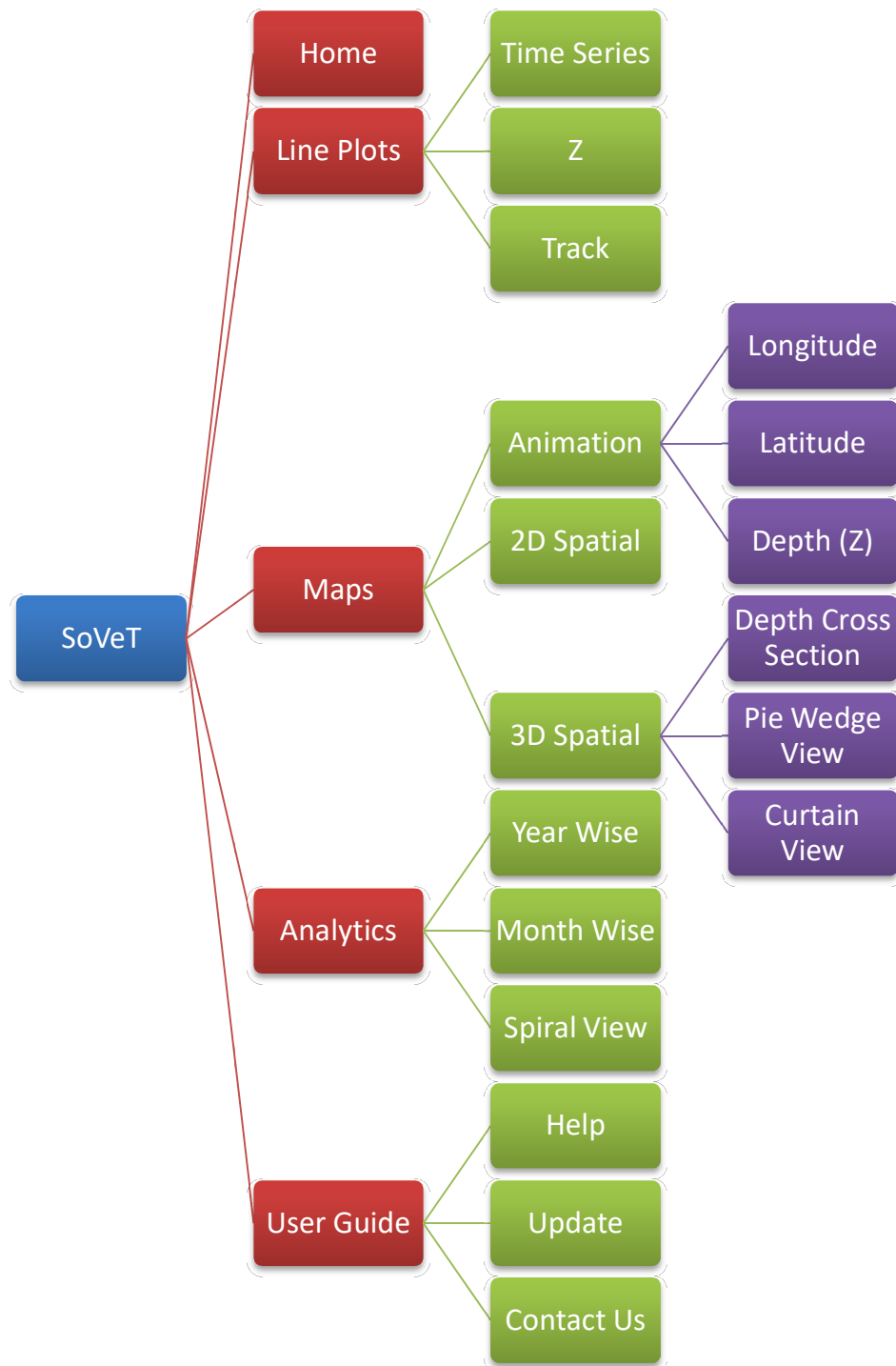


Sound Velocity Visualization Tool: SoVeT

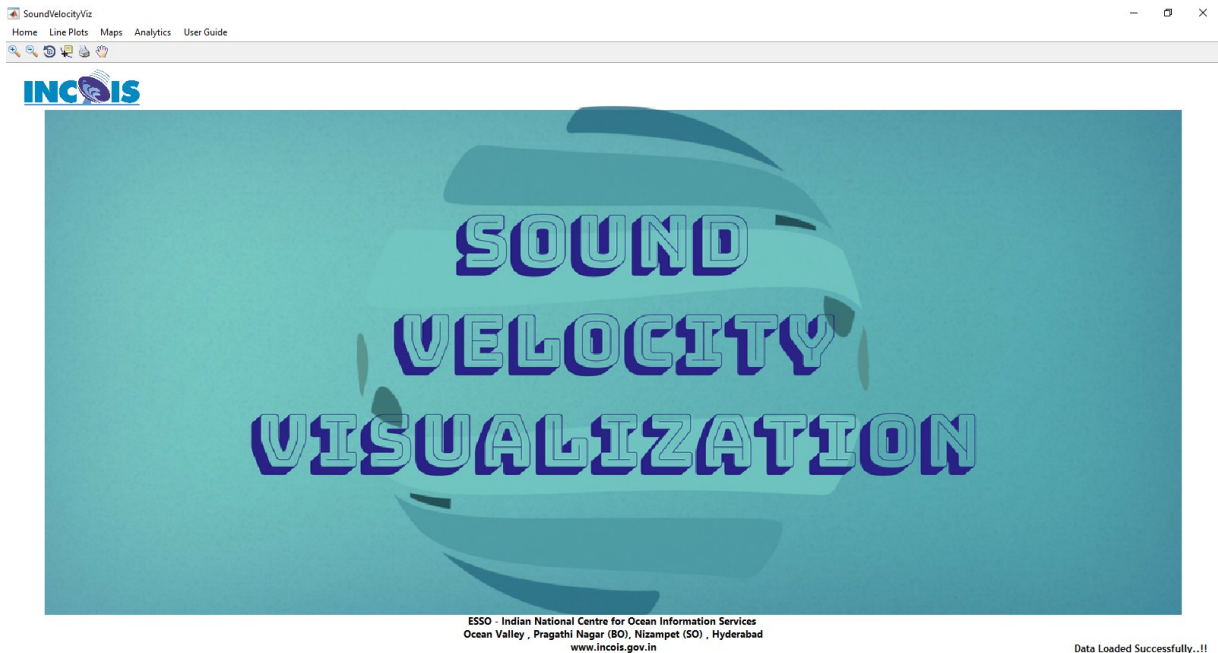
Menu Tree:



Menu Actions:

1. Home

When we click on "Home" menu item it resets tool to initial state.

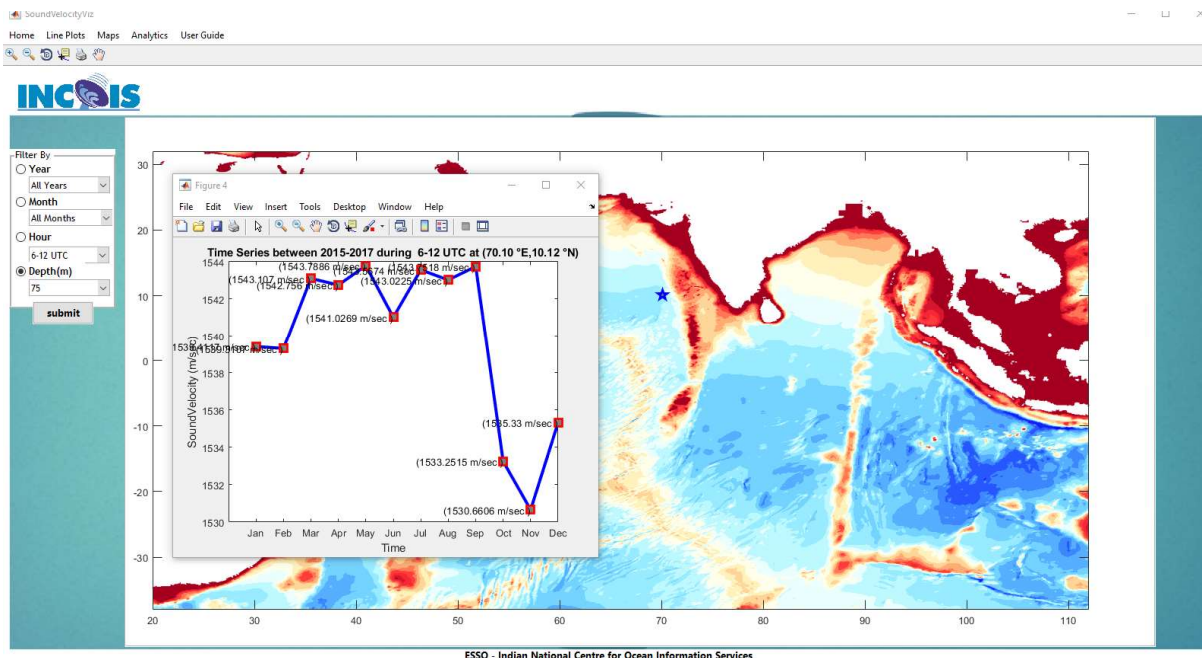


2. Line Plots

2.1 Time Series

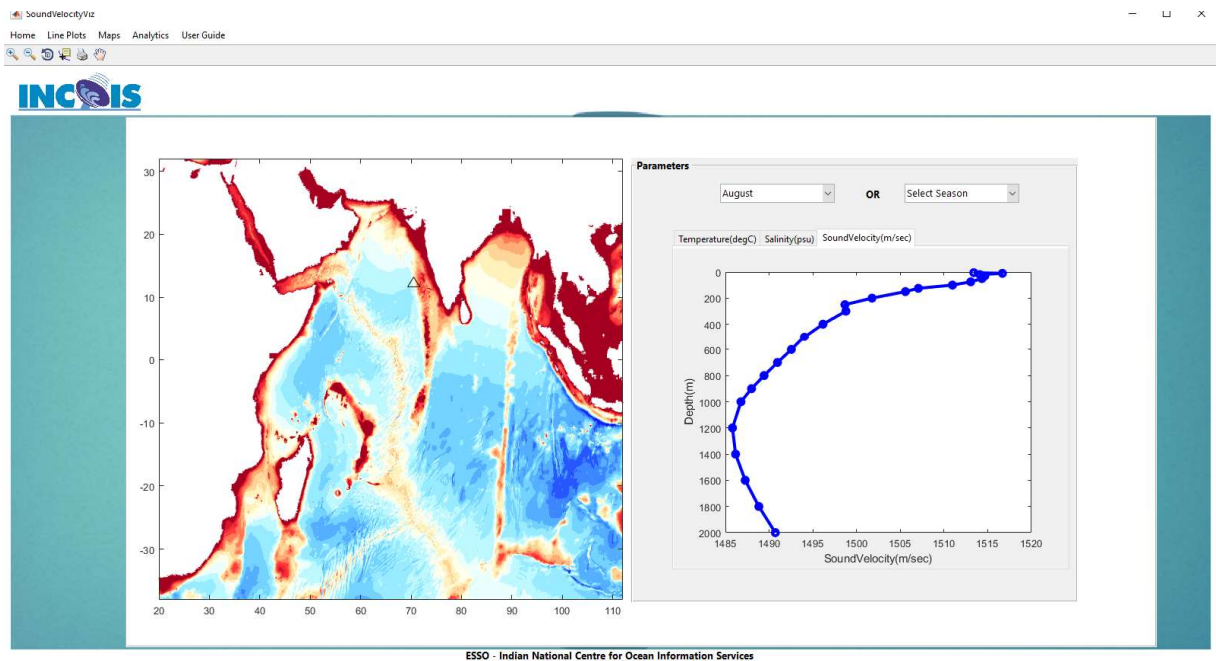
To generate time series plots the user is given the option to choose his desired months (Jan - Dec) and the time zones of the day vis., 00 - 06 Hrs, 06 - 12 Hrs, 12 - 18 Hrs, 18 - 24 Hrs. Figure 1 shows that selection of years range, month and time zone from the dropdown menus for generating the time series plots. Once the user selected the year range, month and the time zone, he can select any location in the map which executes a query from the data stored, which results in filtering the data so as to match the query and the output is generated in the form of a line plot. The user is also provided with an option to choose and plot the sound velocity variations for all the months and one specific time zone and for a specific month and all time zones with varying depths respectively. The tool is also capable of throwing errors if the choice of filtering is wrong Ex: choice of all months all time zones. This type of choice results in an error box indicating "invalid selection" and the user is asked to recheck his selection

and change it for getting a valid output. Figure 2 shows the time series plots for a choice of all month and time zone 06 - 12 Hrs.



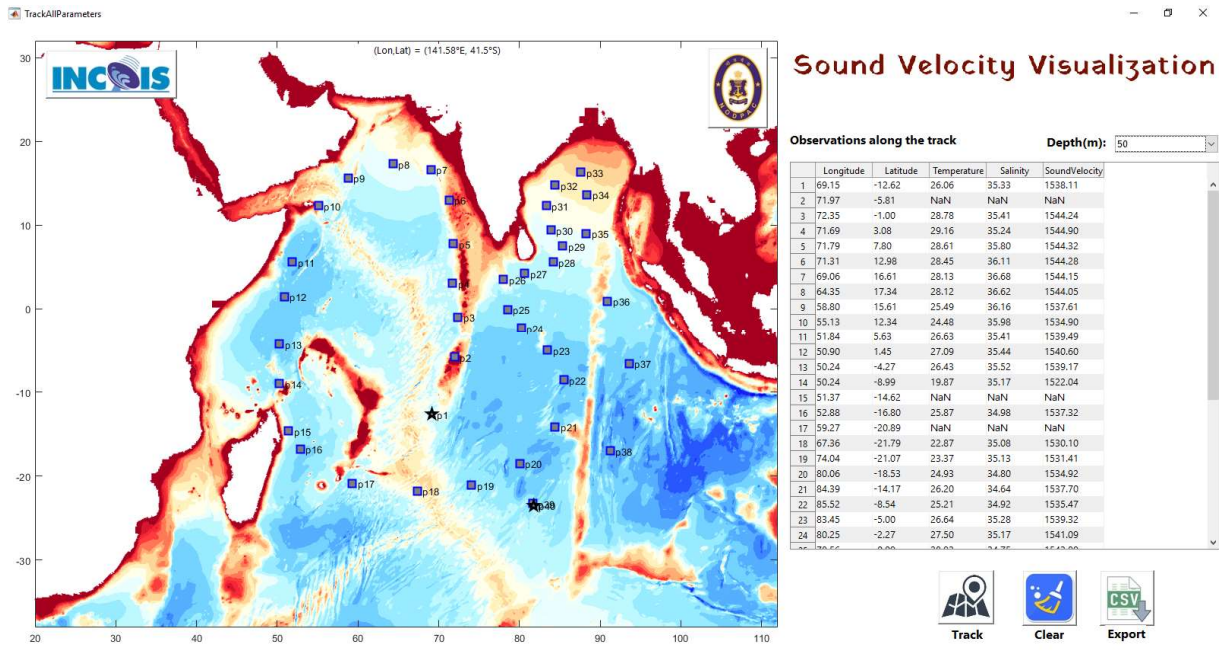
2.2 Z

Visualization of sound velocity along different depths is done by selecting "Z" submenu item under Line Plots. By selecting Z user requested to select a point on map to fetch the corresponding data and plotted in adjacent pane. Here, user is provided with two choices i.e., filter by month and filter by season for the selected location which results in new plot. Figure 3 explains about the above description.



2.3 Track

In addition to the time series and depth plots, the user is also given an option to generate the line plots along any specified ship tracks for any specific month or season. The user can create a cruise track file before uploaded or the track of his choice can also be created with manual selection of (longitude, latitude) points which can be eventually saved into the desired locations and can be used at a later stage. Figure 4 shows the available options to give the track positions. After selecting the option and the locations the user is given an option to save this cruise track for later use. The positions of the cruise track are shown as $P_1, P_2 \dots P_n$ where P_n is the n th location of the track. The values along these positions are computed from the data and then displayed in the left hand side frame which can be copied and used for any purpose. Also the line plot of the parameter chosen is shown for all the position along the track. User can also export the track locations data as excel.



3. Maps

3.1 Animation

3.1.1 Longitude

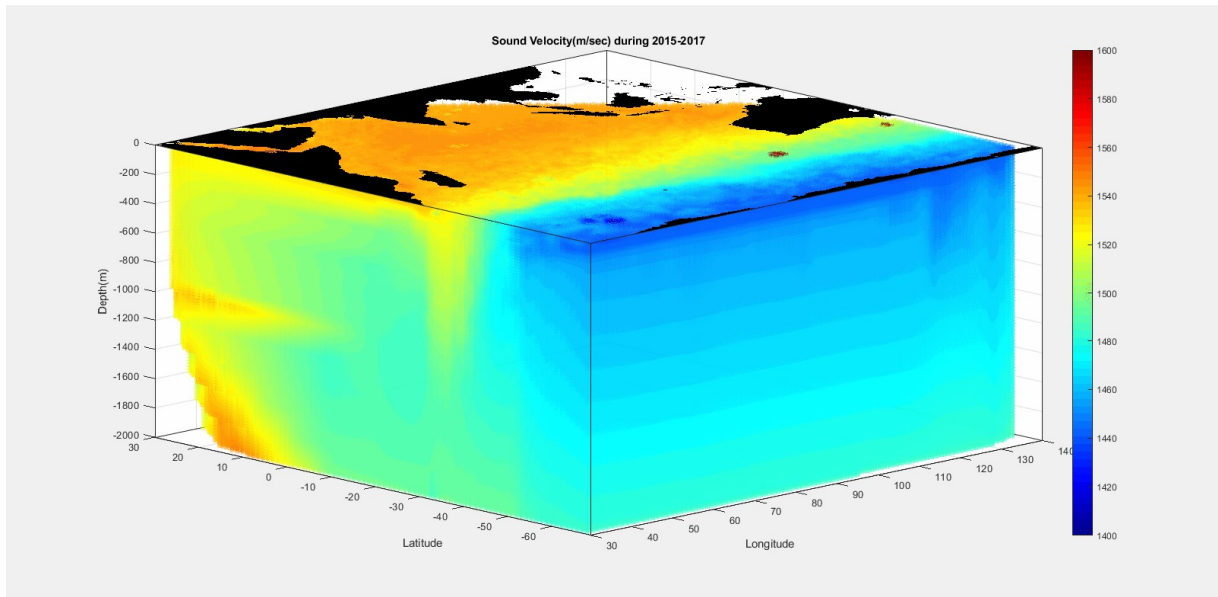
Created an animation file in which sound velocity varies along the longitude by making depth and latitude as constant. Figure 5 explains about it.

3.1.2 Latitude

Created an animation file in which sound velocity varies along the latitude by making depth and longitude as constant. Figure 6 explains about it.

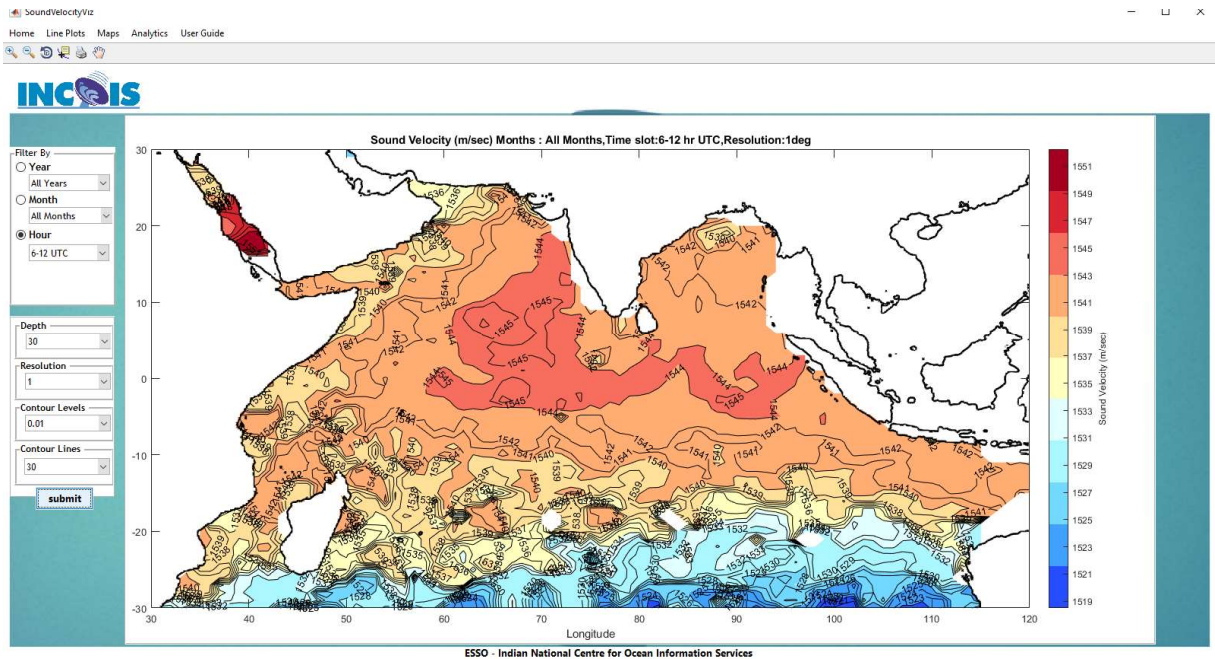
3.1.3 Depth (Z)

Created an animation file in which sound velocity varies along the depth by making longitude and latitude as constant. Figure 7 explains about it.



3.2 2D Spatial

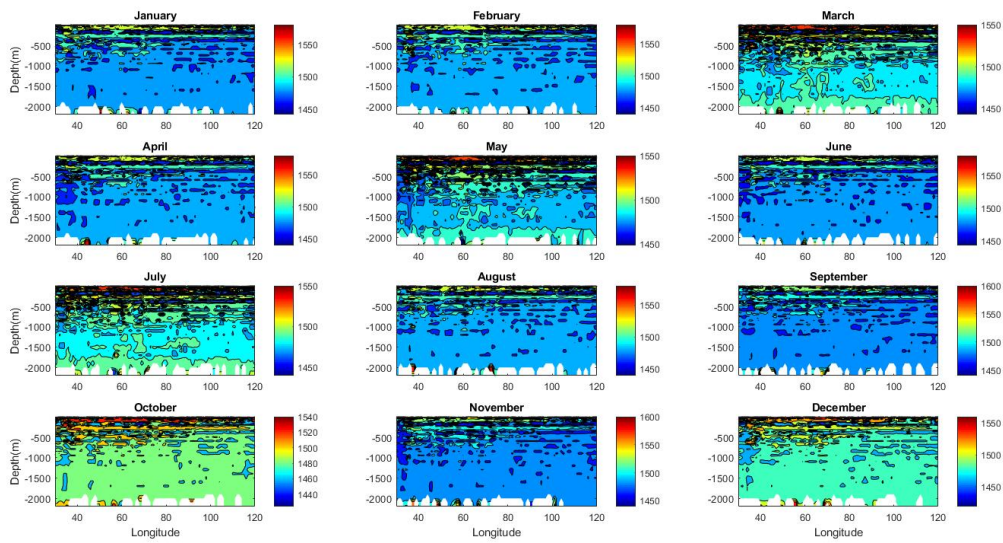
Tool has the feasibility of generating climatology dynamically. Unlike climatologies which are generated once and all the analysis is derived based on it, here the climatology generation is made dynamic. The user is given an option to generate climatology for any resolutions like, 1.0° , 0.75° , 0.50° and 0.25° degrees and also for period of his choice. Also, the option for choosing the number of contour lines and levels in the spatial plot that would be produced is provided. By default the climatology uses all the data for all the years available. However an option is given to the user to choose the time range (year x 1 - year x) so that all the data available between this period is obtained and climatology is generated. Also provision for updating the data for years to come is also provided, so that this tool is not limited to the current climatology but also caters to all upcoming years too. Figure 13 shows the options of generating climatology. Figure 6 shows spatial climatology of SST of all years, all months for 6 - 12 UTC, for a grid resolution of $1^\circ \times 1^\circ$ with contour level 0.01 deg Celsius and with 25 contour lines. Figure 8 showcases the visualization.



3.3 3D Spatial

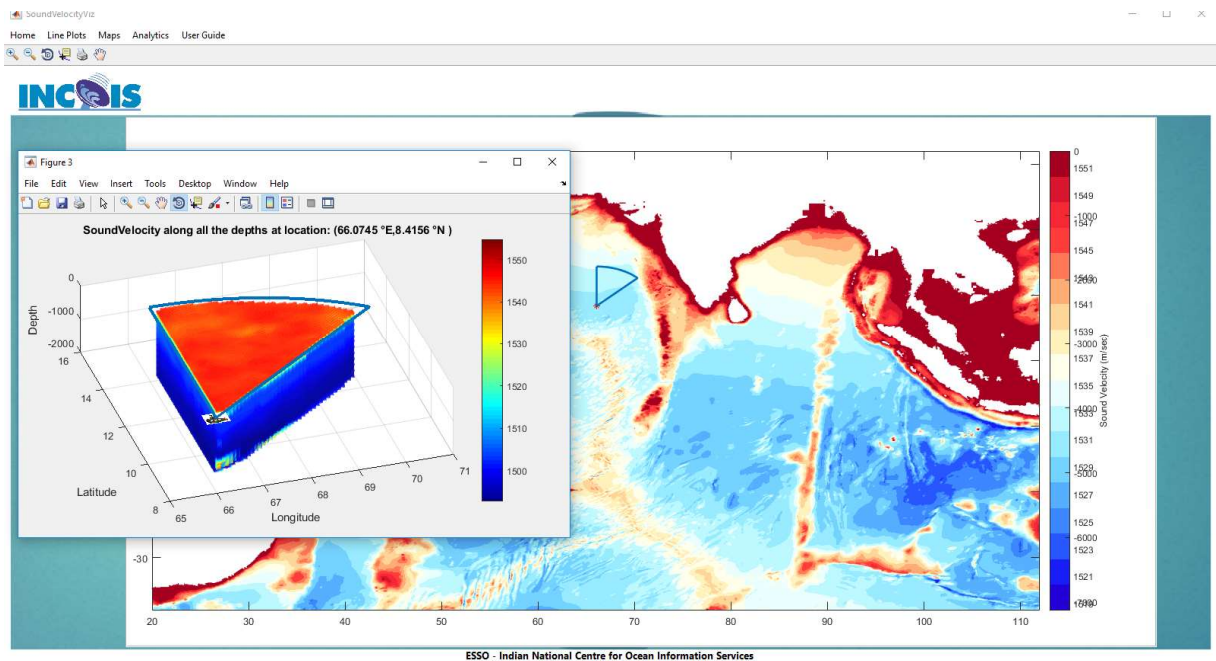
3.3.1 Depth Cross Section

While visualizing sound velocity depth plays a crucial role. Considering this tool is embedded with an option of depth variability of sound velocity along the longitudes and latitudes. User can get the daily and monthly variability in the form of animations. Figures 9 & 10 give the representation of the above.



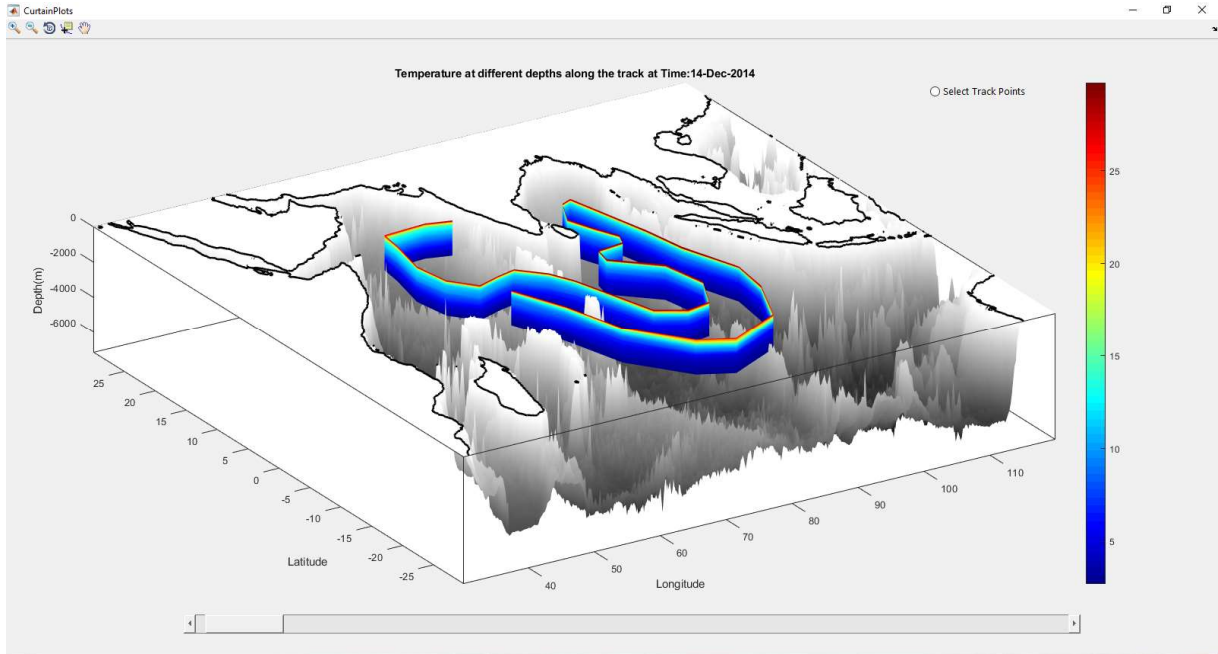
3.3.2 Pie Wedge View

This view of visualization tells about the visibility from the selected location on map along with angle of elevation. When user selects a location on map, a pie is drawn and corresponding sound velocity data along all the available depths is fetched from the database. Figure 11 explains about the above scenario.



3.3.3 Curtain View

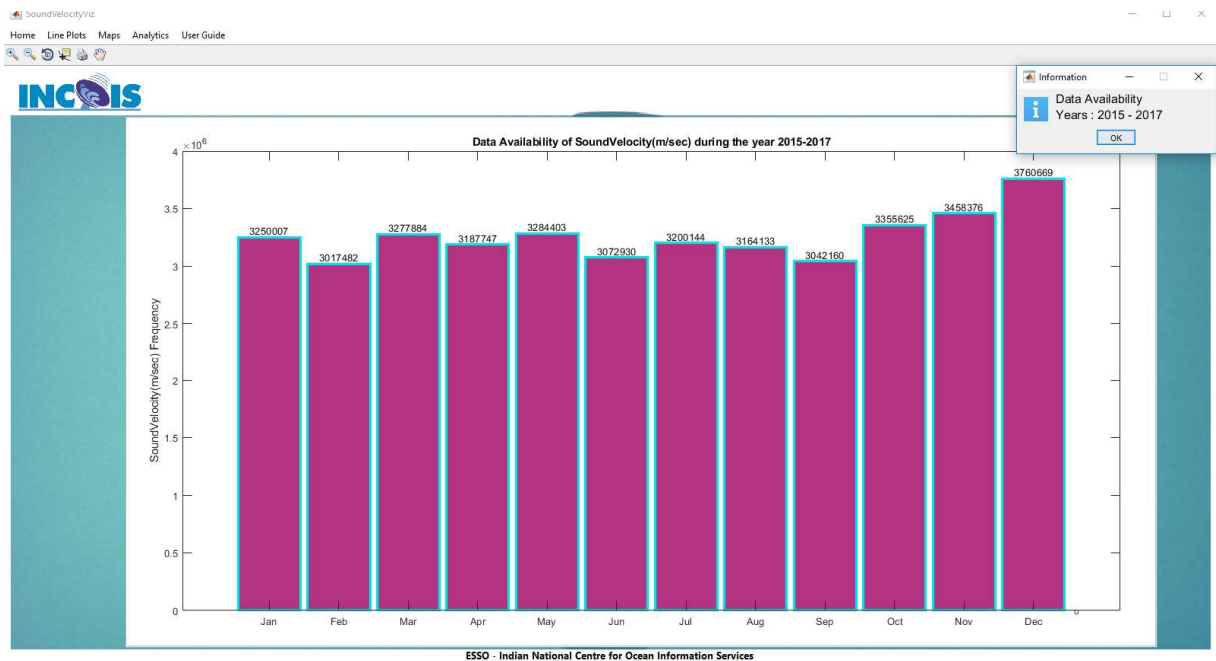
Visualization of sound velocity data along the bathymetry is provided in this tool. For a chosen track it extracts the sound velocity along the given track with respect to bathymetry as base layer. Bathymetry is displayed as gray color and on top of it sound velocity is plotted in color. Figure 12 shows the visualization of the above case.



4. Analytics

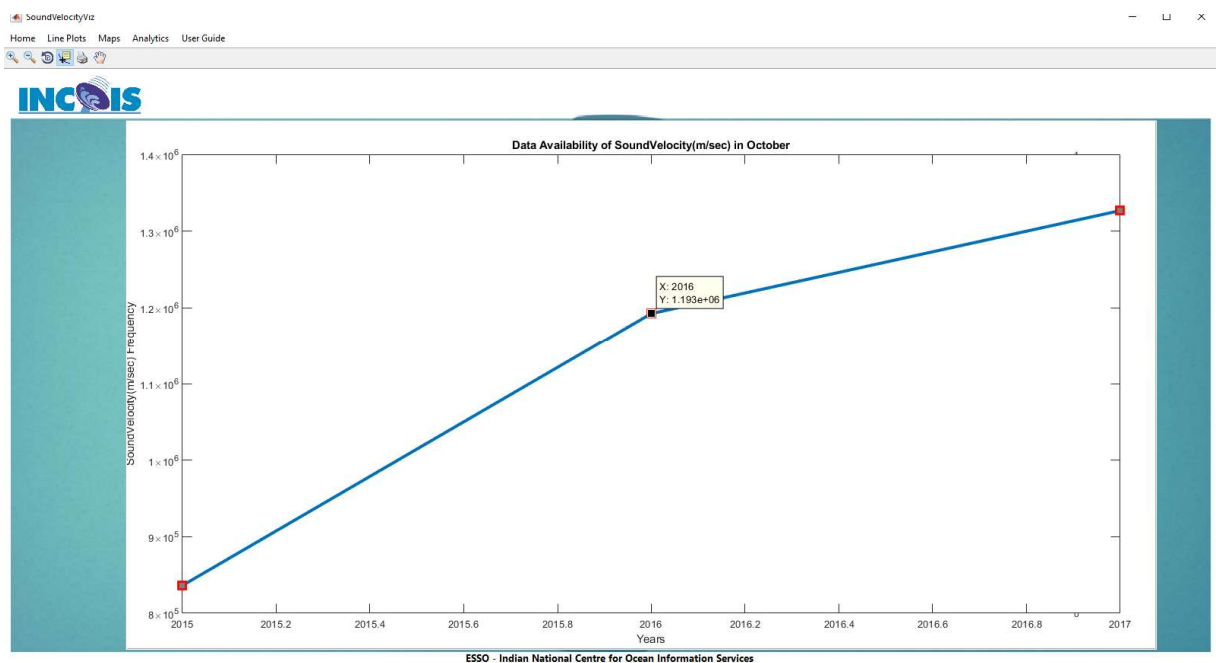
4.1 Year Wise

The user is given an option to view the number of records available in the tool database to proceed before any visualization. The user can view the bar chart for yearly data. Figure 12 explains about the bar chart.



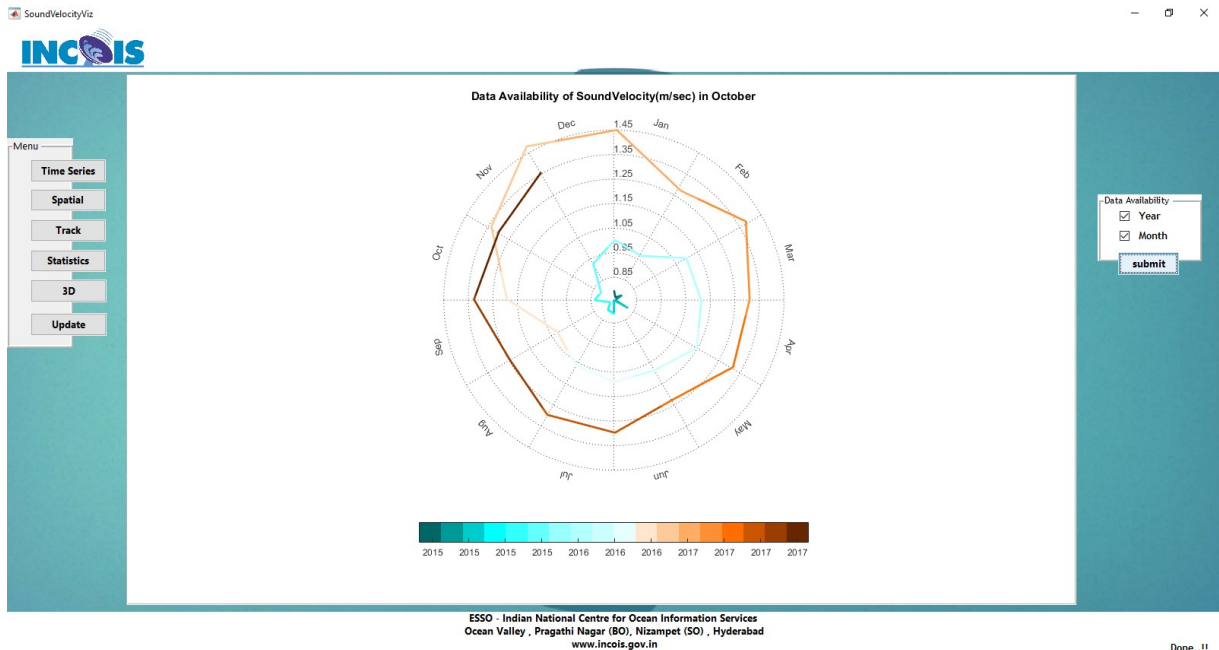
4.2 Month Wise

The user can view the line chart for monthly. Figure 13 shows the data availability of Sound Velocity parameter for a selected month.



4.3 Spiral View

Spiral view gives the complete distribution of database along all the years and all months. Figure 14 gives glance of it.



5. User Guide

5.1 Help

A new user who installs this application will be provided with help documentation file regarding how to use this tool.

5.2 Update

5.3 Contact Us