Bad Elf GNSS Unit Training Exercise

Training Goals

- Read updated guidance for Status & Trend Network location data collection.

- Prepare your mobile device (tablet / phone) for navigation and data collection.

- Connect the Bad Elf GNSS unit to your mobile device and inspect GNSS unit settings.

- Set the Bad Elf GNSS unit as the location provider for the ArcGIS Field Maps and ArcGIS Survey123 applications.

- Practice Navigation - Use the Field Maps application to navigate to the GNSS training site located at your field office.

- Practice Data Collection - Use the Survey123 application to collect location data at the training site.

- Practice Backup Option for Offline Navigation - Use the "Organic Maps Offline Hike Bike" application to navigate to the GNSS training site located at your field office.

Training Part 1 – Preparation

Training Part 1 may be performed indoors. A cellular data or Wi-Fi connection is required.

1. Locate the Watershed Monitoring Section GNSS Basics Manual, June 2024 version (GNSS Manual). Read this document to learn about the Bad Elf GNSS Units and how they will be used for Status & Trend Networks location data collection. This document provides detailed instructions for completing all components of this training exercise.

   https://publicfiles.dep.state.fl.us/dear/DEARweb/WMS/Reports_Docs_SOPs/Standard%20Operating%20Procedures/GPS%20Manual/WMS-GPSBasicsManual.pdf

2. Prepare the Bad Elf GNSS unit. (GNSS Manual p. 4)

   - Ensure that the unit's battery is charged.

   - Review the guidance for powering on/off, understanding indicator lights, antenna orientation, and weather conditions.

3. Prepare your mobile device.

   - Install the following applications: Bad Elf Flex; ArcGIS Field Maps; ArcGIS Survey123; Organic Maps Hike Bike. (GNSS Manual p. 3)

   - Prepare ArcGIS Field Maps content. (GNSS Manual p. 22)

     o Sign-in using your ArcGIS Online credentials.

     o Locate the Status and Trend Networks Navigation Map.

- o Add offline areas if you will be navigating without a reliable cellular data connection.

- Prepare ArcGIS Survey123 content.

  - o Sign-in using your ArcGIS Online credentials.

  - o Download the "FL DEP Status and Trend Networks – Surface Water" and "FL DEP Status and Trend Networks – Groundwater" surveys.

- Prepare Organic Maps content. (GNSS Manual p. 26)

  - o Download the maps for your field sampling areas.

  - o Download the KML NAV file for GNSS Training. Unzip the downloaded file. Import the KML file into the list of bookmarks in Organic Maps.

    https://publicfiles.dep.state.fl.us/dear/Watershed%20Monitoring/GPS_KML_NAV_FILES/

Training Part 2 – Connect GNSS Unit to Mobile Device

Training Parts 2-6 must be performed outdoors.

1. Power on the GNSS unit and mobile device.

2. Establish Bluetooth connection between GNSS unit and mobile device. (GNSS Manual p. 6)

3. Use the Bad Elf Flex application to adjust GNSS unit settings. (GNSS Manual p. 9)

   - Check data transmittal (NMEA) settings.

     Bluetooth / NMEA settings -> Default NMEA output -> GNSS, with sats

   - Check GNSS engine settings.

     GNSS Engine Settings -> GNSS Simulation -> GNSS Simulation Disabled

   - Check settings for units displayed.

     Display settings -> Coordinates -> decimal seconds

     Adjust units for distance and speed according to your preference.

   - Check the GNSS unit firmware version. (GNSS Manual p. 16)

     Firmware version 1.0.28 build 1255 or later must be installed. Contact the WQMP GNSS Coordinator if a build number lower than 1255 is displayed.

4. Use the Bad Elf Flex application to inspect the GNSS Fix and Satellites. (GNSS Manual p. 15, 17)

   - Confirm that you are able to obtain an SBAS GNSS fix.

Reminder – Do not close the Bad Elf Flex application. This application must be kept open in the background while the GNSS unit is in use.

Training Part 3 – Set Location Provider

Training Parts 2-6 must be performed outdoors.

1. Open the ArcGIS Field Maps application and adjust the location provider settings (GNSS Manual p. 19)

    -   Add the Bad Elf GNSS unit to the list of providers.

    -   Select the Bad Elf GNSS unit as the location provider and confirm the anticipated antenna height if prompted.

2. Open the ArcGIS Survey123 application and adjust the location provider settings (GNSS Manual p. 28)

    -   Add the Bad Elf GNSS unit to the list of providers.

    -   Select the Bad Elf GNSS unit as the location provider and confirm the anticipated antenna height if prompted.

Training Part 4 – Practice Navigation

Training Parts 2-6 must be performed outdoors.

1. In ArcGIS Field Maps, open the Status and Trend Networks Navigation Map. (GNSS Manual p. 22).

2. Practice using the map tools (GNSS Manual p. 23-24).

    -   Use the layers tool to confirm that the "GNSS Training Exercise – June 2024" layer is visible.

    -   Use the legend tool to view the symbology for all visible layers.

    -   Practice using the search tool. Type "Training" to see a list of all GNSS training sites.

3. Practice using navigation tools. (GNSS Manual p. 24)

    -   Select the GNSS Training site for your field office and navigate to the site. If you encounter any safety concerns or major barriers to navigation, please select an alternate location for navigation practice.

    -   Select "Directions" to open driving directions in Google Maps / Apple Maps.

    -   Select "Compass" for straight-line directions in the Field Maps application.

Training Part 5 – Practice Data Collection

Training Parts 2-6 must be performed outdoors.

1. After navigating to the selected site, click the "Open in Survey123" link in the Field Maps site pop-up window.

2. In Survey123, confirm that the FL DEP Status and Trend Networks – Surface Water form has opened and information about the selected station has been loaded into the form.

3. Complete all questions in the Survey123 form for the training site visit and submit the survey response. (GNSS Manual p. 32) (Tallahassee WMS staff will review the location data collected.)

   - Monitoring Network = Training

   - RQ = NA – No Lab Data

   - Location Data Collected = Yes

   - Water Level = Normal; Flow = N/A; Tidal = No

   - Field Measurements; Water Sample Collected; Sediment Sample Collected; Bioassessment Performed = No

   - QA/QC Blank Collected = N/A

Training Part 6 – Practice Backup Option for Offline Navigation

Training Parts 2-6 must be performed outdoors.

1. In the Organic Maps Hike Bike application, open the bookmarks menu and select the list for GNSS Training (list was imported in Training Part 1 above). Select the training site for your field office. (GNSS Manual p. 27).

2. Practice using navigation tools. (GNSS Manual p. 27)

   - Within the pop-up window for the site, select "Route To" for driving directions or straight-line directions.

   - Within the pop-up window for the site, select the arrow & distance icon to navigate using a distance and compass bearing display.

If you encounter difficulty completing the training exercise or have questions, please contact DEP WQMP staff:

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