

**** Getting Started with OpenCPN: A Practical Installation Guide (with Snacks)****

OpenCPN is a free “Chart Plotter and Navigational software program for use underway or as a planning tool.” It has been “Developed by a team of active sailors using real world conditions for program testing and refinement.” It’s a bit like the Swiss army knife of navigation software – it does pretty much anything and everything, but perhaps at the cost of not doing everything quite as well as some more expensive or dedicated tools.

Many cruisers want to try OpenCPN but find the installation and setup daunting, and don’t know exactly what to do to get it going so they can try it out. They run aground on the minutia of the installation and never really get going, leaving half installed software and a sense of regret behind from the effort. This guide is designed to help you get OpenCPN setup and running on your computer in a useful configuration so you can try it out.

This is not a guide on how to use OpenCPN, how to enable the advanced functions, how to fine tune it for your vessel, how to connect it to data sources such as GPS, AIS or NMEA inputs, this is just a guide on getting the software installed and configured with some charts on a computer for use in a way that’s convenient to operate so you’re ready to explore and use it.

There are many installation and setup routines for OpenCPN. Here I outline the method I use and the one I have taught in numerous seminars and workshops in Canada, Mexico, the USA and Panama over the past 10 years, which results in a flexible, easy, and ready to use installation. I will also take the time to introduce a few of the nuances of the program and show how to load and update the plugins (more on why that’s important later). These instructions are for Windows based PCs, but the setup is very similar for Mac computers and following along these steps should work for a Mac too.

Ok, so here’s how I do it. Let’s get started!

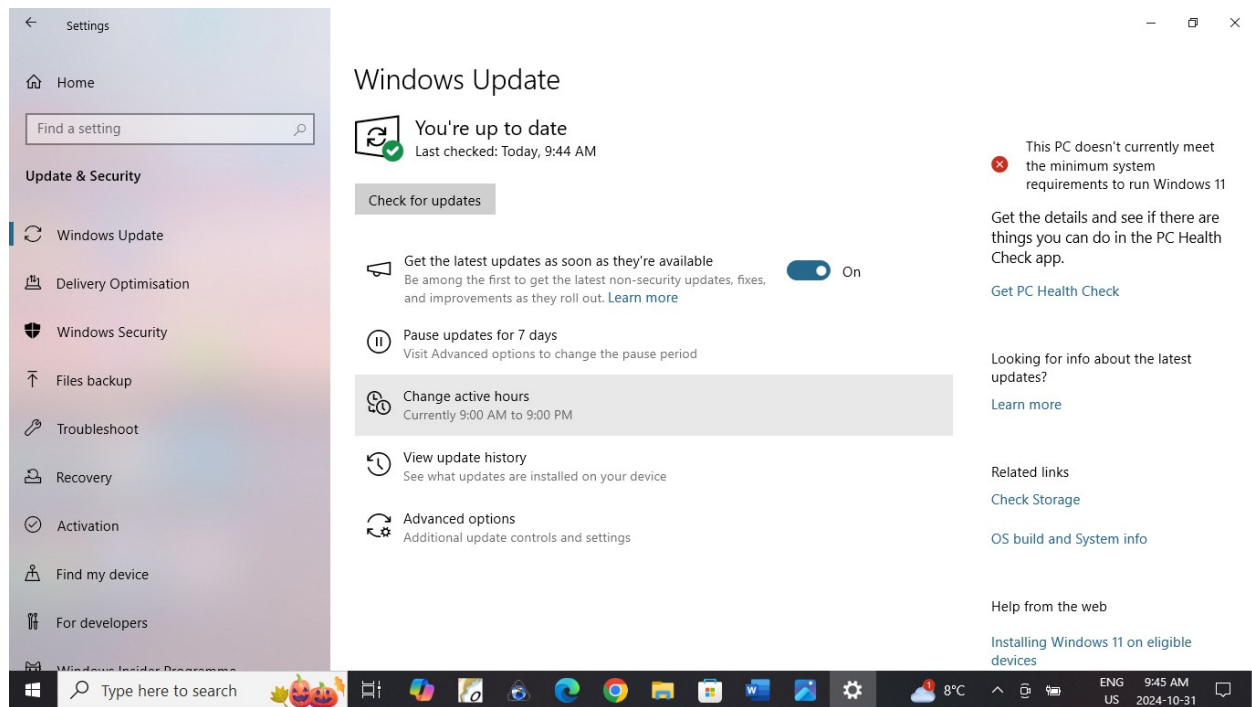
STEP ONE: PREPARE SNACKS

First, prepare some delicious snacks and beverages as this is going to take a while, and much of the setup is waiting for files to copy and install. Watching this is more satisfying when you can graze. Trust me on this.

To get ready, get comfy and start up your PC. Which version of Windows you use isn’t important, OpenCPN supports Windows 7/8/10/11 (except W8 RT). Newer is likely better, as OpenCPN may not support older versions indefinitely, so do upgrade your version of Windows as you can. Hard drive capacity should match your anticipated chart storage and can easily run to hundreds of gigabytes. Have at least 50-100 Gb free space for this to get started. NOAA charts of the USA in vector and raster take about 12Gb, CM93 charts about 4Gb, and MBTiles can add up to over 200Gb (or more) quickly. If your PC does not have enough free space on the internal hard drive, charts can be stored on an external USB flash drive/thumb drive, a MicroSD card in the PC’s MicroSD card slot or an external hard drive or you can upgrade the internal drive in the computer to allow more storage. If you’re buying an external drive, get an SSD (Solid State Drive) as they last longer in salty environments. OpenCPN doesn’t need a very powerful computer, fancy graphics drivers or a lot of memory (4Gb is ok, 8Gb is better), so don’t sweat those features.

STEP TWO: UPDATE WINDOWS

Now, update your computer with Windows Update. This may take hours if the computer has been off the internet for a while, but its worth it as the updates may include operating system components and device drivers OpenCPN uses.



Ah, I'm up to date!

This may take a while, so use the time to enjoy some of your carefully prepared snacks.

STEP THREE: RUN DISK CLEANUP

To run Disk Cleanup, search for "Disk Cleanup" in the Start menu, select the drive you want to clean, check the boxes for files you want to remove, and click "OK". For a deeper cleanup, you can click "Clean up system files" to remove extra Windows files after the initial cleanup is complete. (You should do this to remove any old system files on an older PC).

Have a snack now. You've earned it.

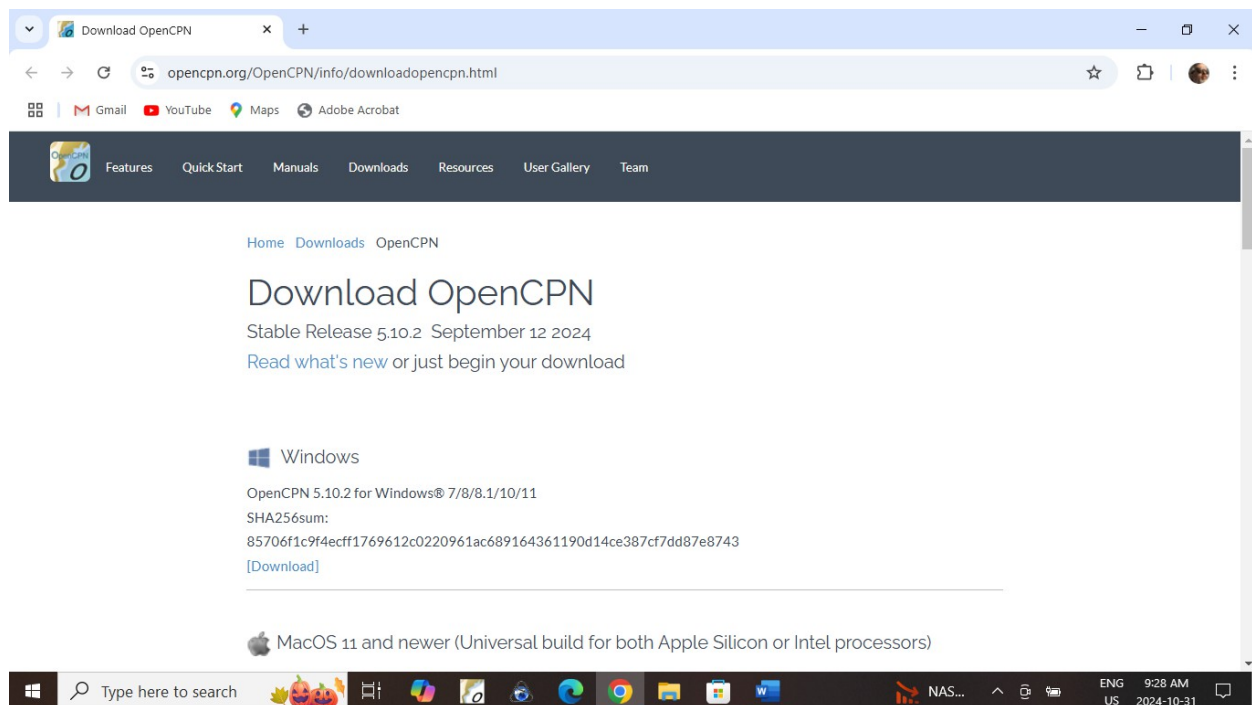
STEP FOUR: DEFRAGMENT YOUR DRIVES

Next, defragment your hard drive(s). To do this, select the search bar on the taskbar and enter 'defrag', then select 'Defragment and Optimize Drives'. For each drive, Select the 'Optimize' button. This can take a long time if the drive(s) are badly fragmented but is worth doing as a fragmented drive will copy files slowly and there is a lot of file copying and downloading in subsequent steps of this process. (SSD drives don't require this step).

This is another excellent opportunity to enjoy some of your specially curated collection of goodies.

STEP FIVE: INSTALL THE BASIC OpenCPN PROGRAM

Now that the PC is updated, tidied up and defragmented, you can start the installation. Open your internet browser of choice and navigate to < [Download OpenCPN](https://opencpn.org/OpenCPN/info/downloadopencpn.html) > (pro tip: add a bookmark to your browser so you can easily get back here to check for updates). Download the appropriate installer by clicking on it and install OpenCPN. Your computer will likely cough up a furball with a warning that says something like “Do you want to allow this app from an unknown publisher to make changes to your device?”. The OpenCPN development team doesn’t participate in the Windows or Apple application verification processes, so this warning is inevitable. You may get even more dire warnings from your anti-virus software if you have one installed. Ignore the warnings and click ‘Yes’ to continue with the installation. If necessary, disable your anti-virus program to allow installation.



Select the appropriate language and proceed with the default options. Installation is quick, usually a minute or two.

It is probably a good idea to add a shortcut for OpenCPN to your desktop and/or toolbar for easier access. If you don’t know how to do this, just google it.

Have some more of your snacks now.

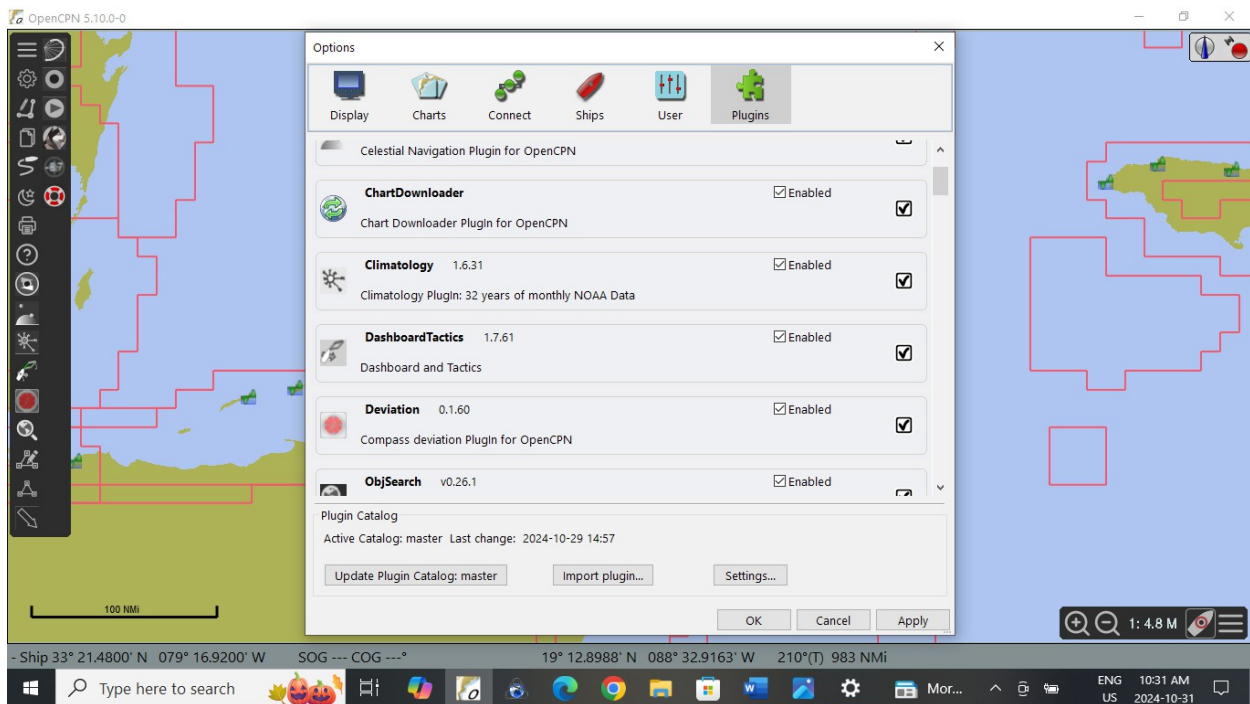
STEP SIX: SETUP

Now we can begin setup and configuration of OpenCPN. There are a few steps here that make using the program easier and add more functionality and options.

STEP SEVEN: PLUGINS

Plugins are an important part of the OpenCPN 'ecosystem'. They are how the legion of OpenCPN developers add new features (and there are lots of them). Over time, popular Plugins migrate to the basic install when sufficiently popular and mature. You may want to use quite a few, but in this basic install we will cover just two. You can go back and get others later to meet your interests and needs.

Later, to shop for what Plugins you might be interested in, go to <https://opencpn.org/OpenCPN/info/downloadplugins.html> and click on the Plugin name to get a description of what each one does. Then, to install the plugins once you know which ones you want, open the OpenCPN program and click 'Options' on the menu (the little gear symbol). Click 'Plugins' (the jigsaw puzzle icon in the upper right of the popup box). Click 'Update Plugin Catalog: Master' in the lower right of the popup box). Now we can install and configure plugins.



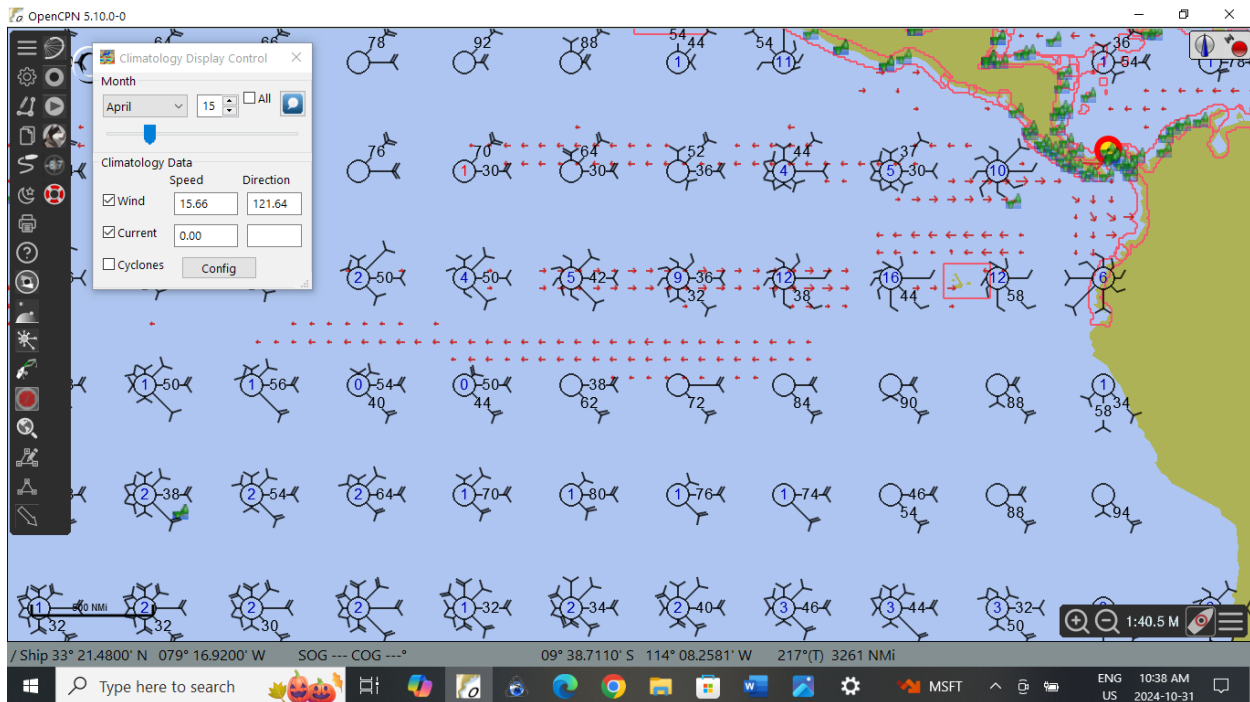
OpenCPN showing an updated plugin catalog and the ChartDownloader and Climatology Plugins installed and enabled.

(Note: Plugins are updated on a separate schedule independent of the base OpenCPN program, so in future you should periodically check for updates for your plugins by updating the catalog and any plugins you have installed.)

STEP EIGHT: INSTALL CLIMATOLOGY PLUGIN

The first Plugin we will install is Climatology, an interactive view of historic weather patterns derived from satellite data, a kind of modern pilot chart. After you've updated the Plugin Catalog as above, find Climatology in the list and click to install it. After you install a Plugin you will

need to click 'Apply' in the lower right of the popup box to enable it. Then click 'OK' to close the popup box.



The Climatology view for a passage from Central America to the South Pacific showing average conditions on April 15th.

When the popup box closes, you will notice the menu will have changed and a new icon will have appeared, shaped like a wind rose (or mis-shaped spider). Clicking on this will start the Climatology plugin. The first time you run it (by clicking on the icon), it will download the data sets, which takes a few minutes. After the data is downloaded, you can select what data you want to see (wind, current, cyclones) and day of the year you want to see it for in the display control box that pops up. A great way to visualize average weather for some other time of year.

Take some time to look around and play around with it, checking the wind roses for various times of year in various locations.

Have a bit of a nosh while you explore.

STEP NINE: CHART DOWNLOADER

The Chart Downloader is either incredibly useful or totally useless, depending on where you are cruising. The Chart Downloader Plugin is included in your OpenCPN installation and automatically enabled in new installations. It lets you download, install, and keep up to date the navigational charts provided by various free governmental and other sources worldwide directly from within OpenCPN's Toolbox. Free charts are available from many governments, and the Chart Downloader automates their initial download and subsequent update (Charts are like milk, bread and beer, they are best enjoyed fresh). Having a utility that automates the management of thousands of charts is spectacularly useful if you're in an area that is covered (and sadly useless if you're not).

Make sure it is enabled by clicking ‘Options’ (the gear icon) and then let’s go to ‘Preferences’ by clicking ‘Preferences’ in the lower left of the box. Chart downloader will default chart storage to a curiously chosen directory like C:\Users\<user name>\OneDrive\Documents\Charts, which is a bit inconvenient when adding and organizing charts. I like to have it installed in a “root” directory like C:\CHARTS so it’s faster and easier to get to with my file management program. Chart File management is an important feature in OpenCPN, so it’s nice to have it a bit handier.

To change the default directory for the chart downloader, click ‘Options’ (the gear icon), ‘Plugins’, then click on the ‘ChartDownloader’. Click on ‘Preferences’ and in the box at the top edit the entry to the top level of your chart folder (C:\CHARTS on your main drive or wherever you may have put it on a separate storage device).

This is a good time to reward yourself with a choice tidbit from your snack tray.

STEP TEN: INSTALLING CHARTS – ORGANIZATION AND MANAGEMENT

Installing and managing Charts is at the heart of a successful OpenCPN installation, and good chart ‘hygiene’ is critical to making OpenCPN fast and easy to use. Charts should be installed in a set of sub directories under the “C:\CHARTS” directory you created in the step above, segregated as to type and geography so you can switch them in and out of use like you might select the blades and tools on a Swiss army knife. Like a Swiss army knife, OpenCPN won’t work well if you have too many of the tools open at once, and segregating charts in subdirectories allows you to switch them in and out within the program (more on how to that later).

There are myriad types of charts: various types/brands/areas of Vector, various types/brands/areas of Raster, KAP image files, MBTiles, and several proprietary chart types like O-Charts and CM93.

So your “C:\CHARTS” directory and subdirectories for your whole library may end up looking like something like this:

```
C:\Charts
  \CM93
    \Vector Chart set from <some source>
    \Vector Chart set from <some other source>
    \Raster Chart set from <some source>
    \Raster Chart set from <some other source>
    \KAP Chart set from <some source> for <some area>
    \KAP Chart set from <some other source> for <some other area>
    \MBTiles Chart set from <some source> for <some area>
    \MBTiles Chart set from <some other source> for <some other area>
    \Special Chart set from <some source> (for example, Pilot Charts)
```

... and so on

You are aiming for a set of neatly organized and segregated chart subdirectories clearly labelled that you can switch them in and out of like the blades in a Swiss Army Knife or multitool as needed. Just as with a Swiss Army Knife, if you have all the blades open at once it’s impossible to use, and segregating your charts allows you to surgically select the charts for the voyage you’re on or the task you are doing. The naming conventions you choose are important, as you

won't revisit this very often and using plain language names you can understand will be appreciated later. This is helpful so you aren't presented with 20 or more chart selections when looking at an area and allows you to limit the number of charts OpenCPN indexes for use during your navigation session, which also improves performance (you don't need your Portuguese or New Zealand charts when you're navigating in California, and vice versa).

Name the directories in a way that makes sense to you. These directories may have charts from the chart downloader tool, from other cruisers, from the internet, that you made yourself, or what have you.

Then, when you are going to make trip, you choose the ones you need. In a real world example for a trip from San Diego to Ensenada it might be:

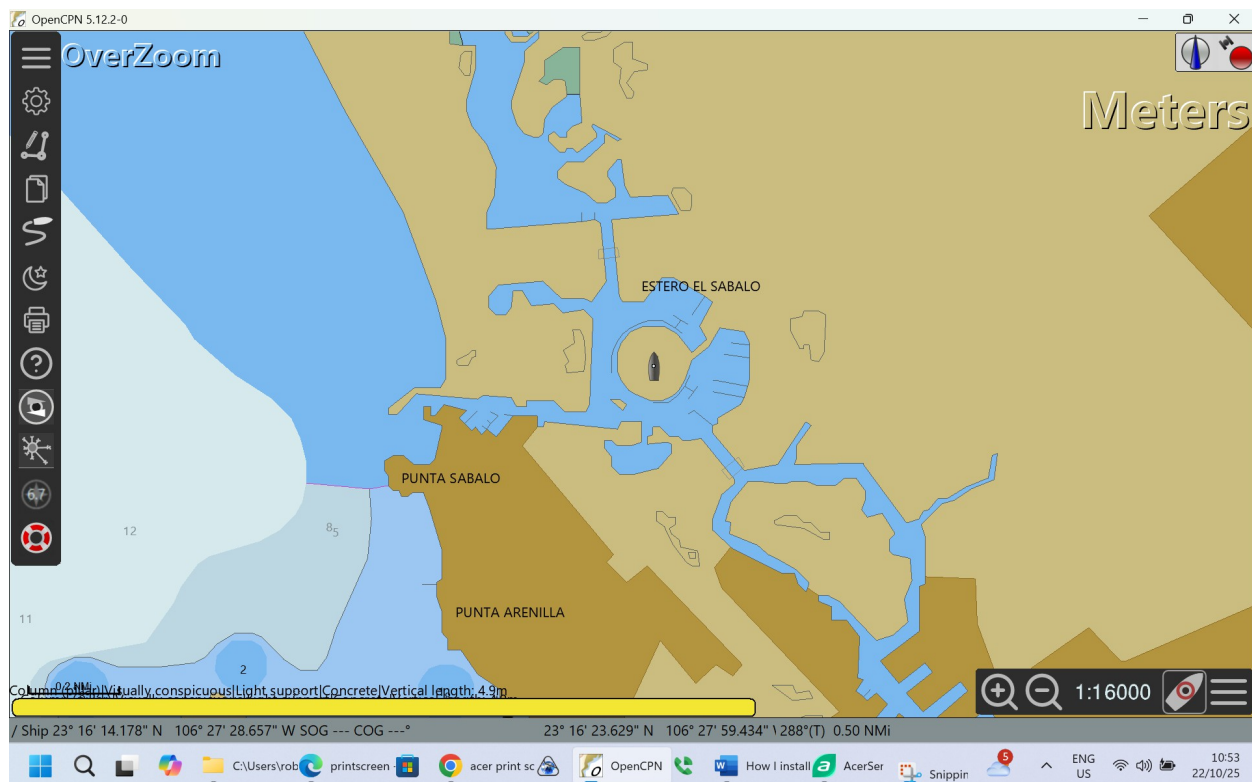
```
C:\Charts
  \CM93
  \NOAA ENC
  \MBTiles Chart set Pacific Mexico
```

CHART TYPES

So, lets talk charts, and chart types.

Some common chart types are:

CM93 – pirated copies of C-MAP charts circa 2010-2015. These are outdated unofficial (commercial) global vector charts. Some versions may have newer or older dates, but the dates on the chart files themselves are often suspect (suspect in that they bear no relation to the dates of the charts). Sometimes they have version numbers (V1, V2, etc.) but these are also suspect indicators of the version as they're often typed in by a cruiser. They are sometimes available on the internet for brief periods of time from various sources, but they are usually taken down quickly. The best source for these is other cruising sailors. They are out of date but have tremendous utility as a single chart set covers the whole world, has reasonable quality, and was created within living memory. The best way I have found to determine the age of the CM93 charts is to look at Mazatlán, Mexico (23° 16' 14" North, 106° 27' 28' West) and check the detail there. Old versions don't show the circular island, new marina and docks, the newer ones do and will look like this:



Official ENC (Vector) charts – are a digital format of navigational charts used for marine navigation. They are vector datasets that contain all the necessary information for safe navigation, such as coastlines, depth soundings, and navigational aids like buoys and lights. These are great when available for an area, provided by local authorities either directly or via a third-party reseller. Download with chart downloader or use one of the plugins to get the third party supplied charts like those from O-Charts or NV Charts. These can usually be downloaded via the chart download tool. The downside of the ENC format is the loss of detail when zoomed out to a large area. Several vessels have been documented coming to grief when using charts zoomed out to the point where islands and reefs disappeared from view on the plotter, including a Volvo Ocean Racer in 2014 (<https://www.boatus.com/expert-advice/expert-advice-archive/2015/april/what-the-volvo-race-crash-teaches-boaters>)

Official RNC (Raster) charts – are scanned images of traditional paper nautical charts used for electronic navigation. They function as a direct digital substitute for paper charts, making them familiar to users but lacking the interactive data features of newer ENCs. Because they are image-based, zooming in and out on an RNC can appear less smooth compared to ENCs. Download with chart downloader or use one of the plugins to get the third party supplied charts like those from O-Charts or NV Charts. (NOAA discontinued RNC charts in January 2025, but others still support the format.)

KAP charts - these are image-based charts (Georeferenced Raster Images), used for satellite images (although the KAP based Sat charts are largely replaced by MBTile charts now) and for images from cruising guides, etc. They can contain other raster images, such as those from scanned charts or cruising guides.

MBTile charts - these are typically image-based satellite charts (Georeferenced Raster Images), created from satellite images. Technically far more sophisticated than KAP charts, these have a better colour palette and are 'zoomable', showing more detail as you zoom in to view a smaller area (if appropriately made). Here are a couple of articles on how to make Mbtiles at [Mbtiles for OpenCPN: a Huge Step Forward for Satellite Charting - Currents Bluewater Cruising](#) and [Revisiting MBTiles for OpenCPN - Currents Bluewater Cruising](#). Some cruising rallies, like the Ocean Posse Rally, have MBTiles libraries available for members. You can get them from various other sources such as other cruisers and websites ([The Chart Locker \(brucebalan.com\)](#), <https://svsoggypaws.com/SatCharts/index.htm> and [Chart Downloads \(svocelot.com\)](#) are good ones).

You can get more information on various chart sources from the OpenCPN website at [Chart Sources \(opencpn.org\)](#).

OK, have a quick nibble and then we'll install some charts.

STEP ELEVEN: INSTALLING CHARTS

Let's go get some charts. If you have some to copy from a fellow cruiser, you can just copy them in (using the file management program and the protocol for separating them into different directories above). If you don't have any, you can use the chart downloader to download any of the free charts it lists.

The chart downloader will create separate sub-directories for the charts within the C:\CHARTS directory automatically. You may not like the OpenCPN naming convention and wish to change the directory names, which you can do by editing it in the box in the bottom of the window.

As an example, let's download the ENC chart sets for the USA first. Click 'options' (the gear icon in the menu), then select 'Chart Downloader' (tab on the right in the pop-up box). Select click through to select 'all ENCs' and download them. (If you're in a hurry to get to the end of this tutorial, you can download a single state or coast guard district. Less to download will be faster.)

Snack again now.

The chart downloader will create separate sub-directories for the charts within the C:\CHARTS directory automatically.

Now we can get the pilot charts, again, same steps.

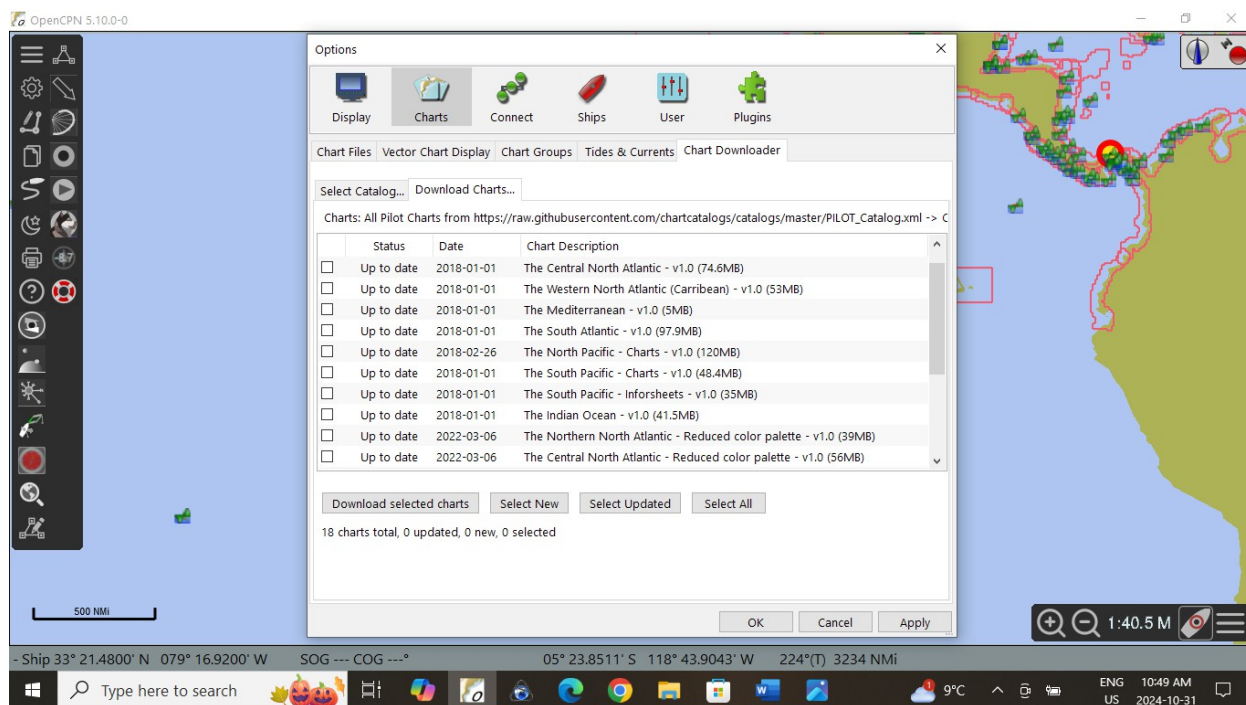


Chart Downloader showing downloaded and up to date pilot charts.

Have another snack, perhaps a beverage.

Now you have charts loaded on your hard drive and are ready to use them.

STEP TWELVE: CONFIGURING CHARTS FOR USE

Now that we have some charts, we can use them. But loading, copying or updating charts to your C:\CHARTS directory does not get them to automatically show up in OpenCPN. You need to tell OpenCPN which of your available charts you want to use (this selection will change over time as you get different charts and cruise in different areas — think of it like selecting which blade or tool you want to use on your Swiss Army knife). You do this via the 'Options' (gear icon in menu) and then the 'Charts' icon (second from left in the popup box).

Select the chart directories you want to have OpenCPN display in use by click 'Options' on the menu (the little gear symbol). Click 'Charts' (second from the left in the top row) and add the appropriate directories (chart files you have added by folder). So here you can add NOAA ENCs, and Pilot Charts you have downloaded. Then click 'Apply' in the lower right and OpenCPN will index the charts for use.

After clicking 'Apply' you will see OpenCPN index the charts for use, and then you can click 'OK' to close the popup window, OpenCPN will now display the charts and pick which one it thinks is best for the area you're viewing at the zoom level you have selected. There will be a series of coloured 'Piano Keys' across the bottom that will allow you to choose the chart you want to see (as opposed to the one OpenCPN thinks is best). The keys are colour-coded, and hovering over one with your mouse will pop up a box showing what chart the key represents. This display can get very "busy" with many keys and a confusing array of choices, but there's an easy way to make it easier to use.

Have another snack and we will set up Chart Groups.

STEP THIRTEEN: CHART GROUPS

The ‘Chart Group’ feature allows you to define different Chart Groups, with different chart folders in each group, and then to rapidly switch between them. The Group desired for viewing may be selected quickly, through the right-click pop up menu or the number keys on the keyboard, without adding or deleting charts from the Active database.

This allows you to switch from Vector -> Raster -> KAP images -> MBTiles -> {any other chart type} in an instant and revert to an all-charts view (the default) at a keystroke or mouse click. This makes rapid assessment of your position quicker and allows you to better understand the chart resources you have enabled for your (or any given) position.

Setting up which charts are in which groups, and what order they display in is a personal choice, but I like to set them up in this order: Vector, Raster, Satellite Image (KAPs and MBTiles), then specialty charts (like those from cruising guides, pilot charts, etc.).

To begin, click ‘Options’ (the gear icon), then ‘Charts’, then ‘Chart Groups’ (third tab from left). You will see two windows, the upper is a list of your available charts you have added and had OpenCPN index for use, and the lower has a single chart group, ‘All Charts’ (All Charts is a default Chart Group and can’t be removed). To the left of the lower window is a ‘New Group’ button. Click the ‘New Group’ button and name the group in the popup box (for example, “NOAA ENC”), click ‘OK’ and then in the upper window in the popup box select the chart sub-directory you want to add to the group from the list (the directory with your NOAA Vector Charts in this example). Click ‘Apply’. Repeat this process for each of your chart directories. When you’re done adding them one-by-one, click ‘OK’ in the popup box to close it.

Now you can switch chart views at a keystroke. Press ‘0’ for the default ‘All Charts’ view, press ‘1’ for the first of the custom groups you have created, ‘2’ for the second, and so on. You can also right click anywhere on the OpenCPN screen and ‘Chart Groups’ will be one of the options in the popup menu, allowing you to select with your mouse or other pointing device.

When you switch Chart Group, the screen does not move relative to the earth or your vessel icon, you simply see a new set of charts.

You will still see the “piano keys” on the bottom of the screen, but the keys will only be displayed for the charts in the selected group.

Time for another morsel, I think ...

A FEW USER TIPS

Now let’s have a quick look at a few user interface features before you start using the program.

The Menu on the left allows you to switch on and off some of the plugins, start and end a track, plan a route, etc. Hovering over a button displays the functionality. Clicking the three-bar icon at the top of the menu will “collapse” it, giving you more screen real estate to view charts. Clicking it again will expand the menu again.

The circle-in-question-mark icon in that menu is how you get to the help file. This is likely to be of great utility.

Clicking the three-bar icon in the lower right corner allows you to control some of the chart viewing options. Other controls for vector charts are within the 'Options' -> 'Charts' -> 'Vector Chart Display' menu options. This can allow you to 'declutter' the chart view, deselect certain chart features you may not wish to see, etc.

You can configure OpenCPN to show two windows side by side with different charts in each one. You do this by clicking Options -> Display and selecting the 'Canvas Layout' you prefer. Then use the chart group feature in each window to get the charts you want in each one (for example, a vector/ENC nautical chart in one, MBtiles satellite images in the other).

As I said at the outset, this is not a guide on how to use OpenCPN, so I will leave it you to research the user manual, YouTube videos, Blogs, and internet resources to fill out your facility with the program.

OpenCPN evolves, so do update the program every 60-90 days. Set a reminder on your phone so you don't forget. Run the chart downloader at the same time to keep your charts fresh. Plugins are updated separately, you need to visit the plugin installer, update it, and check for updates there too.

Have a snack, and perhaps a beverage to celebrate our completion of the program installation!

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