications work

- Cell towers are not found everywhere, and other problems

- Map applications that can use free offline maps

- Advantages and disadvantages of offline maps

- How to obtain and install offline maps

- How to use offline maps in a map app

Maps and GPS

- Mapping apps on your phone or tablet depend on **two data sources**:

- **Global Positioning System (GPS) signals** to determine your location. The FCC initiated a requirement known as E911 for all phones to have GPS reception capability, even before smart phones were introduced.

- **Cell tower data** (**or WiFi)** to obtain maps for the region around you.

- When cell tower data service is absent, you will not see maps.

- When cell tower data service is slow, or demand exceeds supply, your maps will update verrrry slowwwwly.

Cell tower data is NOT available everywhere

- Any sparsely populated area, especially away from interstate highways. Do not expect this situation to improve anytime soon.

- **Mountains** – West Virginia, western Maryland, Pennsylvania, Carolinas, Kentucky, Tennessee, Georgia, the Rockies, the Black Hills, the Sierras.

- **Yellowstone National Park**. Cell sites are *intentionally* limited to the Villages (hotel and gas station sites).

- Other national parks.

- Any place where a crowd overtaxes the one and only cell tower.

CAR GPS receivers

- These have offline maps built in, and no need for cell tower access.

- Some people do not want to spend money on a car GPS receiver (typically $100+)

- Some national parks intentionally limit number of cell towers, to avoid impacting the natural scenic beauty.

- I was very glad to have a car GPS receiver when I visited Yellowstone National Park!

What can you do when there is no cell phone data service?

- Use free **Offline Vector Maps**

- **Offline** means stored on your phone

- **Vector** means good sharp detail at any magnification

- Some phone/tablet map apps can display Offline Vector Maps.

- The trade-off: offline vector maps are often BIG FILES

Map Apps
that can use offline maps

- Map apps supporting offline maps fall into 3 categories:

- **FLEXIBLE:** apps that use online maps and any compatible offline maps that you choose to install.

- **OFFLINE-ONLY**: apps that use only offline maps; use the app itself to do the downloading.

- **ONLINE+:** apps that use online maps and permit you to download maps for offline use, again using the app to do the downloading.

Map Apps
that can use offline maps

EXAMPLES OF THE FLEXIBLE APP GROUP:

- **Locus Map:** a versatile general mapping app for Android only.

- **c:geo:** geocaching app, displays a map showing geocache locations. For Android only.

More Map Apps
that can use offline maps

AN EXAMPLE OF THE OFFLINE-ONLY GROUP

- **Maps.me:** offline maps only, for iOS and Android. Works only with maps downloaded using the app.

AN EXAMPLE OF THE ONLINE+ GROUP

- **Google Maps**, for iOS and Android. You can download an save temporarily a map of an area, small or large.

Offline Maps work like online maps

- You can Zoom in and Zoom out.

- You can set the map app can to stay centered on your position and scroll the map automatically as you move along on foot or in your car (or a train, ship or airplane).

- In some map apps, you can create a a track of you travel, including the duration. This is useful for tracking walking pace during a hike.

- In some map apps, you can automatically plan a car travel route.

WHERE TO OBTAIN OFFLINE MAPS

for Locus Map and c:geo

Where to download free offline vector maps

https://bit.ly/2ICoDTq

Use the QR code →

A German Mapsforge mirror site that provides free downloadable maps of US states, US regions, and Canadian provinces.

The maps of regions and provinces are BIG, some are more than 1 GB. The file extension on each is **.map**

Where to download free offline vector maps

Each time you click a map file, it will start downloading. **US-South** and **US-West** are the largest files.

US Regional Maps

Index of /pub/Mirrors/download

Name	Last modified	Size	Description
Parent Directory		-	
canada/	2020-07-17 12:51	-	
greenland.map	2020-07-18 10:19	931M	
mexico.map	2020-02-08 21:11	359M	
us-midwest.map	2020-07-20 18:00	1.0G	
us-northeast.map	2020-07-21 00:30	683M	
us-pacific.map	2020-07-21 04:34	661M	
us-south.map	2020-07-22 08:11	1.7G	
us-west.map	2020-07-23 04:05	1.3G	
us/	2020-07-23 09:44	-	

Scope of US regional offline maps from Mapsforge site

- **US-South:** DE, MD, VA, WV, NC, SC, GA, FL, AL, MS, LA, TX, OK, AR, TN, KY

- **US-Northeast:** PA, NY, NJ, CT, RI, MA, VT, NH, ME

- **US-Midwest:** ND, SD, NE, KS, MN, IA, MI, MO, OH, WI, IL, IN

- **US-West:** WA, OR, CA, NV, AZ, CO, NM, UT, ID, MT, WY

- **US-Pacific:** AK, HI

Make a map storage folder on your Android phone or tablet

- I recommend using micro SD card storage, at least 32 GB. As of April 2021, 32GB micro SD cards cost less than $10.

- When your phone or tablet is connected to a Windows computer, you can **use Windows File Explorer** to create the folder for map storage, and to copy the downloaded offline maps files to that folder.

- Make sure the internal storage or micro SD car has several gigabytes of available space.

- Name folder so that its purpose is *crystal clear.* I named mine **Mapsforge v5 maps.**

Download to your computer, or to your portable device?

- The offline map files are BIG.

- If your computer has an ethernet connection, that will likely download the map files much faster than a download to your portable device via WiFi.

- Then copy the files from the computer to the phone or tablet.

- Also, keeping a copy of each offline map file on your computer is a good backup tactic.

Use Offline maps in map apps
specifically Locus Map and c:geo

Two Steps

These instructions assume you have copied offline maps to a known storage folder on your Android device.

- **Configure** the map app to find offline maps

- **Select** an offline map for use in the map app

Offline Maps in Locus Map

version 4.1.1
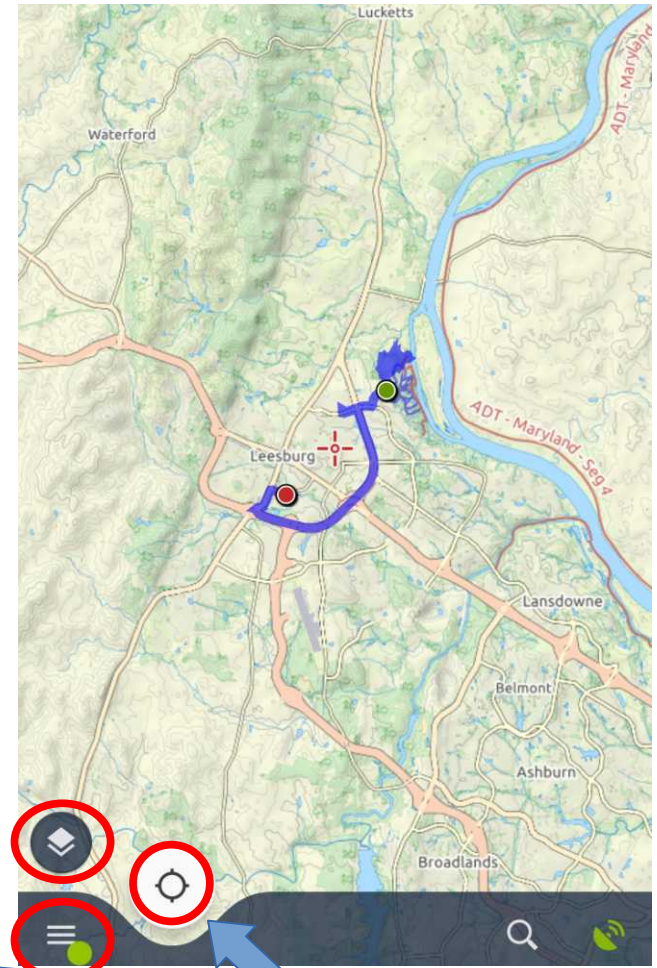
Quick map access icon

Main menu icon

Center Map at My Location icon

Why did I first use Locus Map?

- This app has a feature, **hike tracking**, that I use to record the distance and duration of my hikes, and specific GPS coordinates along the way. It can also be useful to find your way back to your starting point, such as where you parked your car.

- Later, I used another feature of Locus Map to create extensive groups of **Waypoints**, map markers with info on each marked site. These can be found either by browsing the map or by search for a keyword contained in the waypoint.

Locus Map default config
uses *all* offline maps concurrently

- If you travel beyond the border of one offline map, then Locus Map will ***automatically*** switch to the adjacent offline map, assuming you have that adjacent map file in your phone or tablet.

- I turned off that feature temporarily to determine the US states included in each map.

Locus Map configuration

- Locus Map on my smart phone detected the Mapsforge v5 Maps directory for offline maps immediately, with no action on my part.

- This is very convenient.

- On my tablet, I found automatic detection did not happen.

- I had to tell Locus Map where to find offline maps.

Confirm Locus Map has detected offline maps

- Tap **Main menu** icon:
  The Main Menu appears

- In the menu, tap the **Map Manager** icon.
  The Map Manager screen appears, with the ONLINE tab selected by default.

- Tap the OFFLINE tab.
  Offline maps are listed in that tab.
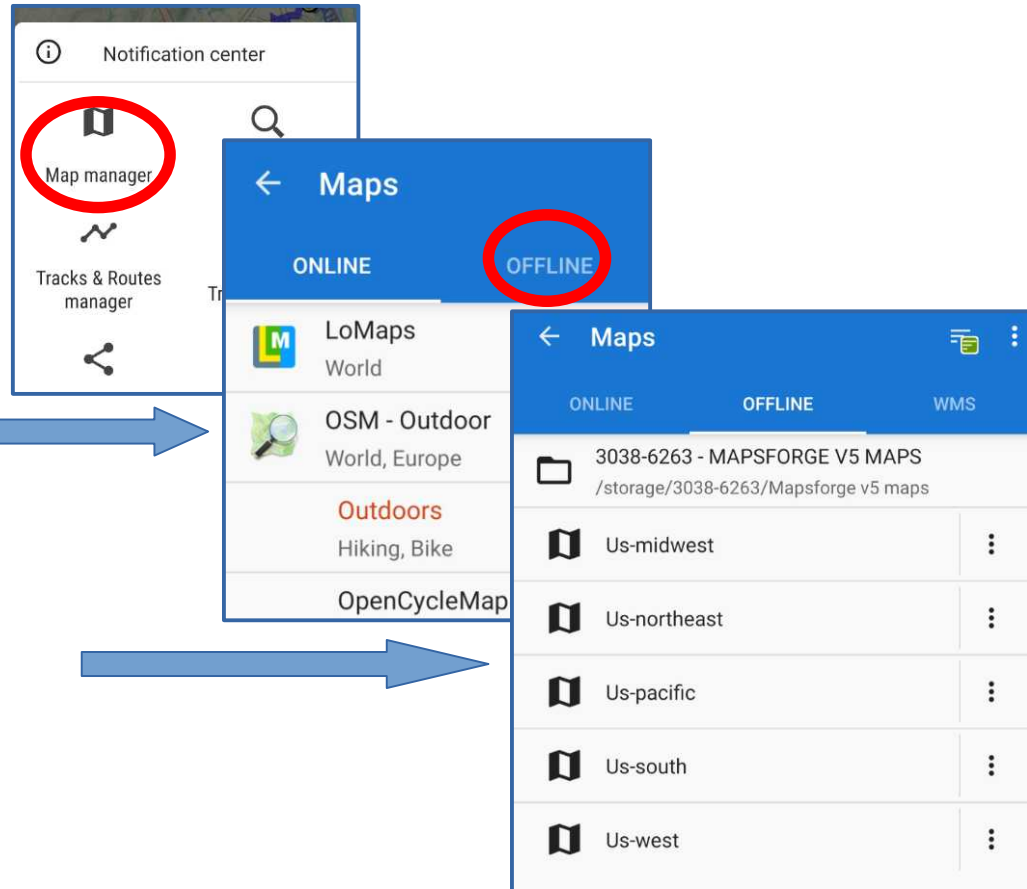
If Locus Map does *not* find offline maps automatically

- No map file will appear in the Offline maps tab.

- Instead, you will see the message "Nothing here yet"

- Tap the **+** icon to browse to the offline maps folder you created
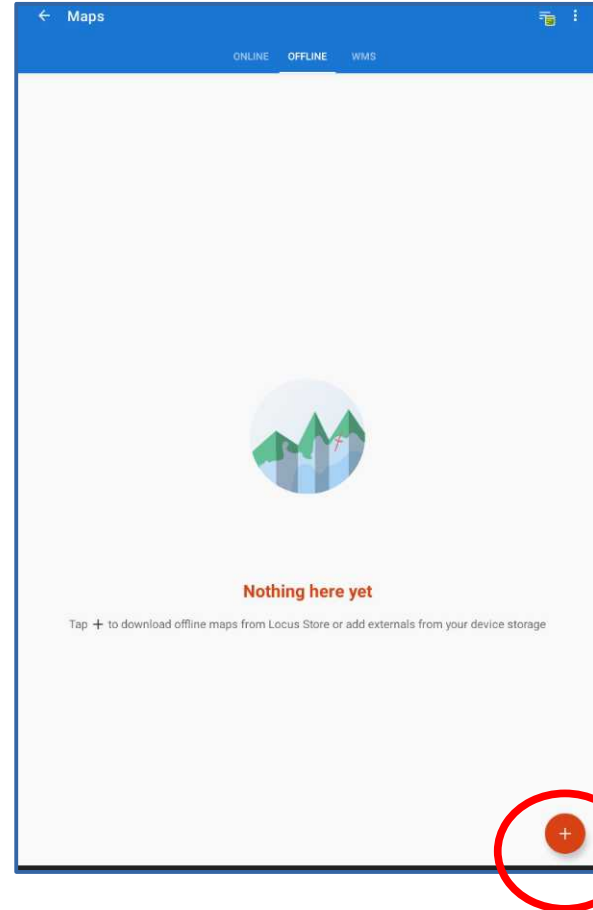
Locus Map: click on External Maps
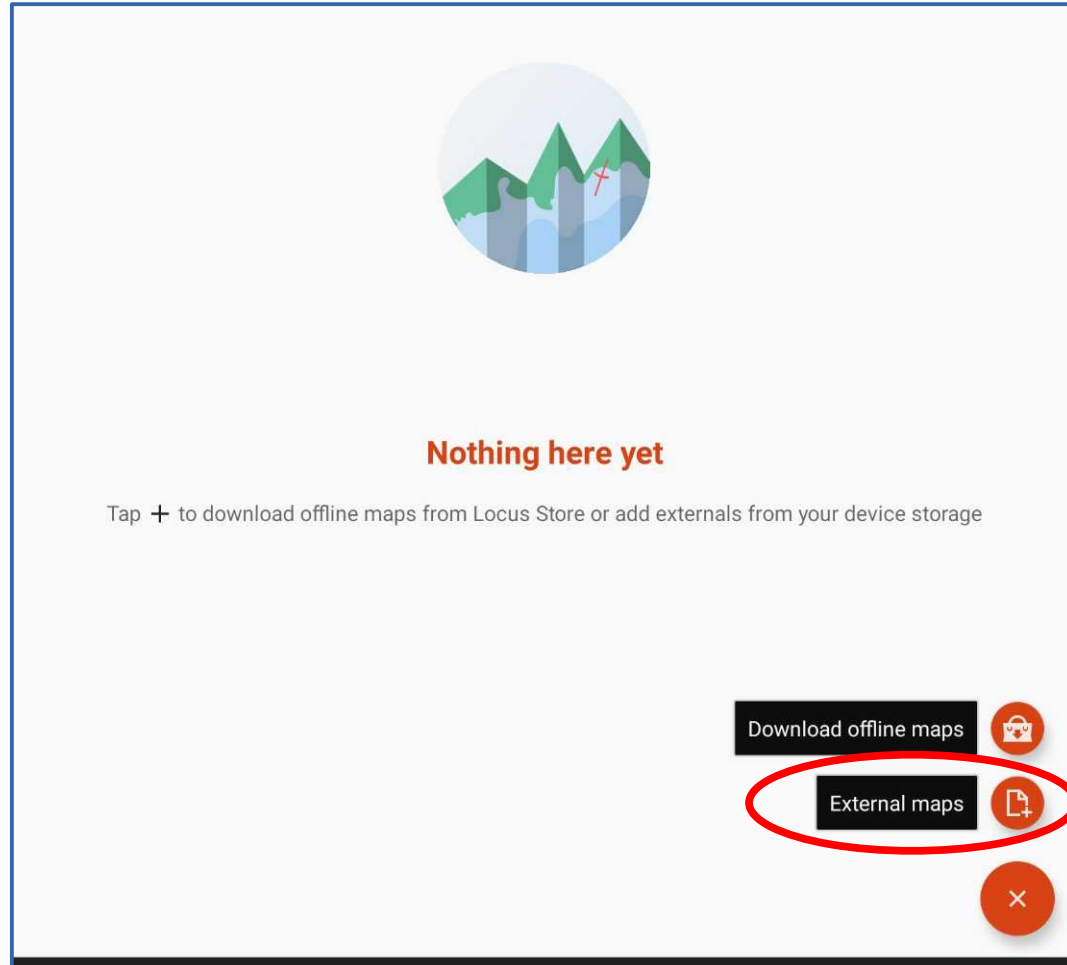
Locus Map: click on + icon
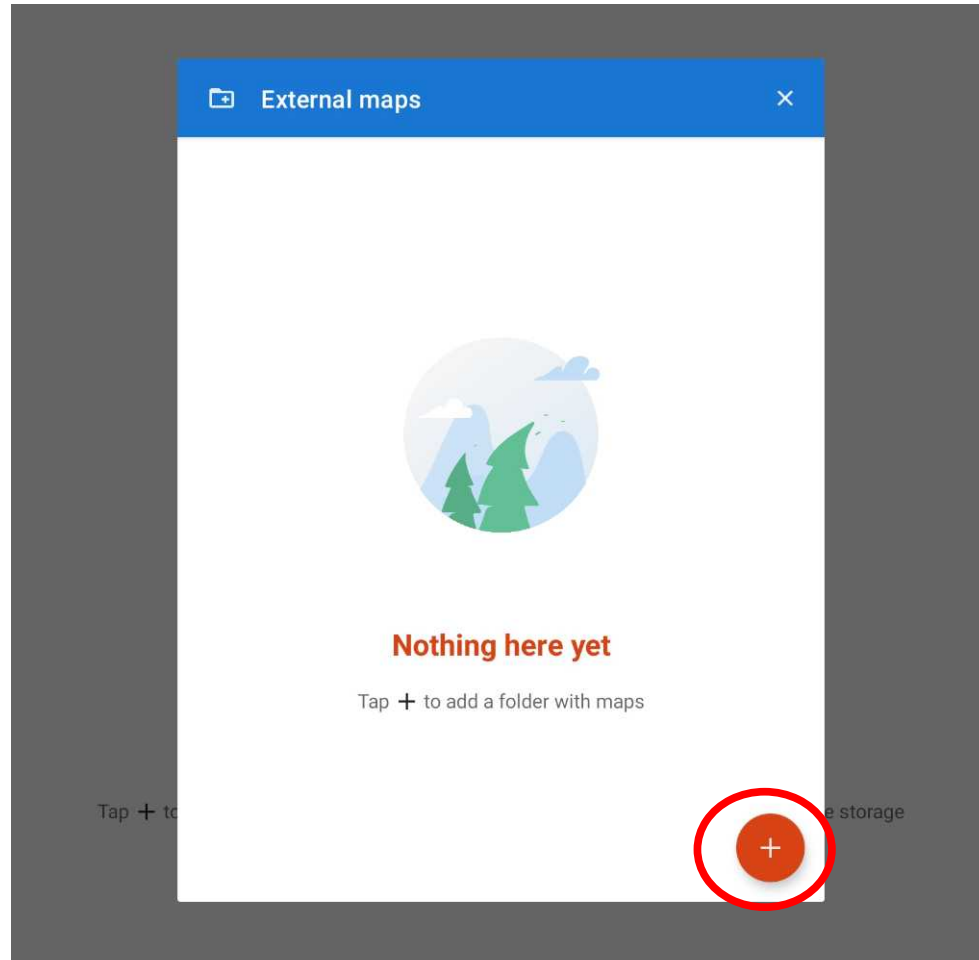
Locus Map: browse to offline maps folder

Assuming your device has a micro SD card installed, Locus Map browser displays a menu with two starting points:
* Internal storage
* SD card
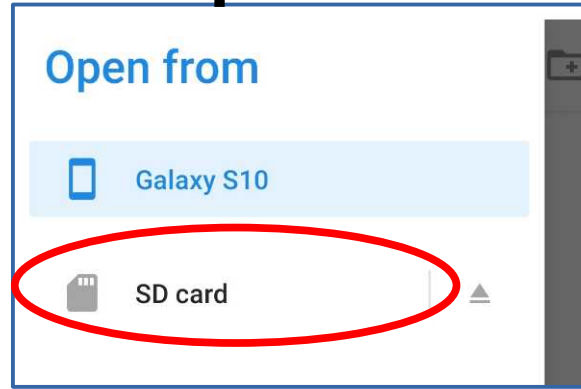
Tap **SD card**

A list of folders appears.
Tap the offline maps folder name.

Open from

Galaxy S10

SD card

← File browser

> STORAGE > FAA0-9BF9

..
One up

Alarms
Dec 6, 2020, 5:41 PM • 0 files

Android
Oct 13, 2019, 1:55 AM • 3 files

Audiobooks
Apr 25, 2021, 9:02 PM • 0 files

DCIM
Nov 16, 2020, 5:13 PM • 1 files

Documents
Apr 25, 2021, 9:02 PM • 0 files

Download
Dec 6, 2020, 5:41 PM • 0 files

GPS waypoints
Dec 10, 2020, 9:01 AM • 2 files

LOST.DIR
Oct 13, 2019, 12:43 AM • 0 files

Mapsforge v5 maps
Apr 18, 2021, 3:30 AM • 9 files

Movies
Apr 25, 2021, 9:02 PM • 2 files

Music
Apr 25, 2021, 9:02 PM • 2 files

Locus Map: when you see the offline map file names

- Tap the Checkmark icon in the lower right corner of the screen (not seen in this screen capture)
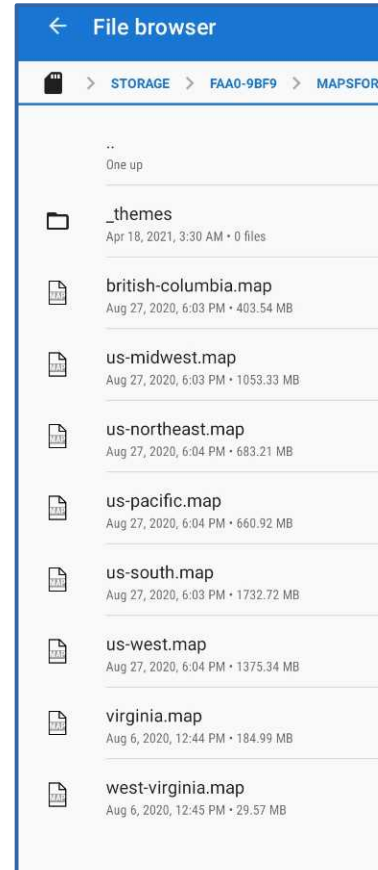
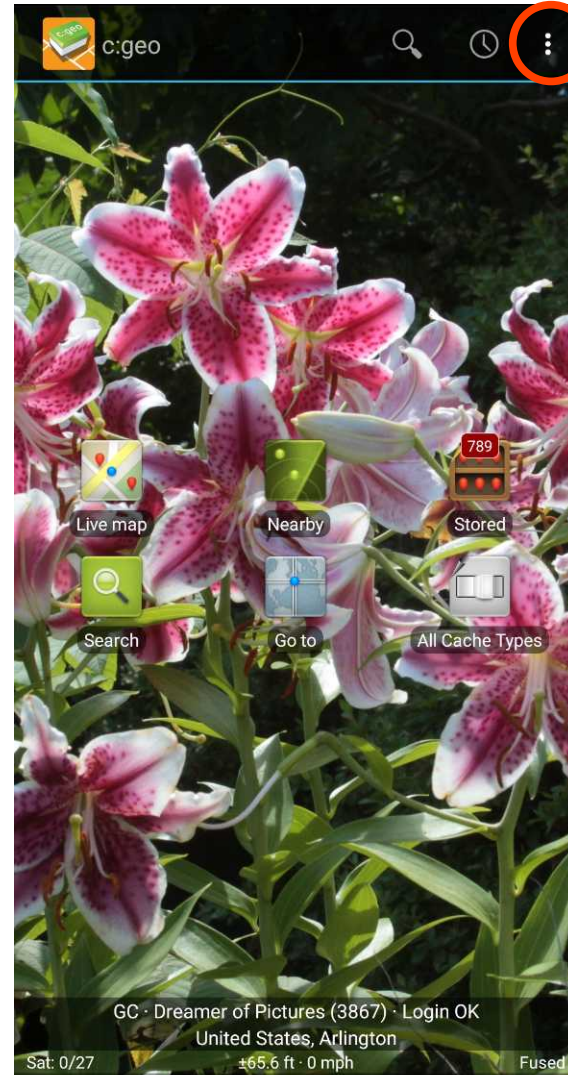# How to select an offline map for use in Locus Map

- Tap **Main menu** icon:
  The Main Menu appears

- In the menu, tap the **Map Manager** icon.
  The Map Manager screen appears, with the ONLINE tab selected by default.

- Tap the OFFLINE tab.
  Offline maps are listed here.
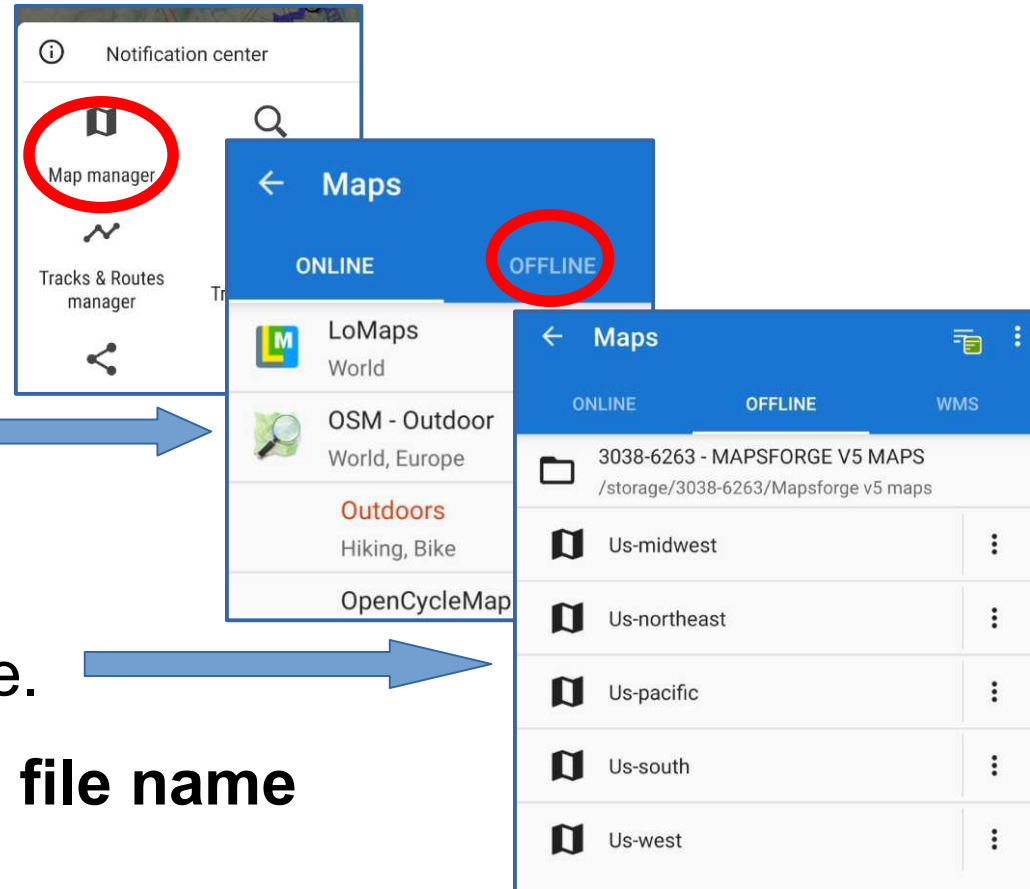
- **Tap any offline map file name to use that map file**

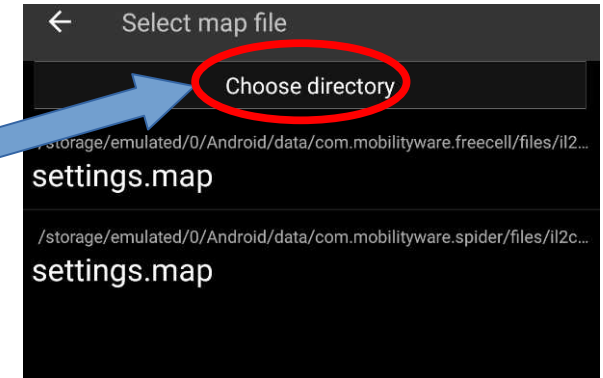# Offline Maps in c:geo

version 2021.04.25

Main Menu icon

Configuring c:geo to access offline maps

- Tap the **Main Menu** icon: the Main Menu appears

- Tap the **Settings** choice: the Settings menu appears

- Tap the **Map** choice

Pocket queries

Settings

Backup / restore

Utility programs

About c:geo

< c:geo Settings

Services
Configure user account informatio
optional services.

Appearance
Configure distance units, languag

Cache Details
Customize the display of cache in

Map
Set map source, offline map settin
details.

Logging
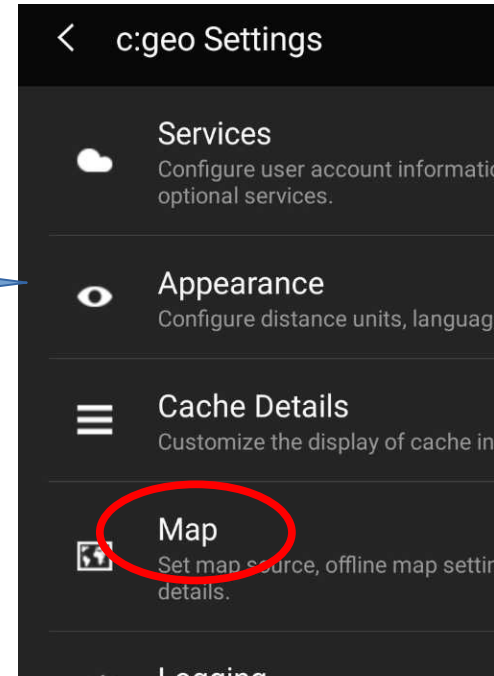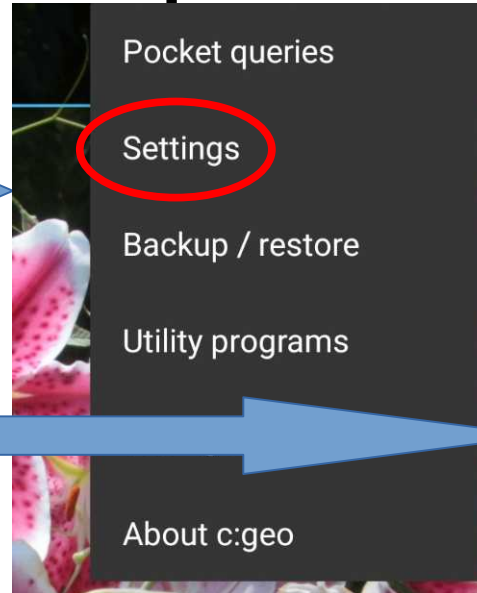
Configuring c:geo to access offline maps

- The Map menu appears.

- In the **Map menu**, tap **Directory with Offline Maps:** Choose Directory appears

- In **Choose Directory**, tap **Choose directory**
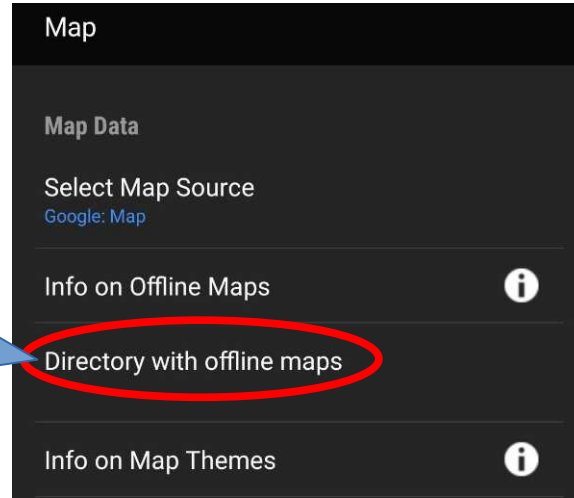
Configuring c:geo to access offline maps

- In the File Browser,

- the default starting point is Internal Storage/cgeo/maps

- If you stored offline maps on the micro SD card, then tap on the **menu icon** at the top left of the screen
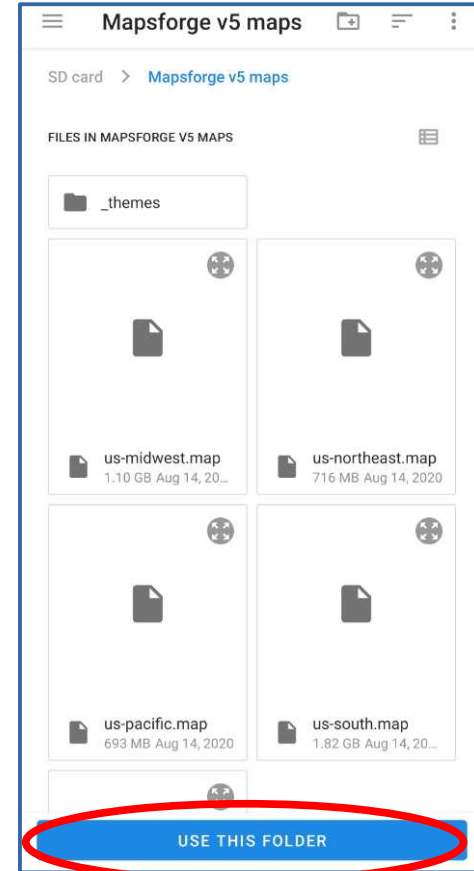
- A menu appears; select **SD card**
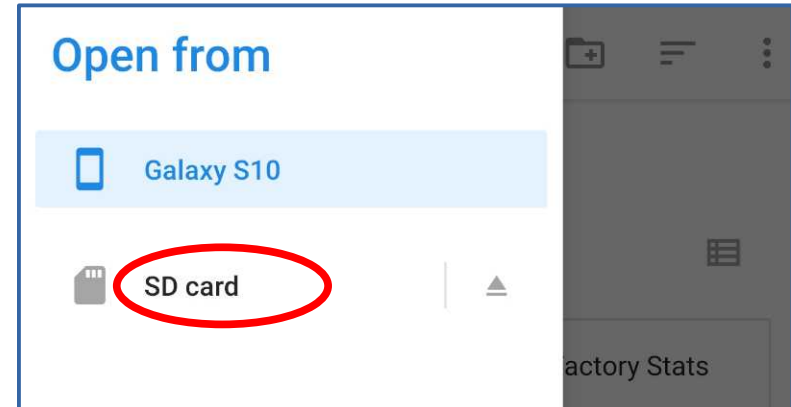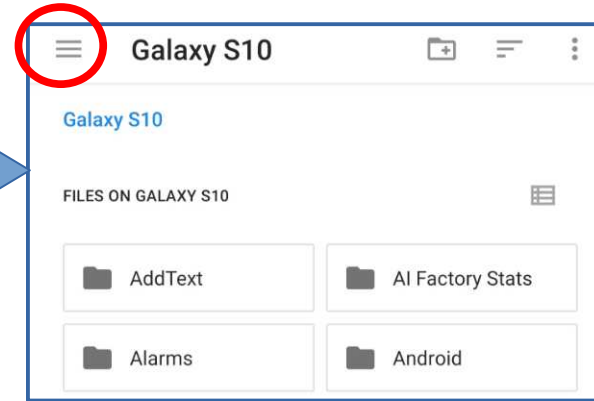
Configuring c:geo to access offline maps
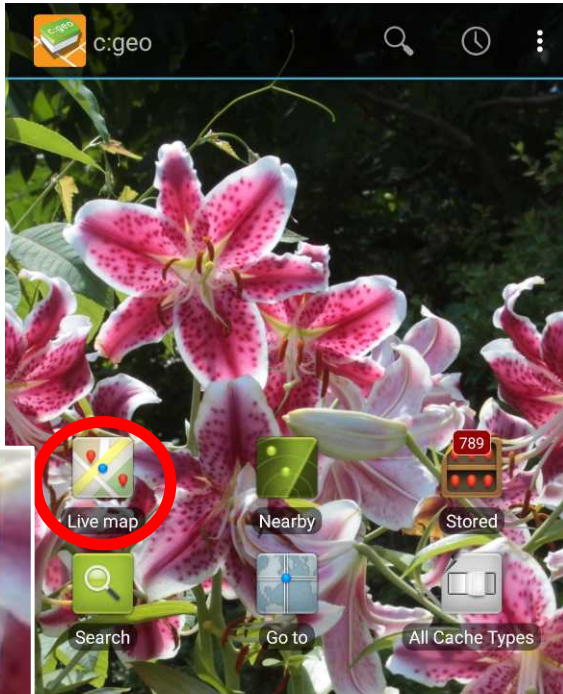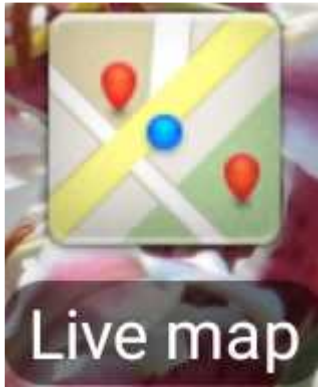
Find and tap the Offline Maps folder you created
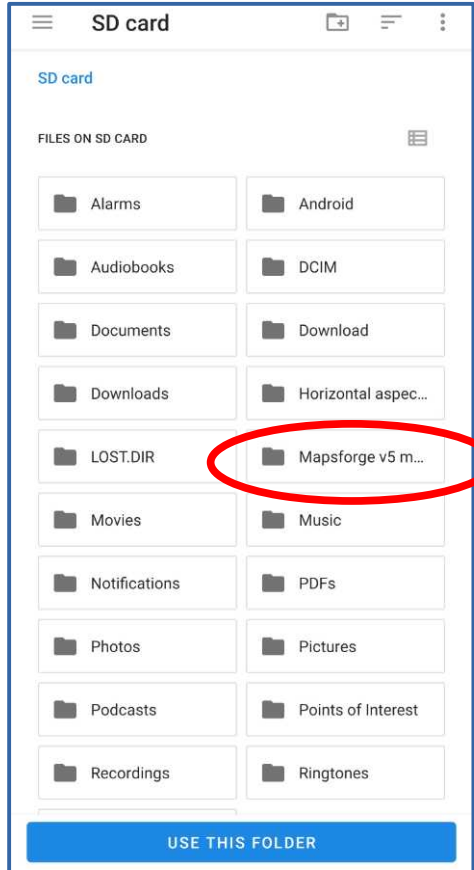
Confirm map files are in the folder; then tap the **Use This Folder** button
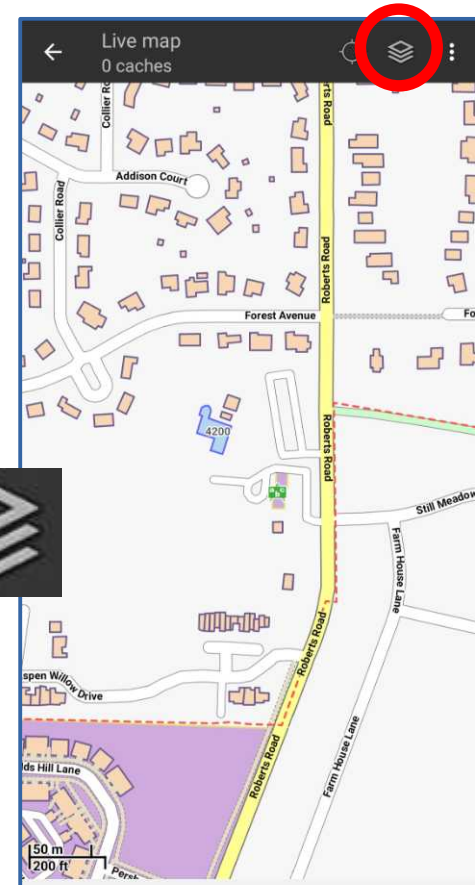
How to Use offline maps in c:geo
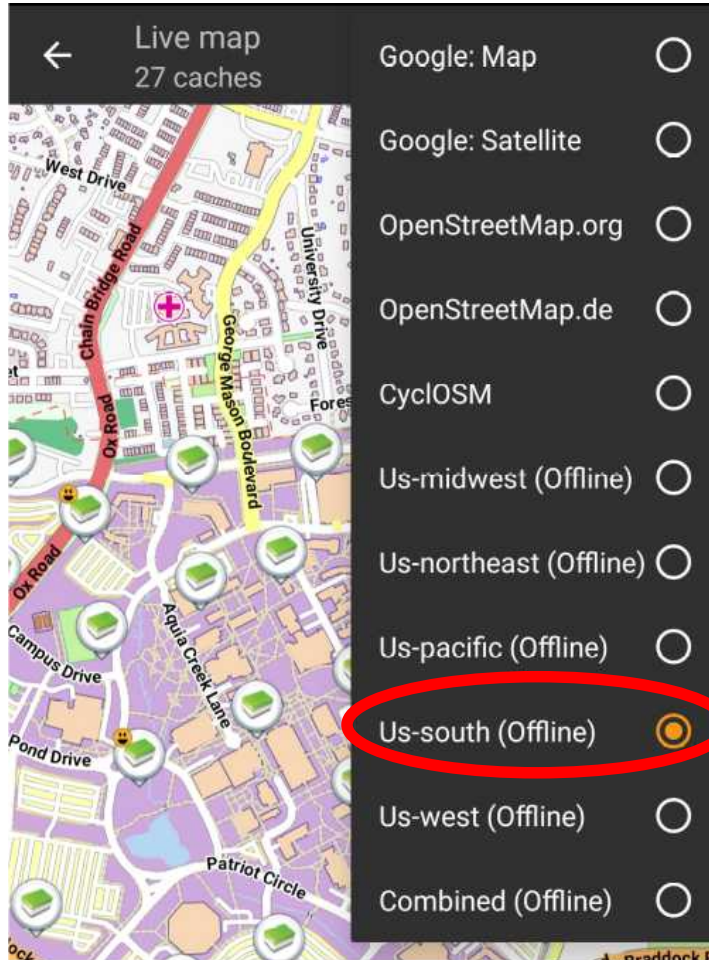
In c:geo, tap the **Live Map** icon

A map appears. Above the map, tap the **Select Map** icon.

How to Use offline maps in c:geo

A menu appears. In the menu, tap the **Map** you wish to use.

The menu closes. The chosen map is displayed.

C:geo does not automatically use all offline maps

- Assume in this example that you start with the US-South map, covering Virginia

- If you travel from Virginia to Pennsylvania, then you will have to switch manually to the US-Northeast map

- If you travel from Virginia to Ohio, then you will have to switch manually to the US-Midwest map

Maps.me
for both Android and iOS

Maps.me

- Uses **OpenStreetMaps (OSM)**, the same data source used by Mapsforge. Its level of ***urban and suburban detail*** seems close to Mapsforge maps.

- It organizes US maps into 185 regions, each with its own map, and will prompt you to download each new region when you move the map there manually.

- The Android version has a Settings option to store maps on a micro SD card.
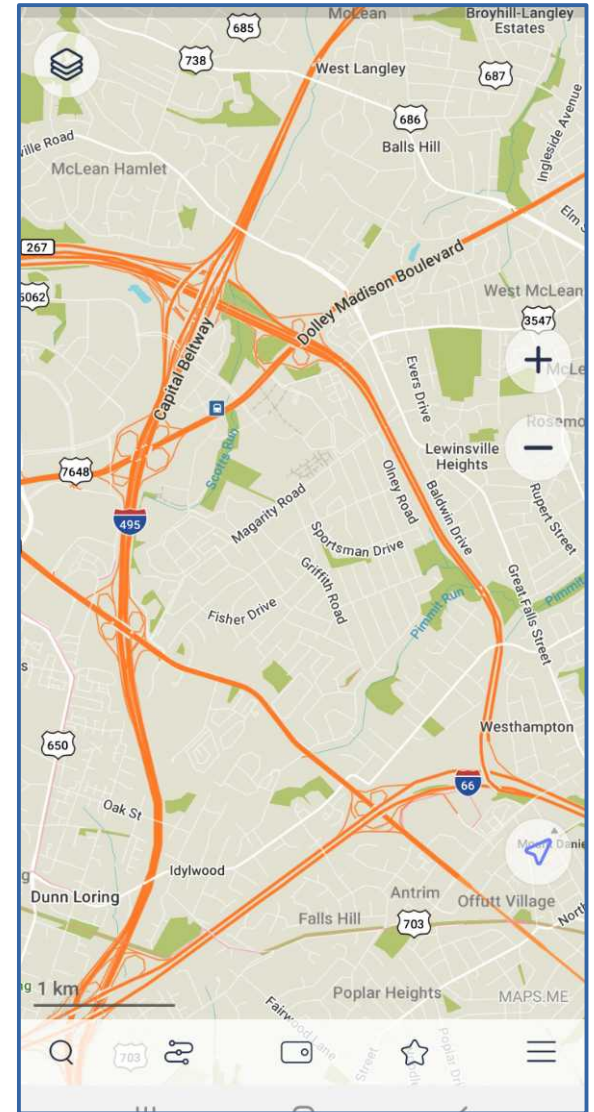
Maps.me features

- Maps.me supports creation of custom waypoints, which the app calls Bookmarks. It has an option to back up bookmarks on the Maps.me server farm, though you can do that on your computer easily.

- Each map needs to be downloaded only once, and will remain on your phone indefinitely. Whenever you need it again, it is there.

- Maps include many cities and other areas world wide.

- In some ways it is the easiest to use of any map app, but it conspicuously lacks a feature of most other maps: a TRACK ME icon, so the map scrolls along as you travel.

Maps.me tradeoffs

- The app does not appear to have an option to use pre-installed offline maps such as the Mapsforge maps.

- Do your downloading on WiFi at home, to avoid impacting the contractual limit on you monthly data usage volume.

- You can download addition map layers, including terrain and Metrorail.

- The Maps.me map for West Virginia lacked both roads and trails that appear on the Mapsforge map.

- The map for my county lacks many but not all of the house numbers.
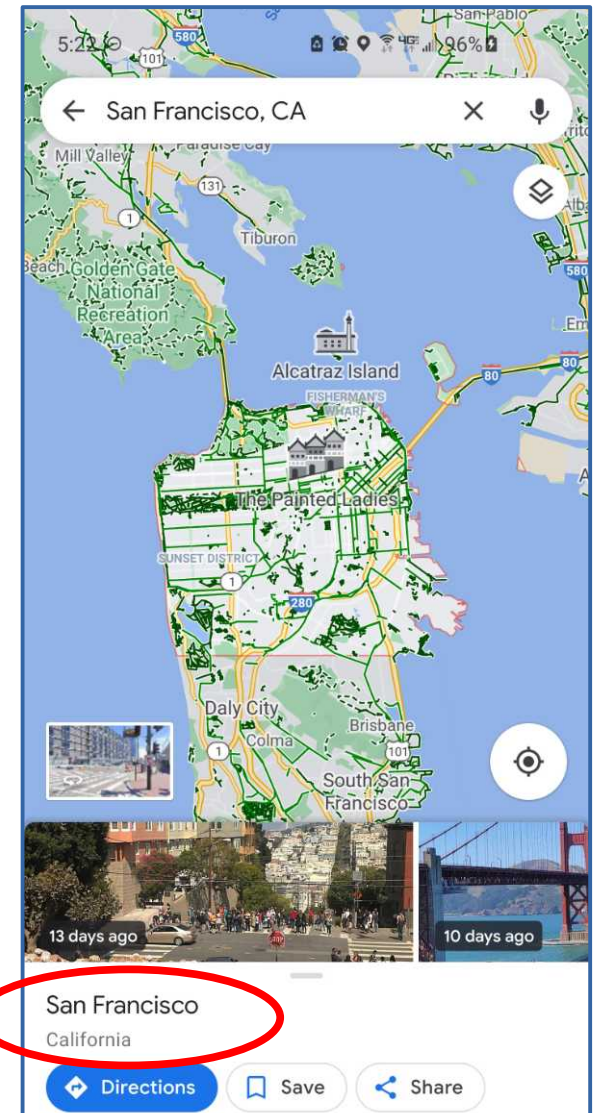
Google Maps

for both iOS and Android

Google Maps

- On both **Android and iOS**, this app does permit local storage of maps for offline use, but only maps downloaded using the app.

- Use WiFi and download in advance, rather than cell tower to download on site.

- Offline maps are *temporary*, with expiration dates, typically 15 days or 30 days. Expired maps are pured by the app, but you can download them again.

- There are some limits on how the app can use offline maps; for instance, no route planning is supported for transit or walking.

Google Maps: Store a map

- Ideally, do this while on WiFi, to avoid impacting your monthly ceiling on cell tower data downloads.

- Search for a specific city or location **by name**

- The location appears on the map, with its name at the bottom left.

- **Tap the location name at the bottom left.**

Google Maps: Store a map

- This screen of map options appears.

- **Tap the Download icon.**

- The screen changes, showing you the amount of space required to store the map offline.

- **Tap the Download button.**
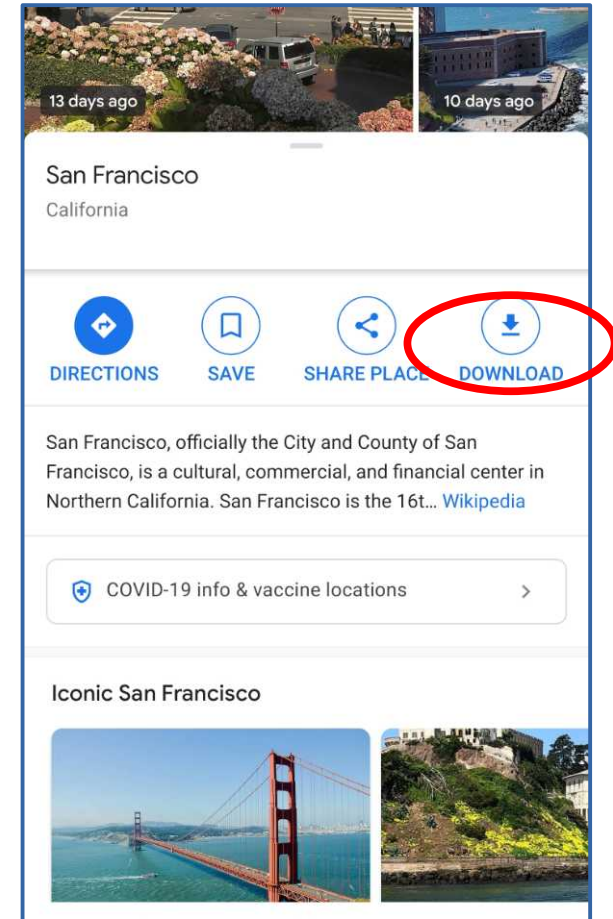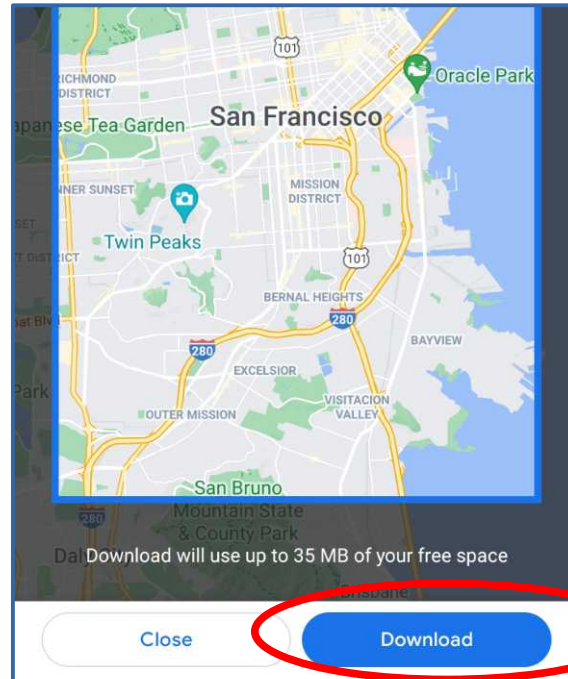
Google Maps: Use a stored map

- Tap the Search field at the top

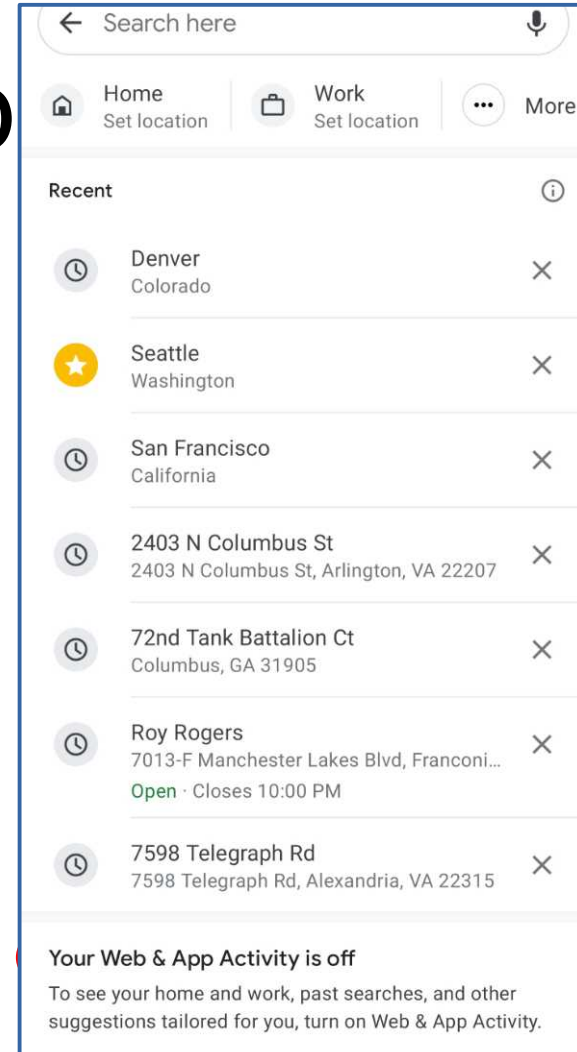- The app displays a list of Downloaded maps and Saved maps like this.

- **Saved maps** are *online only*, and are marked with a Star. ⭐

- **Downloaded maps** are marked with a Clock Face. 🕐

- **Tap a Downloaded map, and it appears.**

THE END