SiliconSneaker2 User Documentation v0.14.0-beta

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1. Program Purpose

The purpose of this program is to display graphs, a map, and summary information for activities generated by a GPS watch that stores files in the Fit Format.

Most Garmin watches and several other brands support the FIT format (ref: https://medium.com/decathlondigital/gpx-tcx-fit-how-to-choose-the-best-file-extension-for-sport-activity-transfer-403487337c04).

1.1. Feature Summary

- Trend graphs of pace, cadence, heartrate, altitude, temperature are provided.
- A map indicating position is provided via a GPS generated path. Multiple map tile sources are supported.
- Zoom functions for the graphs and map.
- Support for multiple unit systems is provided.
- Individual measurement readings and position can be displayed in the graph and on the map.
- Text report on numerous measurements on a per-lap and per-activity basis.
- Available in English, French and Spanish.
- The program is GPL licensed and open-source.

1.2. History

SiliconSneaker2 is a new iteration of the original SiliconSneaker program rewritten in the Rust programming language. It retains much of the flavor of the original but makes some new design choices.

Figure 1. SiliconSneaker2's graphical user interface on Linux

2. Installation

Before you can start using SiliconSneaker2, you have to make it available on your computer.

There are a number of prerequisites in order to use this application.

- Builds are available for 64-bit versions of Microsoft Windows (10 and above). Linux must currently be built from source. MacOS/OSX builds are not available or supported.
- A 64-bit Intel-compatible processor with approximately 300MB of free disk space and 300MB of available RAM free for the program.
- Administrator/root privileges are necessary for installation.
- A functioning Internet connection is necessary to view the map portion of the application.
- A USB port to transfer .FIT files to the PC or a means to download from an online service.
- Drivers
  - Windows: Devices that support the USB protocol are often recognized automatically on Windows after it downloads the appropriate drivers.
  - Linux: Most newer kernels contain the GARMIN_GPS module as a driver. In addition to this, in order to affect transfers, the media transfer protocol (MTP) must be installed. For example on Debian Linux: sudo apt install libmtp-runtime

The latest release builds are available for download here:

https://github.com/cprevallet/siliconsneaker2/releases

SiliconSneaker2 is open source software. The actual program code for this software to view and modify is online at Github.

https://github.com/cprevallet/siliconsneaker2

SiliconSneaker2 is currently only offered as an unsigned binary (a signing certificate costs money which is a problem for a small hobby project). As a result, when installing and running the program under Windows, Windows Defender will issue a warning about an unrecognized app. If you have downloaded this from Github, it should be safe to ignore this warning. Click "More Info" and "Run" to start SiliconSneaker2.

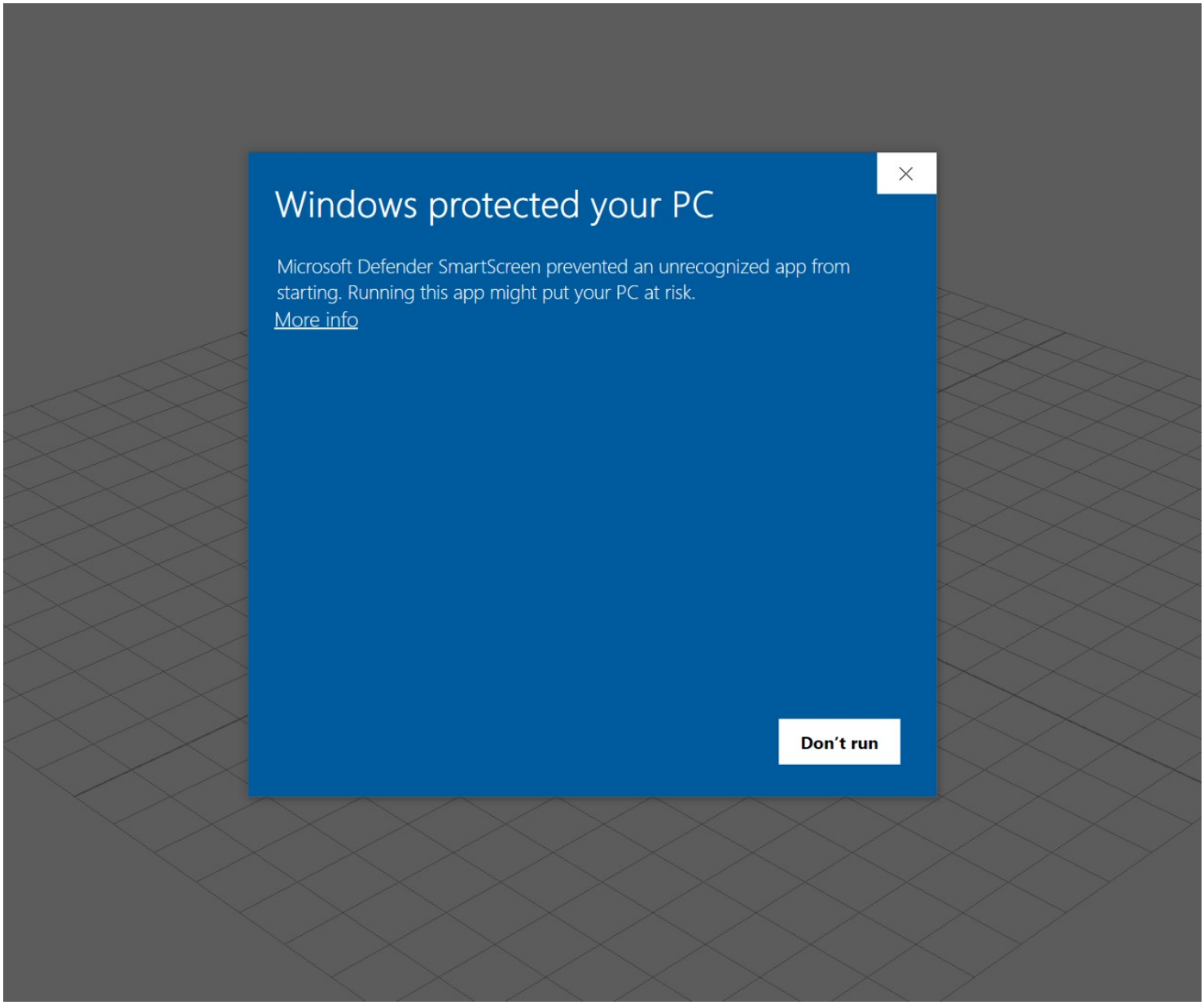

Figure 2. Windows Defender warning about an unrecognized application.

2.1. Installing on Windows(64 bit)

As of this writing, there is a graphical installer available. Download it from the source (Github) and double-click on the setup routine to start.

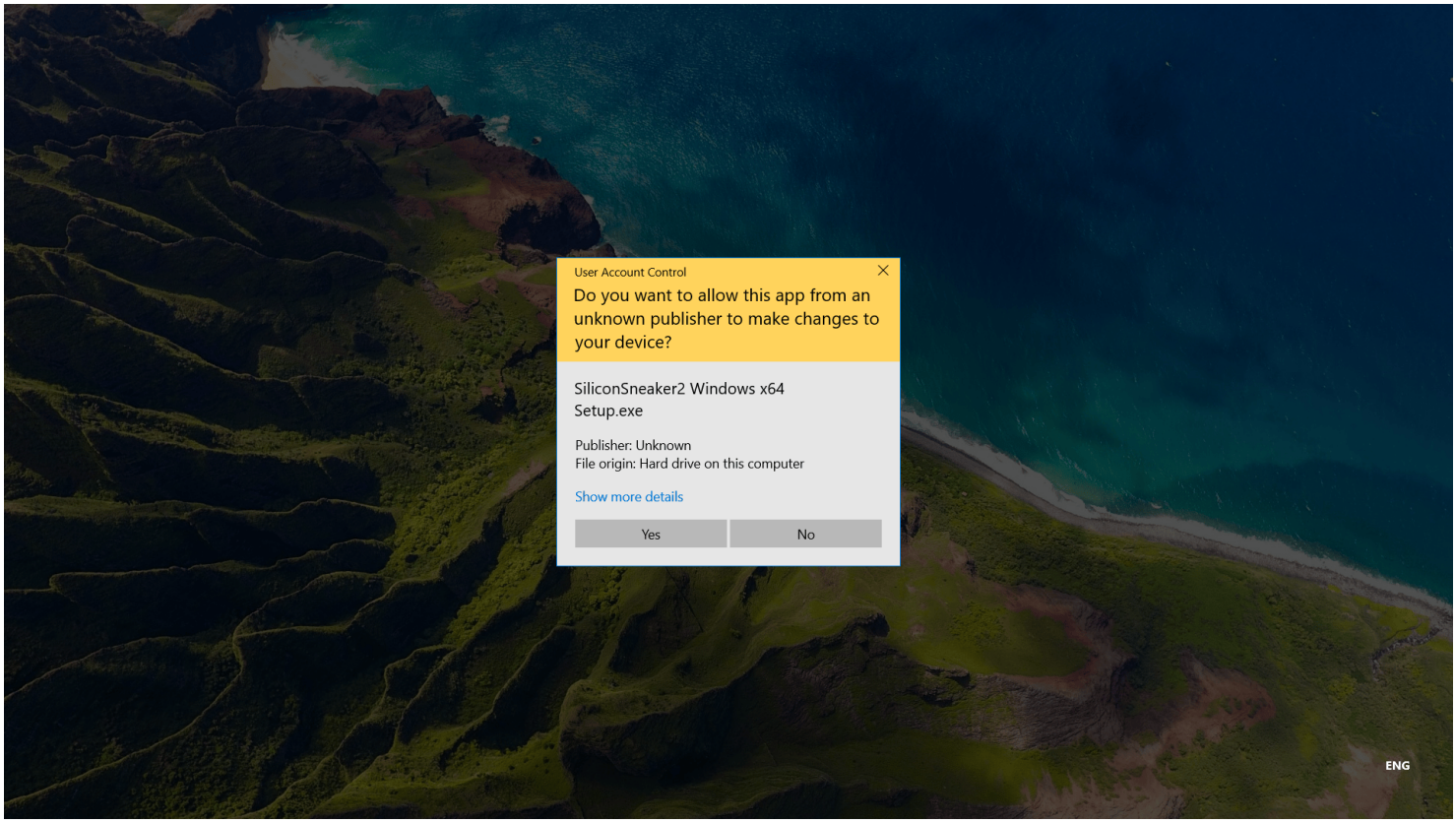

Figure 3. Initial installation screen

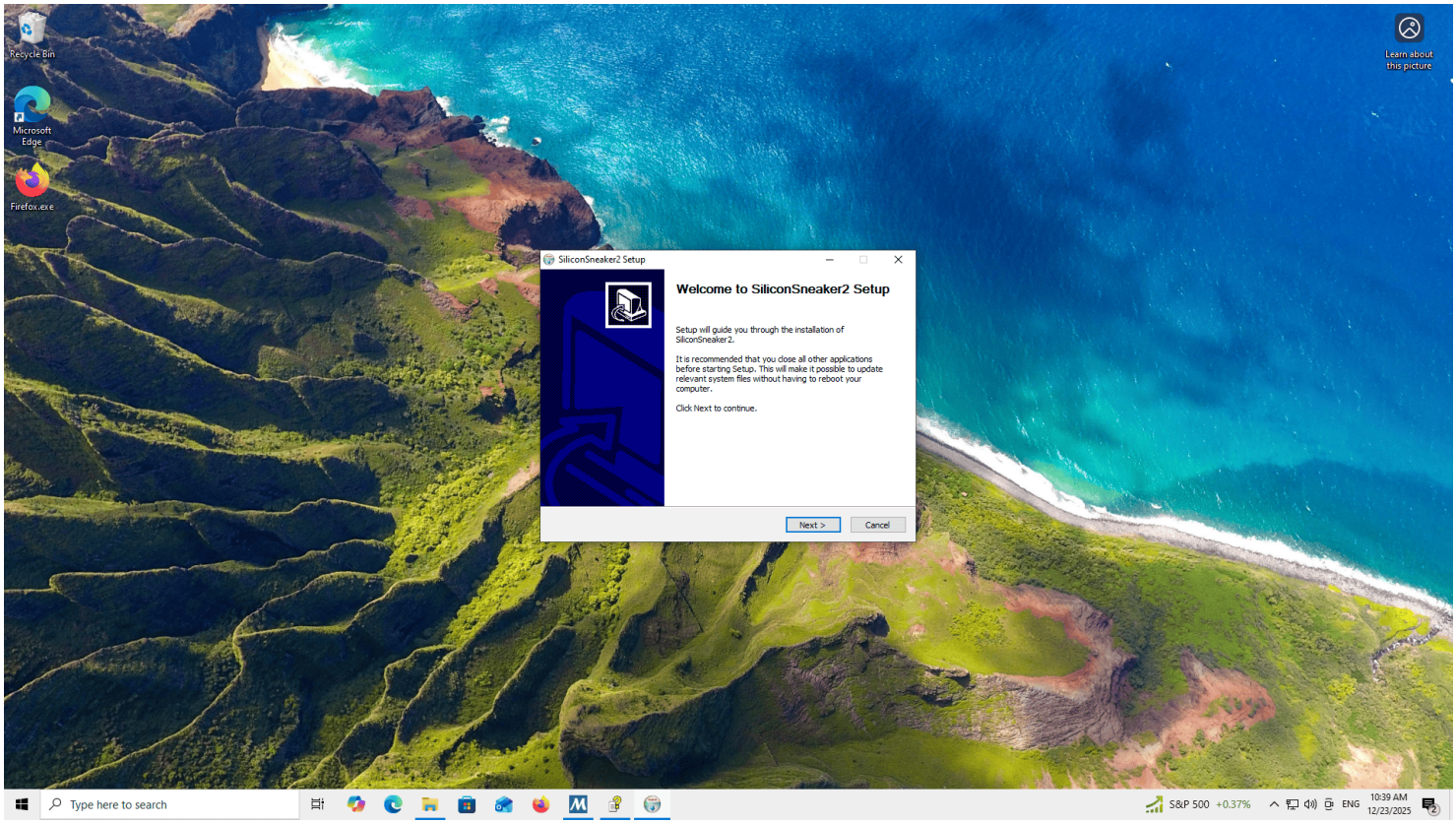

Figure 4. Welcome screen

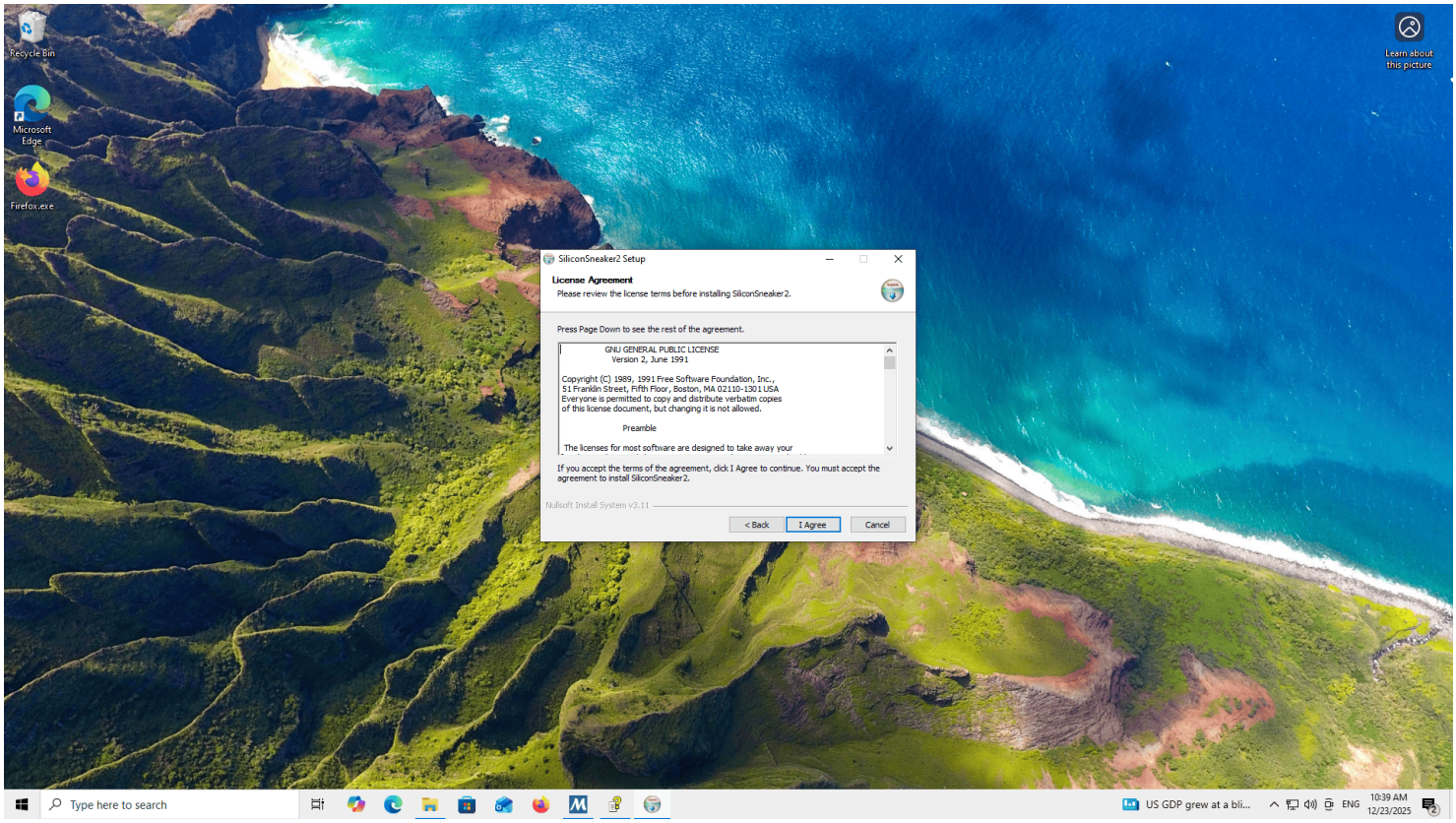

Figure 5. License screen

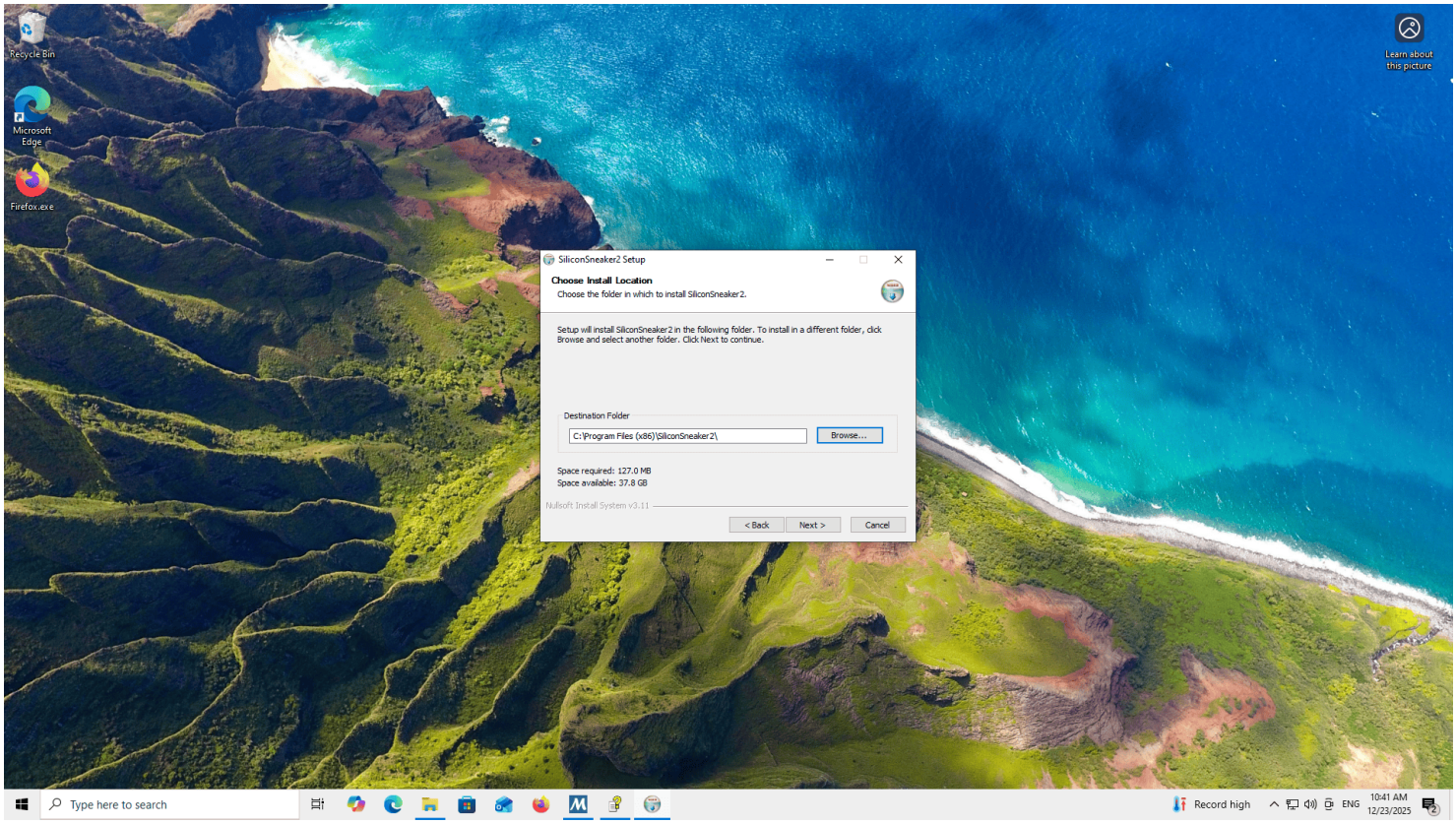

Figure 6. Install location screen

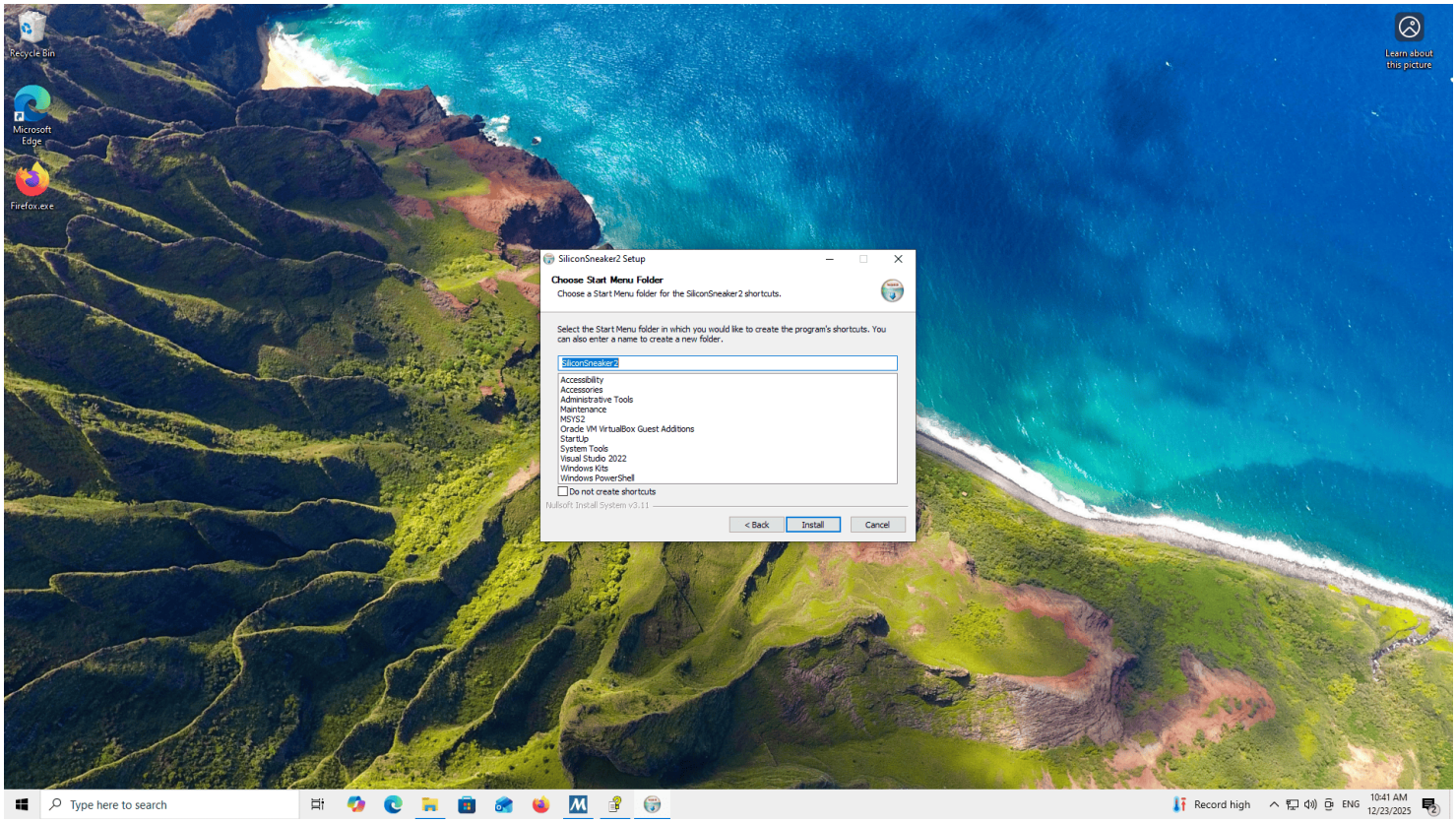

Figure 7. Start menu location screen

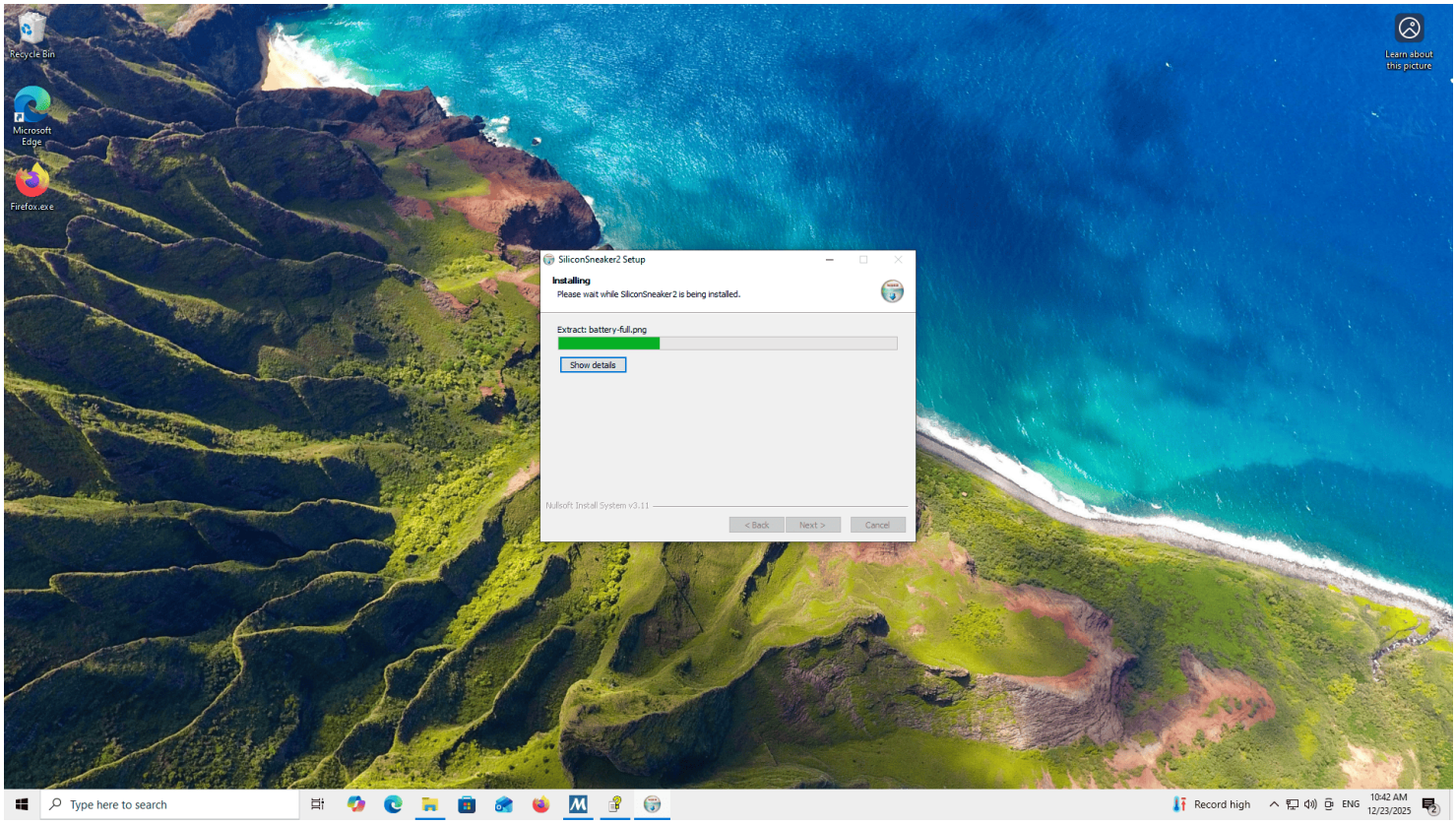

Figure 8. Installation (copy files) screen

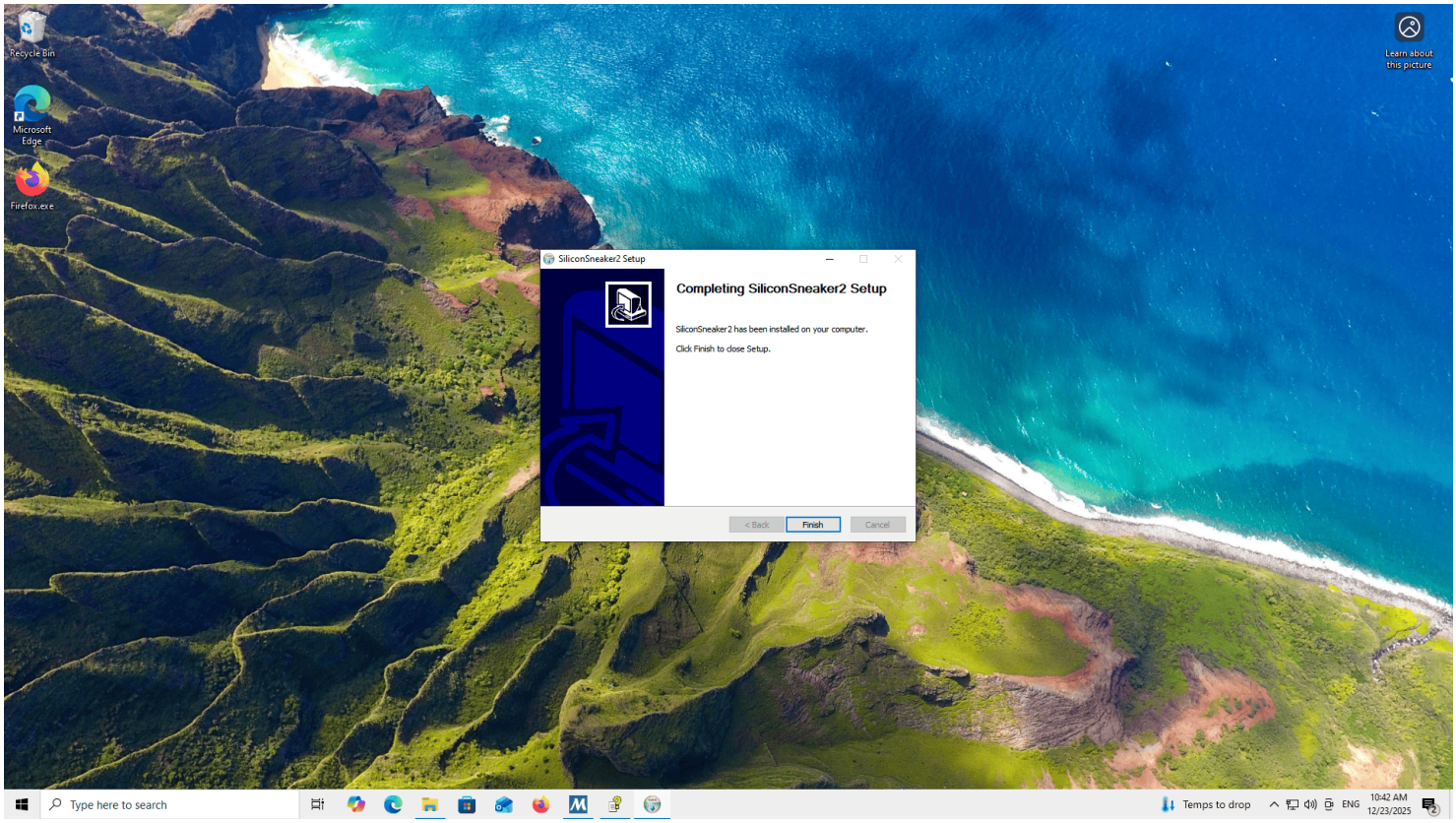

Figure 9. Installation complete screen

2.2. Installing on Debian Linux(64 bit)

As of this writing, there is a compiled binary available. See below for an example of installing the program from the compiled binary on Debian Linux.

2.2.1. From source

CONSOLE

```
# $ sudo apt install git cargo rustc pkg-config libglib2.0-dev libcairo2-dev libgdk-pixbuf-2.0-dev libpango1.0-dev
libgraphene-1.0-dev libgtk-4-dev libshumate-dev
# $ git clone https://github.com/cprevallet/siliconsneaker2
Cloning into 'siliconsneaker2'...
remote: Enumerating objects: 1017, done.
remote: Counting objects: 100% (1017/1017), done.
remote: Compressing objects: 100% (408/408), done.
remote: Total 1017 (delta 428), reused 985 (delta 396), pack-reused 0 (from 0)
Receiving objects: 100% (1017/1017), 932.34 KiB | 2.92 MiB/s, done.
Resolving deltas: 100% (428/428), done.
$ cd siliconsneaker2/
$ cargo build --release
   Compiling serde_core v1.0.228
   Compiling pkg-config v0.3.32
   Compiling winnow v0.7.13
   Compiling target-lexicon v0.13.3
   <snip>
    Finished `release` profile [optimized] target(s) in 0.19s
$ sudo cp src/icons/siliconsneaker2.svg /usr/share/icons/hicolor/scalable/apps
$ sudo update-icon_caches
$ cp siliconsneaker2.desktop /usr/share/applications/
$ ./target/release/siliconsneaker2
<gui loads>
```

2.2.2. From a compiled binary

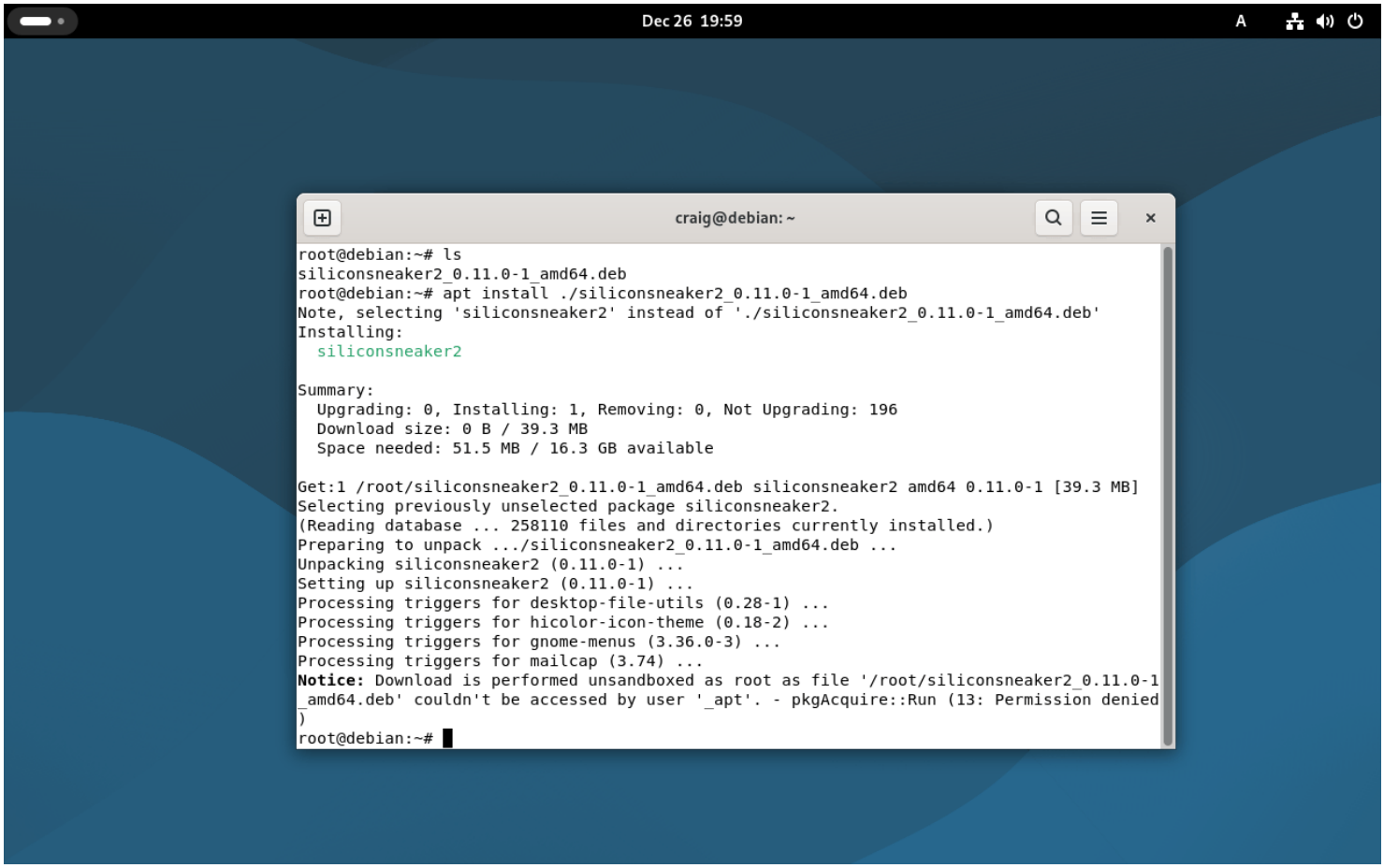

Figure 10. Installation on Linux from the terminal

3. Language Support

As of this writing, SiliconSneaker2 has support for three languages: English, French, and Spanish. The program uses the system's "locale" language setting to determine the language to use. If no settings are applied, the default will be English.

3.1. Windows

You can change your region in the Settings App - Time and Language - Region.

3.2. Debian Linux

Run locale -a to get a list of the locale names suitable for use in environment variables.

Add a line like this to your /etc/profile file:

```
"${LANG:=fr_FR.utf8}"; export LANG
```
CONSOLE

where fr_FR.utf8 is the locale you want to use as a default.

Alternatively, a language may be selected for a single invocation by setting an environmental variable. For example:

```
env LANG=es_ES.UTF-8 siliconsneaker2
```
CONSOLE

will invoke SiliconSneaker2 with Spanish for a single time.

4. Satellite and Outdoor Map Tile Support (Optional)

As of this writing, SiliconSneaker2 has support for three different map tilers: OpenStreetMap (the default), MapTiler-Satellite, and MapTiler-Outdoor. Use of OpenStreetMap requires no additional configuration and you may skip the rest of this section (although you may return to it later if you change your mind). Using either (or both) of the latter two tilers requires additional steps as follows.

4.1. Windows

1. Create a free account at https://www.maptiler.com/ and obtain one or more API key(s) - an alphanumeric string used to access the "tiles" used to create a map. Generally it is preferred to obtain separate keys for each tiler.
2. Open the environmental variable editing application from the Control Panel.
3. Add a new user environment variable.
4. Add the API key from MapTiler using the appropriate variable name. The variable name must match either MAPTILER_SATELLITE_KEY or MAPTILER_OUTDOOR_KEY and the variable value must match the alphanumeric API key provided by MapTiler in the previous step.
5. Reboot
6. Restart SiliconSneaker2
7. Select map tiler you have the key for from the hamburger menu. The map should momentarily update with the new tiles.

A visual representation of the above steps are provided in the next series of screenshots.

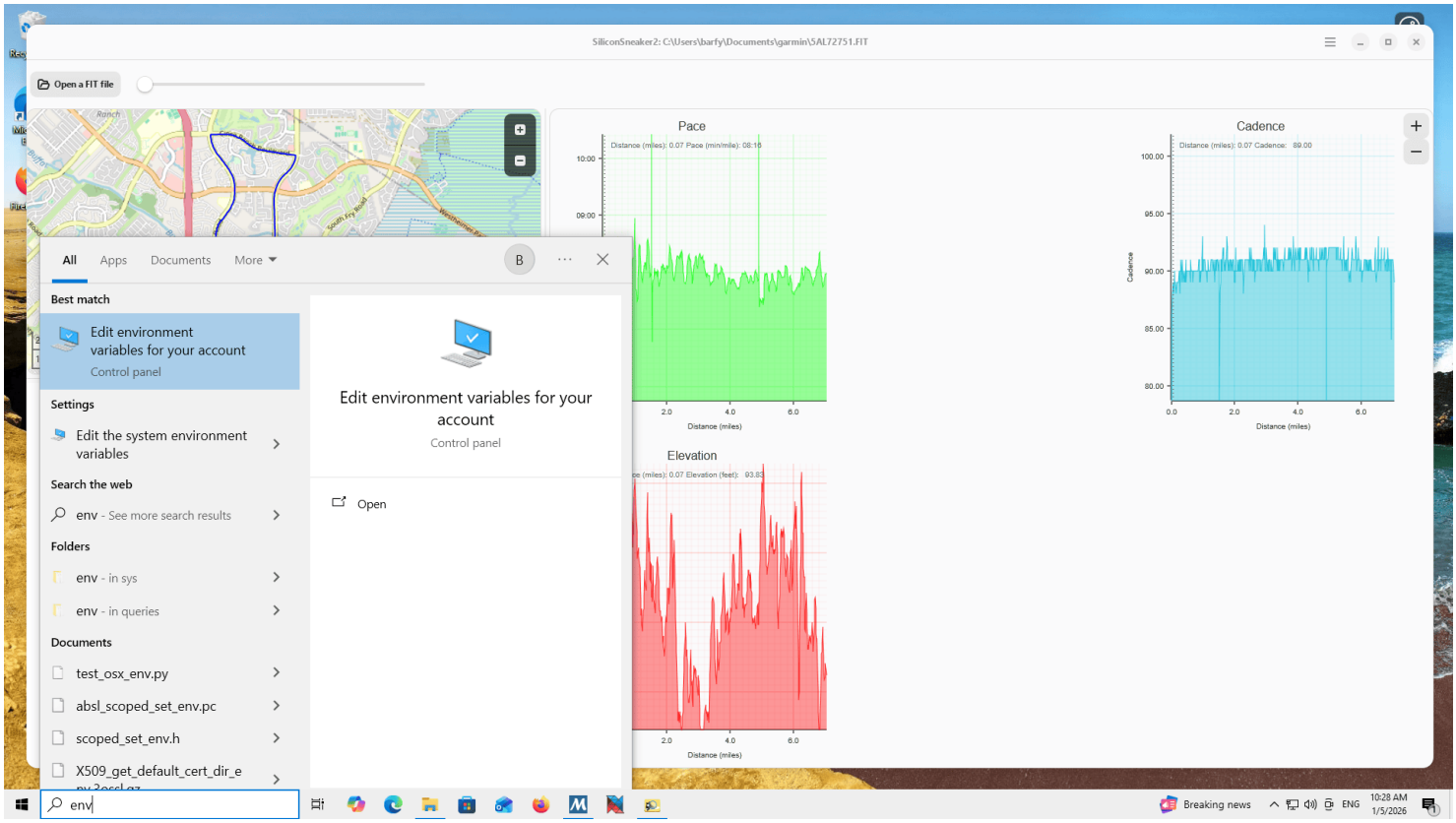

Figure 11. Open the environmental variable editing application from the Control Panel.

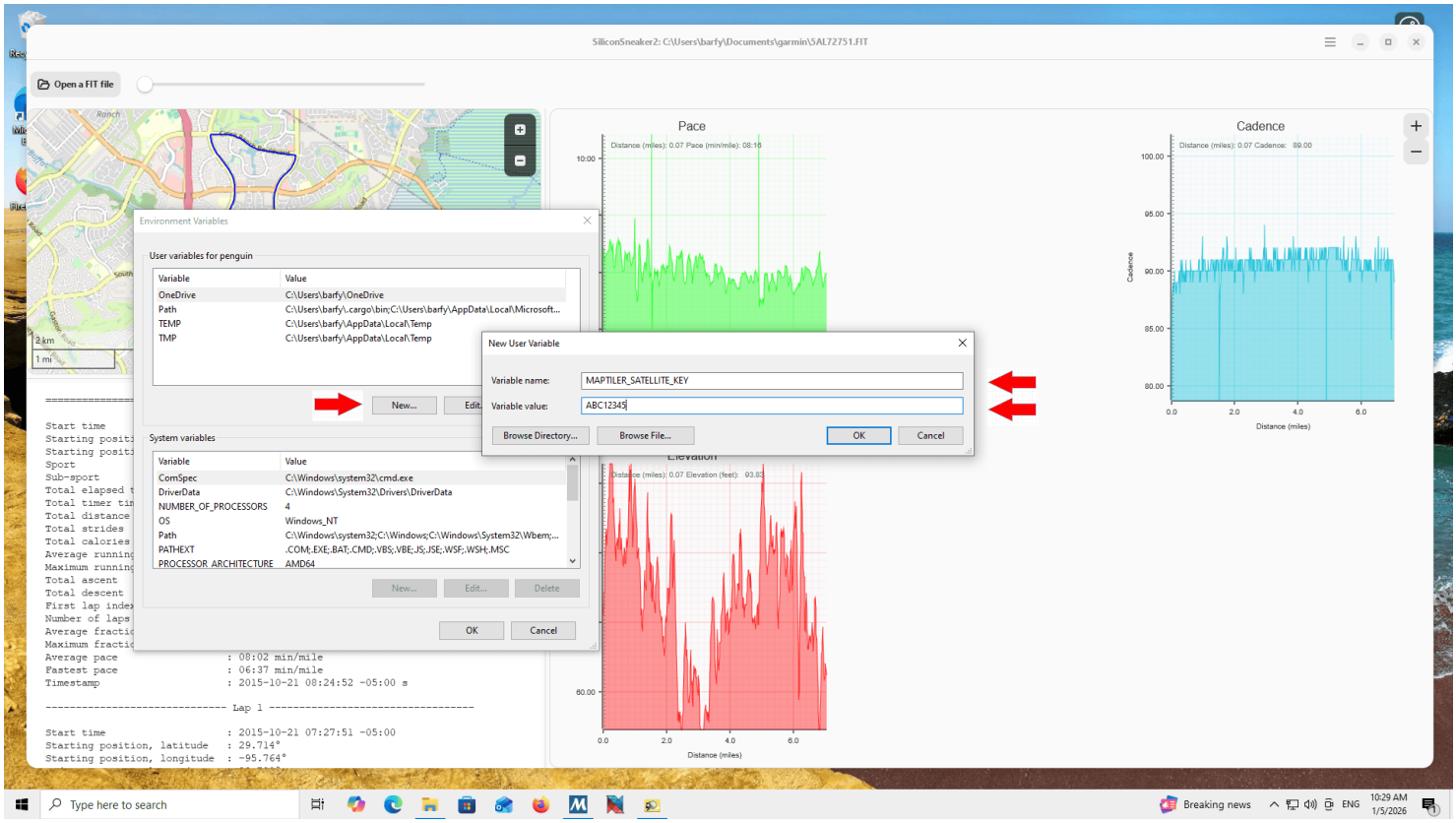

Figure 12. Add the API key from MapTiler using the appropriate variable name and value. The variable name must match either MAPTILER_SATELLITE_KEY or MAPTILER_OUTDOOR_KEY and the variable value must match the MapTiler API key.

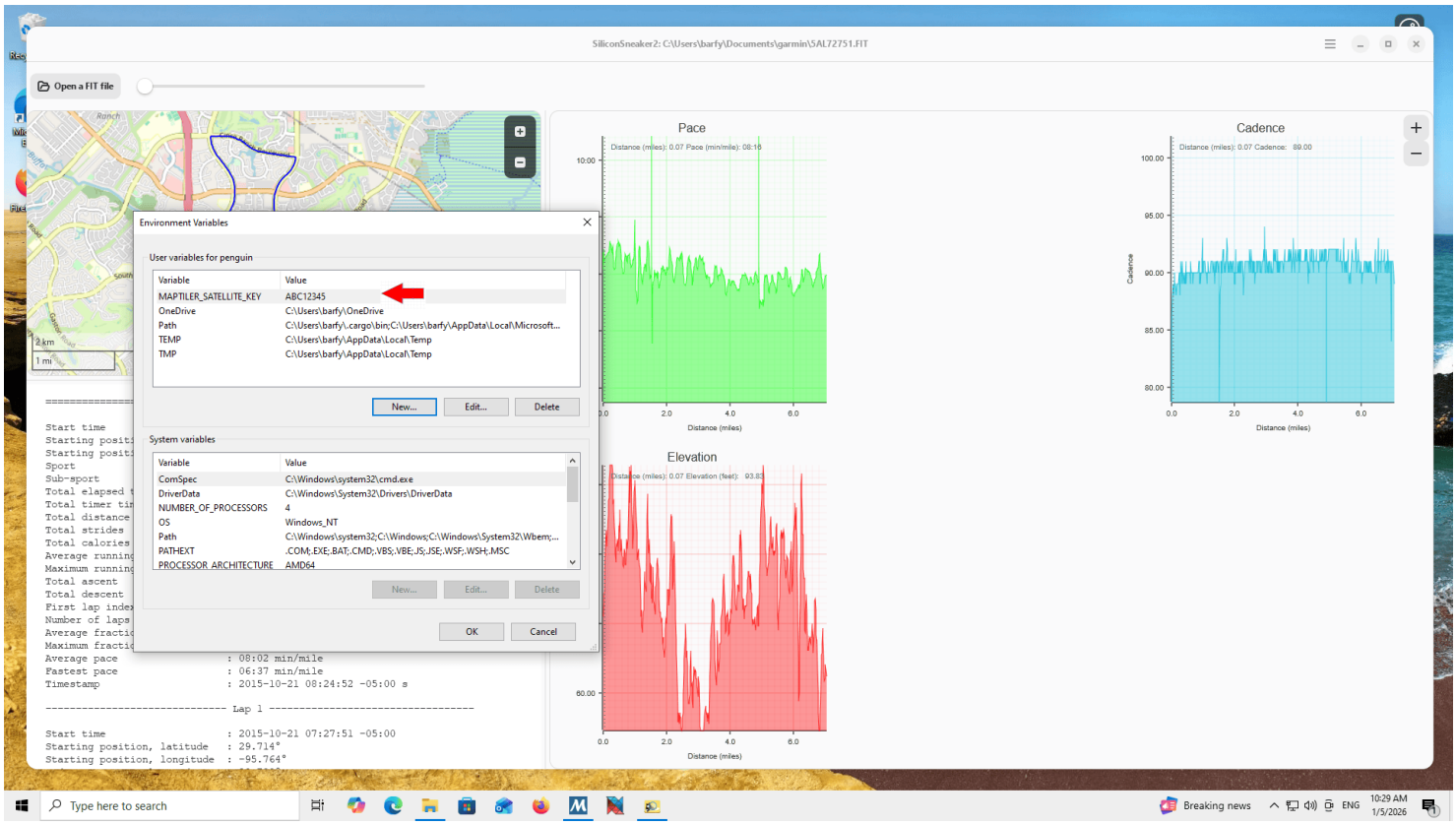

Figure 13. A successfully entered key

A reboot will be necessary for the environment variable (and key) to become active.

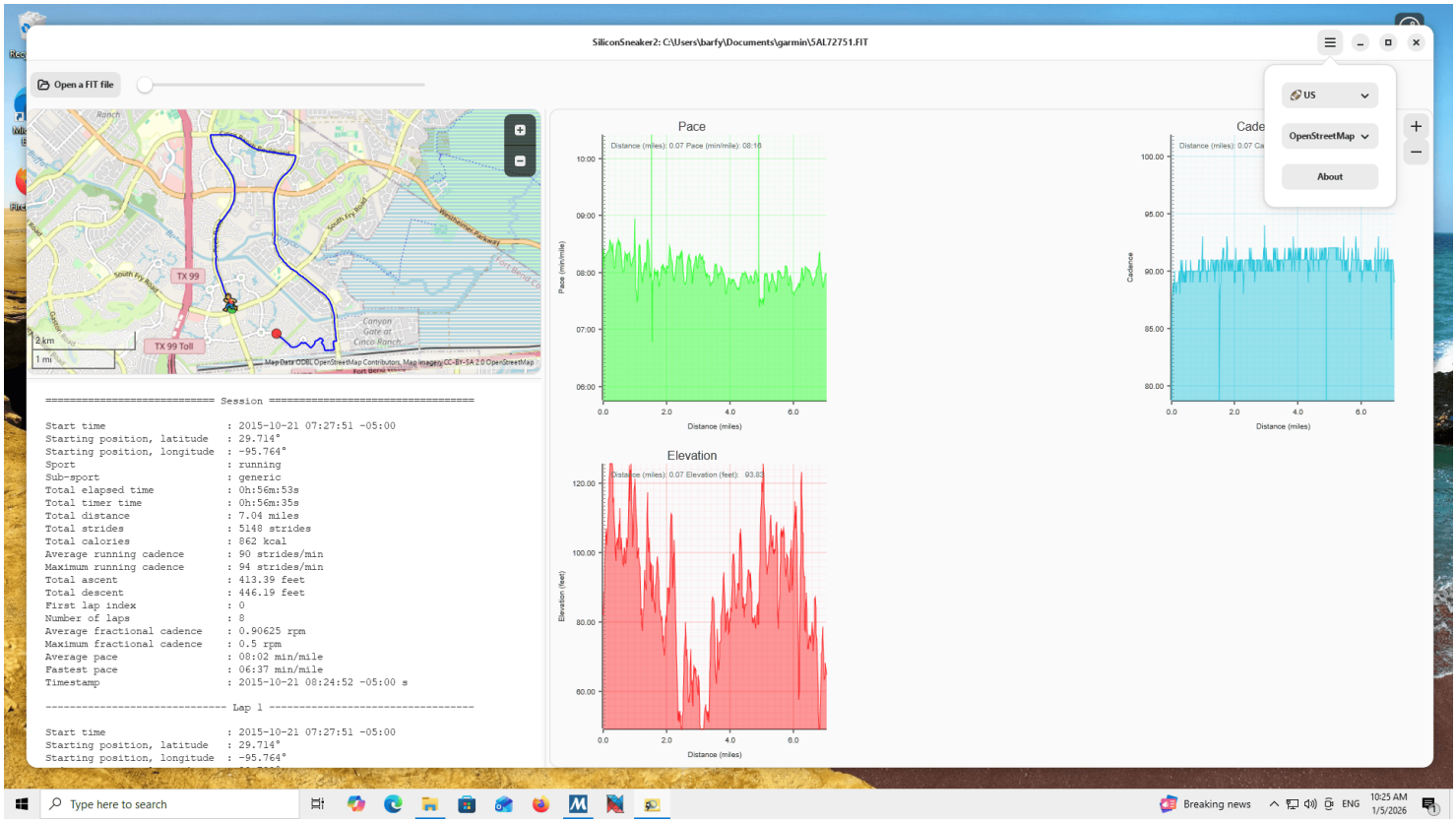

Figure 14. Selecting the map tiler to use.

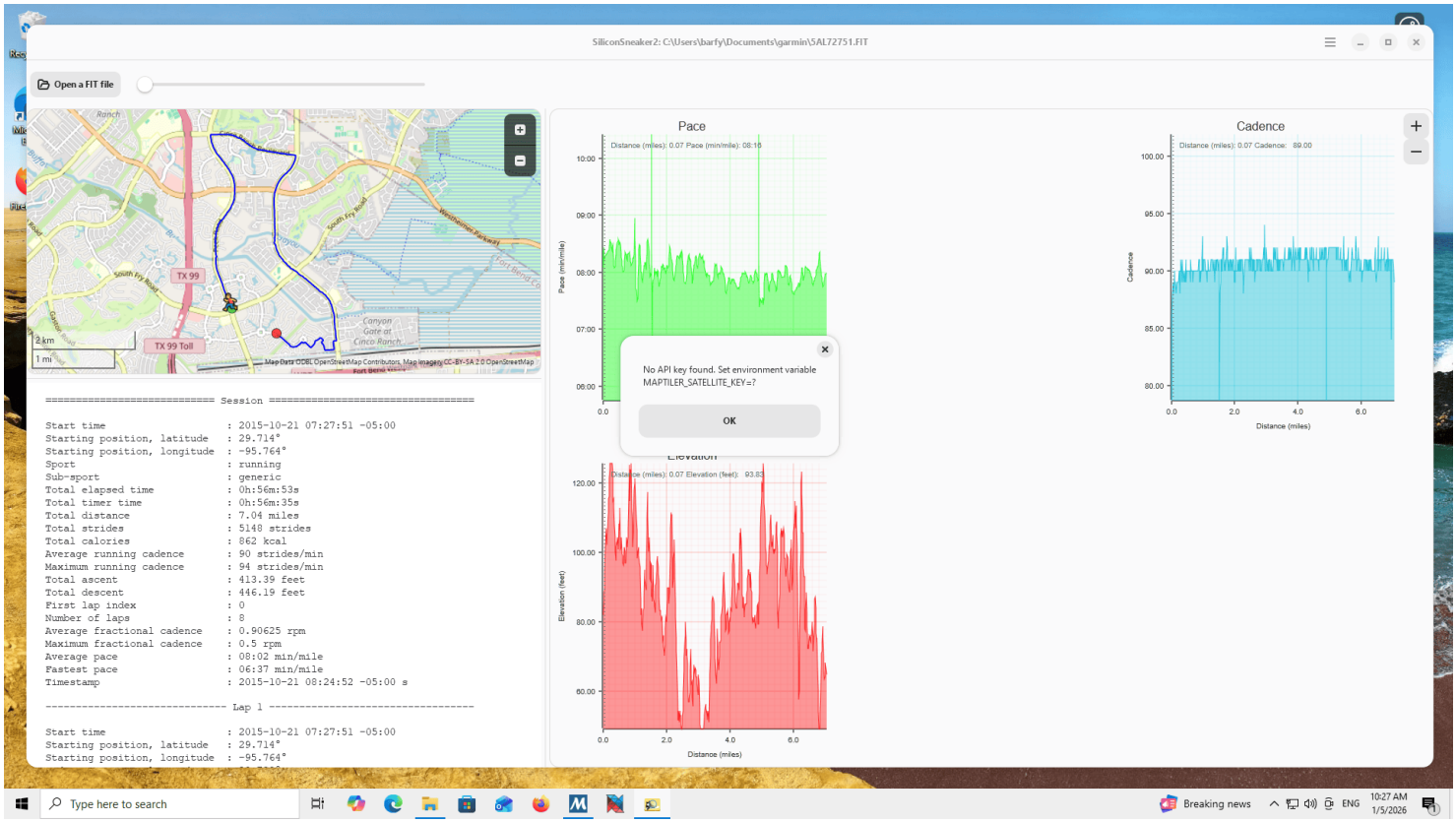

Figure 15. Selecting the Satellite map tiler generates an error message if no key has been provided. Acknowledge and reset

back to OpenStreetMap.

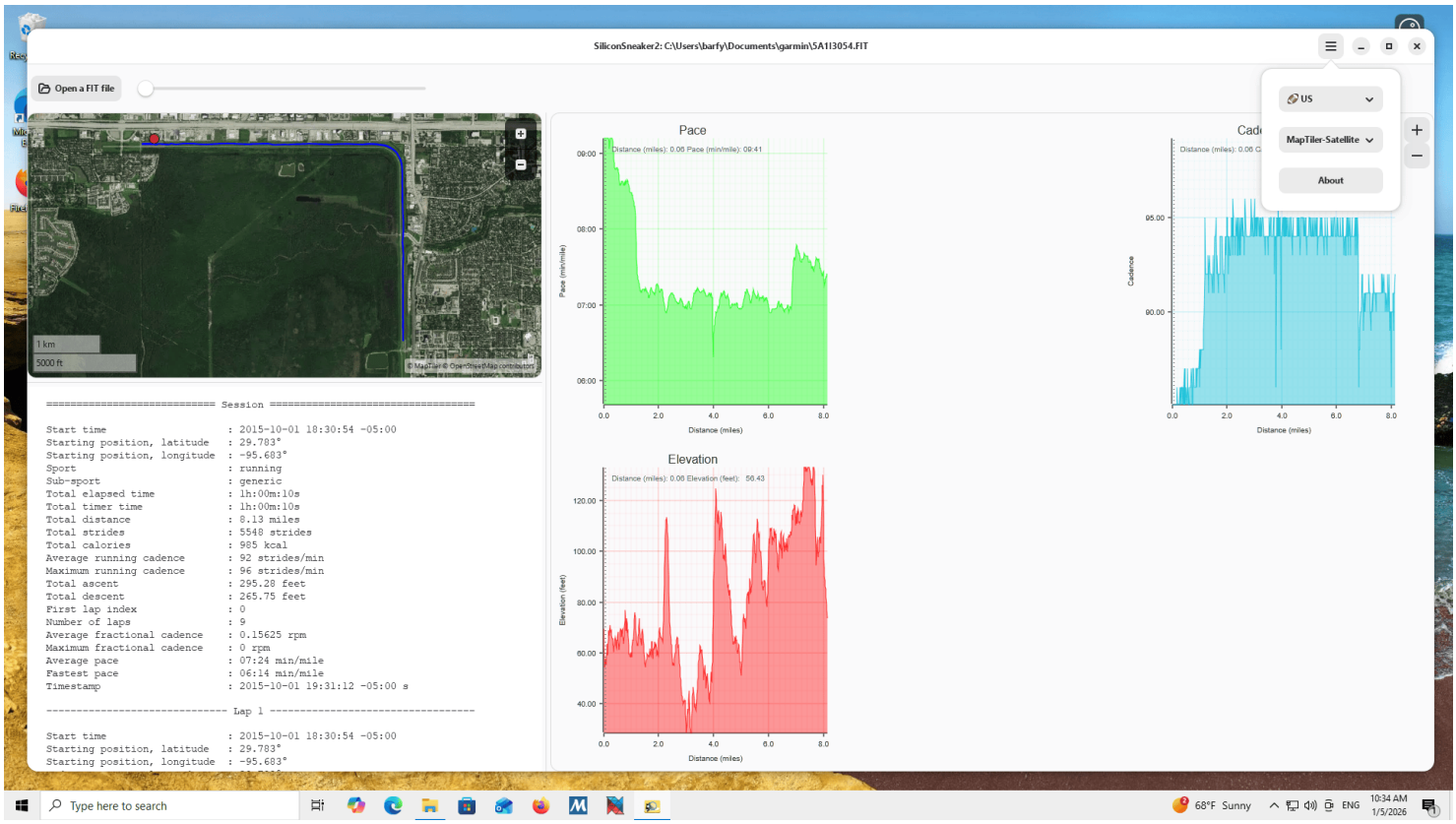

Figure 16. Once the key has been installed the satellite view should appear once selected.

4.2. Debian Linux

Create a free account at https://www.maptiler.com/ and obtain one or more API key(s) - an alphanumeric string used to access the "tiles" used to create a map. Generally it is preferred to obtain separate keys for each tiler. Add a line like this to your /etc/profile file:

CONSOLE

```
"${MAPTILER_OUTDOOR_KEY=<KEY>}"; export MAPTILER_OUTDOOR_KEY
"${MAPTILER_SATELLITE_KEY=<KEY>}"; export MAPTILER_SATELLITE_KEY
```

where <KEY> (no brackets) is the alphanumeric key obtained from MapTiler.

Alternatively, a language may be selected for a single invocation by setting an environmental variable. For example:

CONSOLE

```
env MAPTILER_OUTDOOR_KEY=<KEY> siliconsneaker2
```

will invoke SiliconSneaker2 allowing the use of the MapTiler-Outdoor tiles for a single time.

5. Making FIT files Available On a PC

Now that the program has been installed, SiliconSneaker2 needs information on your activity in the form of a Fit files generated from your sports watch. In general, Fit files may be made available in one of two ways - directly from a device or downloaded through an online service.

5.1. From a watch

- Devices using a USB cable to download files is the modern, preferred configuration.
  - Connect your watch to the USB cable and ensure the cable is plugged into your computer and wait for your computer to recognize the device. Files may be loaded directly from the watch in this configuration.
  - On Windows the drivers will be located automatically but may take some time. The Fit files should be accessible at "Devices and drives".

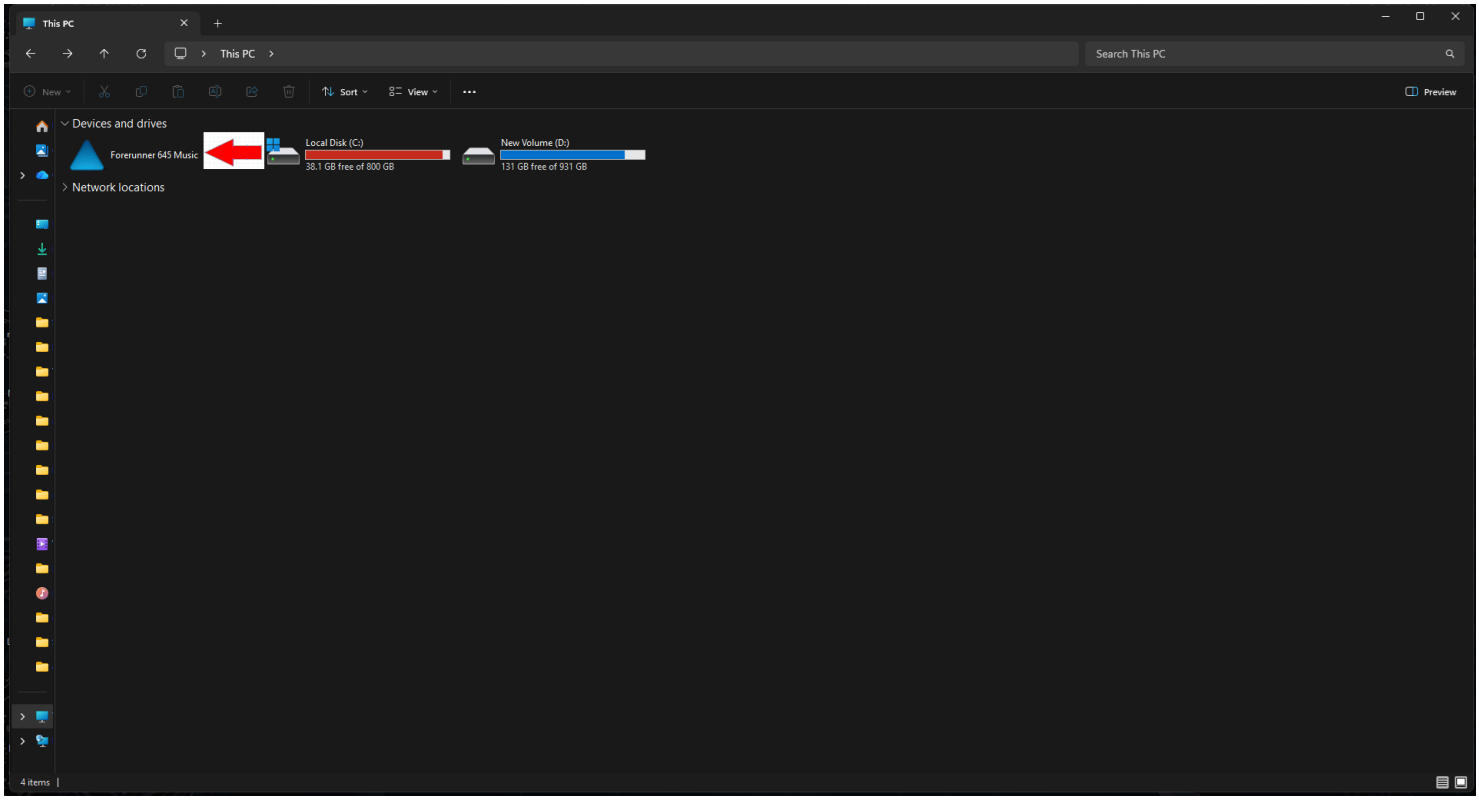

Figure 17. A connected watch in the Windows file manager.

- On Linux the Fit files should be accessible at /mnt/Primary/Garmin/Activity or similar. Under the Gnome desktop environment the file path might be: /run/user/1000/gvfs/mtp:host=091e_4b48_0000c7a5291e/Primary/Garmin/Activity as seen in the following picture.

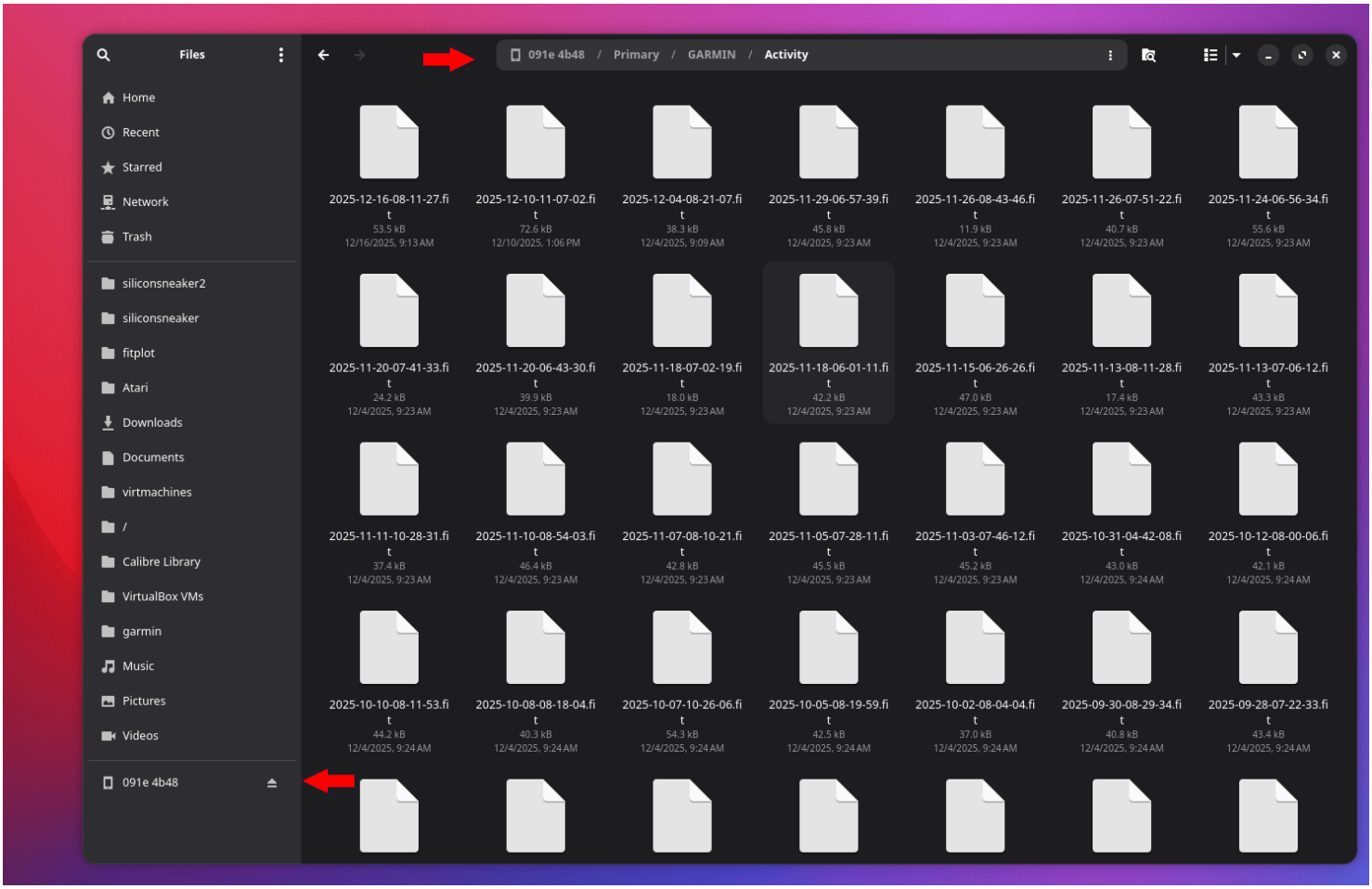

Figure 18. A connected watch in the Nautilus file manager on Gnome(Linux).

- Devices supporting this method (media transfer protocol over USB): Forerunner/Edge 10, 110, 210, 220, 620, 500, 510, 705, 800, 810, 1000, and 920XT. Newer Garmin devices support the USB option which tends to be less problematic than older Ant Agent transfers.
    - Devices using Ant Agent to download files: Forerunner 50, 60, 70, 310XT, 405, 405CX, 410, 610, 910, 910XT, and Garmin Swim
    - Devices using a docking cradle to download files: Forerunner/Edge 205 and 305

Instructions for moving a Fit file available to the PC from the device vary according to the manufacturer and model of the individual watch. Any description of the methods to connect given here will be, by necessity, incomplete. Additional information gladly accepted.

5.2. From an online service

5.2.1. Strava

- Strava can export FIT files if they were originally FIT files. Go to the detail page for an activity. See figure.

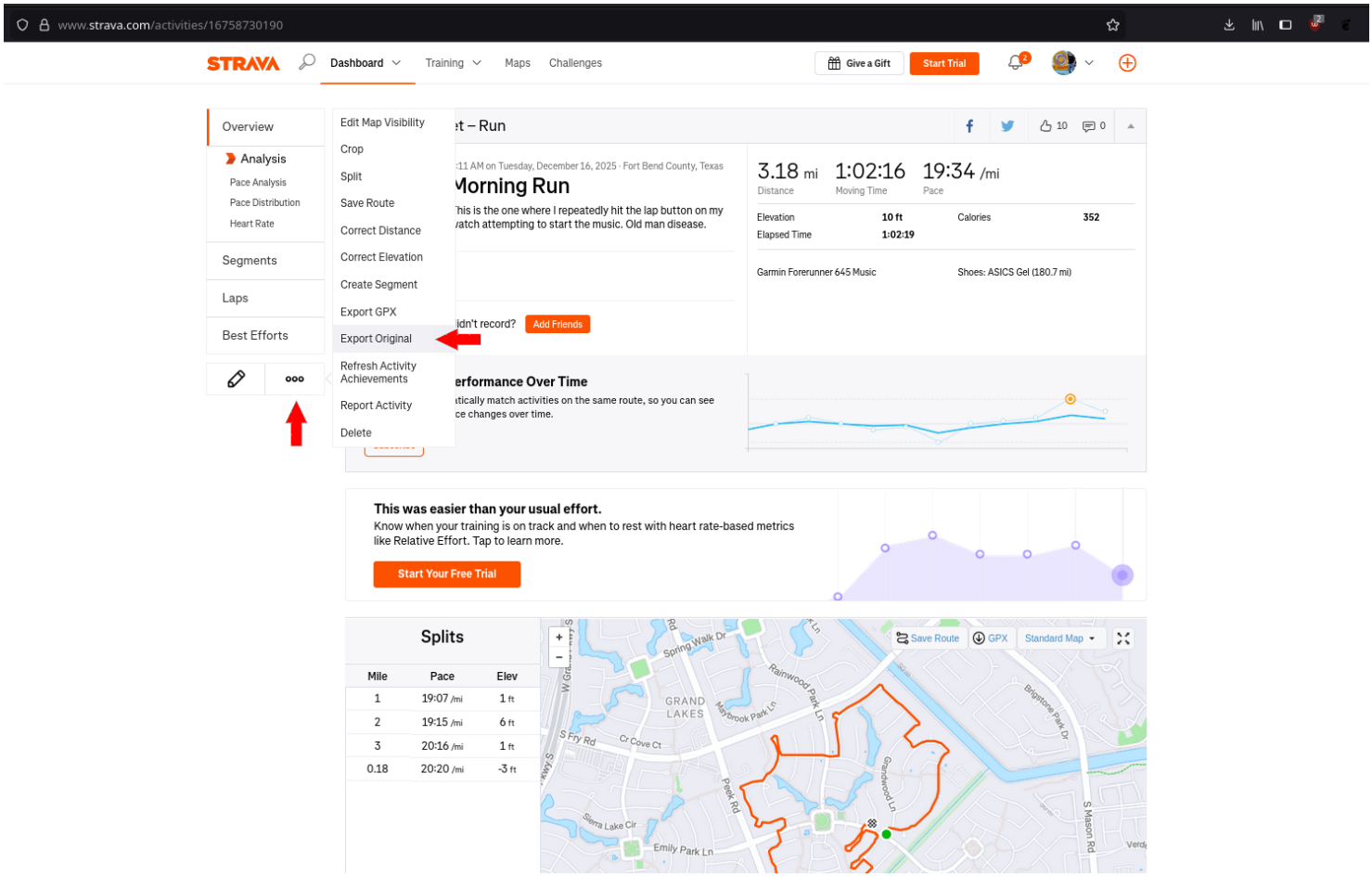

Figure 19. Exporting a Fit file from Strava.

5.2.2. Garmin Connect

- Garmin Connect can export FIT files if they were originally FIT files. Go to the detail page for an activity. See figure.

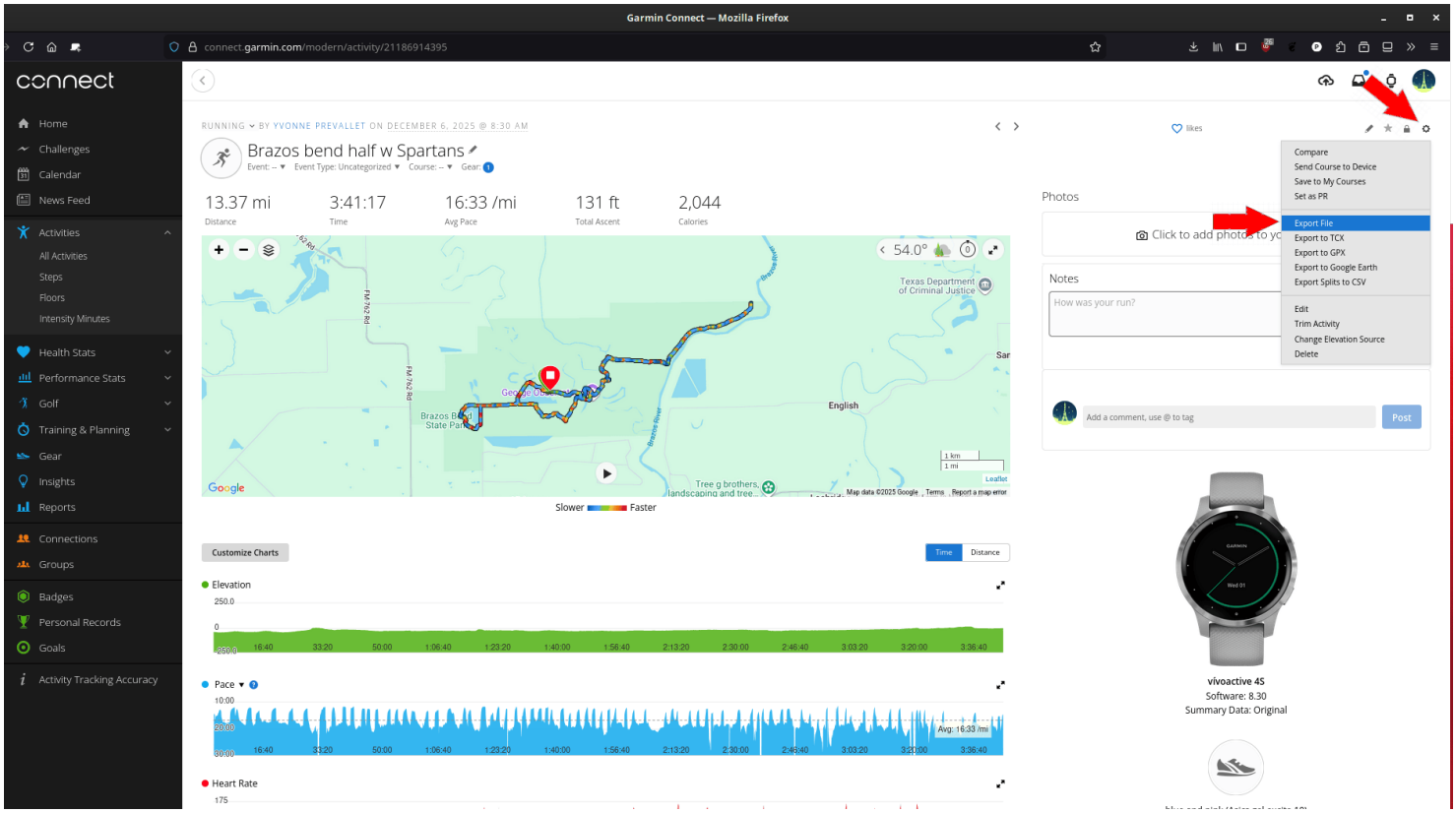

Figure 20. Exporting a Fit file from Garmin Connect..

6. Locating and Starting the Application

On Linux, there should be a menu item to start the application after installation.

On Windows there will be a Start menu item under SiliconSneaker2 (if you chose create one during installation, the default). Click it to start the program.

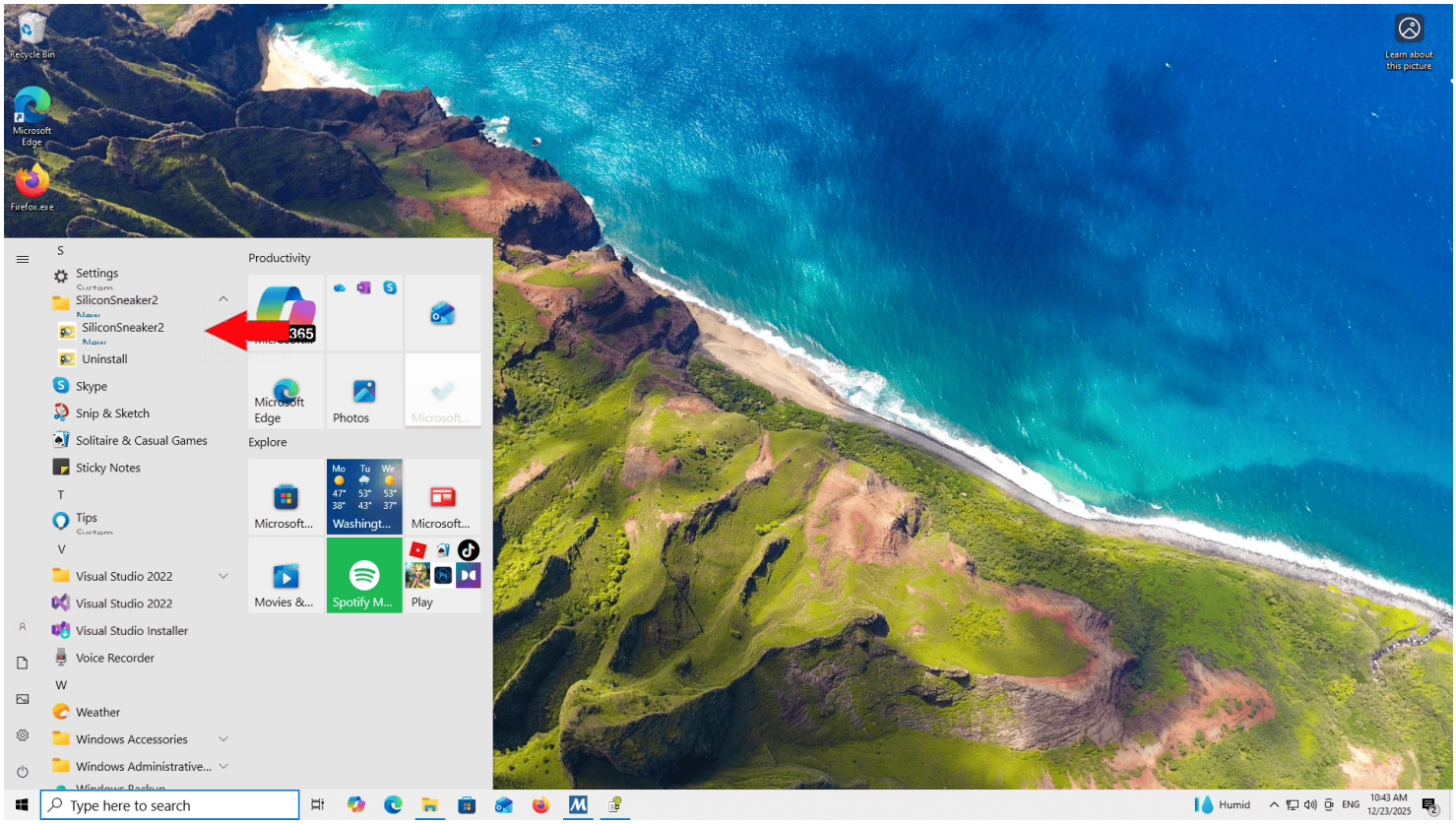

Figure 21. Start Menu item

7. Loading the Fit File

Now that the files are available to the PC by whatever means. It's time to load them into SiliconSneaker2. It's also a good time to select your preferred unit system. It can be changed anytime before or after a file has been loaded. Side note: SiliconSneaker2 has only read access to the FIT file and cannot change it.

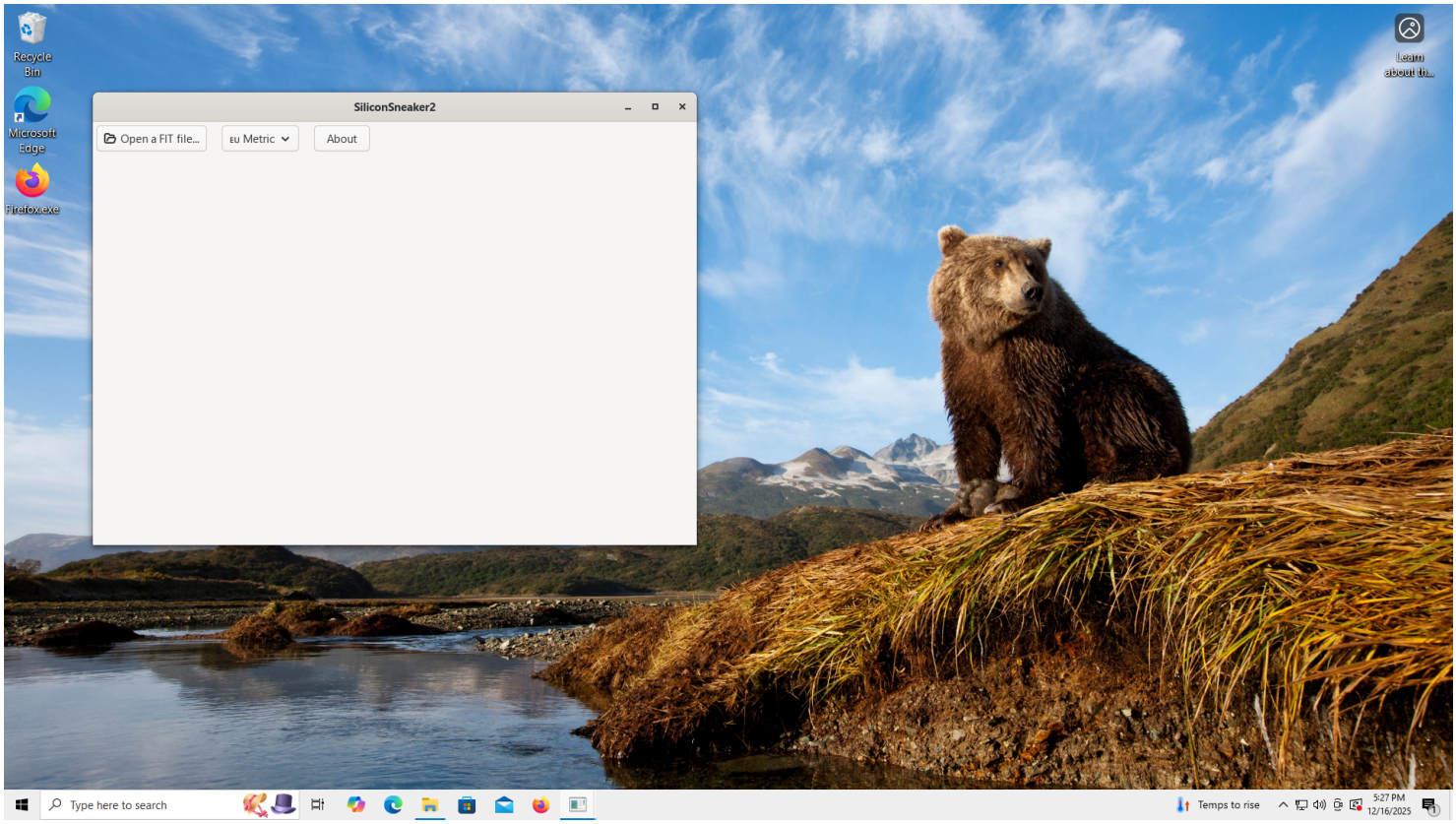

Figure 22. Initial program screen. Click on the Open button to load a Fit file.

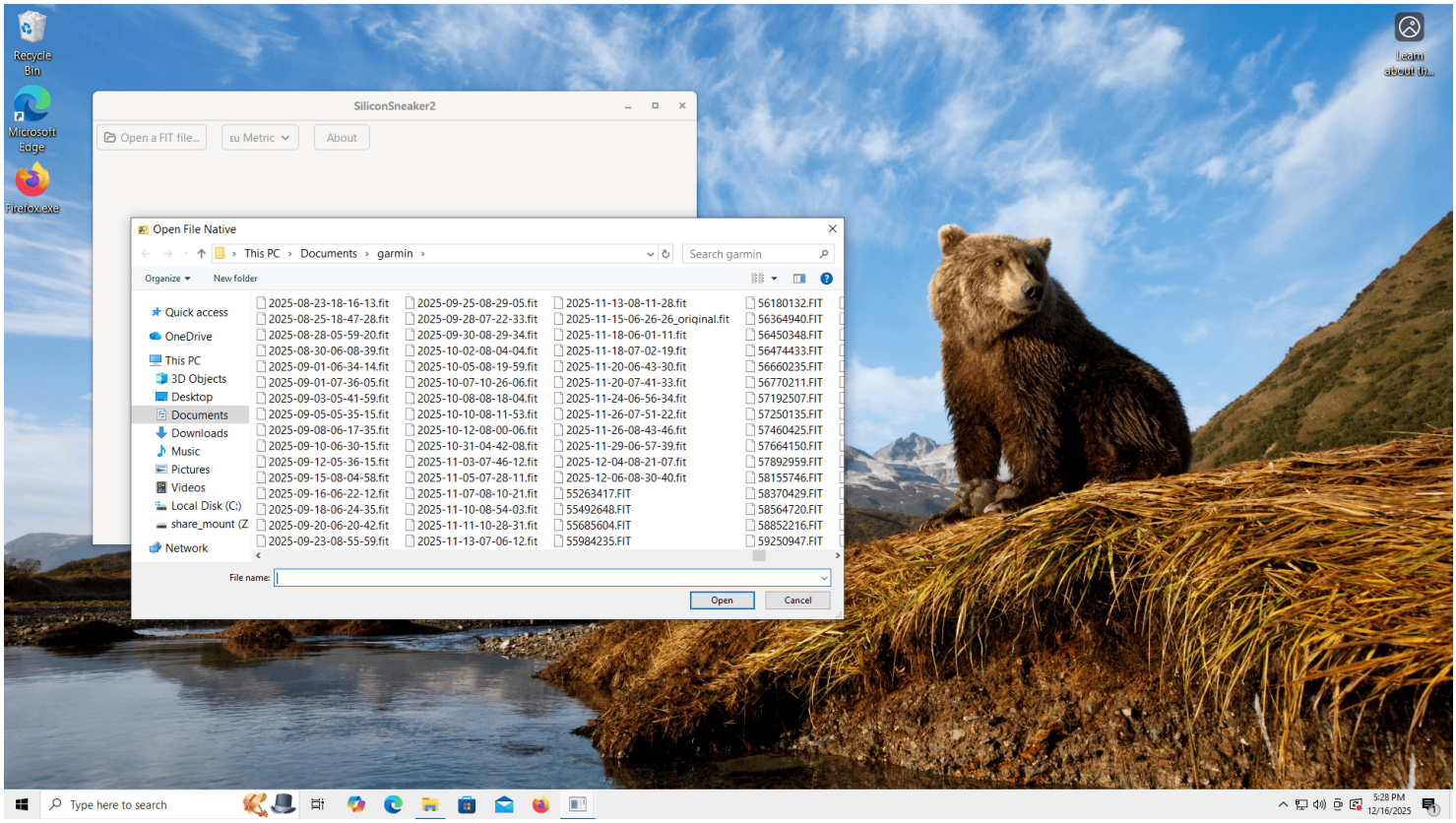

Figure 23. Selecting a Fit file to load.

After the file loads, don't worry if the program window looks messy (compacted) on the first run. Simply resize the window so that it looks good on your monitor. SiliconSneaker2 will retain your layout preferences on the next run. It's also a good time to select your preferred unit system. The preferred unit system will also be retained on subsequent program runs.

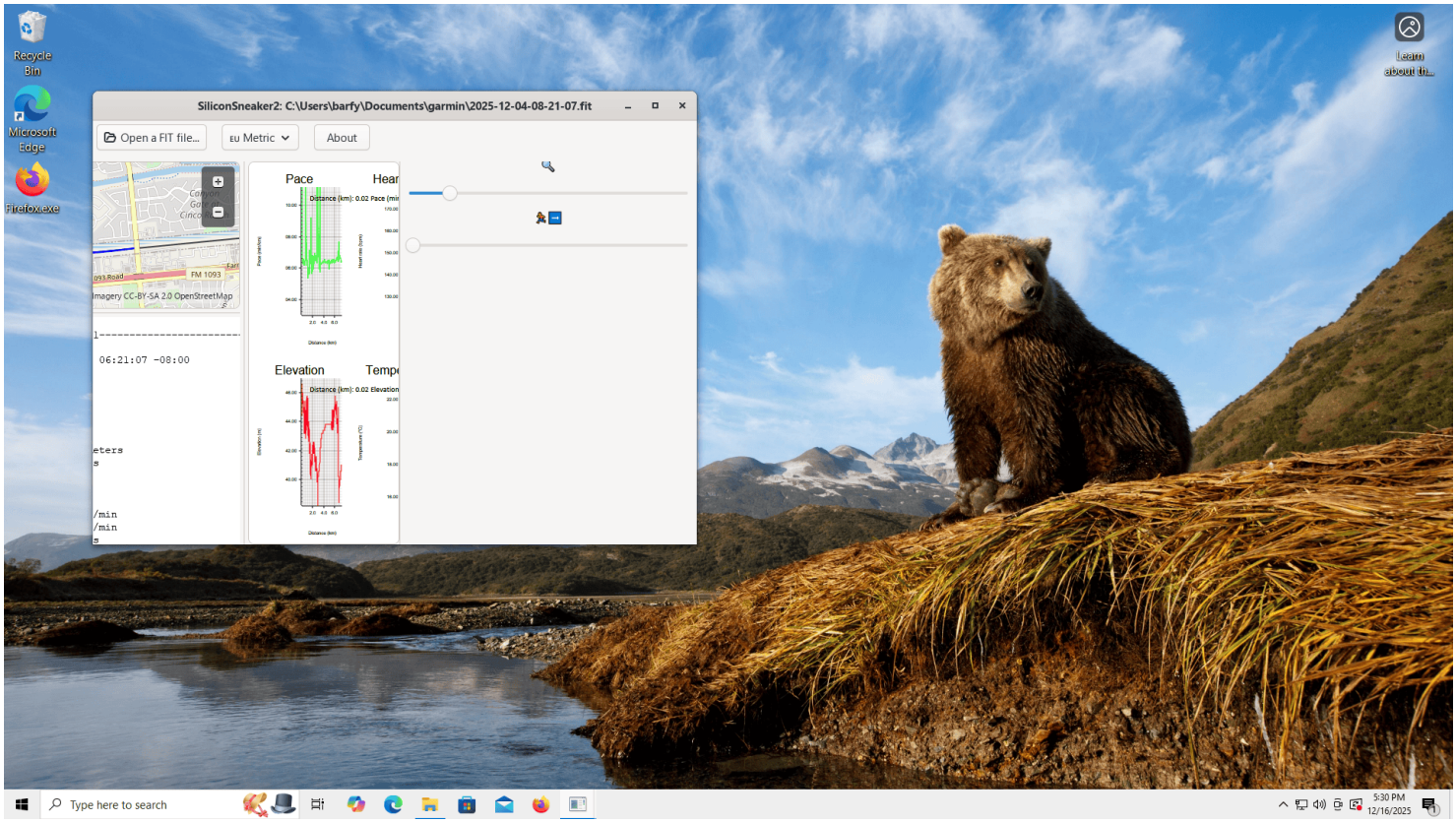

Figure 24. Don't panic! Resize the window and carry on.

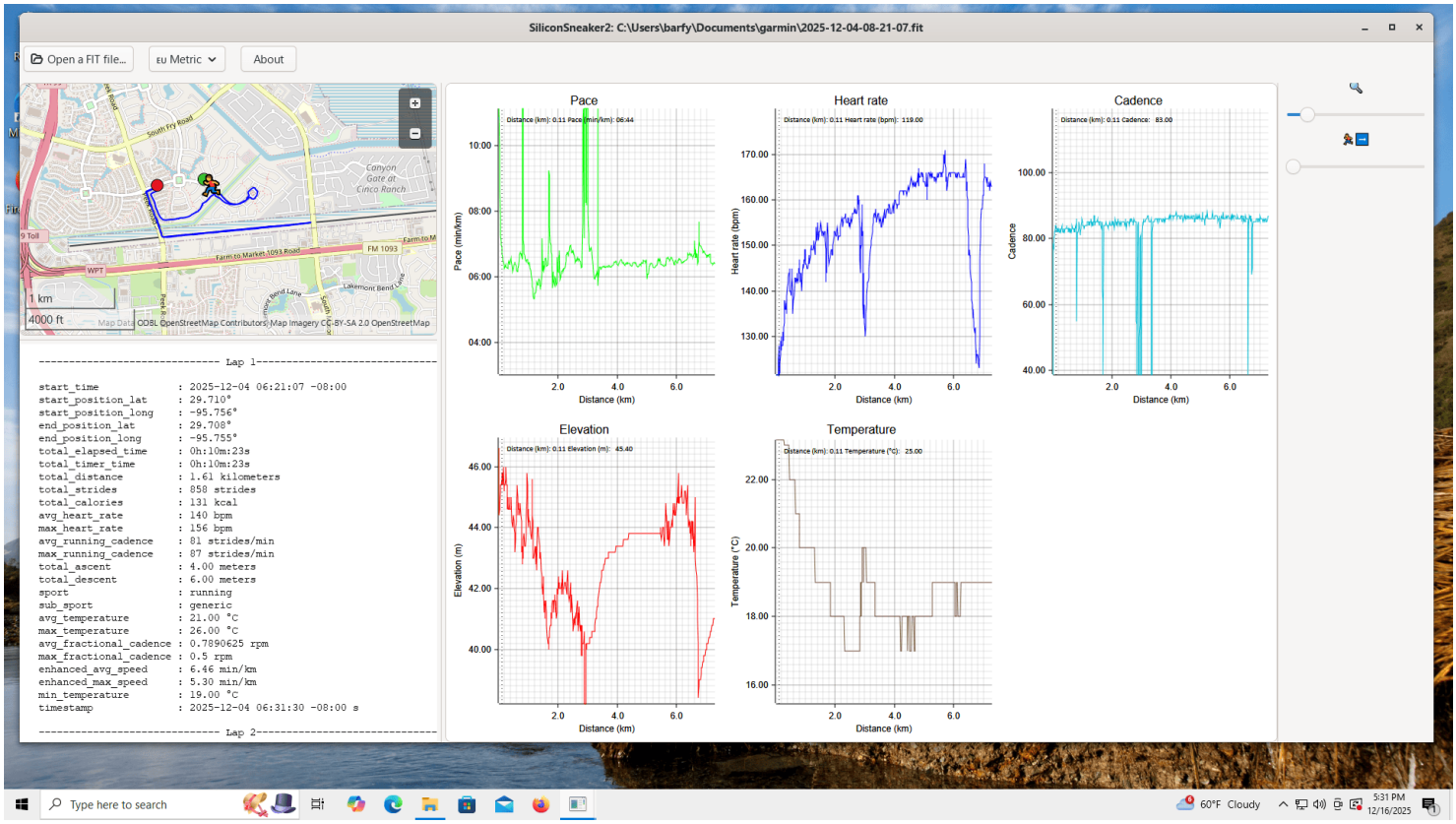

Figure 25. O.K. that's better. We're up and running. Goodbye Mr. Bear.

At this point, explore the interface. Enjoy.

8. Usage

8.1. Using the application

Hovering your mouse for about a half second over various parts of the interface will display useful tooltips describing the function of the interface widgets. Let them guide your way!

You may not want to see all of the information at the same time. The three individual "panes" of the windows may be resized so that any portion of the interface is hidden from view. For example if you are just interested in the map function. It may be resized to fill the entire window (including the controls on the left). Simply drag a hidden window pane's edge to restore the view within it. Similarly the Summary and Graph panes may be hidden or displayed as preferred. The program will remember these choices.

The number of graphs displayed is dependent on the data from watch sensors. Currently supported sensors include position, heart rate, barometric altimeter, and temperature. "Missing" graphs are usually an indication that the watch doesn't have a particular required sensor to supply the data.

The slider controls may be moved either via the mouse or keyboard. The arrow keys and page up and page down keys control the movement from the keyboard.

Use the +/- buttons to zoom the graphs' y-axis. Use the similar looking controls for zooming the map.

Use the slider to advance through a run. Note the indications on the map and graphs.

Toggling between US and Metric unit systems will redisplay the graphs and summary information in the newly selected unit system.

If your fitness activity is dated to one of several holidays, the runner marker on the map will change to something indicate the holiday.

8.2. Troubleshooting

On first use, SiliconSneaker2, creates a file cache to hold map "tiles" (provided by OpenStreetMap) in order to display the map. Initial retrieval of the tiles can take several seconds even on a fast (1GB) internet connection. Repeated activities in the same location will use the cached tiles for faster performance. Please be patient initially. Due to this design, it may be possible to use SiliconSneaker2 without an internet connection for subsequent activities in the same location.

It may occasionally be necessary to force the map to redraw. Zooming in or out is often enough to make this happen. Alternatively, resize the map pane.

For some watches under Windows 10 it may be necessary to install Garmin Express in order that the watch be recognized as a USB devices. Details here: (https://docs.microsoft.com/en-us/troubleshoot/windows-client/backup-and-storage/garmin-usb-devices-not-working)

8.3. Ending the application

There is no dedicated exit button. Simply close the window (Alt-F4 or Window Control).

9. Uninstall

9.1. Windows

When you installed the program a link was created in the start-menu to uninstall.

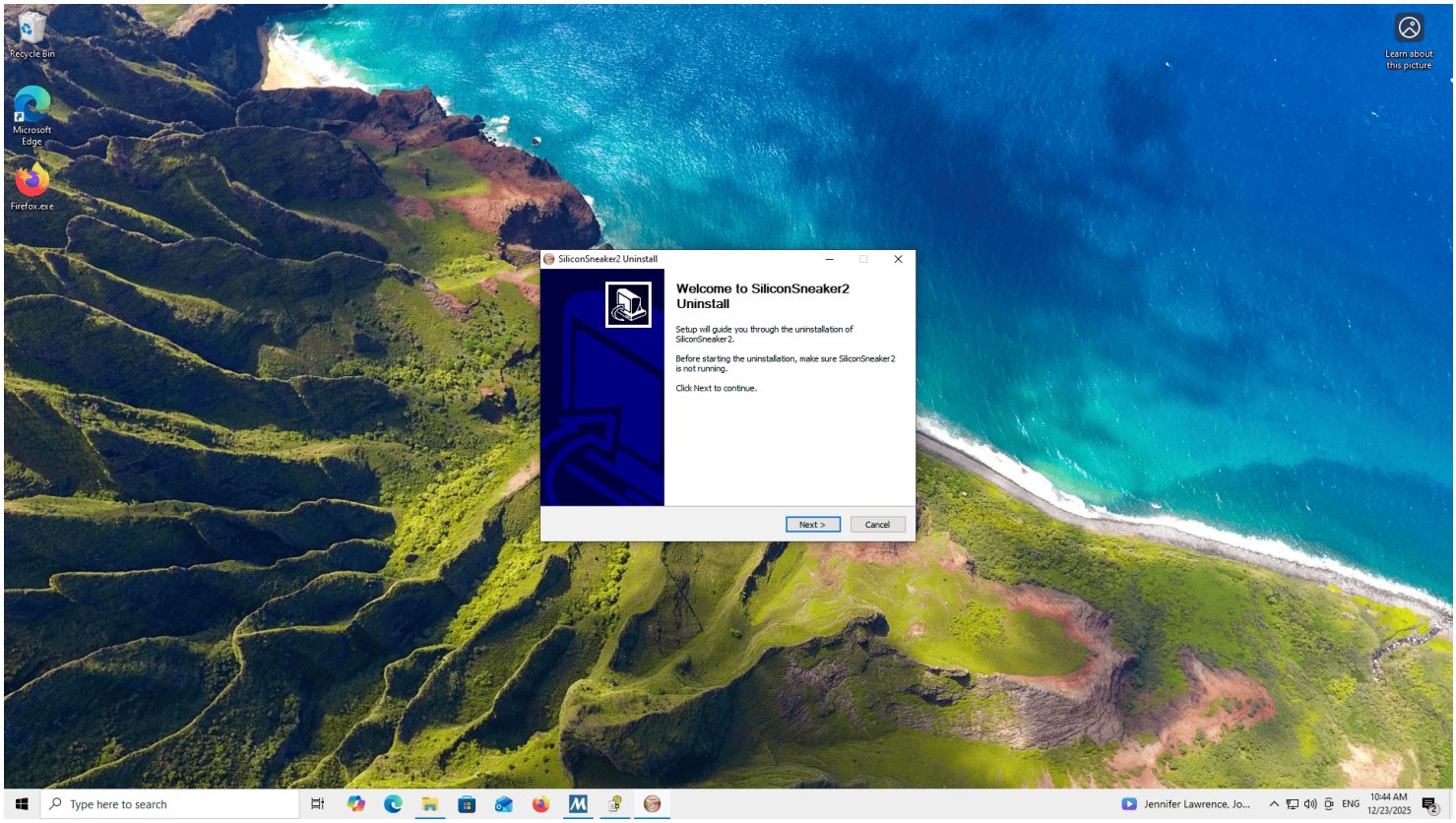

Figure 26. Initial uninstallation screen

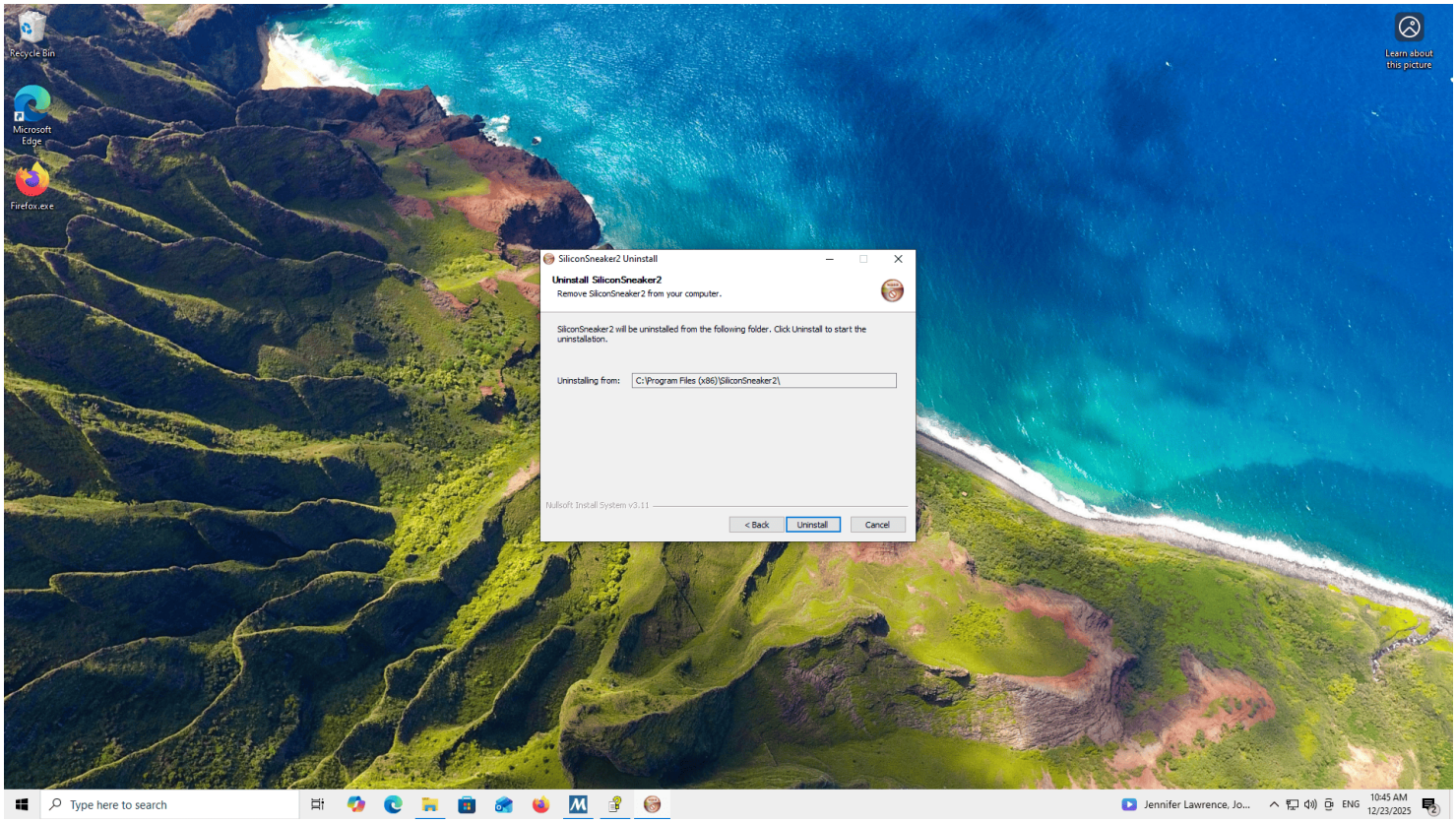

Figure 27. Click the uninstall button to proceed.

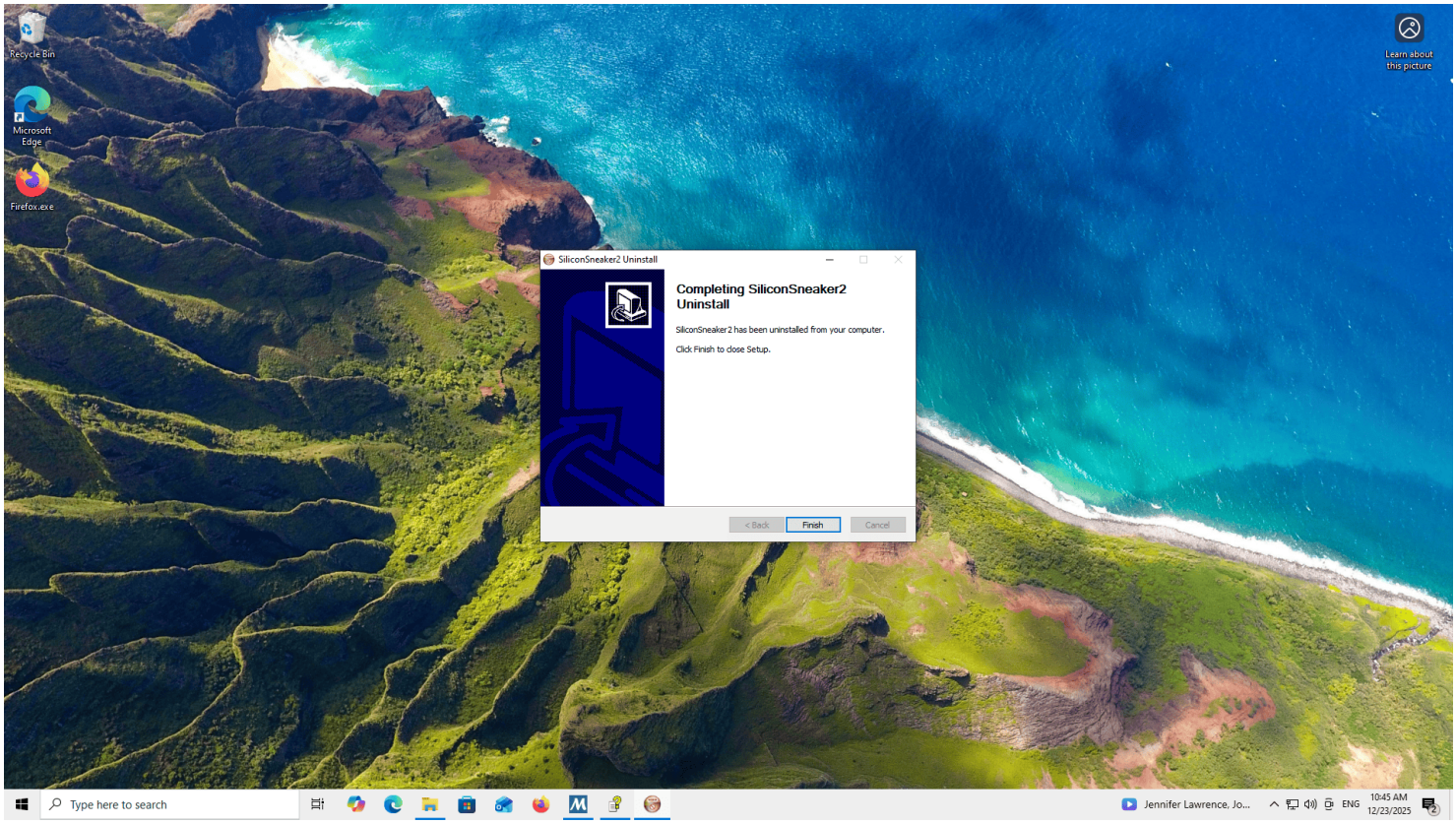

Figure 28. Goodbye, we'll miss you.

9.2. Debian Linux

Debian uninstalls are from the terminal using the APT command as root.

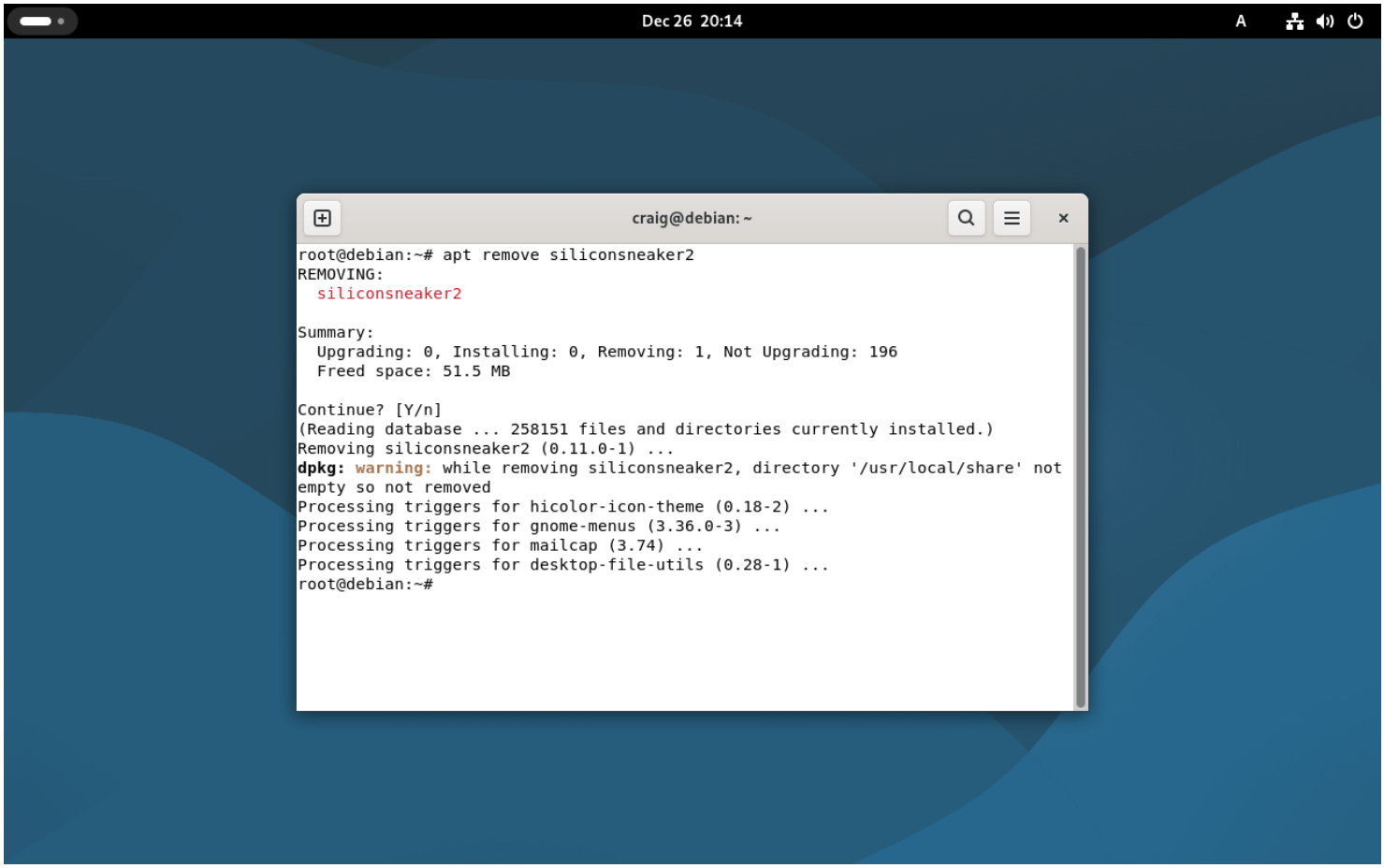

Figure 29. Deinstallation on Linux from the terminal

10. Online Support

10.1. Issues

The tracking system at Github will be used to report problems and suggest enhancements. As SiliconSneaker2 runs under a variety of versions, operating systems, identifying the operating environment is a key to understanding and resolving problems. Please use the About button and note the version + build-time. Report this and the operating system when submitting your issue.

- https://github.com/cprevallet/siliconsneaker2/issues

10.2. Enhancements

The above tracking system will also be used to identify potential enhancements and improvements. If you have an idea for improvements, actual source code speaks louder than words. Let's collaborate! Create a fork of the SiliconSneaker2 source code, update it with your changes and issue a pull request at:

- https://github.com/cprevallet/siliconsneaker2

11. License

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```
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 *
 * On Debian systems, the complete text of the GNU General
 * Public License can be found in `/usr/share/common-licenses/GPL-2'.
```

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Copyright (c) fitparser stadelmanma

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gtk4, libshumate

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