The ESP board used was ESP-S3-wroom-1-N4. This particular board is only supported by using ESP-IDF for the IDE. The framework is Arduino and Espressif provides a website that explains some of the functions/variables in esp\_wifi.h.

**ESP Set-up**

* Install ESP-IDF extension on VS Code
* Install Espressif ESP-IDF v5.4.1 off of the internet
* Configure ESP-IDF

The majority of this required a lot of research and trial and error. Create a new project using ESP-IDF, the Fast ESP Wi-Fi sample, and make sure to select the correct files to set up the project that are in the Espressif file that is downloaded to your computer. You will find issues if the file Espressif is downloaded to has a space in the path name.

Once you are able to successfully create a new project using ESP-IDF you will need to open Device Manager. First make sure that you programmer and board are plugged into your computer. Look for the drop-down that says PORT(S). Identify which port shows up when you plug your programmer in. Go to VS Code and click View. You will need to select Command Palette. In command palette you will search for ESP:Select Port. It will give you options of which ports are being used due to a usb on your computer. I recommend you select the top one. On my computer it put the ESP’s port as the top option. Depending on if it is set up correctly you will need to check the port the ESP is on and look at the driver. Download which driver is named. You can find this through going through Device Manager.

**Flashing Errors:**

Depending on the error that you receive here is a list of things to check to fix it.

* Loose connections on the board
* The USB cord needs to be reliable and strong enough to support the data transfer. Some are just chargers basically. Try different cords if needed.
* Loose connections on the external cords(USB, etc.)
* Sufficient power supply (recommended is about 3.3V I think)
* Baud rate is too fast
  + To fix this click the Manage button, select Settings, and search for baud rate. Select Flash Baud rate and change the baud rate to 11520.
* The board is not in the right state.
  + To put the ESP-PROG board into download state, you need to hold down the boot button and then click the reset button. Release the reset button first, then the boot button.

Beyond this set up, you would then need to set up wifi using the esp\_wifi.h library. I tried and even if you download a different library to use it causes a lot of issues with the program.