Example Exercise

Your organization may find itself needing to send people to support damage assessment, debris management, shelters, or facilities in an emergency. This is an example activity that can be done to increase awareness of location information.

Exercise Goals

1. Familiarity with common location formats in Emergency Management
2. Quick and accurate transmission of location data over voice and data.
3. Sending locations that can quickly be used in GIS or other applications like SARTopo, Google Earth or GPS Devices.

Outline

1. Execute your local activation plan
2. Conduct a radio net to accept check-ins for participants
3. Give assignments to members or teams.
4. Have member/team take photo at location
5. Have member contact net control when on location and give location over the radio and what they have taken photo
6. Additional assignments may be given
7. Net control will provide a summary of the locations provided by radio report that can be used by GIS staff.
8. End of Exercise

Details

Preparation

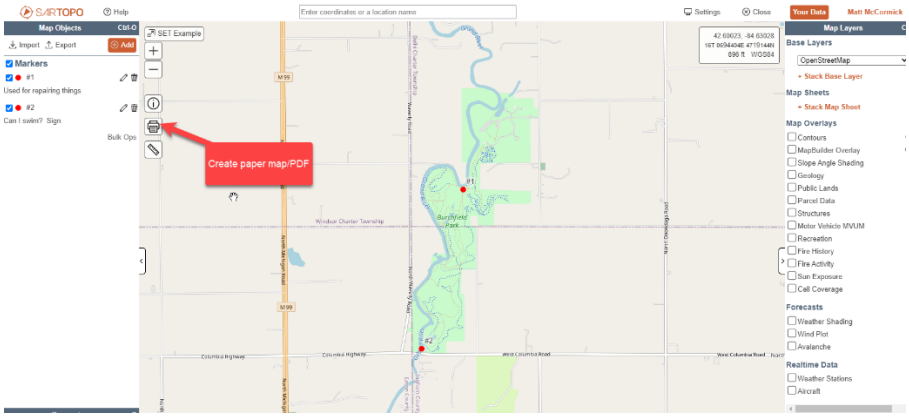
Identify safe and accessible locations to send members/teams. A couple key points:

- No cost to enter. Some parks have entrance fees.
- Safe. Avoid locations on highway or busy roads
- Accessible by car or brief walk
- Should be obvious and match clue/description. Avoid hidden or object obscured by brush.
- Locations should be near your members if possible to avoid lengthy travel

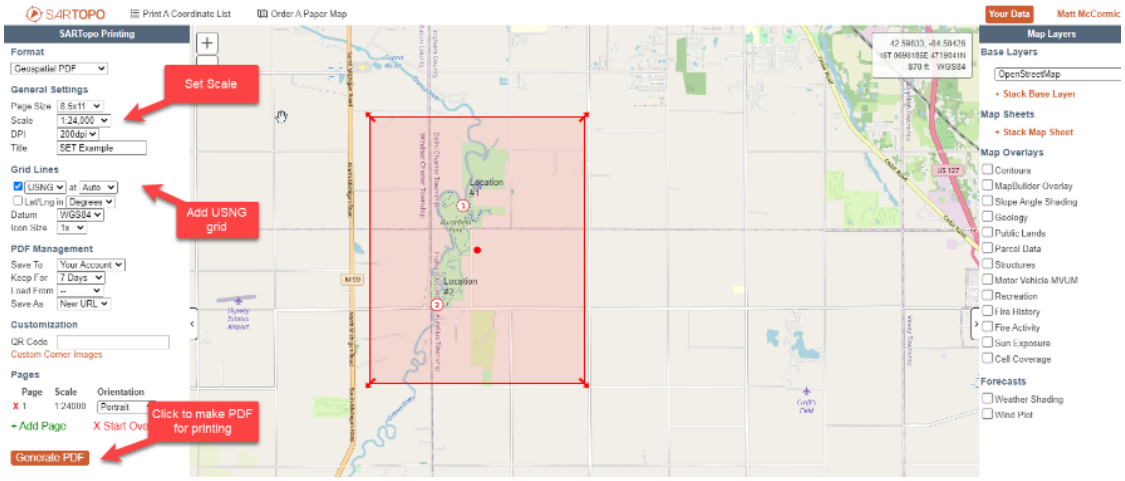
Create a map of locations. SARTopo (https://sartopo.com) is a great planning tool. The free version should let you accomplish this task and even has an easy way to make paper maps. If you have other GIS tools, you may use them instead.

SARTopo Suggested Method:

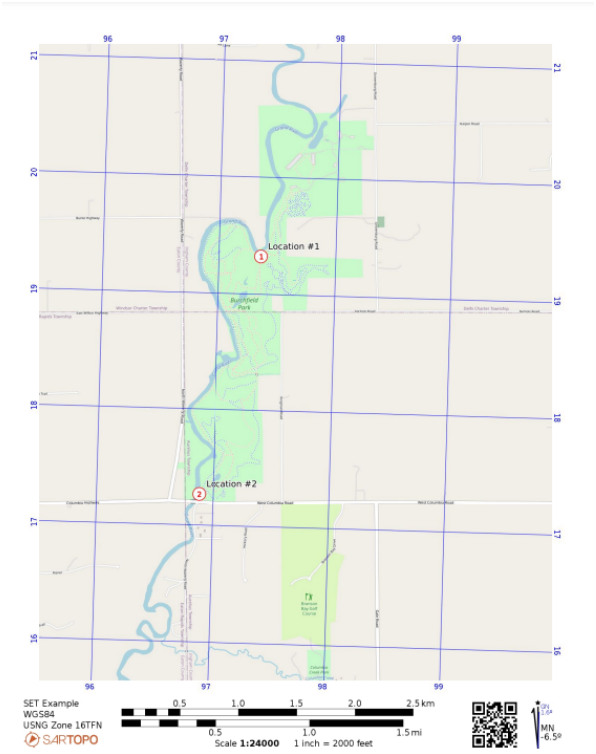
1) Add markers to map. You can right click anywhere on the map, choose the Marker object, and set the coordinates by pasting a latitude/longitude or a USNG coordinate. You can add a tactical label and a description.



2) Print PDF to distribute to members for printing. The key to this is to include the USNG grid and to set scale appropriately. 1:24000 is fairly common and works well for land navigation.

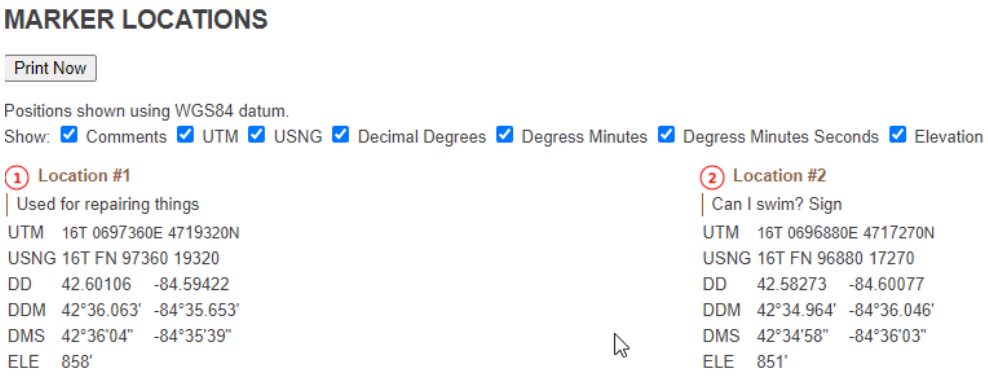


Resulting PDF can be printed or saved to mobile device for use on apps like Avenza PDF.

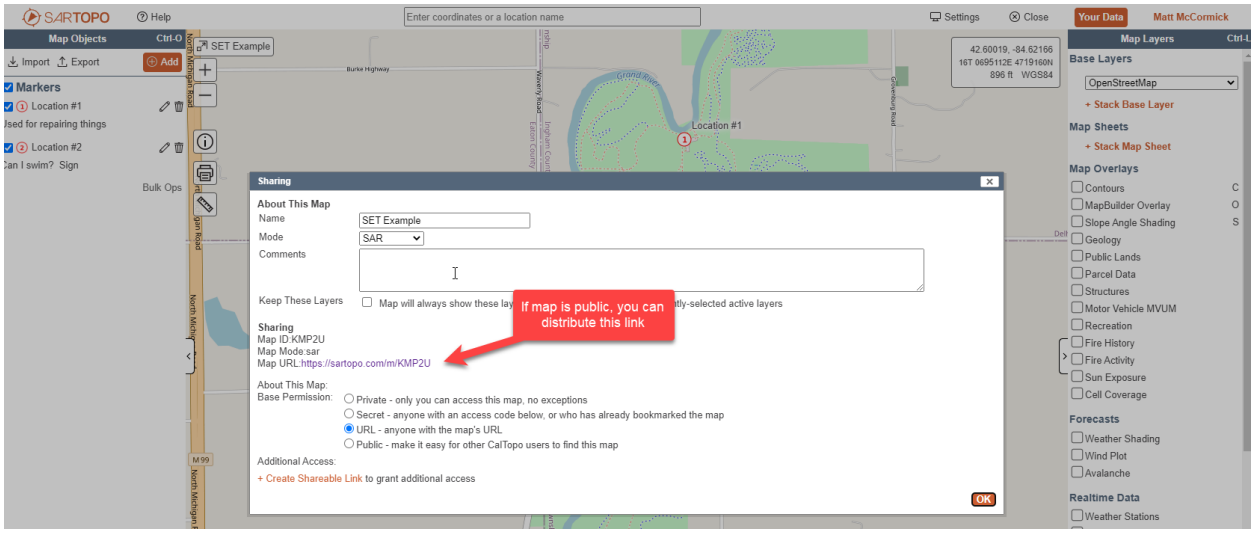


Save the PDF to your local machine. You may choose to email this to members or post in the MI CIMS activity log for the SET incident if one exists.

3) (Optional) Print a Marker List. This will list out the locations you choose and provides the coordinates in several formats for the members. You can choose to provide this to members or not.



4) (Optional) Share map link with members/teams. Members can open on the SARTopo, also known as CALTopo mobile app



This example is available here:

https://sartopo.com/m/KMP2U

Net

Provide a preamble to the net control person. The net control operator will open the net, take checkins, confirm team locations, and conduct checkouts at end of exercise. You can conduct periodic radio checks too.

Members/teams should report location tactical description like Location #1 followed by a description of what they are seeing. If this is correct, net control should advise them to report their location in UNSG format over the radio. Members are encouraged to email or text the location to net control as well but the goal is to transmit over the radio.

The Net Control or assistant/scribe may choose to plot the coordinates on a map to confirm. For example, if using SARTopo, you can add an additional marker and set the coordinates to what was copied from the field's radio report. The location should be fairly close to what was setup otherwise you there may have been a problem in sending/receiving the location.

Net control will want to record a timestamp, callsign, tactical location, and coordinates.

Assignments

Assignments will include address of a publicly accessible facility such as a park and a brief clue of what they are looking for.

Objects could be some sort of easily recognizable landmarks within the facility like a sign, outbuilding, or natural feature like a boulder.

Location 1

Location: Riverbend Natural Area, 6200 Nichols Rd, Holt, MI

Description: Location #1 : used for repairing things

Latitude/Longitude (Decimal Degrees): 42.60106, -84.59422

USNG: 16T FN 97360 19320

Location 2

Location: McNamara Canoe Landing, 6450 W Columbia Rd, Mason, MI 48854

Description: Location #2: Can I swim? Hint: it's a sign.

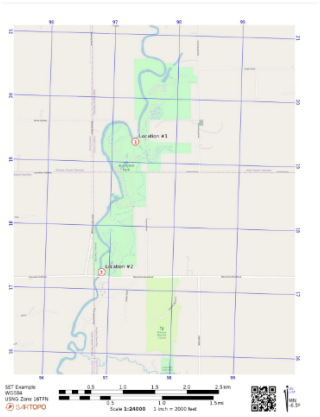
Latitude/Longitude (Decimal Degrees): 42.58273, -84.60077

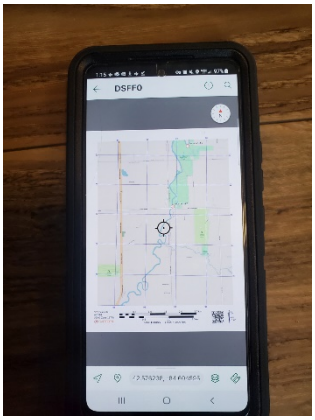
USNG: 16T FN 96880 17270

For those unable to travel, it might be sufficient to report your current location and station status

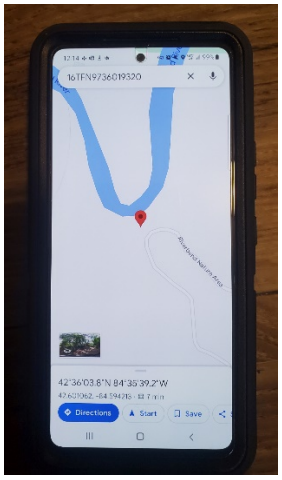
Members/Teams will need to travel to the assigned locations. They can use several methods:

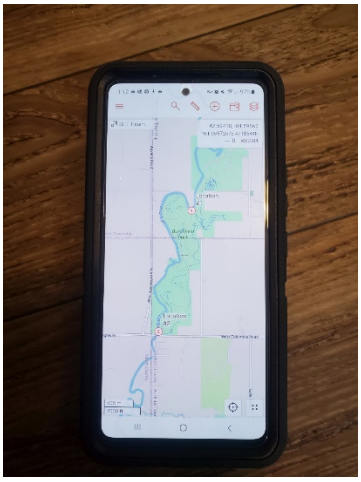
1. Paper maps or geospatial PDF on mobile devices





2. Google Maps or their favorite online mapping application





3. Dedicated GPS devices

Photos

Encourage geotagging of photos if possible. This depends on the camera/phone being used and the settings specific to each device.

Have members take a picture of the assignment and provide that to net control before end of exercise

Location #1

or

Location #2

or

Collect the photos from members using whatever method you prefer.

This is for Net Control or local exercise planners to ensure that the location was indeed found. They do not need to be submitted for the SET. In real world incidents, photos would also accompany excel or csv files.

Reporting location over radio

Once member has arrived at the location, confirm the location over the radio. Have the member report their current location using USNG format. Have them send location over email as well if available.

The user could use a paper map, a GPS device, or a phone app to determine their coordinates. If USNG coordinates cannot be determined, have the member report what they can but tell you it's in a different format.

For example, the user might say something like:

Team #1 has arrived at Location #1. Coordinates are in US National Grid and are as follows:

16T FN 97360 19320 read as:

One Six Tango Foxtrot November Nine Seven Three Six Zero One Nine Three Two Zero

Spaces are not necessary and just help readability. They could even truncate the USNG to less precision. For example, 16T FN 9736 1932 Further simplification is possible too if all the points are within the same 100km square. In this example, the receiver would know all points are in 16T FN and would only require the digits be transmitted.

Location may vary depending on accuracy of devices or person. Within 10m is usually good enough to find a building or person.

Summary

Create a csv or excel file with these columns:

Address, City, State, Zip, Latitude(decimal degrees), Longitude(decimal degrees), USNG, Description

At close of exercise, send this to: <insert DEC name/email>

It is important not to mix locations formats as this can cause trouble for GIS teams who will waste time having to clean the data.

End of Exercise

Make sure all members log out of the net. This helps to ensure safety of all members. Make sure they have returned home safely

Record your activities in the MI CIMS Activity Log if it exists

Resources

USNG

There are many types of coordinate systems each with benefits and drawbacks. FEMA uses the US National Grid (USNG) on paperwork and this format has some benefits on ease of use with paper maps and easy to transmit over radio.

https://www.fgdc.gov/usng/how-to-read-usng

This site has links to lots of training material and tools:

https://usngcenter.org/

Hint: if you remove the spaces from a USNG coordinate, 16TFN9736019320, you can copy and paste into Google Maps and it will display.

SARTopo

You can collaborate on web maps with other people and even create paper maps with USNG coordinate grids for navigation for free. The free version is sufficient for this exercise. RACES cards can be used to get discounted upgrades if interested.

https://sartopo.com

This platform is also known as CALTopo. The SARTopo applications has all features of CALTopo but includes additional tools for Search and Rescue operations/planning.

https://caltopo.com

SARTopo/CALTopo Mobile App

Android: https://play.google.com/store/apps/details?id=com.caltopo.android&hl=en_US&gl=US

IOS: https://apps.apple.com/us/app/caltopo/id1460038458

ArcGIS Online

Many county and State Agency GIS departments utilize this application. Your agency would have to provide access.

Avenza PDF

This app can be loaded on to mobile devices to use the “geospatial” pdf features. Free version is sufficient for the exercise.

iOS and Android links available at: https://www.avenzamaps.com/

Hint: On your mobile device, Avenza may ask you to sign-in. You can close the sign-in page to open the PDF without signing in.

Frequently Asked Questions

Q: Why do you use USNG instead of UTM format?

A: Nothing wrong with UTM format. Some teams find it easier to use. We opted for USNG as its common in emergency management

Q: What about What Three Words?

A: What Three Words is a relatively new format, https://what3words.com/. Some public safety answering points (PSAP) or 911/Dispatch do accept this format. It is a proprietary format and could cause confusion transmitted over the radio if not spelled correctly. It also does not work well in geocoder tools used by GIS departments.

For example:

Location#1: ///unique.recliner.entered

Location#2: ///glided.nightfall.microchip

Q: Why not use the maidenhead format that many amateur radio operators are familiar with?

A: Nothing wrong with the format. It is not a common format outside of amateur radio which becomes an issue when working with various public safety agencies and GIS departments.

Q: What about datums?

A: If not specifically listed, assume WGS 1984

Q: Is there any help available?

A: Contact Matt McCormick, KE8CRV KE8CRV@gmail.com from Ingham County ARPSC