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ATTACHMENT 23 to the METEOROLOGY GROUP FACTUAL REPORT
DCA16MM001

Bon Voyage System version 7 User Manual.

Submitted by: Mike Richards
NTSB, AS-30

BonVoyage System (BVS 7)

Voyage Optimization Software

User Manual

Applied Weather Technology

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October 2013

Applied Weather Technology Inc. BVS Version 7.0 User Manual.

October 2013

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Contents

Preface

Resources for BVS Instruction

To assist you in quickly learning the basis of BVS, please read this preface, then read Chapter 1 which includes system requirements and Chapter 2 which guides you on physical installation and setup strategy. Then you'll be ready to start using BVS.

The resources to assist you in becoming familiar with BVS are as follows:

- Tutorial videos on CD which provide a guided tour of BVS features and functions.
- This manual, which is designed to instruct you with the following:
    - Short overview chapters
    - Chapters with detailed explanations of BVS functions
    - Reference sections for lookup.

A suggested 'quick-reading plan' is given later in this section.

Purpose of Document

The *BVS User Manual* for Bon Voyage System provides orientation, use instructions, and reference information for the software application.

What's in This Manual

This manual is designed to allow for selective reading to match your needs. It is divided into main modules, each covering a major BVS topic. Each module may contain any of these types of chapters to cover different aspects of the specific feature or function:

- An introduction on the topic
- Task instructions for working with the subject
- Reference information—to look up specific items—for instance: chart symbols
- Frequently asked questions - advice

The main sections are listed below; each part is shown by a bullet, and chapters are shown in parentheses.

Section 1 Introduction

- **Preface** important introductory material
- **Introduction** BVS Key Features; Key Steps for Preparing to Use BVS; Startup and Shutdown Procedures

Section 2 BVS Elements and Controls

- **Chart Window** Overview of Chart Window and User Interface; General Chart Operations; Chart Window Menus; Frequently Asked Questions; Reference Information

- **Left Panel** The four tabs: Snapshot; Tools; Data Display; Route Input
- **Bottom Panel** The three tabs: Track List; Voyage Details; Graph;

Section 3 BVS Activities and Operations

- **Tracks: Route Planning** How to Work With Tracks; Frequently Asked Questions; Reference Information
- **Weather Data and BVS** Weather Data Display and Controls; Data Management in Broadband systems; Data Management using EMail; Reference Information
- **Voyage Operations with BVS** Overview; Setup for Each Voyage
- **Optimizing Voyage Tracks** How to Create Optimized Routes
- **Hazard Reduction** Resonance; Other Hazard Types; Track Alarms and Resonance; Reference Information & Frequently Asked Questions

Section 4 Installation and Initial Setup

BVS Installation and Initial Setup Program Installation; BVS Initial Setup

Suggested Reading Plan

Getting started with BVS does not require reading the entire manual.

You might first consider reviewing the following chapters, which will assist you in in understanding the key functions within in the program.

The set of introductory chapters as follows:

Chapter 1, Introduction to BVS 7.0 Features

Chapter 2, Preparing to Use BVS

Chapter 4, Overview of Chart Window

Chapter 10, Introduction to the Left Panel

Chapter 15, Introduction to the Bottom Panel

Chapter 19, Introduction to Voyage Tracks in BVS

Chapter 22, Introduction to Weather Data in BVS

Chapter 27,Voyage Planning and Setup

Chapter 28, Voyage Optimization

Optionally also read Section 29.1 of Chapter 29, Resonance, which introduces hazards avoidance.

Once you have a general understanding of the main BVS features, you can begin reading specific topic chapters for usage details.

Finally, these are additional ways to find information:

- Search the index to look up a specific topic or feature by name
- click hyperlinks in the online/PDF version of the manual to go to a discussion of the item.
- Use your mouse on the BVS Chart Window—'tool tip' dialogs provide pop-up descriptions when you hover the cursor over a screen item.

Related Documents

AWT provides these additional documents for the BVS product:

Document	Description
BVS Installation Guide	Short-form step-by-step instructions for the installation of BVS.
BVS Quick Reference Guide	A concise document containing a brief explanation of the most common functions.
BVS Resonance Quick Reference	Contains a precise explanation of the resonance display feature found within the BVS program.

Help Tools

The BVS Menu bar has a *Help* menu that you can use to view a digital copy of this manual as well as the QRGs mentioned above. From the Menu bar select **Help | Manual**. The help manual is in PDF format and Adobe© Acrobat Reader® is required to view the manual.

For help with Windows features, such as how to use menus and dialog boxes, activate the Microsoft Windows Program Manager and select the appropriate topic. The *Windows Tutorial* provides a useful introduction to using Microsoft Windows.

If You Need Assistance

If you cannot resolve a problem by using the BVS manual or the (video) tutorial, contact Applied Weather Technology Customer Service 24/7/365 at the following:

BVS@awtworldwide.com

Office: 408-731-8600

Fax: 408-731-8601

Please include a detailed summary of problem you are experiencing so we may assist you as efficiently as possible.

If you would like to contact the sales department:

www.awtworldwide.com

AWT Headquarters
140 Kifer Court

Sunnyvale CA 94086, U.S.A.
T: 408 731 8600
F: 408 731 8601
E: info@awtworldwide.com

Send Us Your Comments

We value your feedback about our products and their documentation. If you would like to make comments or suggestions about BVS or other Applied Weather Technology Inc. software or documentation, please send email to:

BVS@awtworldwide.com

So that we can make the best use of your comments, please include the following:

- Name of the software and revision number of the software, which is shown on the screen reached by menu path Help | About.
- For a document, give the exact title of the document from the cover page. For example, *BVS7 User Manual*.
- Also for a document, give the chapter or section number for which you want to make a comment. Please identify places by giving the section number and/or page number.
- To identify any item on the BonVoyage screen, please use the name given for it in the BVS user manual.

We appreciate your input.

Thank you.

1 Introduction to BVS 7.0 Features

Product Purpose

BVS 7 is an Applied Weather Technology Inc. computer application running on Windows PCs, for planning, organizing, and optimizing ocean voyages for safety and performance. It allows you to monitor weather and hazards along routes.

Product Operation

The BonVoyage System provides you with voyage planning, management, and monitoring capabilities integrated with weather forecast data. It can help you optimize routes for least time / fuel, while minimizing voyage hazards.

Under normal operation, BVS would initially be set up to receive periodic weather updates and other data from AWT. BVS displays that information graphically in the chart and table areas. The updated information is also used to calculate optimum routes and vessel performance along a selected track.

In addition, BVS monitors for potential hazards and user-defined sailing restrictions. Its hazard displays assist you in making both strategic and tactical decisions to minimize risk and improve fuel efficiency.

Once BVS is installed and configured in the initial setup process, your normal operating procedure will be to set up a voyage plan before start of each voyage, and to use BVS to monitor conditions throughout the voyage. Sections of this manual will assist you in these efforts.

1.1 General Features and Functions

Track Management and Planning

Voyage management is a key function of BVS. Within the program, voyages are referred to as 'tracks'. A track is defined as a collection of route points which pertain to a specific voyage. Tracks and their associated route points can be entered and displayed both graphically (on the chart) and numerically (in the Track Input Table). Tracks are saved as a file (in the Windows system) and can be retrieved, as well as sent as an email attachment to another party. Tracks saved as templates can be re-used for similar voyages that are made in the future to help you minimize route input efforts.

BVS will help you plan voyages according to your specific requirements. It can optimize your voyage using the current forecast and operational specifications, such as fixed ETA (optimized for fuel savings) or for minimum en route time, using weather avoidance constraints and other user-defined factors.

Simulation and Optimization

When BVS simulates a voyage, it takes into account your vessel's characteristics. It uses a speed-down table to calculate the vessel's handling and performance under the specified wind and sea conditions of the selected track. BVS predicts ground speed and arrival time, and displays the computed course and the distance of the route.

BVS optimizes tracks while taking weather data into account. It can optimize a track for time, speed, or fuel efficiency.

Weather and Voyage Display

BVS employs graphic displays that show voyage tracks and can display weather data and ocean climatology for the world region through which you are sailing.

BVS obtains new forecast data from Applied Weather Technology Inc., using either Broadband Internet or email. Weather data for BVS is updated four times per day at Applied Weather Technology Inc.

Operating Environment: Platform

BVS runs on IBM-compatible personal computers equipped with Microsoft Windows®. For computers on a Network, Weather and Route Data storage can either be on the local BVS computer or shared through the Vessel Network from an accessible Server or Computer.

Communications

Broadband Support for Data

BVS 7 supports broadband data updates. When connected to a Broadband service, BVS has immediate access to AWT's frequently updated data and handles larger data files than email generally supports. Using Broadband, BVS systems automatically download data and thereafter provide it for instant display on the chart.

With BVS and Broadband, there is no manual intervention required in normal operation. Once data are received, BVS automatically updates its files and makes the data available. When appropriate, weather data is automatically interpolated between the model data intervals.

Email Support for Data

BVS continues to support email data deliveries as with previous versions. It also uses email means as fallback when broadband is not available aboard your vessel.

Email data requests are performed similarly to previous BVS versions. As in the past, weather data reports are requested either as a *scheduled* (automated) delivery, or by a '*one-time* email delivery' (formerly referred to as an "*Immediate Request*").

Users thereafter monitor their email for file receipt and manually load the email attachment into BVS, updating the forecast data on the chart display. If the file is placed in the **\weather\import** folder, it will be automatically processed.

1.2 Voyage Planning and Track Management

BVS has a rich set of voyage planning and track management features:

- Route input (by graphical or numeric entry)
- Graphical display of AWT recommended track (for vessels receiving Full Weather Routing)
- Ability to optimize route with weather induced constraints and roll resonance avoidance with the following options: least time , least fuel (consumption), or least fuel (cost).

UTC Time Display in BVS

- Use of UTC Time - BVS displays times for weather data and ship's position in Coordinated Universal Time (also known as UTC, GMT, or Z time). The format of date and time is: 'yyyy/mm/dd-hh:mm', for year, month, day, hour, minute.

Voyage Planning and Track Management Feature Improvements

- Improved voyage planning functions
- Enhanced track management improves fleet management ability
- Enhanced route comparison and track details displays
- New capability to insert via ports with layover times (bunker ports or multiple load/discharge ports)
- Vessels using AWT's Full Weather Routing service can receive their recommended route in the form of an XML route track with a ".BVS" file extension, which can be easily imported into BVS for immediate display on the chart.

Voyage Optimization

- Optimization (Least time/Best ETA): ability to define constraints to avoid severe weather areas and achieve best arrival time
- Optimization for Fuel (Least cost/Fixed ETA): ability to set an arrival time and define constraints to plan the most economical voyage

Simulation Feature Improvements from Previous Versions

- Additional vessel types have been added
- Improved speed down calculations ensure more accurate vessel display and calculated ETAs
- Ship-specific speed down and consumption curves which are user-editable.
- Improved model for climatological ship resistance.
  AWT proprietary model used to determine the speed loss beyond the short range forecast. This model provides a significant improvement over climatological data which was previously provided.
- Saving/Exporting Data: BVS 7.0 route data format has improved compatibility with certain charting programs.

1.3 Data Support for Planning and Operations

The BVS long range forecasts provide comprehensive data support for strategic voyage planning. Furthermore, throughout the voyage, BVS details along with vessel position information can provide sufficient information for important tactical decisions in regards to current operating conditions.

1.3.1 Weather Data

Applied Weather Technology Inc. maintains a comprehensive world-wide weather database for use in BVS, including meteorological and oceanographic data.

For broadband-equipped systems, weather data is automatically downloaded, updating the BVS chart immediately upon receipt.

For systems relying on Email, BVS supports either 'one-time' or ongoing forecast update deliveries. New weather data is processed manually by users from email file attachments. See Section 23.1, Weather Display and Controls, for a description of available weather items.

Forecast Update Times

- Main Forecast Model Data, up to 16-days in length, are available from AWT four times per day (03:00, 09:00, 15:00 and 21:00 UTC). Additional products, including Piracy Information, Weather Bulletins, Port Vicinity Forecasts, etc., are available immediately to Broadband users, as this information is updated on the AWT Server, to ensure you receive the most up-to-date weather data.

Displayable Standard Meteorological Data

- Displays of tropical storms, hurricanes, and other types of severe weather
- Wind (normal and high resolution)
  - Speed (in Knots and Beaufort Force)
  - Direction
- High/Low Surface pressure system movements
- Frontal displays (cold, warm, occluded, and stationary fronts)
- 500mb contours
- Cloud Forecast
- Visibility (fog, snow & rain)
- Air Temperature
- Weather Type (thunderstorms, freezing, rain, etc.)
- Port Vicinity Forecast (for user-selected ports)
- Marine Bulletins for your specified forecast area
- Color Satellite Images

Displayable Standard Oceanographic Data

- Currents
  - Climatological ocean current data
  - HYCOM Surface Current Data
- Significant Waves (normal and high resolution data)
  - Height and direction
  - Period (in seconds)
- Swells: normal and high resolution
  - Height and direction
  - Period (in seconds)
- Wind Seas (normal and high resolution data)
  - Height and direction
  - Period (in seconds)
- Rogue Wave Forecast
- Surface Pressure Contours
- Sea surface temperatures

- High seas bulletins
- Ice
    - Pack ice and icebergs
    - Ice boundaries
    - Vessel (Structural) Icing

Hazard Data

- Resonance Conditions Display
- Piracy Reports (location and attack details)
- War Risk Regions

Almost any combination of available weather data can be displayed on the chart. Using the "Next" and "Previous" Time Step buttons, you can move through the forecast series (TAUs) and observe the changes in weather patterns. BVS's voyage animation shows the animated progress of the route track with the associated weather displayed simultaneously on the chart.

BVS's data color scheme has been designed to help interpret several types of graphically displayed weather parameters simultaneously. (Users may need to optimize their Computer Monitor's color settings for best appearance of data.)

Weather Data Feature Improvements from Previous Versions

Weather Data Requests and Data Delivery

- BVS7 has significant improvements over previous versions in the request and delivery of BVS forecast files. Broadband users receive weather data forecasts almost immediately after they are generated by AWT, and the BVS chart is instantly updated with the newly downloaded data. (For email based systems BVS continues to support one-time and scheduled requests, and either manual or automatic processing of the BVS email attachments.

Weather Data Product Additions and Improvements

- New weather products include wind seas, humidity, air temperature and rogue waves
- Significantly higher resolution data through broadband data collection
- Improved simulation and optimization processes
- Better chart display accuracy through higher resolution surface currents, wind, wave and swell data
- Detailed port vicinity forecasts. Users have access to a 3 day forecast at 6 hourly time steps. Includes precipitation, temperature, humidity, visibility, & winds, along with wind and sea conditions at the pilot.
- Rogue wave forecast - 72 hour forecast of areas where a freak wave is more likely to occur due to waves opposing a strong current.

1.3.2 Hazard Data

Resonance Conditions Display (Improved Feature)

- Displays potential resonance conditions both as an alarm along the voyage track and in the Resonance Graph, located in the left side “Snapshot” panel. The resonance graph now includes track snapshot data—sea, swell, significant wave & current details along with the shaded areas which alert the user to potential roll resonance conditions.

Piracy Activity (New Feature)

- Data includes all attack information reported to the IMB and supplemented with NATO reports.
- War Risk track alarms can be enabled by users and will be based on received data reports.

1.4 User Interface

The BVS 7 chart menu and display options have changed to provide a simpler, more user friendly display.

Feature Improvements in BVS 7

- Weather selection buttons have replaced the earlier icons with text descriptions of each weather parameter
- Time step controls, as well as date, time, position and broadband status information have all been strategically placed at the top right section of the BVS chart.
- BVS’ right-click menus will intelligently display additional control options for newly added features.

1.5 Supported Vessel Types

What vessel types are supported in BVS, and how is vessel performance determined in BVS 7?

BVS supports a wide variety of vessels as listed below, each having its own corresponding 'speed down' file. Using its decades of weather routing experience, Applied Weather Technology has created a calculated speed curve with realistic vessel configurations to simulate vessel performance, but also taking into account forecast and climatological weather factors that would affect vessel's calm sea speed.

This calculated speed down is a combination of involuntary and voluntary speed down factors: involuntary speed down due to added resistance, and voluntary speed down from intentional speed reduction due to heavier weather conditions.

Vessel types:

Bulk Carrier, Handy
Bulk Carrier, Panamax
Bulk Carrier, Cape
Bulk Carrier, VLOC
Bulk Carrier, ULOC
Car Carrier (PCC)
Container, Panamax
Container, Post Panamax
Container, ULCV
Container, New Panamax
Container, Feeder
Container, Small Feeder
Container, FeederMax
Reefer and Ro Ro
General Cargo
Tanker, Panamax

Vessel types (continued):

Tanker, Handysize
Tanker, Aframax
Tanker, Suezmax
Tanker, VLCC
Tanker, ULCC
Tanker, Chemical
Tanker, LNG Carrier
Tanker, LPG Carrier
ITB
Fishing, Commercial
Trawler
Passenger
Yacht, Motor
Yacht, Sailing
Multipurpose

2 Preparing to Use BVS

2.1 Initial Steps

There are two main steps in setting up BVS for use: installation, and vessel/user configuration.

1. Installation

Instructions for the installation of BVS 7 are found in Chapter 31, “Program Installation”. A one-page installation guide is also included with the BVS installer.

2. Initial Setup and Configuration

When BVS is run for the first time, you will be prompted to enter specific information to ensure proper setup. As each of the setup dialogs appear, you will enter: (1) vessel parameters, (2) data update controls, including an option to enable broadband data collection, and (3) your specific BVS data display request requirements.

Instructions for initial setup have been placed towards the end of this manual (Chapter 32, BVS Initial Setup).

Note that the user-defined weather data request selections can be changed at any time. For email based systems, a scheduled-request file will be sent to the BVS Server by email. Broadband users will set up the desired request parameters and BVS will automatically download new data as it becomes available. These procedures are also covered in Chapter 32.

After BVS installation & initial configuration, the next steps would be:

1. Create a weather data delivery configuration that covers your upcoming sailing region. Ensure that new data is displayed on the chart.

2. Create a voyage track and ‘optimize’ the track, where appropriate.

3. Ensure that daily updates are being processed in BVS and the voyage track is appropriately modified to user requirements and/or sailing restrictions. Procedures for enroute activities are covered in Chapter 27.

2.2 System Requirements for BVS Use

2.2.1 Hardware Requirements

Computer with:

CPU 1.2 GHz or higher

2GB of RAM minimum

2GB Hard Disk Space for Installation and archival of weather data

keyboard and two-button mouse

Display with:

1024 x 768 minimum resolution screen (32 bit color recommended)

Color Laser or inkjet printer (Optional)

2.2.2 Software Requirements

Windows Operating System

Win8.1, Win8, Win7 (SP1), Vista & XP (SP3).

Theoretically functions with Windows NT, although NT has not been tested.

Adobe© Acrobat Reader®

2.2.3 Data Communications Requirements

The recommended email communications configuration for BVS are:

- Email with a MAPI email client (application) that runs under Microsoft Windows. Examples of MAPI client programs are Microsoft Outlook Office, Outlook Express, Mozilla Thunderbird, etc.

  MAPI client email programs have the capability of generating outgoing messages from a secondary program (such as BVS) to simplify the data request process.

Preferred Data Collection Method:

- Broadband Data Connection

Broadband provides enhanced operation with fast data transfer, higher resolution weather data, and improved automation of forecast request submissions and file downloads.

Although Broadband might be configured for BVS data collection, a user will have the ability to use email as a backup in the event the Broadband connectivity becomes unavailable.

3 General Program Functionality

3.1 User Controls

Users control BVS through menu item selections in the chart window or through use of the right mouse menu. The main menu bar at the top of the chart window gives the user access to key BVS functions. Many program operations can be accessed from the main menu. Right-click mouse menus on the chart provide access to specific items related to the corresponding object. Example: Right-clicking a track will provide track editing functions; right-clicking a pirate symbol provides the option to view pirate activity information for that specific pirate event. Additionally, there are keyboard shortcuts for several of the BVS functions. These are listed in the Reference section of the manual.

3.2 Starting BVS for the First Time

To start the application for the first time, either click on the BVS 7 icon on the Windows desktop or select BVS 7 from the Windows Program Menu.

When starting BVS for the first time, you will be required to complete the initial setup and you'll be guided through of a series of setup dialogs. Full setup instructions are given in Chapter 32, BVS Initial Setup.

3.3 Normal BVS Startup

To start BVS, either select BVS 7 from the Windows Program Menu, or click on the BVS 7 icon on the Windows desktop.

BVS Behavior on Startup

When opened, BVS will be restored to the previous user state—Displayed track and weather data, including chart focus should all revert to the state of the program when it was previously closed. The weather data displayed on the chart will be based on your last data update, whether by Broadband or Email data processing.

The first priority after opening the program should be to ensure that your forecast data is up to date. See the below Section 3.3.1 for information on updating your weather information.

3.3.1 Updating Weather Data

For a description of available weather, See Section 23.1. After you've started BVS, it is important to update your weather data. There are two update methods: broadband or email.

Case 1. Broadband system

Upon startup, BVS systems with broadband automatically request, receive, and process data files. After the initial setup, there is no user-required action as BVS automatically checks for new data and downloads is almost immediately upon availability.

Once your Weather Data Delivery Configuration has been defined, the program will be able to request the desired data. This selection process is accessed in the Data Request dialog by selecting the menu option Data | Weather Data Delivery Configuration.

Also, since the sailing region can change for each voyage, you should define the appropriate data coverage region prior to departure.

Weather Data and Broadband Icon Behavior After Startup

Upon startup, if Broadband is enabled, BVS will immediately begin checking for new weather and chart data automatically. The Broadband status is displayed in the top right section of the chart. There are three status icons:

Red: Indicates that although Broadband option is enabled, BVS is currently unable to access AWT's BVS Data Server.

Yellow: Once BVS has achieved a connection to AWT's BVS Data Server, the icon turns yellow. During this time, the user account is verified, your data request file is submitted and your compressed data (RKW) file is downloaded. You'll notice that at the end of the download process, the "Weather Forecast Base Time" field in the upper right area of the Menu Bar shows a light blue progress indicator as the chart is updated with the newly downloaded data.

Green: The status icon is green when AWT's BVS Data Server is accessible and data is up to date. Note also that the "Weather Forecast Base Time" field displays the "Forecast Model" time of the most recently processed forecast file.

What if broadband is down at BVS startup or goes down later?

In the event that BVS is unable to connect through broadband, the Broadband icon becomes RED until BVS can access the AWT Server through your broadband connection. If broadband fails, you must fall back to email, and use the procedure for Case 2 below to receive weather email updates.

Case 2. Email Data Requests

As with earlier versions of BVS, you are able to receive forecast updates by email. To receive updated weather data, you will need to:

1. Set up request. Either perform a 'one time email delivery request' or set up a scheduled request. The procedure for one-time requests is given in Section 25.1 Instructions for scheduled request setup are given in Section 0.

2. Select the forecast region and user-defined weather parameters, etc.

3. Update BVS with the incoming email file. The data update arrives as an ".RKW" file in an email message from bvs@awtworldwide.com. The RKW file can either be opened directly from the email message or it can be stored in the \weather\import folder for automatic processing. BVS will thereafter display the data corresponding to this RKW file and the forecast base time associated with this file will be displayed in the upper right menu bar area of the BVS window.

3.4 Shutting Down BVS

To shut BVS down, select from the menu, **File | Exit**.

If you have any unsaved tracks, BVS will prompt to save them before BVS shuts down.

BVS will retain your user-configured program state for the next BVS session.

Note that if the program is closed for any length of time, the forecast information will need to be updated as soon as possible to ensure accurate depiction of forecast information.

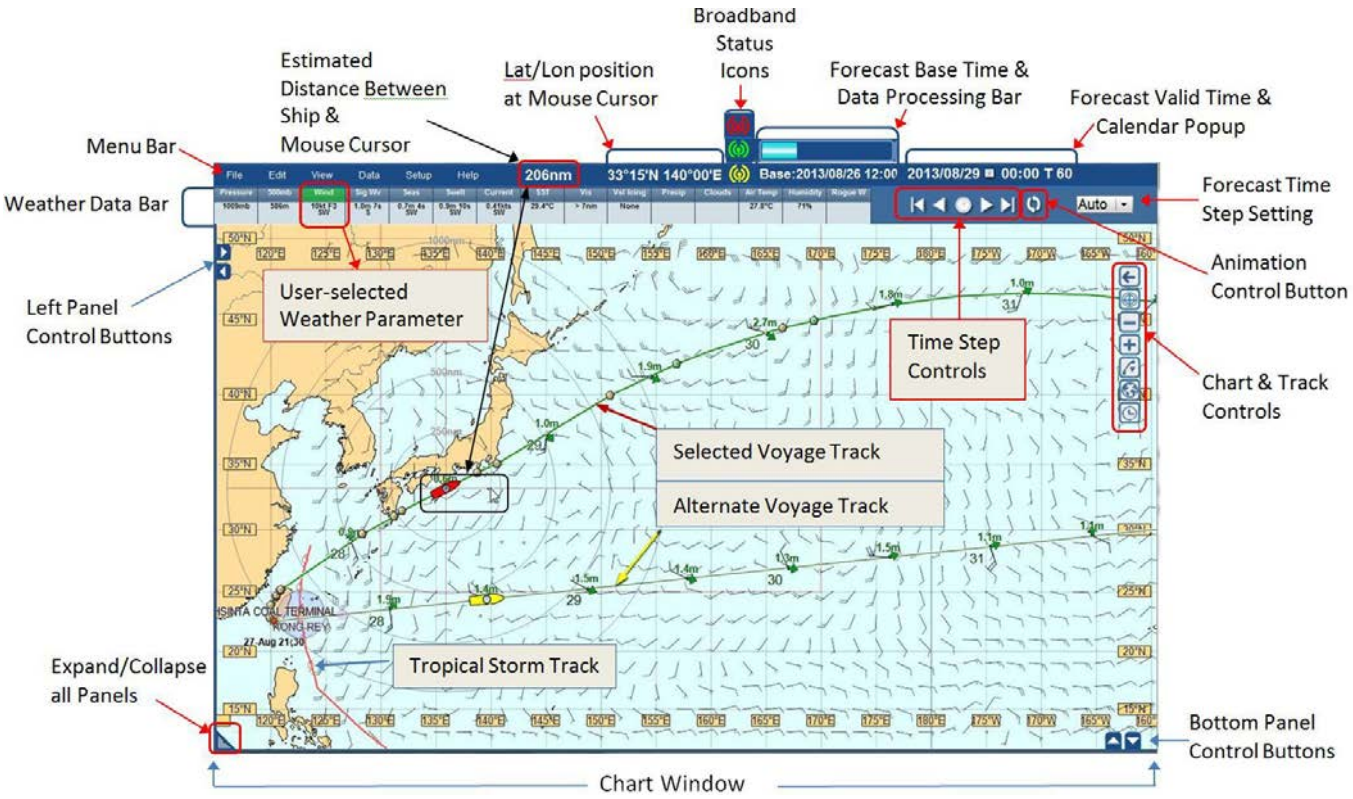
4 Overview of Chart Window

The chart window is the main BVS graphical display and user interface area. It shows a world map with voyage routes and overlaid weather and other data for the regions you selected in your report requests. Waypoint information is also given in the Left Panel and the Bottom Panel.

This chapter introduces the chart window's key items. The first two sections introduce and summarize the key items belonging to the chart window. There are separate Parts in this manual for the Left Panel and Bottom Panel, with their own chapters for each major item of the panel.

4.1 Master Diagram of Chart Window Main Elements

Figure 1 below shows the Chart Window and its main elements.



Below, Figure 1 shows the Left Panel open (with Resonance Snapshot tab selected) and

Figure 2 shows the Bottom Panel open with Track List tab selected. Each Panel contains various tabs for program configuration and for the display of vessel details.

Figure 1. Left Panel

Figure 2. Bottom Panel Opened

List of Chart Window Key Elements

Chart window – displays world map, voyage tracks and all program tools.

Menu bar– Provides access to several program functions. At the far right, BVS displays position information, broadband status, and weather forecast date/time information.

Weather Data bar –Controls the display of weather parameters on the chart. Each item is activated by clicking the title or corresponding lower cell. The lower cells display weather data values which correspond to the mouse cursor location. When the mouse is used to advance or reverse forecast time steps, the weather display values turn RED and indicate data which corresponds to the vessel position. To the far right, the weather data bar also displays Forecast Time Step controls & Setting option as well as the Animation Controls.

Left Panel Display Controls –Arrows expand or collapse the left panel (also known as Vertical Panel) according to the user's need to access the Left Panel features or to hide this area so that additional space is available for the chart view. The left panel provides access to display potential risk of roll resonance, alarm thresholds, optimization parameters, chart display characteristics, and track table editing, etc.

Bottom Panel Display Controls –Arrows expand or collapse the bottom panel (also known as Horizontal Panel), displaying vessel performance and track information and controls.

Track – A track shows a series of waypoints on the chart. Waypoints appear as small pentagons; computed points (between waypoints) appear as small circles; current vessel position appears as a ship icon.

When a specific track is selected, the ship symbol for that track is RED.

For additional tracks that appear on the chart, ship symbols are YELLOW.

At times, the computed points along the track may display an alert symbol (also known as alarms) when the vessel position encounters conditions which exceed the user-defined settings: Examples are severe weather or roll resonance conditions, etc.

Time Step and Animation Controls – The time step control buttons move the vessel along the active track, displaying the corresponding weather data for the corresponding time period.
To the right is the circular "Animation" control button. This opens the animation dialog, allowing the user to view an animated display of vessel movement and weather information throughout the length of the voyage (or the length of the current forecast). Click this button a second time to close the animation dialog.

Forecast Time-Step Setting - This sets the time-step interval used for weather and ship position display on the BVS chart. The animation feature and the time step control buttons are affected by this user-defined setting.

Chart and Track Controls – The upper right area of the chart displays various zoom options, as well as a 'center ship' button and an optimization button. The optimization button is configured from a user-defined setting in the View | Tools menu. The three optimization options are:

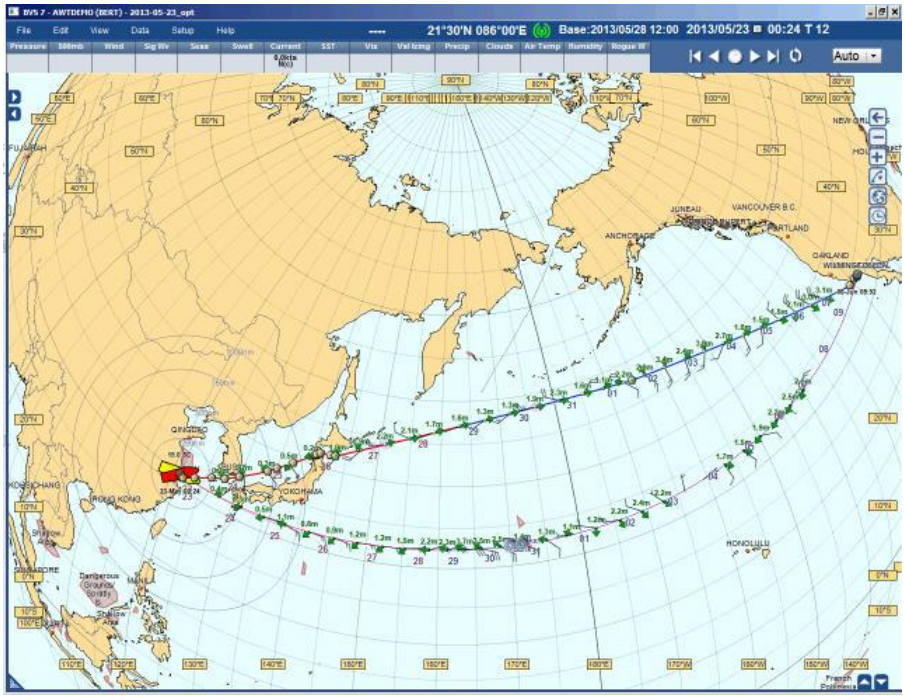
- Least Time
- Lease Cost/Fuel
- Least Cost/Fuel with a Fixed Arrival

BVS has a variety of keyboard shortcuts to help simplify some of the most common program functions. For more information, see Keyboard Shortcuts Reference, Section 9.2.

The following sections in this chapter provide additional detail regarding each main element. A more comprehensive discussion of these elements will be given in upcoming chapters. Several keywords throughout the manual are 'linked' to locations in the manual which provide additional references related to that specific topic.

4.2 The Chart

The Chart Window contains all BVS user interface items. It provides a world map allowing the user to edit and view tracks and to view weather data.

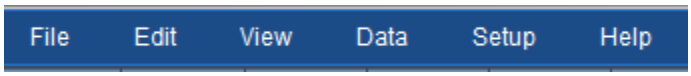


4.3 Menu Bar

Below the program title bar, the menu is separated into two sections: at the left are the program menu options; to the right are details regarding position, broadband status and forecast times .

4.3.1 Menu Items

The Menu items allow mouse-selecting BVS functions:



All main menus are described in detail in Chapter 5.

4.3.2 Key Parameters Display Area

The menu bar row shows the key parameters display area on the right half:

A description of these display items, from left to right:

Estimated Distance: the estimated distance from the current ship position on the selected track, to the mouse cursor position on the chart, in nautical miles.

Lat/Long Position: the latitude and longitude of the mouse cursor position. When clicking on the time step control buttons (to advance forward or backward in time) the Lat/Long Position will correspond with the ship position on the selected track.

Broadband Status Icon and Control: shows connectivity status of the broadband data link. Clicking the icon will open a Broadband Status Dialog. See Section 4.3.3, Broadband Status Icon and Control.

Base Time: data display showing the Weather Forecast Base Time, which is the date/time upon which the forecast model is based. This value will be updated when a new data set has been processed either by broadband or from opening a BVS forecast email attachment. When BVS is processing a new weather file, Base Time is replaced temporarily with a light blue status bar. After the update process has finished, this field returns to the 'Base Time' display.

Forecast Valid Date: shows the 'valid time' for the currently displayed forecast TAU (or timestep). This value (and the displayed weather) changes as the vessel moves along the track, to indicate each forecast TAU and the associated weather conditions and vessel position.

Calendar Icon: small rectangle control used to bring up a calendar. Select the desired date to view a specific time period.

Forecast Valid Time: depicts the forecast hour and is associated with the Forecast Valid Date mentioned above.

Hours Since the Forecast Base Time: data display showing the letter T followed by the number of hours since the base time. T signifies "TAU" or "Now Time". "**T 00**" or "**T + 00**" is TAU + zero (the exact time of the model). For TAU zero, analysis data is displayed on the chart.

T 24 would be 24 hours into the forecast period.

Note that when data is continuously updated, although the forecast files are replaced, the analysis TAU is preserved in the BVS weather folders.

4.3.3 Broadband Status Icon and Control

This icon has dual purposes as discussed below.

1. Shows the operational status of the broadband data link.

   Icon colors have these meanings:

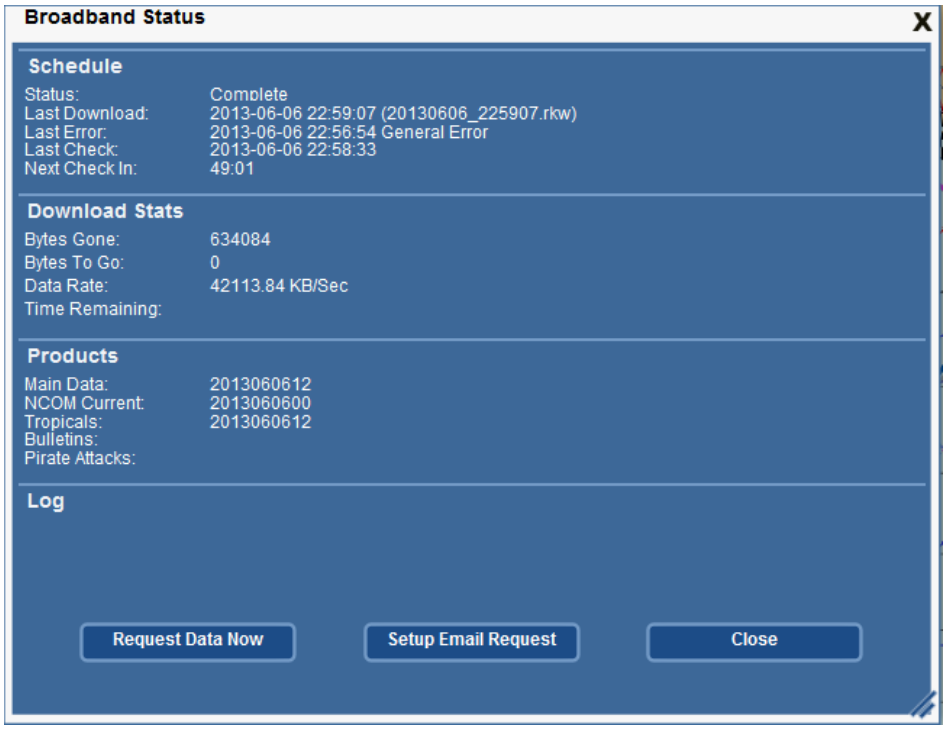
   Red: indicates that the AWT Broadband Server is not accessible. If the status remains inaccessible, you will need to change over to email method to request and receive data. This is done by either setting up a one-time email delivery or by creating a new Weather Data Delivery Configuration and sending this in to bvs4data@awtworldwide.com.

   Yellow: BVS is establishing communications and proceeding to download forecast update files

   Green: the AWT Broadband Server is accessible and data is up to date

   No icon visible: If the Broadband Connection checkbox is not enabled, the icon will not appear and BVS assumes that you are updating the chart by email or that you have configured access to forecast information through your ship computer Network. Example: the main BVS computer downloads data and shares it on a Network Drive. Other onboard BVS computers have access to those weather and data folders.

2. The Broadband Status Icon area can be clicked to open the Broadband Status dialog:



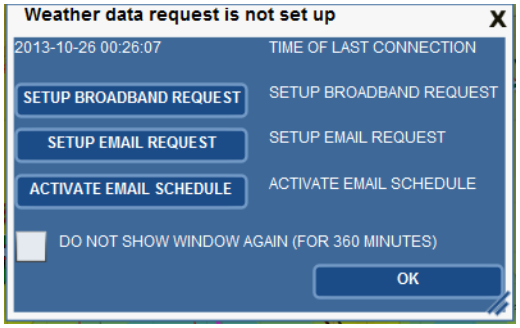
Request Data Now – If Broadband Connection is enabled in the DATA|COMMUNICATIONS dialog (found in the SETUP menu), the Request Data Now button initiates a broadband data request.

Setup Email Request – If Internet Broadband access was not available, this button could be used to open the configuration dialog for a One-Time Data Request. Thereafter, an "…ImmedReq.txt" file would be sent to the BVS Server (bvs7@awtworldwide.com) to obtain a one time delivery of data.It causes BVS to generate an email based data report request. Once this file is sent, an updated forecast file will be delivered to your email inbox.

4.3.4 Broadband Troubleshooting

It's possible that you will encounter connectivity issues with regards to BVS' Broadband data update process.

If the Broadband connection is not available, as mentioned above, you will see the red status icon at the top right of the BVS chart. You will also see an error dialog appear on the chart:



This error occurs when the network connection cannot be established or when it has been interrupted. It's possible that your Internet connection to the BVS computer is e temporarily or permanently down.

There are three troubleshooting options:

• Retry Wx download if the Broadband connection is indeed established.

• Setup a one-time immediate email request, to receive a forecast update while Broadband is down.

• Activate scheduled email delivery of data by emailing to bvs7@awtworldwide.com your Scheduled Request file (found in the \bvs7\data\ folder). This is done by selection the menu option, DATA | Weather Data Delivery Configuration.

When the internet connection is up and broadband updates resume successfully, the email delivery schedule on AWT's Data Server will automatically stop deliveries.

4.4 Weather Bar

This row has two main objects: the Weather Bar and the Display Step / Animation Controls.

4.4.1 Weather Bar

The Weather Bar displays each weather parameter with an associated data cell below each. The cell displays values in units (speed, height, degrees, period, etc.):

Each individual weather bar 'title' or 'cell' can be clicked to turn on or off that specific weather item. Toggling on a specific item will change the background color of the title area to green while that specific display item is activated. The data cells give numeric values for the update items you have requested. These values are displayed dynamically and correspond to the position of the mouse cursor. Alternatively, when you are using the time step controls, the values shown are for the current ship icon position along the selected track.

Please review Chapter 23 for additional details regarding the Weather Bar and its functions.

4.4.2 Time Step Controls/Animation Control Button

To the right of the Weather Bar are the Time Step Controls. These adjust the computed position of the ship along the selected track. Data in the weather bar cells are shown in RED text and correspond to the vessel position when the time step controls are being used.

The circular icon (with two curved arrows) opens the Animation Controls for full animation of the voyage time step process.

For use, see Section 6.9, Time Step and Animation Controls.

Forecast Display Time-Step Setting

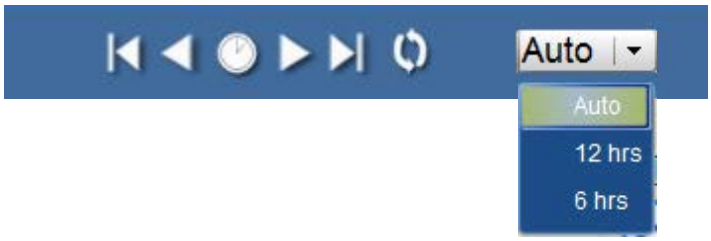
This item defaults to AUTO and allows the user to set a specific interval for use with the animation and manual Time Step Control tools.

Settings are:

Auto - automatically adjusts between 3-hour, 6-hour and 12-hour timesteps.

12 Hours - visible TAUS are at 12 hour intervals. Example: "Day 1, 00z", Day 1, 12z", "Day 2, 00z", "Day 2, 12z", etc.

06 Hours - visible TAUS are at 06 hour intervals. Example: "Day 1, 00z", Day 1, 06z", "Day 1, 12z", "Day 1, 18z", "Day 2, 00z", etc.



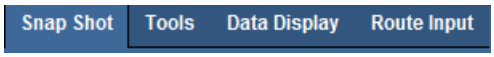
4.5 Chart Display Controls

The chart display controls allow you to alter your general view of the chart. (Controls for display of individual data categories are separate and are on the Left Panel, Data Display tab, and also on the Weather Bar.)

The following chart display control icons are located at the upper right area of the chart & perform these functions:

	Zoom Last: Returns the chart to the previous zoom state
	Center Ship: Redraws the chart with the current vessel position centered on the chart
	Zoom out chart view incrementally
	Zoom in chart view incrementally
	Adjusts chart zoom to display full voyage track
	Zoom to Weather Data modifies the chart view to cover your currently configured weather region.
	Optimize track: Optimizes the user-selected track, using a pre-configured setting found in the left side panel (select menu item VIEW|TOOLS). Optimization options in the TOOLS panel are: • Least Time • Least Fuel Cost or Fuel Consumption • Least Cost/Consumption with a Fixed Arrival time

4.6 Left Panel Overview



The Left Panel has four tabs:

Snapshot - resonance controls and display

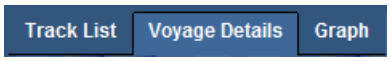
Tools – contains controls for alarm thresholds and for optimization

Data Display - control of data items on the chart

Route Input - track table editing features

For a more detailed description of the Left Side Panel, refer to Section, 10, Introduction to the Left Panel

4.7 Bottom Panel Overview



The Bottom Panel has three tabs:

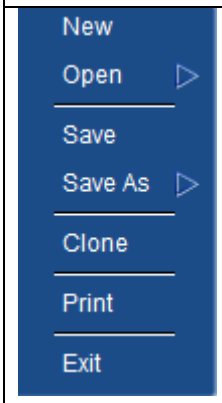
- Track List – a list of open tracks with performance and arrival information for track comparison
- Voyage Details - shows extensive details of the selected track regarding performance, average weather and current factors, interval distances, associated forecast weather conditions, etc. for each computed point.
- Graph - shows weather and performance details of conditions at each waypoint of the active track in a 'line graph' format

For additional information regarding the Bottom Panel and its associated tabs, See Section 15, Introduction to the Bottom Panel.

5 Chart Window Menus (Menu Bar)

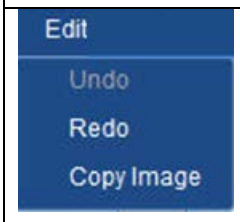
The BVS main menu provides access to the program's principal functions. This area above the chart is called the Menu Bar. This chapter describes each menu item in the Menu Bar.

5.1 The File Menu



Menu Item	Function
New	Creates a new voyage track. A popup appears requesting that a filename be chosen. Type desired filename and click OK. *The default track name is YYYY-MM-DD and the file extension is .BVS.*
Open	Track: Opens a previously created voyage track or an ECDIS file Template: Opens a previously created track template. Templates can be created for frequently used routes.
Save	Saves the currently selected route file in the (default location) folder: C:\BVS7\data\track
Save As	Track: Saves a file as a voyage track with a user-defined name. The file extension is .BVS. Template: Saves a file as a voyage template with a user –defined name. The file extension is .XML.
Clone	This is a copy-track option that opens a dialog box, allowing the selection of various route characteristics. Type in a new name for the cloned track and click OK.
Print	Opens the print dialog box to print the current BVS screen, including the chart and horizontal/vertical display panels.
Exit	Closes BVS after allowing you to save any unsaved changes to voyage track(s).

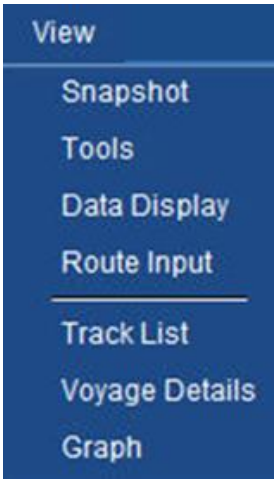
5.2 The Edit Menu



Menu Item	Function
Undo	reverses previous action during track editing, etc.
Redo	restores to previous track state (before 'undo' action was selected)
Copy Image	Copies the BVS chart to the Windows clipboard.

5.3 The View Menu

The View Menu provides access to Left Panel tabs and Bottom Panel tabs.

	Menu Item (keyboard shortcut)	Function
The upper four items appear in the left panel.  The lower three are located in the Bottom Panel	Snapshot (CTRL- S)	Opens track snapshot diagram & displays weather conditions and potential roll resonance risk along voyage track
	Tools	The Tools tab contains user-configurable options for weather constraints, fuel costs and track optimization.
	Data Display	Controls geographical display information as well as chart and track features. Also contains dialog buttons for additional weather display items, such as port vicinity forecasts and weather bulletins, etc.
	Route Input (CTRL- I)	Opens the track input table for editing position, speed, draft & arrival fields.
	Track List (CTRL- K)	Opens the track comparison table to view performance and arrival summary information, etc.
	Voyage Details (CTRL-D)	Opens Voyage Details tab for access to detailed vessel performance and weather information along the various computed points along the track
	Graph (CTRL-G)	A line graph displays vessel and weather details for the selected voyage(s)

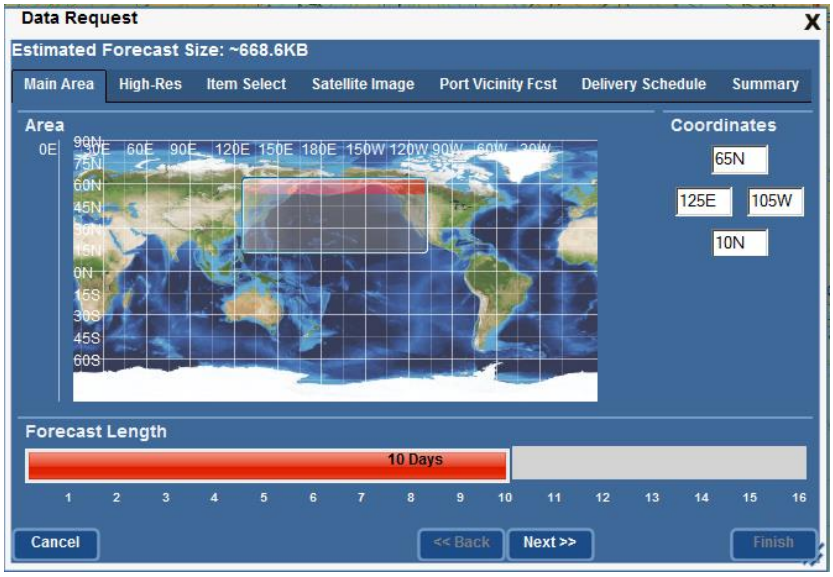
5.4 The Data Menu

The Data menu is for forecast deliveries request management, manual import of weather data, and to access the AWT Data Reporting System.

	Menu Item	Function
	Weather Data Delivery Configuration	Sets up a configuration for ongoing weather data deliveries. Used by both broadband and email (scheduled request) options. Once this configuration is set up, an active broadband connection will use this text configuration file to automatically retrieve the user-defined weather parameters. NOTE: ACTIVE BROADBAND DATA COLLECTION will halt scheduled email deliveries on the AWT BVS Server, as the scheduled email option is designed to be a backup option when Broadband connection fails.
	Stop Scheduled Data Delivery	The email message that is generated from this option informs the AWT BVS Server you wish to stop your previously scheduled email deliveries.
	One-Time Email Delivery of Weather Data	This is also known as a 'one-time data request' and is submitted by email to receive a forecast update within 15 minutes after emailing the request file. This has no effect on your regularly scheduled EMAIL data deliveries, and occurs apart from them.
	Select previously downloaded Weather Data	When there is a need to process and review a previously downloaded weather file, this dialog allows you to select & process an earlier file. Please note that the forecast data from older archive files may overwrite existing analysis data from recently processed weather files.
	Manually Import Weather Data	Used to process a previously received .RKW data delivery file—one which is stored on the computer hard drive or from a Network location.
	AWT Data Reporting System	For vessels receiving Full Weather Routing or Monitoring Services, this option initiates the DRS program interface for sending departure reports, daily positions, arrival reports, and other required information.

5.4.1 Weather Data Delivery Configuration

This configuration dialog is for setting up your delivery configuration for either Scheduled Emails or for Broadband data requests. The dialog consists of a series of tabs for configuring your specific data needs. User instructions for Broadband Systems are in Section 24, Managing Weather Data in Broadband-Enabled Systems, and user instructions for email based systems are in Section 25.2, Scheduled Weather Data via Email.



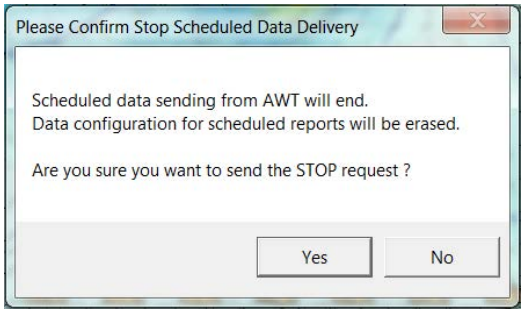
5.4.2 Stop Scheduled Data Delivery

This menu selection stops scheduled data report delivery for email users. It does not affect Broadband data collection.

After submitting a stop request, you may eventually want to resume data reception by email. To do this, you'll need to submit a new Scheduled Request by creating a "Weather Data Delivery Configuration" and by sending the resulting "...SchedReq.txt" file to bvs7@awtworldwide.com.

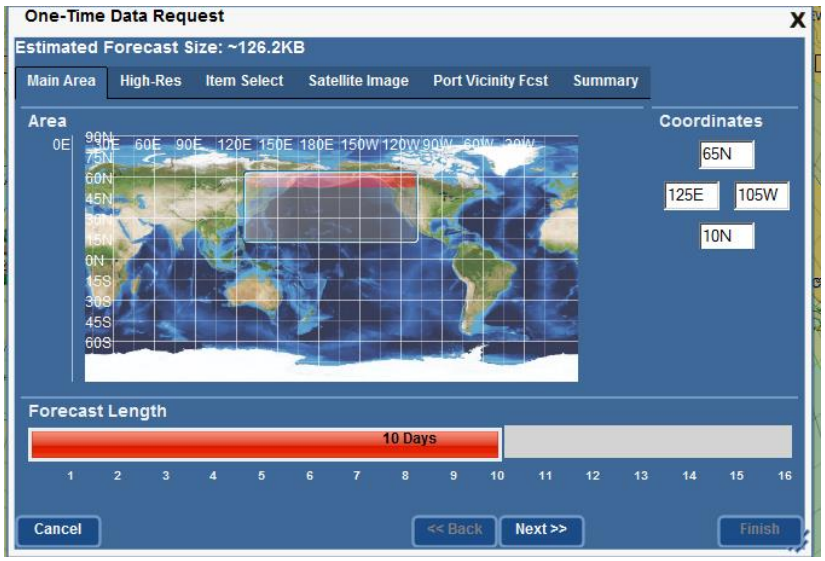
As seen below, a "Stop Delivery" confirmation dialog appears to ask for confirmation of this step. Thereafter, you'd need to send in the resulting file,

"{callsign}-StopSchedReq.txt" to bvs7@awtworldwide.com.



5.4.3 One-Time Email Delivery of Weather Data

This menu item is for setup of a single 'immediate' (also known as one-time) data report request done by email. All tabs are the same as those discussed in Section 5.4.1, however there is no Delivery Schedule tab since this is a one-time request.

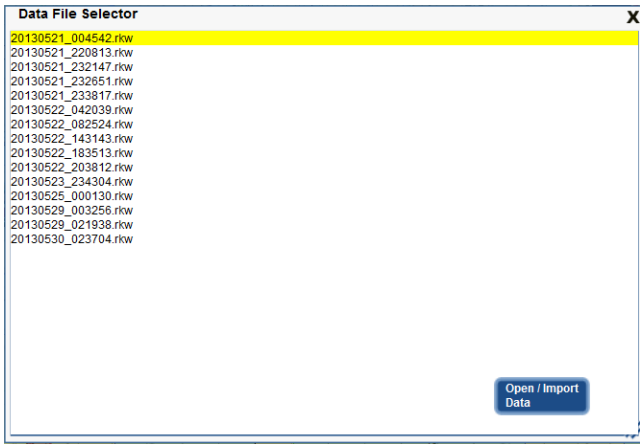


Full instructions for using this feature are in Chapter 25, Managing Weather Data in Email-Enabled Systems.

5.4.4 Select Previously Downloaded Weather Data

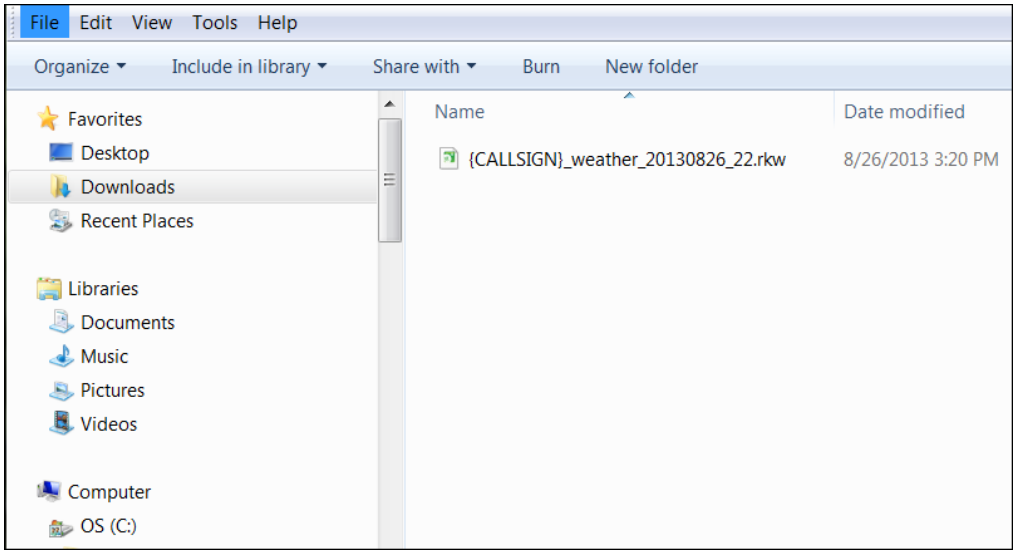
This menu item is for when you need to load previously downloaded and retained weather data. Note that if you desire to process much older weather files, you may need to modify your PURGE OLD WEATHER data setting in the Setup | Data Communications menu. Example: if your intentions were to process a weather file from 30 days ago, you'd want to modify the PURGE OLD WEATHER setting to a number higher than 30 during your data review process. Thereafter the purge setting can be returned to lower number , if desired.

Below is an example of the Data File Selector window which displays the previous Broadband data files that have been processed & archived:



5.4.5 Manually Import Weather Data

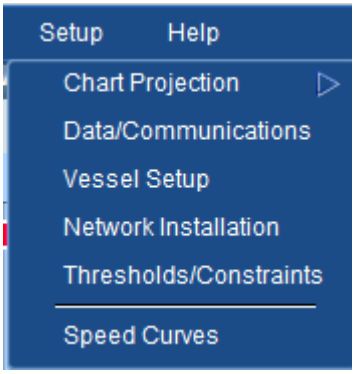
This menu option allows you to import a newly received RKW data file that has been saved to your hard drive.



As an alternative, you may also double-click an RKW file directly from an email message or from a location on your computer.

5.5 The Setup Menu

The Setup menu allows access to various setup dialogs that were used in initial setup, and to set the chart projection format.

	Menu Item	Function
	Chart Projection	Sets chart projection to one of three types. See Section 6.2. Chart Projection Types.
	Data/Communications	Opens the Data/Communications dialog for defining data collection settings.
	Vessel Setup	This dialog contains all vessel characteristics required by BVS for simulation & optimization functionality, BVS account authorization, etc.
	Network Installation	The Network Installation dialog displays to configuration options for configuring shared WEATHER and DATA folders on your computer Network. You may need assistance from your IT department if you do not have ADMINISTRATOR privileges on your NETWORK.
	Threshold/Constraints	Opens the Thresholds/Constraints tab on the Left Panel.
	Speed Curves	Opens the Speed Curves dialog allowing additional adjustment of wind and swell speed down curves.

5.5.1 Chart Projection

You may select any of the following projection types:

- Mercator
- Orthographic
- Gnomonic

5.5.2 Data/Communications

See Section 32.2 for detailed instructions.

5.5.3 Vessel Setup

See Section 32.1, Vessel Setup for detailed instructions.

5.5.4 Network Installation

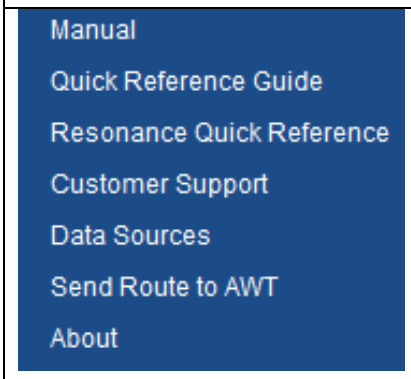
See Section 32.4, Network Setup for detailed instructions.

5.5.5 Speed Curves

See Section 32.1.1, Vessel Speed Curve Setup for detailed instructions.

5.6 The Help Menu

Help menu items and their functions are described in the table below:



Menu Item	Function
Manual	Opens this User's Manual. Adobe Acrobat® reader is required.
Quick Reference Guide	Opens this Quick Reference Guide. Adobe Acrobat® reader is required.
Resonance Quick Reference	Opens the Resonance Feature Guide. Adobe Acrobat® reader is required.
Customer Support	Opens a dialog box that assists you in sending program log information to help in troubleshooting program errors.
Data Sources	This support document explains the origins of BVS Forecast data.
Send Route to AWT	Displays a dialog to assist users in sending of BVS Track file. This is only required if you are receiving Weather Routing Services in addition to BVS weather updates.
About	Displays the **BVS version** as well as the **Installation ID** (or hardware KEY) which needs to be sent to BVS@awtworldwide.com to help ensure access to all program functions.

Note: Versions of the User Manual and Quick Reference Guide are also available in Microsoft Word® format, and can be opened manually. They are found in this default location on your computer: C:\BVS7\docs

6 General Chart Functions

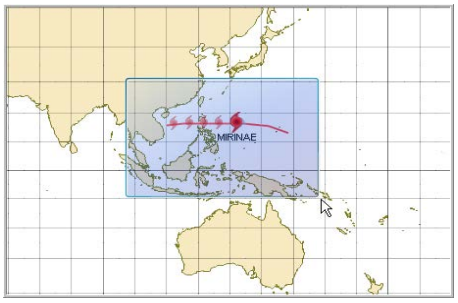
6.1 Chart Scaling and Positioning

You either use the mouse or chart control buttons for this.

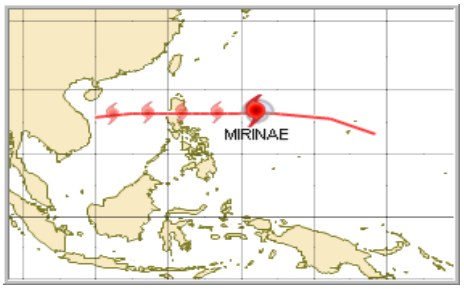
To use the mouse:

- Roll the mouse wheel forward to zoom the view in.
- Roll the mouse wheel backward to zoom out.
- Left-click the chart and drag the mouse to pan the chart in the desired direction.
- Left-double-click the mouse to center the chart on the current position of the mouse cursor.
- Right-click the chart and drag the mouse to create a zoom-in field. The chart view will adjust to the new user-defined area:

1. Select area with Right-Mouse:



2: Chart will zoom into selected area.



For additional information on chart controls, See Section 4.5, Chart Display Controls.

6.2 Chart Projection Types

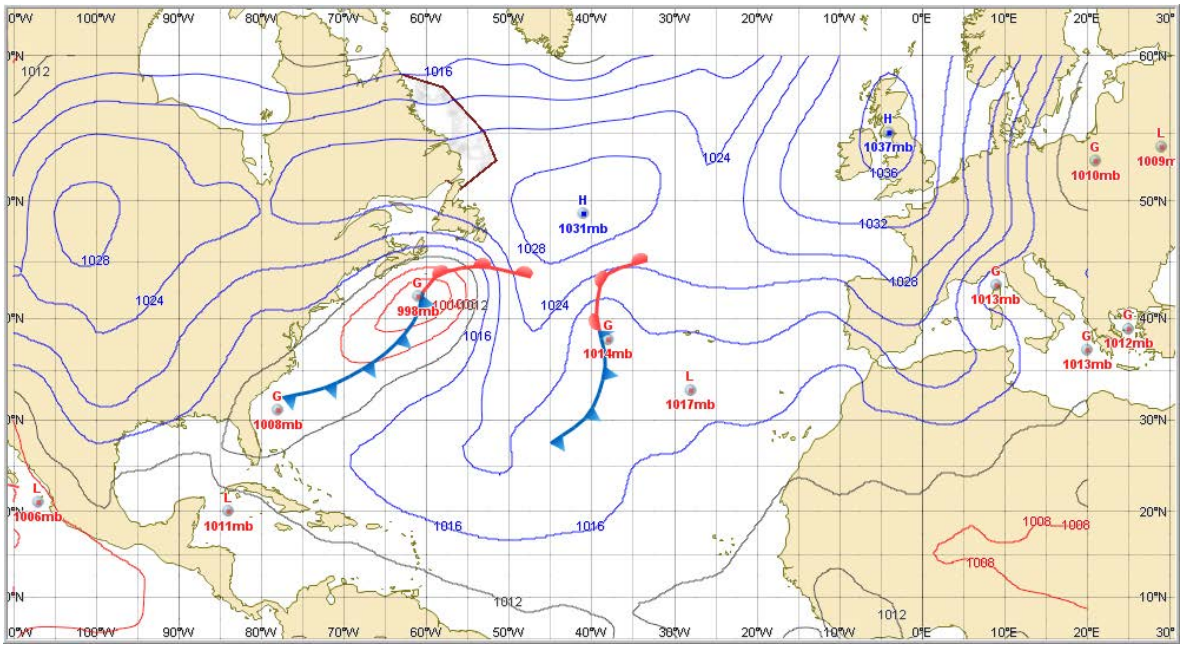
Users can customize projection type used on the chart. These types can be set from the Menu Bar using Setup | Chart Projection.

BVS provides three projection types:

- Mercator
- Orthographic
- Gnomonic

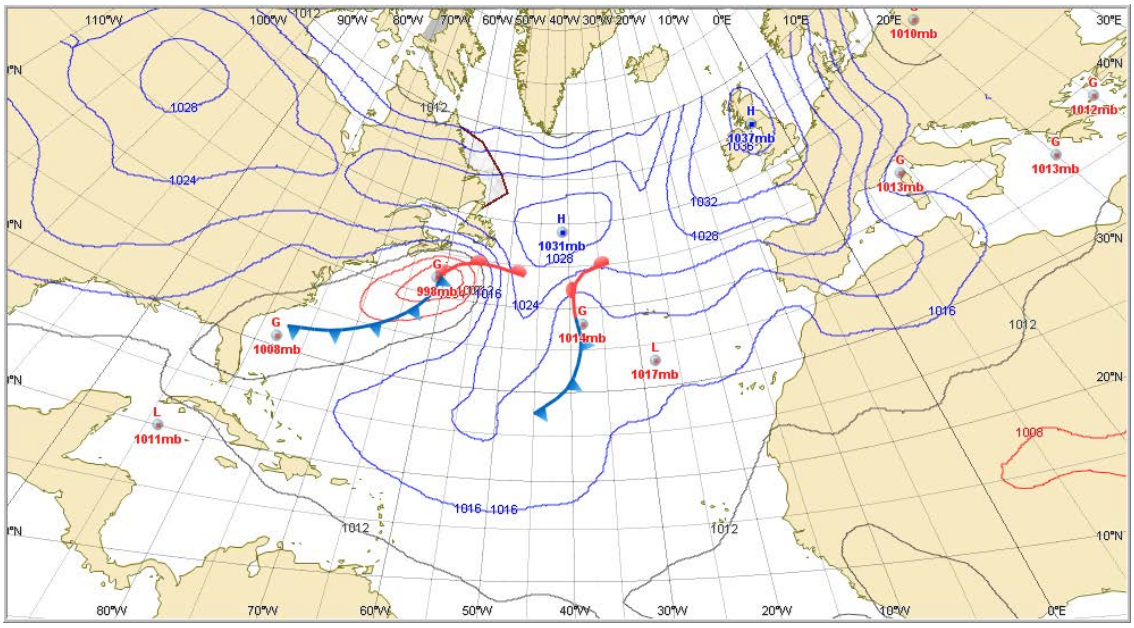
Mercator

A cylindrical map projection, which has become a standard for nautical purposes because of its ability to represent rhumb lines as straight segments.



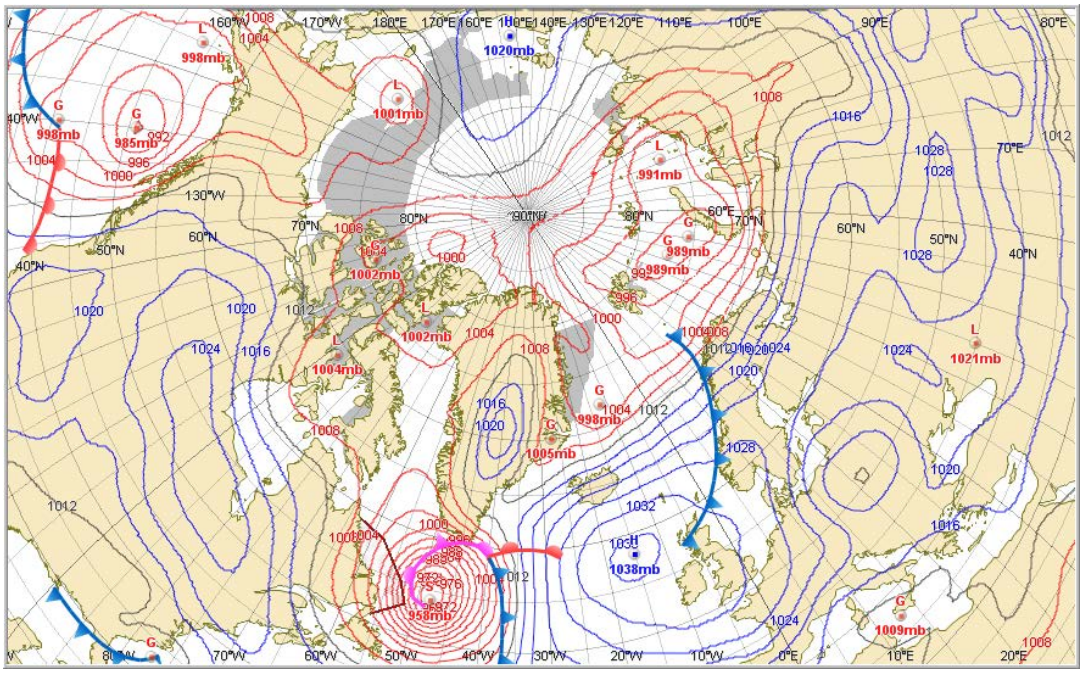
Orthographic

A perspective (or azimuthal) projection, in which the sphere is projected onto a tangent plane.



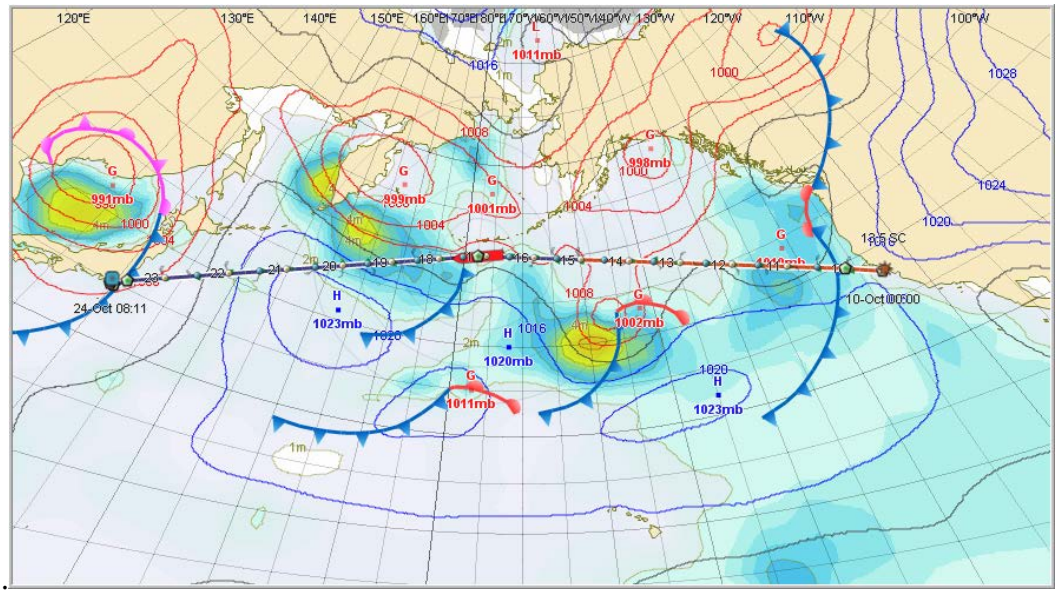
The Orthographic projection depicts a hemisphere of the globe where the horizon is a great circle. The shapes and areas are distorted, particularly near the edges, but distances are preserved along parallels.

A forecast for the extreme latitudes can be easily viewed using either the Orthographic or Gnomonic display.



Gnomonic

Displays all great circles as straight lines:



6.3 Copying the Chart Image

You can copy the chart image to the Windows Clipboard for pasting into a document, email, or image editing program. Select from the menu bar **Edit | Copy Image**. The image may then be pasted into the desired location.

6.4 Printing the Chart

To print the chart, select **File | Print** which opens the print dialog, or alternatively, press keyboard combination **CTRL - P** to print the Chart Window contents.

6.5 Weather Data On the Chart

Weather data is presented several ways on the chart. It is shown graphically and with symbols and text. Graphic display are shown as contours, colored areas, or icon arrays in regions. Text display can be numeric on the Weather Bar or descriptive when you right-click on a point. Weather data display is controlled on the Weather Bar.

6.6 Geographical Data on the Chart

The BVS chart supports a large variety of geographical data. The configuration controls for these options are found in the Left Panel DATA DISPLAY tab. Additional instructions for these display options can be found in Chapter 13.

6.7 NoGo Areas/ Restricted Sailing Zones

NoGo Areas are restricted sailing zones. They are user-defined areas used by BVS' Optimization program to ensure avoidance of restricted areas.

6.7.1 Types of NoGo Areas

BVS supports several types of restricted sailing zones.

1. **Universal NoGo areas.**

Universal NoGo areas have been provided in BVS to display known areas of avoidance. These areas appear on the chart as semi-transparent red polygons.

NoGo areas can be toggled on or off in the Data Display tab, in the Left Panel.

2. **User-defined NoGo areas.**

These areas appear as purple polygons.

Both the user-defined and the Universal NoGo areas are avoided when a track is optimized. Track alarms (or 'alerts') will also display when the user creates a track that traverses a NoGo area.

Editable NoGo Properties include the ability to define a name and to designate start and end times to control the appearance of these areas. When optimizing, BVS will take into account the configured start and end time restrictions of each NoGo area.

NoGo area creation and editing are accessed from the right-click menu. Details follow below.

3. **ECA Zones.**

ECA Zones are "established Emission Control Areas" and appear as green polygons on the chart when the "ECA" option is selected in the Data Display tab.

Because ECA zones are not considered NoGo areas, BVS route optimization will pass through these areas.

If you wish to convert an ECA zone into a NoGo area, right-click on a portion of the ECA area (the border, a polygon point or a portion of the shaded area) and select the menu option, "Convert to NoGo-Area".

4. **Load Lines**.

An option to enable Load Line display is found in the Data Display tab.

Winter, Summer and Tropical load zones appear in their appropriate seasonal periods.

Similar to the characteristics of the ECA areas, Load zones are not considered NoGo areas. If you wish to convert a seasonal Load Zone into a NoGo area, right-click on a portion of the area (the border, a polygon point or a portion of the shaded area) and select the menu option, "Convert to NoGo-Area".

6.7.2 NoGo Area Display

Although the creation and editing of NoGo areas are discussed here, a description of the Data Display controls (including toggling on/off NoGo areas) is further discussed in the Data Display section: Chapter 13.

6.7.3 Creating and Editing NoGo Areas on the Chart

Creating a NoGo area on the chart

1. Right-click on the chart location where you wish to place the NoGo area.

2. This option appears towards the bottom of the pop up menu:

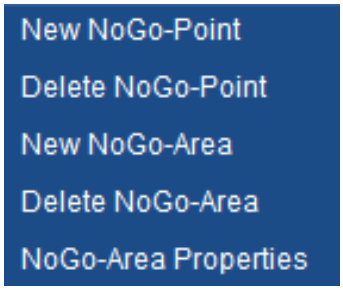
3. Select New NoGo Area. A triangular polygon will appear at the original cursor right-click location. You can edit it, adjusting size, shape, and position.

Editing a NoGo area

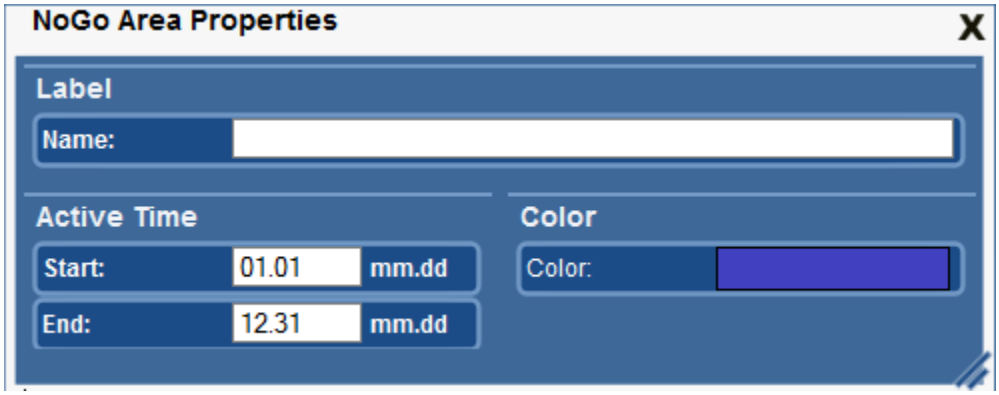
Left-click a NoGo area to select it and make it active for editing. (Clicking outside the NoGo area exits editing mode.)

Each vertex (point) of the triangle will now have a small circle on it. You can left-click on a vertex, hold the left button down, and drag the mouse to move the point.

If you right-click on a vertex, this top portion of the popup menu appears to assist you in the editing of the NoGo area:



- The New NoGo Point menu selection adds another vertex to the polygon area.
- When the cursor is on a vertex, right-clicking and selecting "Delete NoGo Point" removes that vertex.
- Select NoGo-Area Properties to enter a label for the area and to input start and end dates in the 'Active Time' section. The default start date is 01 January, and the default end date is 31 December, making the NoGo area available throughout the year.



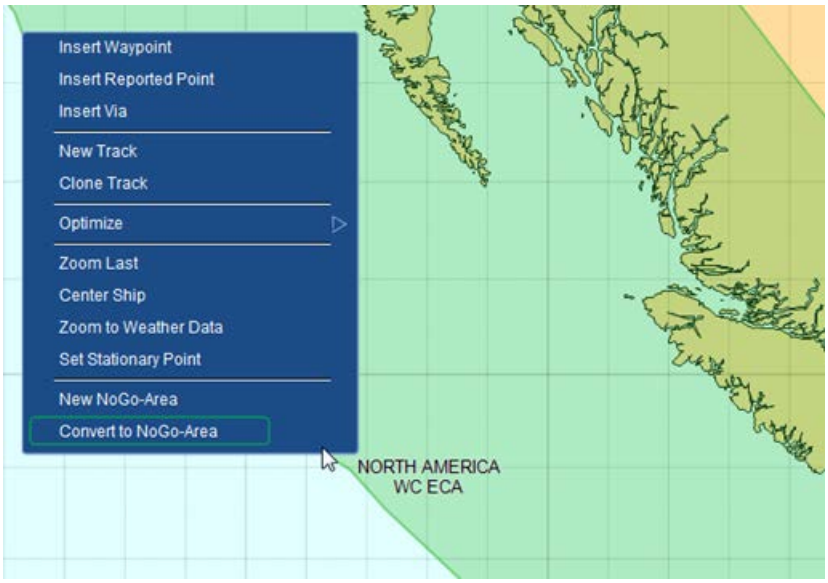
Deleting a NoGo area on the chart

1. Left-click on a NoGo border to make it active for editing.
2. With the cursor over the area, right-click to open the pop-up menu.
3. Select the option, **Delete NoGo-Area** and the area will be removed.

User-defined NoGo areas will be retained in a BVS NoGo file until you delete them from the chart display. Even when BVS is shut down, these NoGo areas will be available for display when BVS is restarted.

Right-clicking on an ECA Zone

When the ECA Zone display is enabled (using Left Panel Data Display tab), you can convert a specific ECA Zone into a NoGo area by right-clicking the area and selecting the option: 'Convert to NoGo Area'. An example is shown below:



6.8 Warnings and Alarms on the Chart

BVS provides certain special messages on the chart. Some are general advisory messages and some are alarms indicating that user-defined hazard restrictions have been exceeded.

1. Undefined resonance settings warning –

This message (or one with similar wording) appears in red text in the upper left of the chart if you have not defined resonance settings. If it appears, you need to enter those settings using the Left Panel Snapshot tab which handles resonance. For information, see Chapter 27.2, BonVoyage Pre-Voyage Actions, and Chapter 29, Resonance.

2. If you see colored disks along a voyage track, they are advising that potential roll risk hazards or that weather restrictions have been exceeded. Right-click on an alarm and then hover over the alarm symbol in the pop up menu to view a description of that alarm. For more information, see Section 19.1.3, Track Weather and Alarms.

6.9 Time Step and Animation Controls

The Time Step Controls are found on the far right side of the Weather Bar. These control the movement of weather information and vessel position on the chart. The Animation Control Bar Toggle button opens the animation control button.

The Time Step controls are, from left to right:

	Go to beginning of route	Set route position to the departure point. If no route exists, beginning of weather time series is used.
	Previous time-step	Set route position to the previous BVS-calculated point using the 'Forecast Time Step Setting' interval (see last section in this table)
	Go to current time	Go to the position for the current time
	Next time-step	Set route position to the next BVS-calculated point.
	Go to end of route	Set route position to the end. If no route is selected, end of weather time series is used.
	Animation Control button	Clicking this toggles on or off the display of the Animation Control dialog to enable animated viewing of voyage and weather details
	Forecast Time Step Setting	This pull down menu allows user to configure the time-step increments for both Animation and Time Step controls: Auto (a combination of 3, 6, and 12 hrs.) 6-hour 12-hour

Animation Control Bar

These controls provide options to play, pause, loop the animation and control its frame display speed.

The controls are:

Play Backward

Pause (Stops vessel at the currently displayed position)

Play Forward

Speed Control (This slider speeds up/ slows down the 'pause time' between time steps.

Loop on/off (The looping feature will replay the animation from departure point to voyage destination. If no track is selected, the current forecast will be repeated from TAU zero to the last forecast time step (or TAU).

To close this control panel, click the Animation Control button a second time.

7 Chart and Track Right-Click Menus

The mouse button actions follow the standard conventions of window applications:

Left-clicking the mouse will select items or drag the specified item (examples: waypoint, chart image, etc.)

A right mouse click displays menus that are customized to display commands/options relevant for that item or region. Simply stated, BVS provides context-sensitive popup menus.

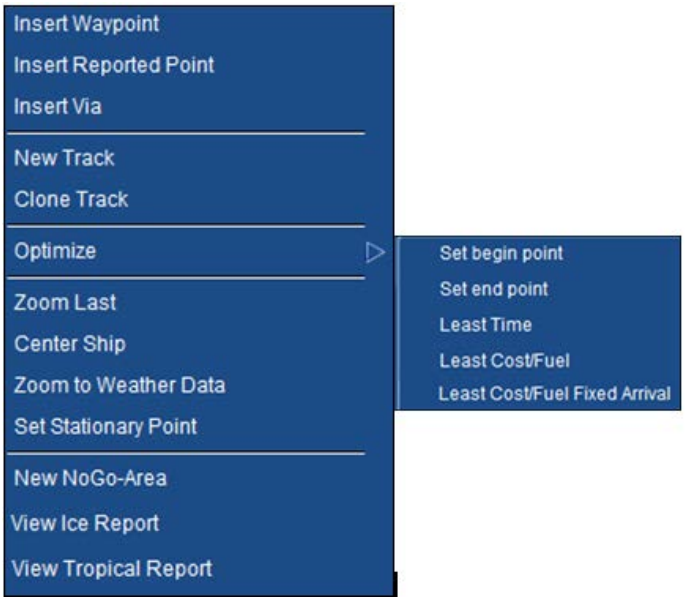
This section identifies right-click menus for specific items:

- Chart
- Waypoints on Tracks
- Alarms at waypoints

NoGo area right-click behavior is described in Section 6.7, NoGo Areas/ Restricted Sailing Zones.

7.1 Chart

Right-click menu items are shown below:



Options may be added to or suppressed from the menu depending on the item selected. For example, if you click on a tropical storm track, BVS adds the menu item View Tropical Storm Report at the bottom of the menu dialog. The View Ice Report appears in a similar manner.

Insert Waypoint

A waypoint is added at the location of the mouse cursor.

Note: This option will not appear unless a voyage track has first been created and has been selected using a left mouse click.

Insert Reported point

A noon position or reported point is placed at the mouse location.

Note: This option will not appear unless a voyage track has been created, has first been selected on the chart (using a left mouse click).

Insert Via

Inserts a via at the cursor location.

New Track

Creates a new track file. The initial dialog requires that a track name be entered and saved.

Clone Track

Generates a track similar to the one you have selected, with options to maintain or exclude various waypoints and to generate a 'reverse waypoints' track for a return voyage.

Optimize

The Optimize submenu contains the following items:

Set Begin Point

Optimization will use this location as the starting point

Set End Point

This point will become the optimization end point.

Least Time

Generates an optimized route with best ETA option.

Least Cost / Fuel

Considers fuel cost (or fuel consumption when cost is not defined) to create an optimized route.

Least Cost / Fuel Fixed Arrival

A required arrival time is considered as BVS considers fuel cost (or fuel consumption when cost is not defined) to create an optimized route.

Zoom Last

Reverts the chart to previous zoom state.

Center Ship

Maintains current zoom state and centers the ship icon on the chart.

Zoom to Weather Data

Adjusts chart to display full weather display region.

Set Stationary Point

Creates a stationary forecast point on the chart. When using the Time Step Controls, the data in the Weather Bar corresponds to the stationary point's chart position.

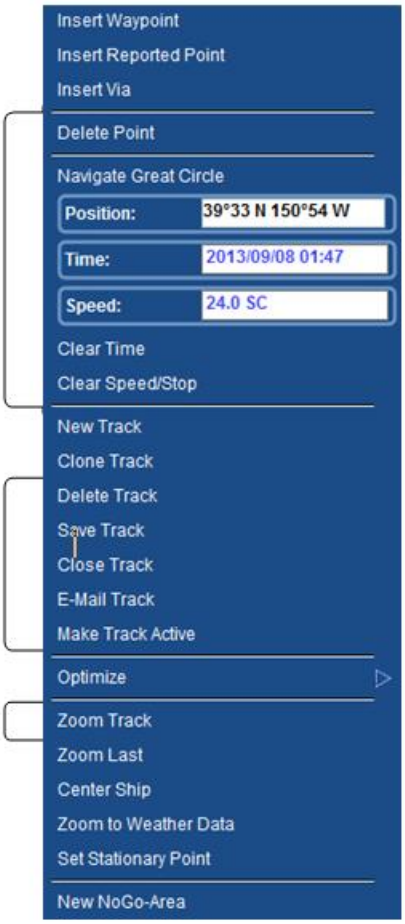
New NoGo-Area

Creates a new NoGo polygon on the chart. User may thereafter add vertices and adjust the polygon to create specific optimization avoidance area.

7.2 Waypoint on the Voyage Track

Some menu items shown below have descriptions written in the previous section (7.1, Chart).

Items described in this section are identified using (3) gray brackets below:



Delete Point

Removes the selected waypoint from the track.

Navigate

The 'Navigate (from)' option toggles between Great Circle and Rhumb Line with a single mouse click. Navigation type for each waypoint is set 'from the selected waypoint to the next waypoint'.

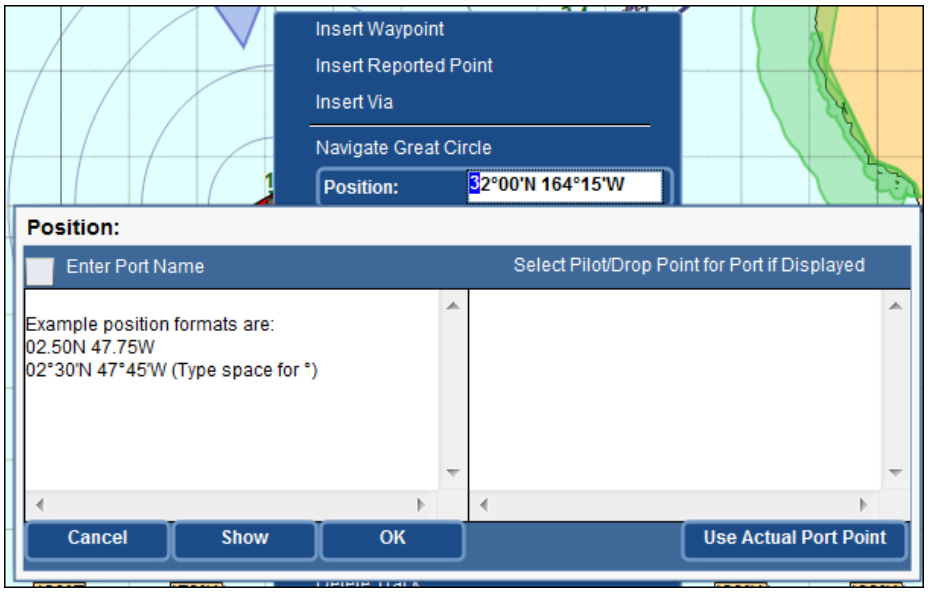
Position

This menu item has two unique options, depending on whether you are at a Departure/Arrival point, or at a waypoint along the track. At DEP/ARR points, you can select a specific port or pilot location. For waypoints, there is an option to select a common navigation point, such as a cape, strait or passage:

Functionality of the Position Field at a Departure or Arrival Point

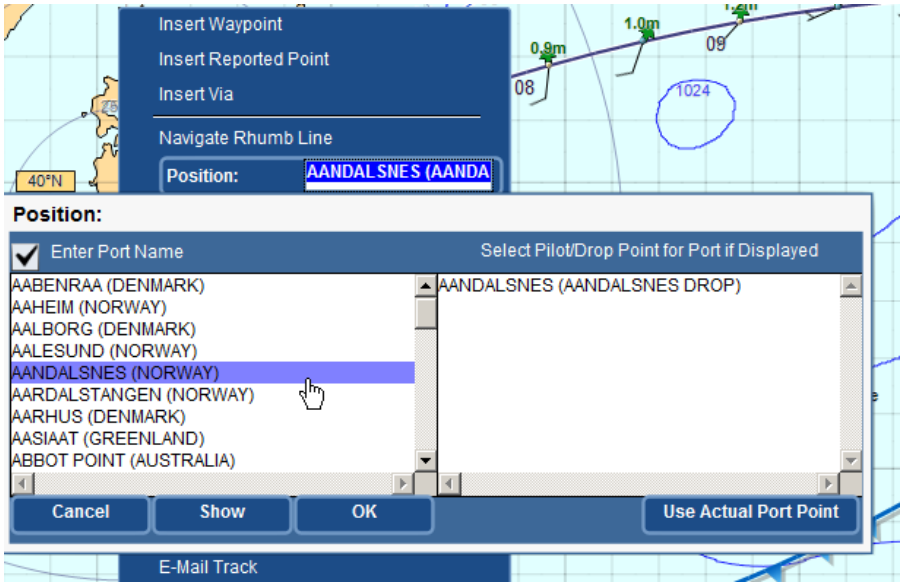
Note: Click on the FIRST character of the Lat/Long field. You may either enter the numerical position or the port name into this field.

Click on the first character in the LAT/LONG field and the Position dialog appears.



If you wish to enter a specific port name, select the checkbox, “Enter Port Name”. As you begin to type the name, the port list below will be filtered to show a list of corresponding possibilities. If you see the desired port name in the list, double-click it. This will actually select the pilot drop point (shown in the right half of the dialog).

If you wish your departure point to reflect the actual port, single click the port name on the left, then click the button in the lower right, “Use Actual Port Point”.



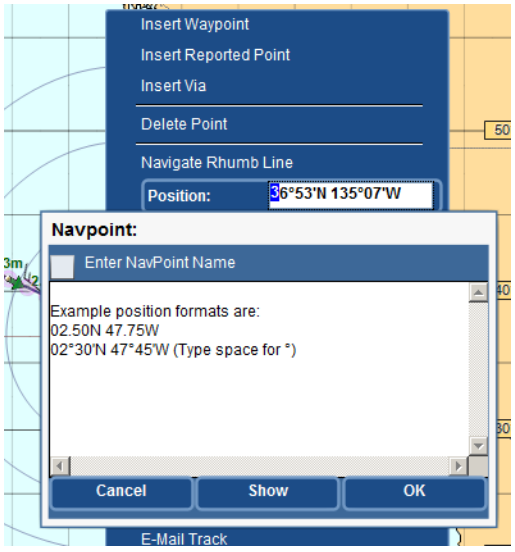
Functionality of the Position Field at a Waypoint

When left-clicking the waypoint "Position" field, the **Navpoint** dialog appears. You can either enter the specific lat/long details or a Navpoint name into the position field.

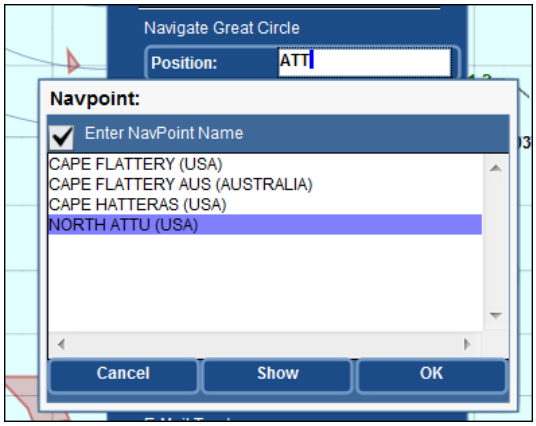
If entering the numerical coordinates, you have the option of entering either:
Decimal Degrees or
Degrees/Minutes

Please see section 14.1.1, Table Columns, for more details.

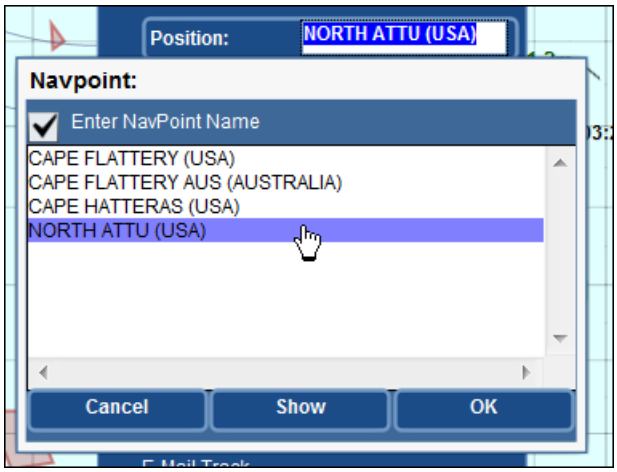
The usage of the Navpoint option allows the selection of a specific cape, strait or passage point:



Click the checkbox, "Enter NavPoint Name". As you begin typing the navigation point name, the dialog below filters the list of options to allow you to select the appropriate name of your passage point:



Clicking the desired item from the list and the position field is populated with that Nav Point. Click OK to accept the location and close the dialog. Alternatively, you can double-click the Nav Point to choose the location and close the dialog:



Time Field

Type in desired details to set a fixed arrival time for the corresponding waypoint.

If you left-click a specific character in the Time field, you can change the value of that character.

NOTE: Although BVS allows for fixed time entry in a waypoint TIME field, it is recommended that waypoints are maintained with BVS-computed times. If you require to enter a fixed time for a specific point (apart from a TRACK or VIA ARRIVAL point), you should use the "REPORTED POINT" entry option.

Clear Time Menu Option

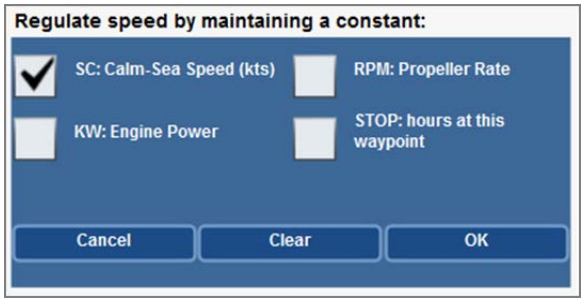
When right clicking a waypoint that has a fixed time, this option will clear the date and time that was previously entered, and use the BVS-calculated time for that point.

Speed Field

Enter a user-defined speed setting. BVS persists speed settings from reported points and from points where a specific speed has been entered by the user. This means that future DR points will reflect your latest speed entered on the track, or the latest calculated speed based on a FIXED time that has been entered.

If you left-click a specific character in the Speed field, you can change the value of that character.

Also, upon left-clicking the Speed field, a pop-up dialog for speed adjustment appears:



Choose the desired speed or power display option by selecting the appropriate checkbox. "SC", or calm sea speed is the default.

Clear Speed/Stop Menu Option

When right clicking a waypoint that has a previously entered speed, selecting this option will clear previous user-defined speed setting and use a BVS-calculated speed.

Note: User-defined speed and time details are shown in **BOLD** text. BVS-calculated data appears in standard (non-bold) text.

Delete Track

Removes the selected track from the BVS chart and from the computer hard drive (c:\bvs7\data\track is the default location).

Save Track

Saves the selected track to the BVS **data\track** folder.

Close Track

Removes the selected track from view, but maintains it in the **data\track** folder. You will be prompted to save the track if changes have been made and you have not previously saved the updated track file.

EMail Track

If your "BVS email setting" is set to **MAPI** (automatic) in the menu option SETUP | DATA/COMMUNICATIONS, this right-click menu function will generate an outgoing message to bvstrack@awtworldwide.com with the selected track file being added as an attachment. If your email setting is set to **MANUAL**, you'll see a helpful dialog which will provide steps in locating the appropriate file and sending it to the above location.

Make Track Active

The active track is usually the Master's intended sailing track. The active track is also the file that should be sent to AWT (see previous paragraph).

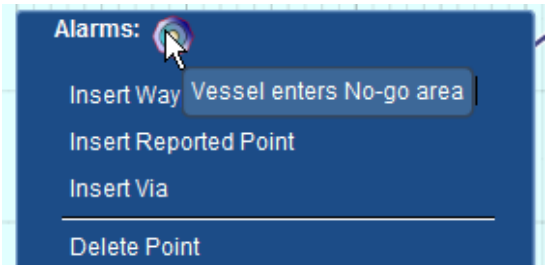
Zoom Track

After you've selected a specific track, this option adjusts the chart view to display the full track.

7.3 Track Alarms

Alarms appear at computed points along the voyage track when encountering one of the following conditions: a NoGo area, User-Defined Weather Restriction, Potential Roll Resonance Risk, etc. If you right-click on an alarm icon, the popup menu appears with a disks or alarms at the top of the menu.

Hover the cursor over any alarm icon to see a tool-tip message. This message gives the specific alarm details, as in the example below.



An ORANGE alarm disk indicates multiple alarms at a specific point. A description of each of these 'multiple alarms' would be accessible from this same right-click popup menu.

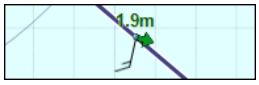
Resonance alarms should be of particular concern.

For more information on resonance, see Section 29.1.1, Resonance Warnings Along the Voyage Track.

7.4 Computed Point on the Voyage Track

Computed points along the track show wind and swell information. The menu items available are similar to those shown when right-clicking a waypoint. Items omitted from the popup menu are those which are specific to waypoint adding/editing/deleting.

Here is an example of data displayed at a computed point.



8 Frequently Asked Questions

Where do I find a description of controls, messages, alarms, or symbols on the chart?

1. **Tool Tips**. Many screen objects have a tool tip/ description that appears when you hover the cursor over them. This feature provide key words to describe a specific item. Those key words might also be used to search for further details in the BVS User Manual.

2. **Major screen elements are described in each associated chapter.** There are several major screen elements, for example, Chart area, Menus, Tracks. and Weather Data. After identifying the element you wish to learn more about, you may search for the chapter that describes the specific item.

You can find major chart elements here: Section 4.1, Master Diagram of Chart Window.

3. **Control** options are found on:

- Menu Bar
- Weather Bar
- Time Step Controls
- Left Panel tabs
- Bottom Panel tabs
- Right-click menus

There is a section in the manual for each of these areas.

4. **Messages, Symbols, Alarms**

- For information about Chart Symbols, see Chapter 9.
- Weather symbols are identified in Section 26.1.
- For text alerts, also see Section 6.8, Warnings and Alarms on the Chart.
- Track symbols: symbols on a track are identified here: Section 19.1.2
- Alarms: alarms on tracks are identified by right-clicking on the colored disk and then hovering the cursor over the alarm symbol to get a pop-up description. Resonance alarms relate to the risk of Roll Resonance conditions reaching or exceeding the thresholds you set in the upper area of the Left Panel's Snapshot tab.

5. **Colors and legends**

How do you identify the intensity of specific filled contours on the chart?

When a Weather Data product is enabled (along the Weather Bar), a small color legend for that product appears in the lower right corner of the chart to assist you in identifying speed, height, temperature, etc. measurements for each specific weather parameter.

NoGo areas are color-coded by specific type as described in Chapter 9.

What if I right-click on the chart and don't see an item I need in the popup menu?

The popup menu is interactive and changes according to the item on which the mouse cursor is focused. For example, a different menu appears when clicking a voyage Track versus clicking on the Chart. Make sure you have selected the appropriate chart element with the left mouse button, which sets the focus for activity, before using the right-click menu function.

9 Reference Information

9.1 Chart Symbols

There are several kinds of symbols on the chart:

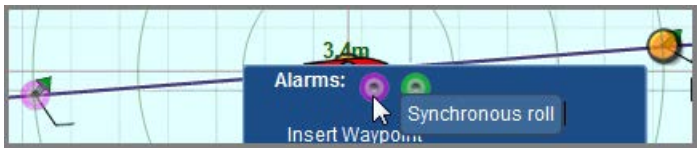
- symbols directly related to the chart itself
- track symbols, which include position and alarms
- weather data symbols
- hazards
- NoGo areas

Chart-specific symbols include the gridlines for Latitude and Longitude and the Lat/Long markers.

Track symbols are identified in the Track reference chapter; see Section 19.1.2, Track Point Symbols.

For **weather data symbols**, see Section 26.1.

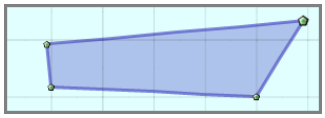
Resonance Warning circles are colored circles shown along the voyage track on the chart when the wave height is in excess of the threshold.



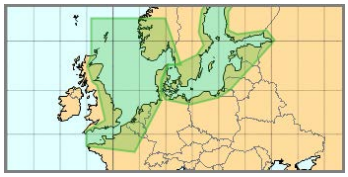
NoGo areas are color-coded:

Universal NoGo areas appear in red on the chart.

User-defined NoGo areas appear in blue on the chart.



ECA Zones appear in green on the chart.



9.2 General Keyboard Shortcuts

Keyboard shortcuts to give quick access to some of the program functions:

Key combination	**Description**
B key	Optimization use: Sets the BEGIN point to the currently selected waypoint when hovering the cursor over the desired waypoint, then clicking the B key.
Ctrl + S	Opens Left Panel Snapshot tab Resonance control and display panel
Ctrl + C	Copy BVS Chart to Windows Clipboard
Ctrl + D	Opens Voyage Details tab on Bottom Panel
Ctrl + G	Opens Graph tab on Bottom Panel with Active track
Ctrl + H	Opens Bottom Panel, displaying the last-viewed tab.
Ctrl + I	Opens Left Panel Route Input Table.
Ctrl + K	Opens Bottom Panel Track List. Used to compare details of all open tracks.
Ctrl + P	Print BVS Chart
Ctrl + Z	Undo last item. Continued use of this function removes each previous action (example: waypoint edit, etc.)
Delete key	Deletes the currently selected waypoint. Does not delete start or end points. You must first click on the track to select, then hover the mouse over the specific point. Tap the delete key to remove from the track.
E key	Optimization use: Sets the END point to the currently selected waypoint when hovering the cursor over the desired waypoint, then clicking the E key.
Insert key	If a track is currently selected, inserts a new waypoint at the current mouse cursor position
Up Arrow ↑	Zooms In (if the chart is active, that is, if you have left-clicked on the chart)
Down Arrow ↓	Zooms Out (if the chart is active, that is, if you have left-clicked on the chart)
Left Arrow ←	Moves back in forecast time-step. This is the same function as that of the Time Step Controls' left triangle icon.
Right Arrow →	Moves forward in forecast time-step. This is the same function as that of the Time Step Controls' right triangle icon.
Ctrl + T	Optimize for Least Time
Ctrl + F	Optimize for Least Fuel Cost or Consumption
Ctrl + L	Optimize for Least Fuel Cost/Consumption with a Fixed Arrival Time

9.3 Piracy Symbols on the Chart

The following chart symbols indicate piracy conditions. Display of piracy symbols is toggled on and off by a control on the Left Panel **Data Display** tab.

Symbol	Meaning
	Pirate attack
	Pirate boarded
	Pirate attempt
	Pirate suspicious
	Pirate mother ship

10 Introduction to the Left Panel

The Left Panel provides quick access to these tabs, which cover the indicated functions:

Snapshot tab:

- resonance hazard analysis and management. Provides a means for seeing data for positions on the track

Tools tab:

- used to set thresholds (for alarms) and constraints for parameters along a path to guide optimization
- set voyage start and end points, and optimization type

Data Display tab:

- set Data display controls for the chart

Route Input tab:

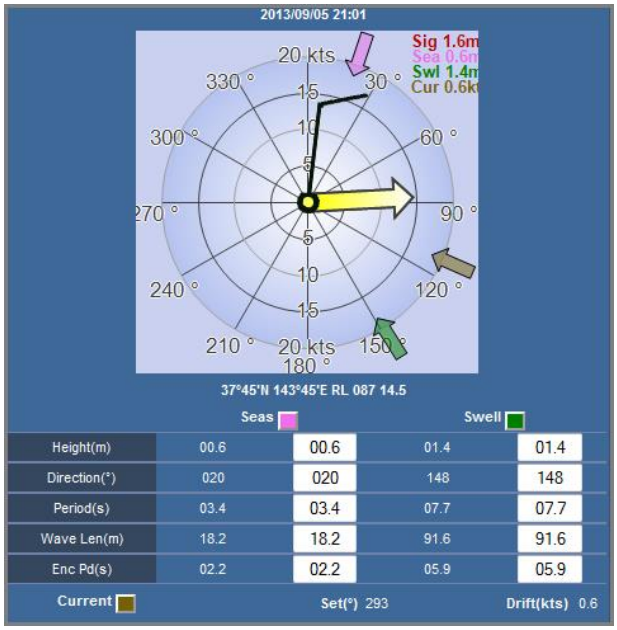
- view and edit track table for a track

11 Snapshot Tab (Resonance Settings and Graph)

The Track Snapshot provides a graphic display of the ship's heading, as well as Wind, Significant Waves, Swell and Surface Currents at the selected route point. This tab also includes a display of **Roll Resonance** likelihood. Extensive instructions regarding this feature are in Chapter 29, Resonance.

To access this feature, from the Menu bar select **View | Snapshot;** or open the vertical panel and click the leftmost tab, "Snapshot" to view snapshot details.

Each weather parameter is displayed "inward" from the outer area of the graph, with the exception of Wind. The wind barb, although pointing 'inward' is connected to the center of the graph. The various graph features are explained below:



Vessel Heading—(yellow vector) changes in length according to vessel's speed/power which user has specified in the selected voyage track. This speed setting can be modified using the Route Input table.

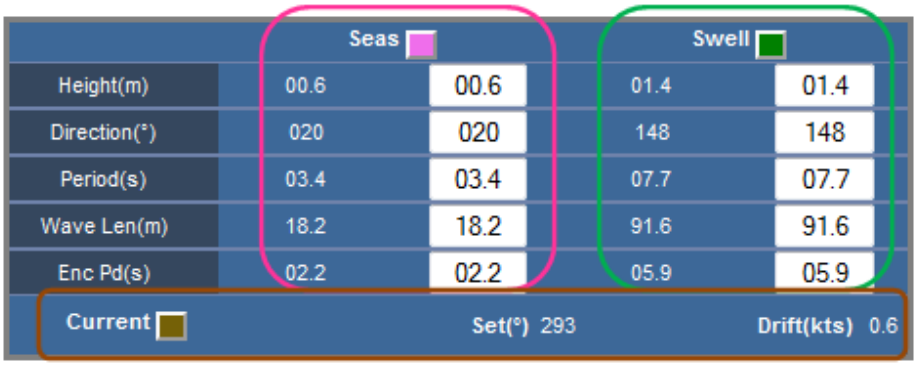
Wind— (black barb) northerly wind shows towards center

Wind Sea— (pink arrow) from North, showing 20°

Swell Wave— (green arrow) from Southeast & showing 148°

Current—(brown arrow) heading to 280°. Note that the arrow placement is consistent with other arrows, but the numerical values are for the surface current's heading from ship center, as opposed to direction towards ship center.

Significant Wave—(red numerical value) always shown in the upper right corner for your reference.



The two main column groups are for seas and swell, respectively. Data provided in the table depicts Height (meters), Direction (degrees), Period (seconds), Wave Length (meters) and Encounter Period (seconds).

The blue background column displays the BVS-generated values for the vessel's position. The white cells allow for user input/modification which in turn affects Roll Resonance display on both the graph and along the voyage track.

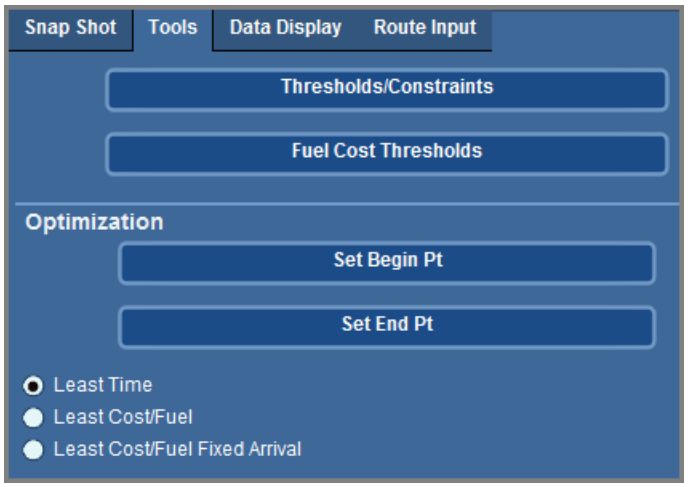
Data for Surface Currents are shown in the row below (identified with the brown box in the previous image).

Additional instructions regarding Roll Resonance alerts are in Chapter 29, Resonance.

12 Tools Tab (Thresholds, Constraints, Optimization)

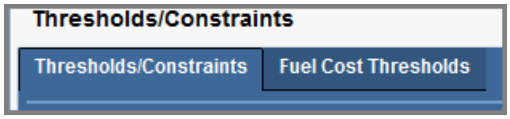
This tab provides controls for setting:

- Thresholds and constraints for weather parameters along a voyage track when optimizing
- Buttons for track optimization start and end point selection, and radio buttons for defining optimization type



Thresholds/Constraints Button

The "Thresholds/Constraints" button opens a dialog with two display tabs:



- Thresholds/Constraints
- Fuel Cost Thresholds—it is important to input fuel costs because optimization uses this cost information to help determine the most favorable sailing option.

Set Begin Pt Button

The "**Set Begin Pt**" button sets the currently selected waypoint as the "Optimization starting point". As an alternative, you can right-click a specific waypoint, then select Optimize, Set Begin Point.

Set End Pt Button

The "**Set End Pt**" button sets the currently selected waypoint as the "Optimization end point". As an alternative, you can right-click a specific waypoint, then select Optimize, Set End Point.

Least Time - Fuel Variable Speed Options

To help you define the differences in Least Time and Least Fuel optimizations, please note this description: If selecting Least Fuel, BVS will minimize passage through an ECA zone to lower cost/usage of Low Sulphur fuels. On the other hand, a Least Time Optimized route will generate the shortest track and may increase sailing time within the ECA zone as a result.

These three buttons are radio buttons; one selection of the three can be made. This setting defines the type of optimization used by BVS to generate an optimized track.

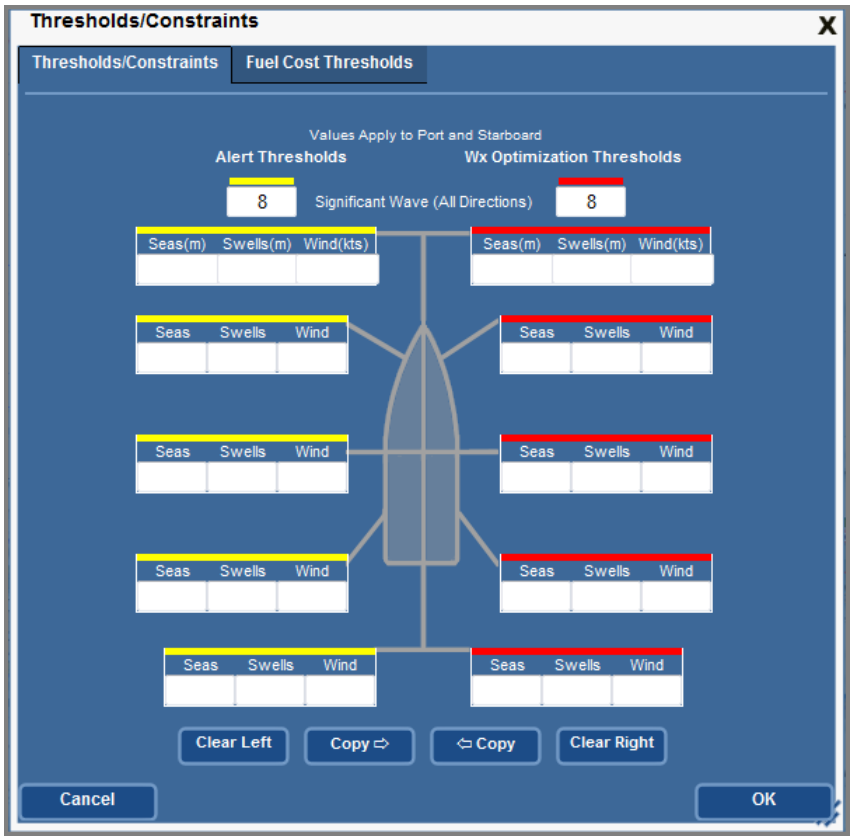
Least Time—Generates an optimized route with best ETA option.

Least Cost / Fuel—Considers least fuel cost or fuel consumption to create an optimized route.

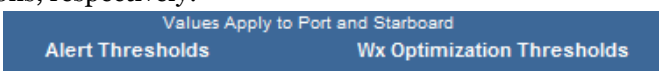
Least Cost / Fuel Fixed Arrival—A required arrival time is considered as BVS minimizes fuel cost or fuel consumption to create an optimized route.,

12.1 Thresholds/Constraints Tab

The Threshold/Constraints button opens the dialog below:



The Thresholds/Constraints tab is displayed by default and provides two columns for 'alert' symbol display along the voyage track and for BVS 'optimization' control options, respectively:



The **Alert Thresholds** section on the left allow you to enter user-defined limits which apply to both port and starboard sides of the vessel. If those limits are exceeded, you will find alarms, or alert disks along computed point on the voyage track indicating that weather encountered at that specific point has surpassed your previously defined restriction.

You can set thresholds for Head, Forward Quartering, Beam, Rear Quartering, and Following conditions.

The **Wx Optimization** area on the right defines the maximum allowed conditions to be used by the BVS Optimization process in the creation of an optimized voyage track.

You can set thresholds for Head, Forward Quartering, Beam, Rear Quartering, and Following conditions. These user-defined limits will apply to both starboard and port sides of the vessel.

You can copy values from one section to the other using the Copy buttons. The Clear buttons clear all entries for the corresponding section above that specific "clear ..." button.

A default entry of EIGHT meters is found in the "Significant Wave" fields at the top of the dialog. This default setting can be modified by the user. Note that if the field is erased or left blank, after clicking OK, the setting will revert to 8 meters.

12.2 Fuel Cost Thresholds Tab

Enter the price per metric ton for each fuel type:

FO (HFO/IFO): Fuel Oils (High or Intermediate)

MDO: Marine Diesel Oil

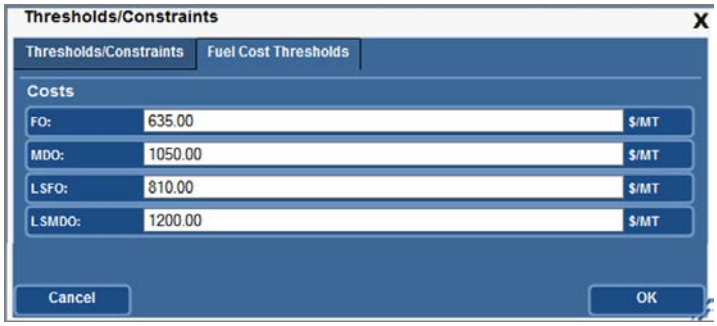
LSFO: Low Sulphur Fuel Oil

LSMDO: Low Sulphur Marine Diesel Oil

Optimizing for FUEL will take into consideration the fuel costs as defined in these various fields. As mentioned earlier, it is important to input fuel costs because optimization uses this cost information to help determine the most favorable sailing option.

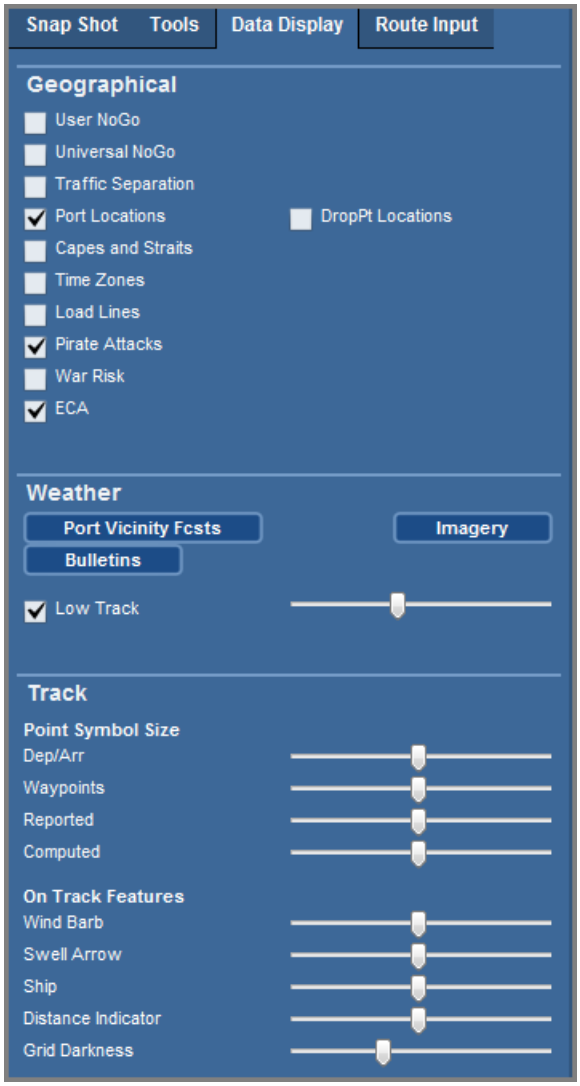
Note: The negative impact (ie: cost) of low sulfur fuel use in ECA zones is taken into account in the creation of "Least Cost/Fuel" optimized routes. When the Least Cost/Fuel optimization types are used, BVS will minimize passage into or through ECA zones.

Here is an example of fuel prices entered into the Costs fields:



13 Data Display Tab (Data Display Controls)

This Left Panel tab allows you to control whether items in major categories are shown on the chart display, and also allows adjusting display sizes for data.



The three main control sections are:

- **Geographical** selections
- **Weather** display features and controls (to access items not found on the main chart's weather toolbar)
- **Track** and chart display items

Geographical

Place a check in the corresponding item to view it on the chart. If you wish to view updated piracy reports, you need to ensure that you have configured PIRACY REPORTS as a data delivery option in the ITEM SELECT option of the DATA REQUEST dialog.

Universal NoGo areas appear on the chart as semi-transparent red polygons

User-defined NoGo areas appear as purple polygons.

ECA Zones are green.

See Section 9.1, Chart Symbols for examples of the polygons mentioned above.

Weather

Each of the three buttons in this section opens a corresponding dialog to display the associated weather item and various display controls for each.

Port Vicinity Forecasts: For more information, see Section 23.2.4, Port Forecasts

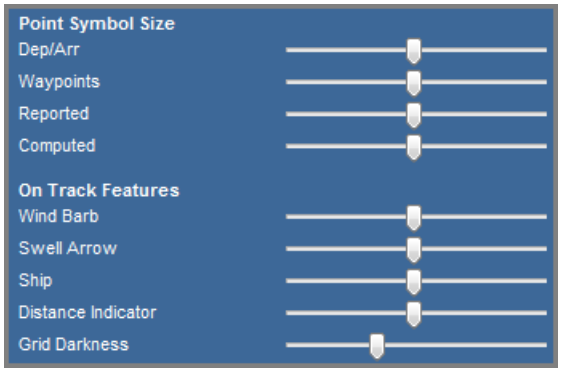
Bulletins: Section 23.2.6, Bulletins

Imagery: For a description of the satellite image, see Section 23.2.5, Satellite Image Display

The Low Track checkbox toggles on and off the display of low-pressure system storm track 'movement arrows'. The accompanying slider adjusts the display length in 6-hour increments.

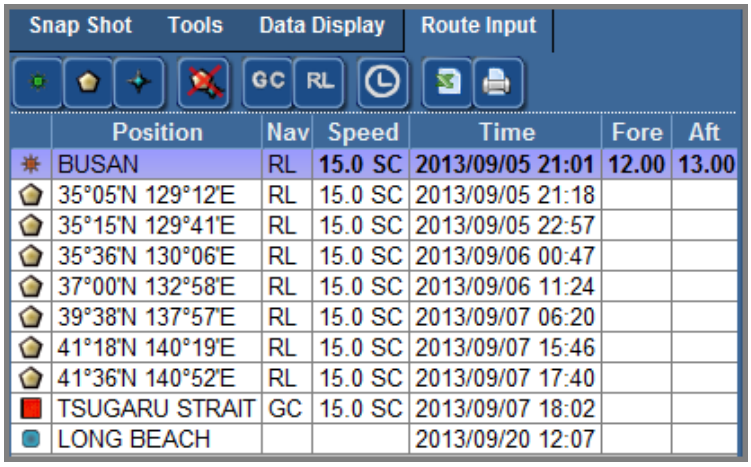
Track

Use each of these sliders to adjust ship symbol, track points & symbols as well as ship distance radii and chart grid lines.



14 Route Input Tab (Track Table)

This tab allows editing of the Track Table. It complements the graphic editing of the track on the BVS chart. An alternative to using the mouse click, drag and edit functions as the primary track creation function, the track table allows you to input details into the table using the keyboard for principal data entry.



	Position	Nav	Speed	Time	Fore	Aft
	BUSAN	RL	15.0 SC	2013/09/05 21:01	12.00	13.00
	35°05'N 129°12'E	RL	15.0 SC	2013/09/05 21:18		
	35°15'N 129°41'E	RL	15.0 SC	2013/09/05 22:57		
	35°36'N 130°06'E	RL	15.0 SC	2013/09/06 00:47		
	37°00'N 132°58'E	RL	15.0 SC	2013/09/06 11:24		
	39°38'N 137°57'E	RL	15.0 SC	2013/09/07 06:20		
	41°18'N 140°19'E	RL	15.0 SC	2013/09/07 15:46		
	41°36'N 140°52'E	RL	15.0 SC	2013/09/07 17:40		
	TSUGARU STRAIT	GC	15.0 SC	2013/09/07 18:02		
	LONG BEACH			2013/09/20 12:07		

The icons found at the top of the input table are:

	Insert VIA: an intermediate port or stopping point.
	Insert Waypoint
	Insert Reported Point: a daily position report should be entered using this icon
	Delete Point: Delete a currently selected waypoint or reported point
	Navigate Great Circle: Navigate great circle from a currently selected point to the next point
	Navigate Rhumb Line: Navigate rhumb line from a currently selected point to the next point
	Optimize Track: optimizes the voyage track using predefined optimization type. Optimization Type can be configured in the TOOLS tab.
	Import CSV File: Import track position information from a .CSV (comma separated values) spreadsheet file
	Print track information, including column headers, to local printer. This opens the Windows print dialog and the appropriate printer can be selected.

14.1 Track Table and Table Editing

Waypoint data can be edited numerically in this table. There are five columns as described below. Each individual field (or cell) in the columns of the track input table can be modified.

14.1.1 Table Columns

The columns provide the following types of information:

Waypoint type

sunburst is the departure/starting point

red square – via point

pentagon – waypoint

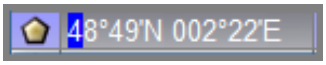
blue star – reported point

blue rounded square – arrival/ end point

Position

Navigational position in either Lat/Long form or named location (NavPoint).

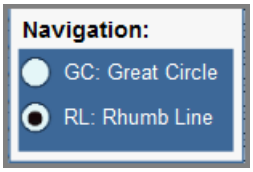
Click on the first character in the position field and begin typing:



Example: The "4" is highlighted an available for editing. The cursor will move along to the next character as you type. Use the Space Bar to pass over the degrees and minutes symbols.
Although numerical positions are always translated into degrees/minutes, they can also be input degrees/decimal degrees:
Example:
48 49 N 002 22 W = 48°49' N 002°22'W
48.82 N 002.36 W = 48°49' N 002°22'W
Spaces were used in the first example: **48**(space) **49**(space) **N**, etc. when entered into the position field.

To enter NavPoint, left-click once in the field. The NavPoint dialog will appear. Its use is the same as described in Section 7.2, Waypoint on the Voyage Track.

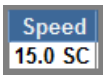
Nav



Rhumb line (RL) or great circle (GC).

To set the value, click on this field and choose GC or RL from the popup window. To close the pop-up, click on tab outside the table.

Speed



Calm sea speed, entered in knots, with an option to enter alternative speed and power settings.

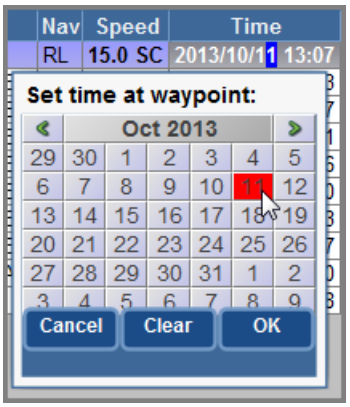
To set the value, click on the first digit and enter the desired Calm Sea Speed, or use the pop-up dialog to select corresponding performance option. Its use is the same as described in Section 7.2, Waypoint on the Voyage Track.

Time

The order of input is: year, month, day, hour.

To set the date, click one of the characters in the date field, then select the specific date from the calendar and click OK.

To set time. click on the portion of the Time field you wish to change and modify the text. Hit the enter key when you are finished.



Example: The “1” is highlighted an available for editing, or you can select the date in the calendar and edit time. The cursor will move along to the next character as you type. The slash and colon are ignored/bypassed.

NOTE: If a fixed time is entered at any of the waypoints, BonVoyage will generate an appropriate performance value from the previous waypoint to ensure the required arrival time can be appropriately met. The time field becomes **BOLD**. Future waypoints will also be set with the same speed as the previous point. They can be easily edited, as required.

15 Introduction to the Bottom Panel

The Bottom Panel (also known as the Horizontal Panel) contains tables and graphic displays, providing several tools for review of sailing options and overall route performance.

The Bottom Panel has these three main tabs:

- **Track List** – displays all open tracks. The selected track is highlighted in purple in the table. The selected voyage track is also identified on the chart with a bolder line and a red vessel icon.
- **Voyage Details** - shows vessel speed down effects of weather and current, as well as various performance and encountering weather details for computed points along the voyage track.
- **Graph** – shows similar details in line graph format.

16 Track List Tab

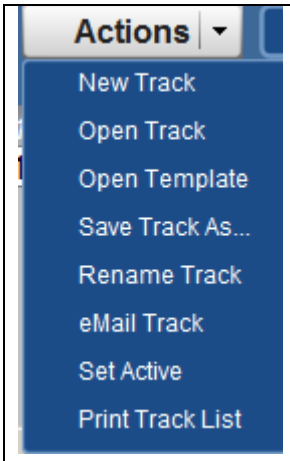
This tab is accessed to review and compare multiple sailing options, along with ETA, total distance and time, calculated fuel consumption and weather speed down information, etc.

It also provides several track control and editing features, which are explained in section 16.1 below.

16.1 Buttons

Actions Button

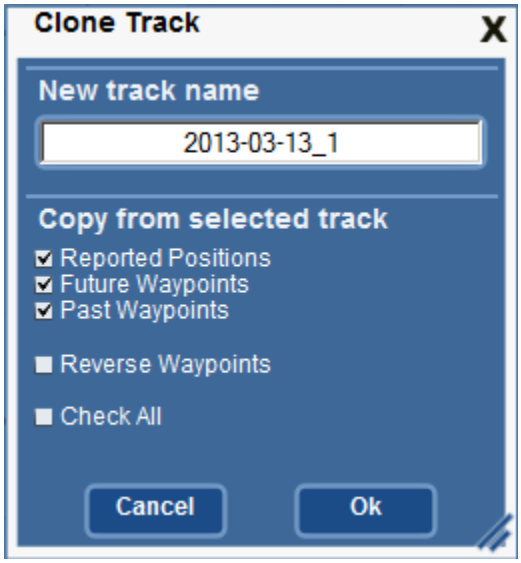
The Actions pull down menu has a list of track options as shown here:



New Track	Creates a new voyage track in the center of the BVS chart
Open Track	Opens Windows browser with the option to select and open a previously saved voyage track from the BVS track folder. Default location is: C:\BVS7\data\track.
Open Template	Opens Windows browser with the option to select and open a previously saved track template from the template folder. Default location is: C:\BVS7\data\template.
Save Track As	Opens Windows browser with the option to save the selected voyage track with a new name to the track folder. Default location: C:\BVS7\data\track.
Rename Track	Opens a pop-up box, allowing you to rename the currently selected track. Modify the name and click **OK**. Otherwise, click cancel to keep the original track name.
Email Track	This feature allows you to email the currently selected voyage track to BVStrack@awtworldwide.com or to the email recipient of your choice.
Set active track	Set the selected (or highlighted) track as Active
Print the track list	Print the track list, including column headers, to local printer. This opens the Windows print dialog and the appropriate printer can be selected.

Clone Button

This button is used to clone a selected track. BVS performs the operations you check.



Save Button

Saves to a file the track that is currently selected in the track table.

Close Button

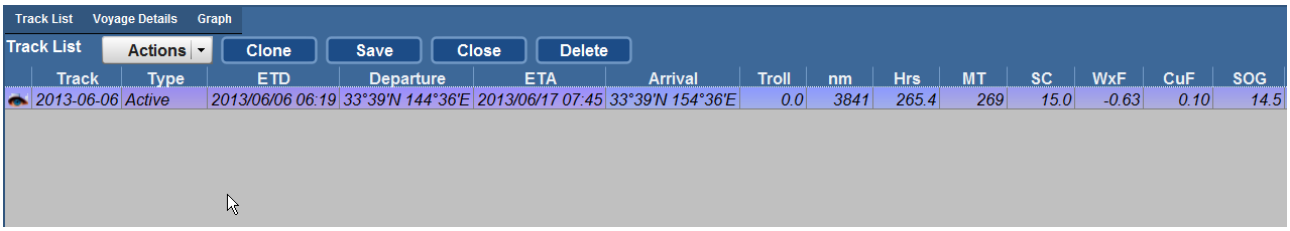
Closes the track that was currently selected on the chart (and is selected in the track table) and removes it from the table. You can load a track using the File menu Open sub item.

Delete Button

Deletes the currently selected track.

16.2 Track List Table

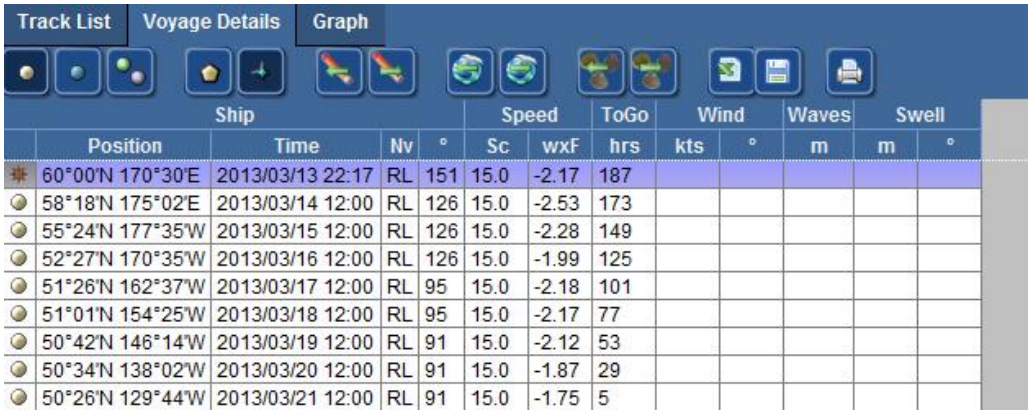
The track list is shown below.



Headings above columns show their meaning, and the column contents for each row show the value for that track. Each heading has a pop-up description that appears when you place the cursor over it. You can show or hide each track by clicking in its leftmost column.

17 Voyage Details Tab

This tab provides detailed information about vessel operating conditions at various intervals along the selected track. The function of each icon is described in the tooltip that appears when you hover the cursor over the specific icon. These controls are used to display or suppress additional information in the table and to export or print the table data.



	Ship				Speed		ToGo	Wind		Waves	Swell	
	Position	Time	Nv	°	Sc	wxF	hrs	kts	°	m	m	°
	60°00'N 170°30'E	2013/03/13 22:17	RL	151	15.0	-2.17	187					
	58°18'N 175°02'E	2013/03/14 12:00	RL	126	15.0	-2.53	173					
	55°24'N 177°35'W	2013/03/15 12:00	RL	126	15.0	-2.28	149					
	52°27'N 170°35'W	2013/03/16 12:00	RL	126	15.0	-1.99	125					
	51°26'N 162°37'W	2013/03/17 12:00	RL	95	15.0	-2.18	101					
	51°01'N 154°25'W	2013/03/18 12:00	RL	95	15.0	-2.17	77					
	50°42'N 146°14'W	2013/03/19 12:00	RL	91	15.0	-2.12	53					
	50°34'N 138°02'W	2013/03/20 12:00	RL	91	15.0	-1.87	29					
	50°26'N 129°44'W	2013/03/21 12:00	RL	91	15.0	-1.75	5					

The display control items found on the Voyage Details icon bar are:

Show/Hide the **12Z** Computed Points

Show/Hide the **00Z** Computed Points

Show/Hide the **06Z** and **18Z** Computed Points

Show/Hide Waypoints

Show/Hide Reported Positions

Less Vessel Details

More Vessel Details

Less Weather Details

More Weather Details

Less Propeller/Engine Details

More Propeller/Engine Details

Copy as CSV

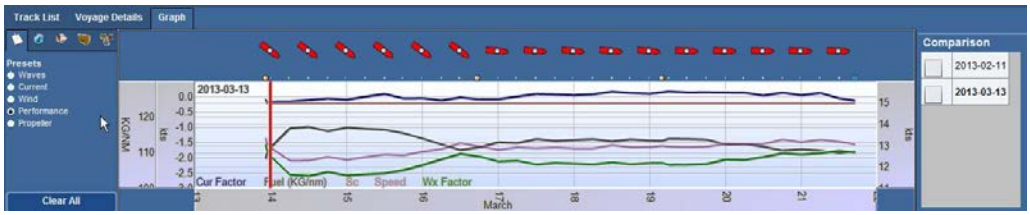
Save as CSV

Print

18 Graph Tab

This tab provides a graphical representation of data at computed points along the specified track(s). The three areas in the tab, from left to right, are:

- Item selection
- graphical data display area
- track selection controls, for data comparison



18.1 Graph Tab Left Panel Display Settings

The five tabs at the left provide access to specific data groups to assist the user in defining each display item. The icon symbols and the tool tips that appear when hovering over each icon provide helpful descriptions.

18.1.1 Presets

The first tab contains preset groups of data for display on the graph. The additional tabs contain items which are more specific to their categories:

Wave, Wind/Current, Engine Performance & Propeller/Hull:

18.1.2 View Waves

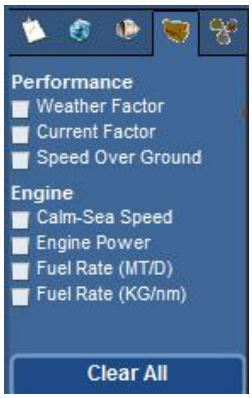
The second tab allows you to select waves, swell, or sea height or period. When an item is toggled ON, it will appear as a graph line.

18.1.3 View Wind/Current

The third tab allows you to select current and/or wind speed.

18.1.4 View Performance/Engine

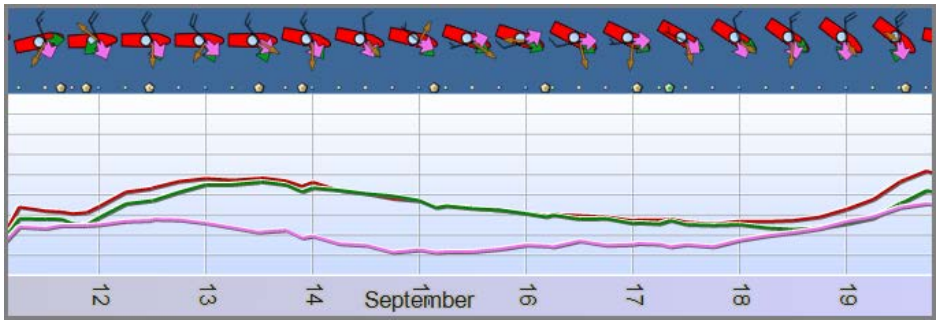
The fourth tab allows you to control display of performance and engine data along the graph.



18.1.5 View Propeller/Hull

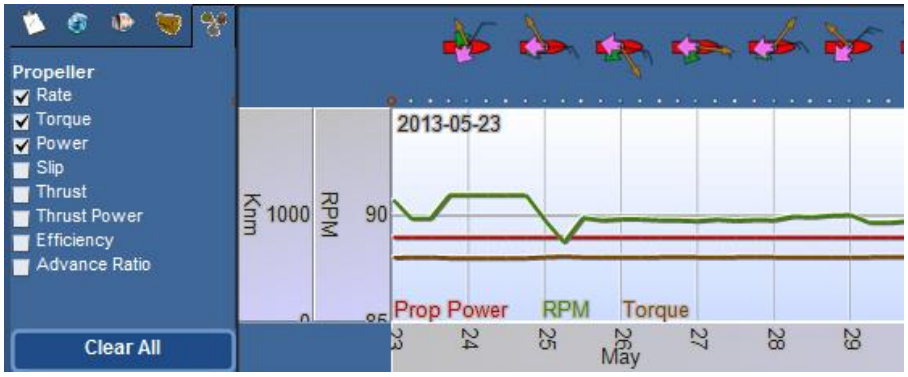
The final tab controls the propeller data display.

In addition to the graph lines, further information is given in the upper panel area. The ship icon depicts vessel heading. Directional wind, wave, swell and surface current vectors are shown at each computed point as well. See above section 11, Snapshot Tab (Resonance Settings and Graph), as well as section 29.2 below for additional information.



18.2 Line Graph Display Area

This illustration shows a typical sample display.



The line graph shows corresponding data for the selected track(s).

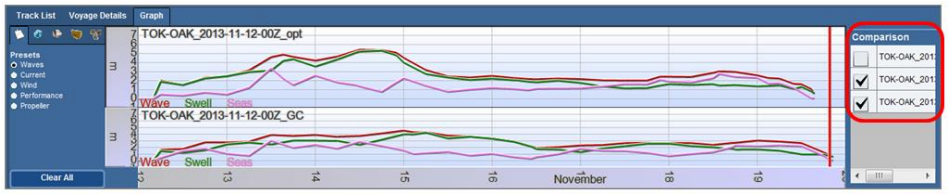
The Graph snapshot area above the table provides a graphic display of the Wind, Waves, Surface Currents and Swell at computed points along the track—the default is 00Z and 12Z. With the exception of Wind, the direction of each weather parameter is displayed "outward" from the center of the ship symbol.

The following table lists the symbols shown in the graph:

Data	Symbol
Vessel Heading	**Red** ship icon
Wind	**Black** prong
Wave	**Pink** Arrow
Current	**Brown** arrow
Swell	**Green** Arrow

18.3 Track Comparison Controls

To the far right is the track comparison control section, which shows the names of all loaded tracks. Selected tracks will appear 'stacked' in the graph panel for track comparison purposes. Vessel icons above the graph appear only when one track is selected—they are suppressed when more than one track is viewed.



19 Introduction to Voyage Tracks in BVS

Track Terminology

A ***route*** is the pathway from a geographical starting point to an end point.

A ***track*** is a collection of waypoints for a route, along with a time reference (ie: a specific date and time of departure assigned to the starting point). Between the start point and end point, there can be various intermediate points. You set the departure and arrival point, along with desired intermediate waypoints. Alternatively, after setting the departure and arrival points, you can have BVS optimize the track and it will choose intermediate waypoints based on the most favorable weather conditions and best ETA, or least fuel cost or fuel consumption, based on user defined sailing requirements. BVS will also display 6-hourly computed points along your track with corresponding weather conditions which are forecast.

Weather conditions at each waypoint are displayed along the track, in the voyage details panel, and at the top of the chart in the weather bar when the user clicks on the TIME STEP buttons (in the upper right of the chart).

BVS users can manipulate tracks either using the mouse, or by entering precise numeric data into the Track Table. Track images can be printed, and track data also can be printed out in table form.

BVS has specific names for each track type. The following key terms are used throughout this manual:

- Active Track
- Alternate Track
- Optimized Track
- Template, or Track Template

An ***Active Track*** is the track that is currently assigned with the “active track” status in the BVS program. You make a track the Active Track by right-clicking on it and selecting "Make Track Active" from the pop-up menu. (See: Setting the Active Track.) BVS assumes that the ‘active track’ is the master’s intended sailing track.

Default Location: C:\BVS7\data\track\

File Suffix Name: *.bvs

An ***alternate track*** is any track that is not the Active track. You can have any number of alternative tracks.

Default Location: C:\BVS7\data\track

File Suffix Name: *.bvs

An ***optimized track*** is an alternative sailing option, created by BVS. This occurs when the user selects a specific track, then clicks the “Optimize Track” option. A new track is created, with the original begin and end points, but with new navigation points between the ‘optimization begin and end point’ to assist in earliest arrival or with least fuel cost or least fuel consumption, depending on the user’s arrival requirements.

Default Location: C:\BVS7\data\track

File Names:

When optimized for time: *opt.bvs

When optimized for fuel: *opf.bvs

When optimized for fuel with a fixed arrival time: *opa.bvs

A ***track template*** contains departure, arrival and other saved waypoints along the voyage track but does not yet contain details regarding ETD, Sailing Speed or required Arrival Time.

Default Location: C:\BVS7\data\ template

Templates are saved as *.XML files

The ***track template*** simplifies the creation of a track for voyages along a trade route or for similar runs which have common sailing points. After you have created a track template, it can be easily accessed to assist in the creation of a similar track.

To generate a track file from a template, open the appropriate template, enter the departure time and speed, and then save the track, It will now be stored in the following (default) folder: C:\BVS7\data\track\. Thereafter, you may optimize and adjust the track points as needed, after reviewing up-to-date forecast information.

19.1 Track Displays

19.1.1 Waypoints and Computed Points

In BVS, a route is displayed as a series of user-defined waypoints. The route also includes computed points which are displayed at 6-hour intervals. This information can be viewed as either:

1) A track line plotted on the BVS chart, or
2) As numeric position data / text format in a table within the Route Input tab (Left Panel, for track editing) or in the Voyage Details tab (Bottom Panel, for display of vessel performance).

Each position type has its own corresponding symbol. Along with the position icons, additional information is shown at the computed track points using various symbols.

19.1.2 Track Point Symbols

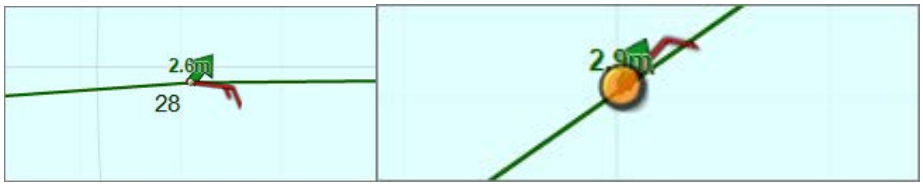
The following symbols indicate the various position types on a BVS track:

Symbol	Description	Symbol	Description
	Departure Point		Nav Point (designated straits and passages)
	Arrival Point		Reported Point
	Waypoint (Rhumbline)		00Z Computed Point
	Waypoint (Great Circle)		06Z Computed Point
	Via Arrival Point		12Z Computed Point
	Via Departure Point		18Z Computed Point

19.1.3 Track Weather and Alarms

Certain weather symbols and alarms appear on the track. Alarms appear when a condition exceeds a predefined threshold for each specific computed point.

Here are examples of a tracks with weather and alarm symbols being displayed:

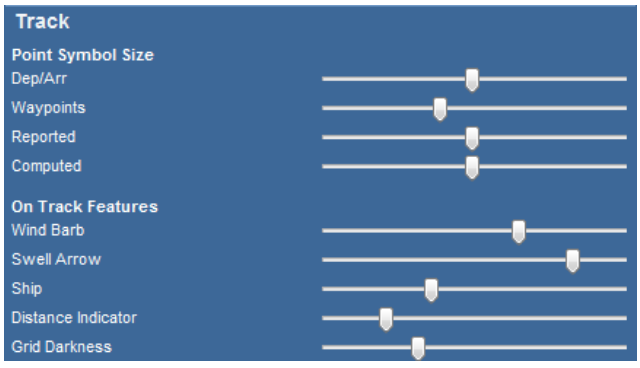


You can set alarm condition parameters at any time using the Left Panel's Tools tab, by clicking the Thresholds/Constraints button there and using the dialog that appears. See: Chapter 12, Tools Tab (Thresholds, Constraints, Optimization).

Symbol	Description	Symbol	Description
	Standard wind barb		Resonance Alarm: Synchronous Roll Risk
	Wind Barb Alert: Wind speed has surpassed user-defined limit		Resonance Alarm: Parametric Roll Risk
	Standard swell arrow		Resonance Alarm: Risk of High Wave Groups
	Swell Alert: Swell height has surpassed user-defined limit		Resonance Alarm: Surf Riding/ Broaching Risk
	Wave Alert: Wave height has surpassed user-defined limit		Multiple Alarms at specific point—right-click to view details

19.2 Controlling the Track Display Characteristics

Display characteristics, such as symbol sizes, can be modified using the track controls in the Left Panel's **Data Display** tab. Each slider controls the size or visibility of the track or chart characteristic:



20 Track Creation and Editing

This section explains common track functions.

20.1 Basic Track Operations

20.1.1 Creating a Track

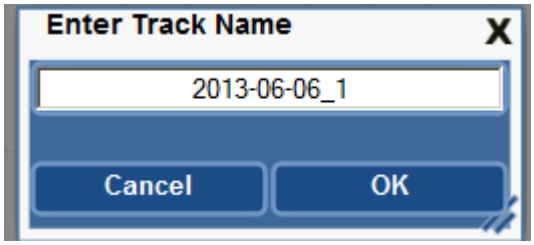
There are several ways to create a track.

1) Using the BVS menu

a. First, set the chart display to the required ocean region.

b. From the Menu bar, select **File | New**.

c. This dialog appears:



The default track name is today's date. Type desired name for the track and click OK. Be sure to enter SC (calm sea speed), ETD and Draft details in the departure point that has been created on the chart. BVS also creates an arrival waypoint. The departure point is identified with an orange starburst. The arrival point is a blue square.

The departure and arrival points can be edited in one of two ways:

i. **On-Chart:** Drag each point to the desired position or right-click on the route point and manually edit the LAT/LONG or port name and other details in the popup menu as necessary.

ii. **Track Input Table:** Open the Left Panel's Route Input tab. Edit the departure and arrival position details. Click the **Insert Waypoint** icon to add additional waypoints as necessary. Waypoints can be easily transferred to BVS while reviewing a sailing plan or spreadsheet, etc. using the route input table. See Chapter 14, Route Input Tab (Track Table).

2) Create on chart

a. Set the chart display to the required region.

b. Right-click the chart and select New Track. The Enter Track Name dialog appears. Type in the desired name and click OK.

c. To add new waypoints, right-click on chart and select the option **Insert Waypoint**.

20.1.2 Deleting a Track

There are several ways to delete a track

1) From the chart.

Right-click one of the track waypoints or on the vessel icon, and select Delete Track. This removes the track from the program view and deletes it from the hard drive.

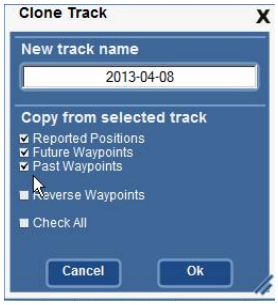
2) From the Bottom Panel.

To do this, open the Bottom Panel and select the **Track List** Tab. Click on the track in the table then click the Delete button, or right-click on the track's specific row in the Track List table and then select "Delete" from the pop-up menu.

20.1.3 Cloning (Copying) a Track

Creating a cloned track generates a second track with similar characteristics to the original.

1) From the chart. Right-click a track waypoint or on the vessel icon, and select **Clone Track**. This open the Clone Track Dialog:



2) Enter data as required and select checkboxes as needed, then click Ok. This creates a copy of the track from the chart and adds a new row in the track table with the associated information for the cloned track.

Save the new cloned track by selecting from the BVS menu **File | Save As | Track**, then by selecting a name for the track file. Note that if you close BVS before saving this or any other modified or newly created track, you will be prompted by the program to save the file before program shutdown is complete. There are two "save" options: Save as "track"; or save as "track template".

Note: If you desire to convert your previous track into a 'return voyage', click the **Reverse Waypoints** box, then click **OK** and a copy of the route will be created with waypoints in the opposite sequence of the original route.

20.1.4 Comparing Multiple Tracks

BVS provides a tool, the Track List in the Bottom Panel, that allows you to view and compare each of the tracks that are displayed on the chart. Among other things, this feature allows you to evaluate and compare:

- Estimated Arrival Time
- Total Distance and Voyage Time
- Total Fuel Consumption, and HS / LSFO (High Sulphur & Low Sulphur Fuel Oils)
- Average Speed

- Average weather and current factors

20.1.5 Setting the Active Track

The "Active Track" is a track designation which you can assign that allows you to specify your intended voyage. Assigning an active track is helpful when creating several alternative sailing options, as it assists the user in identifying the intended or planned sailing route.

To assign a track as 'Active': on the chart, right-click one of the waypoints of the desired track then select "Make Track Active" from the pop-up menu.

20.1.6 Setting Thresholds for Track Alarms

See Section 19.1.3, Track Weather and Alarms for instructions.

20.1.7 Loading and Saving Track Files

File name and location: The name extension of each BVS 7.0 track file is ".BVS" . The default location of the saved file is:

C:\BVS7\data\track\

File formats: The file contents are written in XML format and can be read with a web browser or notepad.

Note: for BVS versions 5.6 and earlier, the Track File name extension is (*.xml).

***Open Track*:** If you have closed a route file which has been saved previously and you wish to display it once again on the BVS chart, you can simply click the BVS menu option **File | Open | Track**, and select the desired file.

In this same menu, BVS also displays a list of recently opened tracks for you to select from.

"Save Track": The "Save" or "Save Track" option immediately saves the selected track to the hard drive as a "voyage track".

To save a voyage track, click the BVS menu option: **File | Save**, or right click the corresponding track and click **Save Track**.

This stores the track file with details which include "departure & arrival" date/time, "reported point" date/time/position/speed , etc. The default location of a saved file: C:\BVS7\data\track\

***"Save As" Options*:** The "Save As" function provides two options for saving the selected track file. This feature is accessed by selecting **File | Save As** from the BVS **File** menu. Two options appear:

***Save As Track*:** see previous "Save Track" paragraph, above, for a description.

***Save As Template*:** A Track template is useful for ships that frequently sail similar voyages. This process creates a file in which the template maintains the departure and arrival point as well as track waypoints for future use. When a track template is opened, the current date and time is displayed as the ETD in the departure point. Any previous reported points will have been removed.

20.1.8 Printing the Track Table

You can print a copy of the track table using the Left Panel, Route Input tab. Clicking the rightmost icon (a printer symbol) prints the table on your default Windows printer.

20.2 Templates

20.2.1 Using Templates

As stated earlier, a track template simplifies the creation of your voyage track when the vessel frequently sails along a trade route or for similar runs which have common sailing points. After you have created a track template, it can be easily accessed to assist in the creation of a 'standard' sailing track.

20.2.2 Loading and Saving Template Files

A Track template is useful for ships that frequently sail the same routes. This process creates a file in which the template maintains the departure and arrival point as well as track waypoints for future use. When a track template is opened, the current date and time is displayed as the ETD in the departure point. Any previous reported points will have been removed.

File names and locations: The name extension of a BVS 7.0 track template file is .XML and the default location of the saved file is:

C:\BVS7\data\template\

File formats: The file contents for ".XML" template files are written in standard XML format and can be viewed by opening the file in a web browser or in Windows Notepad or any other text editor.

***Open Template*:** To open a track template, you can simply click the BVS menu option **File | Open | Template**, and select the desired file.

If you have closed a route file which has been saved previously and you wish to display it once again on the BVS chart, you can simply click **File | Open Track**, and select the desired file.

***Save As Track*:** After making appropriate modifications to the template, adjusting the departure time, modifying waypoints, etc., you'll want to save this working file as a Track. To save a voyage track, click the BVS menu option: **File | Save**, or right click the track and click **Save Track**.

Note that your original template will still be available in its original state, in the template folder on your hard drive.

***Save As Template*:** Again, this option will save only the basic track information: Departure and Arrival locations & the intermediate waypoints.

Make sure you save the template to the correct directory. The default location is: C:\BVS7\data\template\

This procedure helps you keep your templates organized separately from your standard voyage tracks.

20.3 Track Editing

There are various options for performing track editing options:

- on the Chart, using right mouse clicks and the corresponding menus.
- in the Track Input Table, adding/removing points and modifying details for each.

20.3.1 Track Editing on the Chart

Complete instructions are given in the right-click menu functions in Section 7.2, Waypoint on the Voyage Track. This section 20 summarizes those functions.

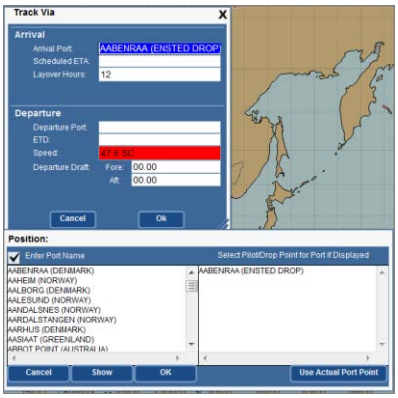
20.3.1.1 Adding VIA Points

A via point is a mid-voyage stop at a user-defined position or at a port along your route track. Example, you might be sailing from Tokyo to Long Beach with a mid-voyage stop in Hawaii. Hawaii would be a VIA point in your voyage track.

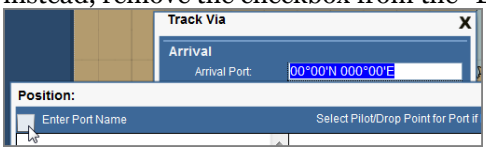
To enter a VIA, please do the following:

From the Chart:

1. Right-click the chart and select, **Insert Via**. The following dialog appears:



2. The Port Selection dialog appears, but if you wish to input lat/long coordinates instead, remove the checkbox from the "Enter Port Name" field:



3. Type in the position details in the Arrival fields.
4. Type the layover hours.
5. Type Departure Port information, ETD date and time and draft information.
6. Click OK to save the information and close the dialog.

20.3.1.2 Adding Waypoints

Select a specific voyage track.

Add a waypoint by right-clicking on a specific area of the chart and selecting **Insert Waypoint**. A waypoint is inserted at the mouse cursor position.

Keyboard Shortcut Option: After clicking on the chart, you can also press the **Insert** key on the keyboard and a waypoint will be inserted at the current location of the mouse cursor.

20.3.1.3 Deleting Waypoints

Delete a waypoint by right-clicking on that specific point and selecting **Delete Point** from the pop-up menu.

Keyboard Shortcut Option: After clicking on the chart, you can also press the **Delete** key while hovering over a specific waypoint and that waypoint will be deleted from the selected voyage track.

20.3.1.4 Editing Waypoints

To edit directly on the chart, right-click the desired way point and:

1) Edit the LAT/LONG information in the Position field
2) If a fixed arrival time is required for a specific point, enter Date and Time (a 'fixed time') in the Time field.
3) Enter the calm sea speed in the Speed field.

You can click on the first digit and enter the desired Calm Sea Speed or another value with its corresponding performance option (RPM, KW, etc.).

EXAMPLE: Click on the checkbox of the desired 'constant' and that selected speed or 'constant' regulation will be maintained throughout the remainder of the voyage track.

If the initial entry speed is modified, future waypoints will maintain that same constant. The popup box will close if one of the other four fields (Position, Nav, Date, and Time) is selected. Otherwise, click **OK** to close.

4) The navigation type is a menu selection that is found above the position field, and can be toggled between Great Circle or Rhumb line. The menu shows the option to 'change' current navigation type. For example, if your current waypoint is set to 'Great Circle', you will see the menu option to 'Navigate Rhumb Line'.

Keyboard Shortcuts: Alternately, on the chart, while hovering the cursor over the desired waypoint, hit the "G" key to change the waypoint to a Great Circle or the "R" key to modify the waypoint to a Rhumb line.

Inserting a Waypoint: To add a New Waypoint, right click the chart and select **Insert Waypoint**. As an alternative, after clicking on the chart, you may press the **Insert** key and a waypoint will be placed at the current mouse cursor location.

Inserting a Reported Point: To add a Reported Waypoint (noon position), right-click the chart and select **Insert Reported Point.** In put position and time information and click OK.

Inserting a VIA: Please refer to section 20.3.1.1, above

20.3.2 Editing with the Track Input Table

You can edit waypoints using data entered in the Track Input Table.

For instructions, see Left Panel Route Input tab description in Section 14, Route Input Tab (Track Table).

20.3.3 Printing and Exporting Main Track Details

See Bottom Panel description, Chapter 17, Voyage Details Tab

20.3.4 Track Optimization

See Chapter 28.1, Creating an Optimized Track.

20.4 Sending Tracks

AWT provides an additional vessel Routing and Monitoring Services. It may be necessary therefore to send in your active voyage track to AWT.

BVS provides an automated feature that reminds you to send tracks. To access this:

1. Select Setup Menu | Data Communications.
2. BVS opens a dialog showing a Track Send Reminder setting. You can choose from values of: None, 1 day, 2 days, or 3 days. When this option is activated, a reminder message pops up on-screen asking you to send your track.

You can easily email the currently selected voyage track on the chart to the BVS automated Server at: BVStrack@awtworldwide.com

To do this:

1. Open the Bottom Panel Track List tab.

2. Make the track you wish to send, the active track. Also make sure the track has been saved.

3. From the **Actions** dropdown list, select 'Email Track'.

4a. If your Data/Communications email option is set to MAPI, you will see a new email message appear, with the specified voyage track file attached.

4b. If your Data/Communications email option is set to MANUAL, you must manually attach the .BVS track file to the email. The system will show you an email dialogue. Follow its instructions to create an email and paste the required attachment to the email message.

Note: If you are using a non-Microsoft 3rd party email program, you may have to manually attach the track file to your email message. Usually this involves browsing to the file location—the default directory for your track files: C:\BVS7\data\track .

20.5 AWT Data Reporting System for Track Reporting

If you are receiving Routing or Monitoring services, additional ship information may be required to be submitted. AWT's Data Reporting System (DRS2) provides an interface to easily submit the required report details. DRS allows you to submit to the following reports: COSP- Commencement of Sea Passage; DAILY-Daily position reports; EOSP- End of Sea Passage, ROUTE REQUEST- a form to request routing assistance, etc.

1. To use this feature, on the Menu bar select **Data | AWT Data Reporting System**.
2. Enter the required details and click **Submit/Send Report**. DRS will send the specially-formatted report to awtdrs@awtworldwide.com , and to any other addresses you have configured for delivery in the **Data Reporting System**.
3. Refer to the AWT Data Reporting System Quick Reference Guide for more details. The QRG can be accessed by clicking the HELP menu and clicking on the appropriate "View Help" button.

20.5.1 BVS Position Updates from DRS

The new DRS2 program is being distributed in two forms:

1) The EXE version, available on the BVS Install CD as an additional installation.

2) As an HTML (Web Form) version, provided by email from AWT.

If the EXE version of DRS2 (item #1 above) is being used to send a Daily Position Report, BVS will automatically have the position details be inserted into the active BVS track as a 'reported point'.

20.6 Receiving Sailing Recommendations from AWT

AWT's *Full Weather Routing Service* includes the sending of an AWT route recommendations to subscribers. A recommendation is delivered by email in the form of a BVS track file which can be imported and viewed directly in BVS 7, along with a text description of the recommendation and forecast conditions along the recommended track.

When you receive an email with an attached track file, you can load it into BVS 7 by double-clicking the .BVS file.

21 Frequently Asked Questions

What are the symbols that appear along a track?

Standard BVS 7 track symbols appear at the 6-hour computed points along the track. Weather symbols encountered at each DR point are described in section 19.1.3. Additionally, weather alerts and resonance alarms are further described in the same section.

If multiple alarms exist at a computed point, an orange disk will be displayed. To view a description of the various alerts at one of these specific positions, right-click the alert disk, and then hover over one of the corresponding alarms at the top of the popup menu. A tool tip will appear describing the alarm.

How Can I Restore Track Data on a BVS Computer if the Primary BVS Storage Folder Fails?

In some instances, you or your vessel IT personnel might decide to set up BVS in a Network environment. This gives all Network users access to the weather and track data.

BVS normally stores tracks and templates in these default directories:

Voyage Tracks: C:\BVS7\data\track

Track Templates: C:\BVS7\data\template

If you have a separate server computer on your vessel, you may set BVS to operate with data stored there.

For example, if your Server name is VESSELSERVER and you have mapped DRIVE N: to access shared data, you might choose to set BVS to store data on the network at:

For Voyage Tracks:

\\VESSELSERVER\BVS7\data\track\ or

N:\BVS7\data\track\

For Track Templates

\\VESSELSERVER\BVS7\data\template\ or

N:\BVS7\data\template\

If there are concerns over accessibility to this data, it is recommended that you back up the BVS7\data\ folder contents to an alternate location so that if problems arise with accessing data in the original location, you will be able to retrieve a copy of these files.

22 Introduction to Weather Data in BVS

A key benefit of BVS is the ability to display various weather parameters on the chart or along a voyage track in a manner that is easy to interpret. The user's ability to easily access this information makes it possible for crucial decisions to be made regarding vessel safety and fuel efficiency.

22.1 Frequently Asked Questions: Weather Data

When are Weather Data forecasts available?

For the greatest benefit while underway, we recommend that you download weather at least once per day. The BVS general forecast includes all forecast products, and is updated four times per day. For broadband users, the data is automatically downloaded as soon as it is available. (You must still manually command its use by BVS.) For email users, the data is emailed as soon as available, but you must detect that the email has arrived, and then you must manually command BVS to unpack it, load it, and apply it to the active track.

The general forecast is available approximately as follows:

00:00Z forecast model at 09:00Z

06:00Z forecast model at 15:00Z

12:00Z forecast model at 21:00Z

18:00Z forecast model at 03:00Z (following day)

Note: The most up-to-date tropical data will be sent together with your main forecast delivery. If additional tropical emails are requested, they will be sent to you immediately after becoming available on our BVS Server.

Tropical data is available as follows:

00:00Z forecast at 04:00Z

06:00Z forecast at 10:00Z

12:00Z forecast at 16:00Z

18:00Z forecast at 22:00Z

What is the weather data resolution provided?

See the Reference Information in section 26.3 for a detailed description.

How do I change weather parameters?

For Broadband and for scheduled (periodic) email data requests, in the Data menu, select "Weather Data Delivery Configuration" (see section 24). Adjust the forecast region and data parameters as needed, then click Finish.

For one-time email request, select from the Data menu, "One-Time Email Delivery of Weather Data" (see section 25.1.1). Adjust the forecast region and data parameters as needed, then click Finish.

How often should I request weather data?

Applied Weather Technology recommends downloading weather data at least once every 24 hours. Weather patterns can change rapidly so it is imperative to keep abreast of conditions by downloading frequently. If you need more frequent updated, please note that the main forecast model data is updated 4 times per day.

When should I download weather data?

The forecast model run and data preparation time is approximately 9 hours. Applied Weather Technology makes the model data available at these times.

Data for **00:00 Z Model** becomes available at **09:00** GMT

Data for **06: 00 Z Model** becomes available at **15:00** GMT

Data for **12: 00 Z Model** becomes available at **21:00** GMT

Data for **18: 00 Z Model** becomes available at **03:00** GMT (following day).

To receive the most current data, request a delivery time shortly after one of the four availability times above.

What is Applied Weather's WAVEWATCH III model?

WAVEWATCH III™ improves forecast data. WAVEWATCH III™ is the most state-of-the-art wave modeling framework available—developed at NOAA/NCEP and adapted at AWT to provide the most accurate wind, wave and swell wave data possible.

BVS forecast improvements can be seen near tropical storms, along coastlines, and all throughout your transoceanic passage.

What is understood by Significant Wave In a forecast?

Significant wave height is the average height of the highest 1/3 of the waves. Individual waves may be up to twice that of the significant wave height.

23 Weather Data Display and Controls

Weather and hazard information is provided in many formats within BVS: Graphically on the chart, in text format in the weather bar and route details tables, as symbols along the voyage track, and in line graph format within the graph panel.

The display of specific weather parameters is controlled in two areas:

- The Weather Bar, at the top of the chart
- Within the Left Panel's Data Display tab.

Note: for a specific item to be available for display, you must ensure to include that item in your weather data request configuration. Example: If you do not 'request' rogue wave' data to be delivered, this item will not be available for display on the BVS chart.

23.1 Weather Display and Controls

23.1.1 Weather Bar Description

The Weather Data Bar is near the top of the chart window:

The bar shows all weather data products horizontally, and has two items for each product.

The top item is the product name, and this area is clickable to turn the chart display of that item on or off. In the picture above, Pressure display is turned on and is green to show this state; pressure will be shown graphically on the chart. When the control is turned off, the bar background is blue and the chart does not show this product.

The bottom item always displays the data value for the ocean position corresponding to the current cursor location on the chart. This can be either the vessel position or wherever the cursor is hovering. In the picture, Pressure data value of 1015mb is shown for the ocean position at the current cursor location.

The values shown on the Weather Bar in each weather parameter change from black to red:

Black: Data corresponds to mouse movement on the chart:

Red: Data corresponds to DR position along the selected voyage track by clicking Display (Time) Step button.

The following AWT weather products are on the weather bar:

Weather Product	Description
Pressure	Atmospheric pressure at sea level, in units of millibars. Surface Pressure Contour Display. Fronts are also shown. The center of each Surface Pressure system is labeled as follows: H- High L- Low S- Storm G- Gale
500mb	500 mbar geopotential height contours Useful in understanding the upper level steering flow of surface systems
Wind	Wind speed in knots Displays wind barbs
SigWv	Significant wave height in meters Displays graphically on chart and numerically in the weather bar
Seas	Direction, height, and period of seas Displays graphically on chart and numerically in the weather bar.
Swell	Swell direction, height, and period Displays graphically on chart and numerically in the weather bar.
Current	HYCOM surface current direction; speed in knots Shown as filled contours & directional arrows on chart; numerically in the weather bar
SST	Sea surface temperature, in degrees C Shown as filled contours on chart and numerically in the weather bar
Vis	Visibility Displays visibility as filled contours at the distances of > 7 miles down to ½ mile or less. See description below this table
Vsl Icing	Vessel icing Displays filled contours for light, moderate and heavy structural icing. See description below this table
Precip	Weather type, shown as a specific weather symbol for corresponding area on the chart Includes precipitation, freezing rain, t-storms, etc. See description below this table
Clouds	Cloud forecast—the measure of the mass of water, at higher densities, in a cloud. A five-day forecast displays forecast cloud movement within your designated weather region.

Weather Product	Description
Air Temp	Air temperature at sea level, in degrees C Air temperature is shown as filled contours.
Humidity	The percentage of relative humidity is shown as filled contours
Rogue W	Rogue wave likelihood. Rogue waves, or abnormal/freak waves are those whose height is more than twice the significant wave height, usually caused by high winds and opposing strong currents. Shown as red polygons—darker polygons indicate high likelihood, whereas lighter red polygons display areas of low likelihood

The interpretation of Visibility, Vessel (structural) Icing, and Weather Type

Visibility, generated by the Marine Modeling and Analysis Branch at NCEP, is displayed as follows:

 Clear

 7-Mile

 3-Mile

 ½ Mile

Vessel Icing, generated by the Marine Modeling and Analysis Branch at NCEP, is displayed as follows:

 None

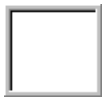
 Light = less than 0.8 inches per 3 hours

 Moderate = less than 2.4 inches per 3 hours

 Heavy = greater than 2.4 inches per 3 hours

The major parameters used in the model are air temperature, sea temperature, and wind speed. It should be noted that the vessel icing data should be considered as the POTENTIAL existing for vessel icing in a given area rather than a forecast that vessel icing WILL actually be encountered. Actual vessel icing is dependent on other factors such as freeboard, ship speed, and heading relative to the weather, which results in the potential spray that might be encountered on deck.

Weather Type - Based on precipitation and stability parameters of the GFS model, this option displays seven weather types on the BVS chart:

ICON	Weather Type
	Clear
	Showers
	Rain
	Thunderstorms
	Sleet
	Freezing Rain
	Snow

Rogue Wave - To view rogue wave data:

Click the "Rogue W" header on the Weather Bar. The header will turn green to enable the display of rogue wave data, and areas of rogue wave likelihood will then appear on the chart as filled red polygons, shown below. The chart legend for rogue waves appears in the lower right corner to assist in the interpretation of "Low" and "High" likelihood of encountering rogue waves. Darker red indicates high likelihood whereas lighter red filled contours indicate a lesser likelihood to encounter these dangerous waves.

23.1.2 Weather Data Display Controls

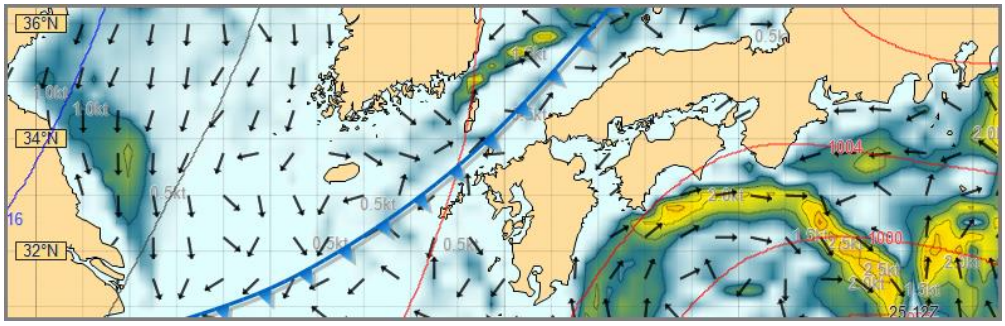
Each weather product has a column header, or title, on the Weather Bar. Clicking on the title with the mouse will toggle on or off the display of that specific weather parameter.

Notice in the example below, the heading for both **Pressure** and **Current** turns green, indicating that these items are selected for display on the chart. In addition, all weather items which have been requested will display their numeric data value in each of the corresponding cells in the weather bar for the specific location of the mouse cursor on the Chart. Weather data that is 'toggled on' will simultaneously be displayed graphically on the Chart.

Weather Bar display:

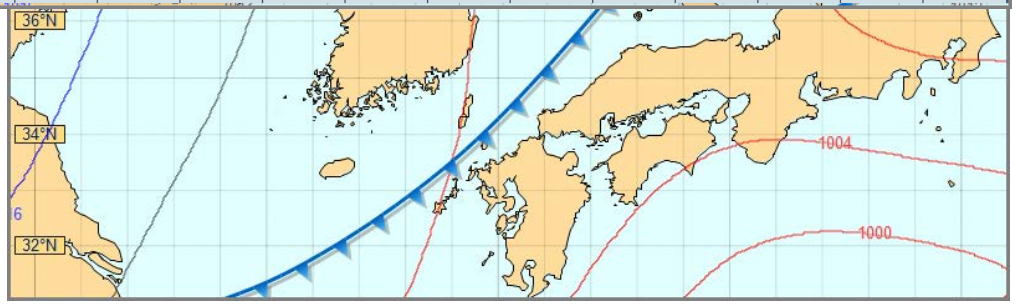
Pressure	500mb	Wind	Sig Wv	Seas	Swell	Current	SST	Vis	Vsl Icing	Weather	Clouds	Air Temp	Humidity	Rogue W
						0.0kts WNW(c)								

Chart display:



In the example above, you would click on Current to suppress the chart display of the surface currents:

Pressure	500mb	Wind	Sig Wv	Seas	Swell	Current	SST	Vis	Vsl Icing	Precip	Clouds	Air Temp	Humidity	Rogue W
1006mb	585m	11kt F4 N	2.9m 11s E	0.5m 4s N	2.9m 14s ESE	0.43kts SE	28.1°C	> 7nm	None			26.9°C	74%	



Now, only Surface Pressure is displayed. All other data is toggled off. Note however that the numerical values for each weather parameter are shown in the cells for each corresponding weather item in relation to the mouse cursor position on the chart.

Weather Bar Numerical Values

The numerical values displayed in each weather parameter of the Weather Bar correspond to three possible sources:

1. **Mouse Cursor**- While moving the mouse cursor, the values (in black text) correspond to the position of the cursor.

2. **Stationary Point**- If a stationary point is created, the values (in red text) correspond to that specific position on the chart while clicking the forward or backward time step control buttons.

3. **Vessel Position**- The numerical values along the weather bar indicate the weather encountered at the vessel position along the voyage track while clicking the forward or backward time step control buttons.

Weather Data Boundaries

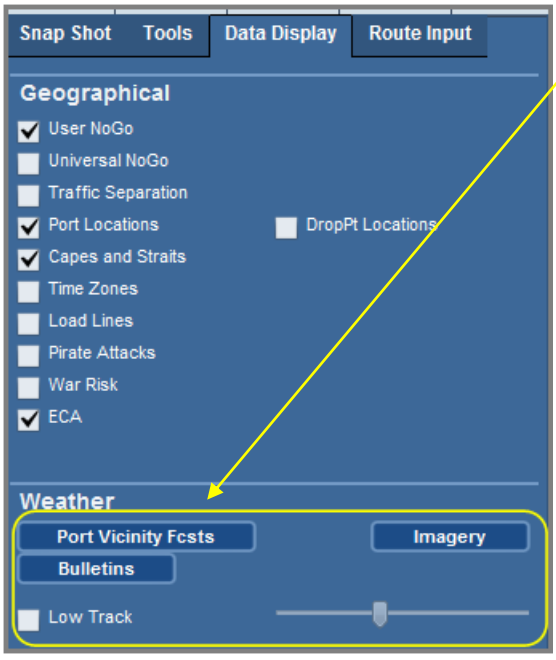
BVS will only show weather data parameters that you have chosen to receive, and only for the specific user-defined region. For this reason, you'll need to ensure that all required data has been previously requested for delivery. This request configuration is set up in the menu option: **Data | Weather Data Delivery Configuration**.

The Weather Data Delivery Configuration specifies, among other things, the specific boundaries for weather data display on the BVS chart.

EXAMPLE: The rectangular boundary on this global chart shows the 'selected region' for BVS data. Most BVS display items will be confined to this region:

Left Panel Display Controls

Certain weather display options are found in the Left Panel's **Data Display** tab:



Port Vicinity Forecasts:

Extensive three-day forecast for conditions near the port and at the pilot drop point

Imagery:

A still satellite image in color for a user-defined region

Bulletins:

Coastal, High Seas, Tropical Storm, etc. bulletins provided by various local sources

Low Track:

Arrows corresponding to forecast positions of each low pressure system's center to assist in identifying movement

Weather Data Animation

When chart animation controls are opened, the user can animate vessel position and weather movement on the chart display. This allows you to see a dynamic picture of weather you may expect to encounter for your selected voyage.

23.2 Other Weather Data Displays

23.2.1 Pack Ice, Icebergs and Ice Bulletins

Pack ice and iceberg areas are shown as polygons on the BVS chart. To view the corresponding bulletin information, you can right-click the polygon and select "View Ice Report". Click the **Open Notepad** button to print this bulletin.

23.2.2 Weather Graphs

Weather forecast and vessel performance details can be displayed in line graph format, in the Bottom Panel's **Graph Tab**.

The following data is available in the Graph Tab:

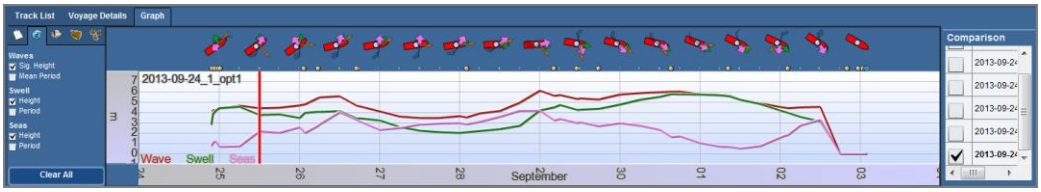
- **Wind**
- **Waves**
- **Swell**
- **Current**
- **(Engine) Performance**
- **Propeller (Performance)**

There are two options for accessing the Graph Tab:

1. From the Menu bar, select: **View | Track Graph**.
2. Open the Bottom Panel and select the "Graph" tab.

For full discussion, see Bottom Panel Graph tab instructions. Chapter 18, Graph Tab.

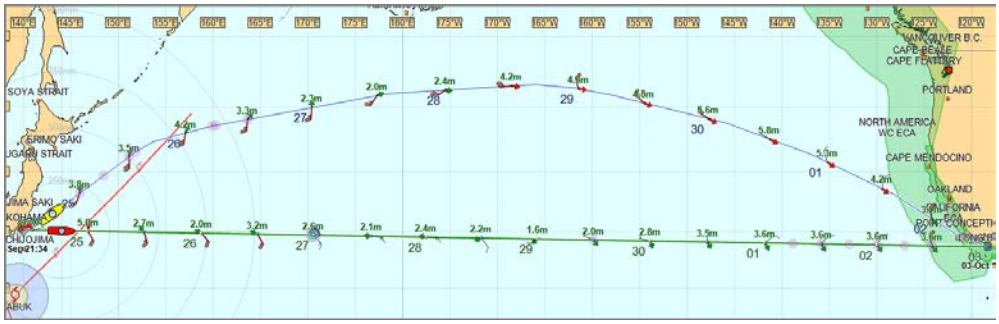
Below is an example of the Weather Graph:



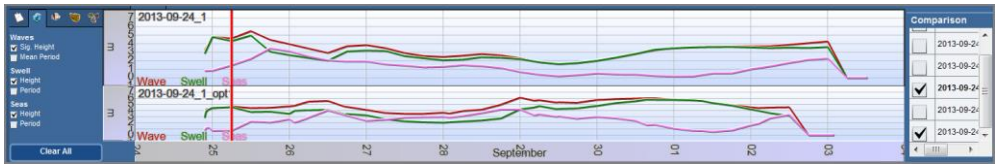
Daily data is displayed along the horizontal axis. In the above example, the legend for Wave, Swell & Seas measurement in meters is displayed on the left side of the graph. The graph line color legend for Wave, Swell and Seas is in the lower left corner of the graph.

The waypoints and the six-hourly computed points will be displayed between the ship icons and the graph details.

In the image below, two tracks have been created:



When more than one track is displayed on the chart, each will be available in the Graph Display:



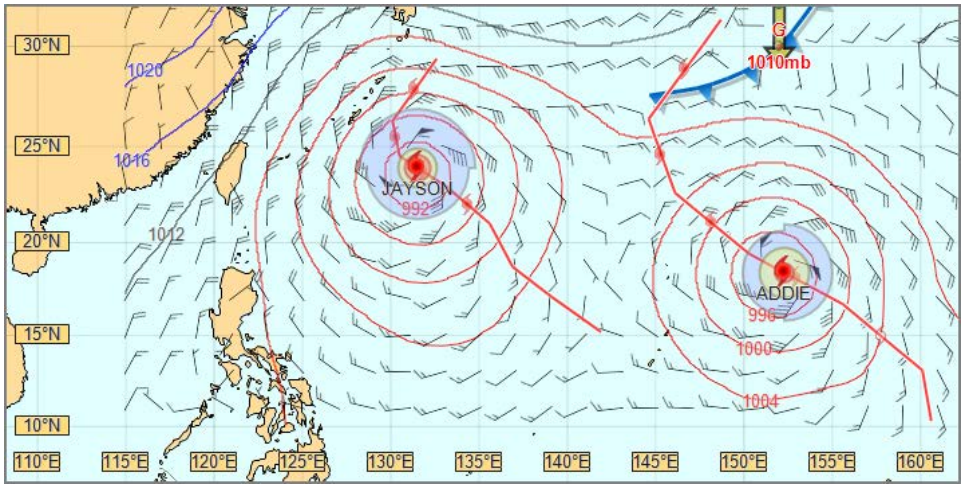
You can click on the check box near the track names (to the right of the graph) to toggle the display details of the corresponding track.

The Clear All button in the bottom left area of the panel can be used to remove ALL selected display parameters.

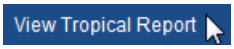
23.2.3 Tropical Storm Display

Tropical storms are displayed on the BVS chart. There is also information available for each tropical storm in text, or table format.

This is an example of tropical storm track displayed on the chart:



If you wish to see a tropical storm description in text-format, right-click along the storm track and a popup menu will appear.



Click View Tropical Report and the detailed report appears.

Tropical storm details are placed in the following default folder:

C:\BVS7\weather\tropical\

The file, “latest.txt”, is overwritten each time a weather data set is processed.

Note: You can print the tropical storm forecast table by clicking the print button at the bottom of the window.

23.2.4 Port Vicinity Forecasts

The Port Vicinity Forecast option is accessed from the Left Panel, in the Weather section of the Data Display tab.

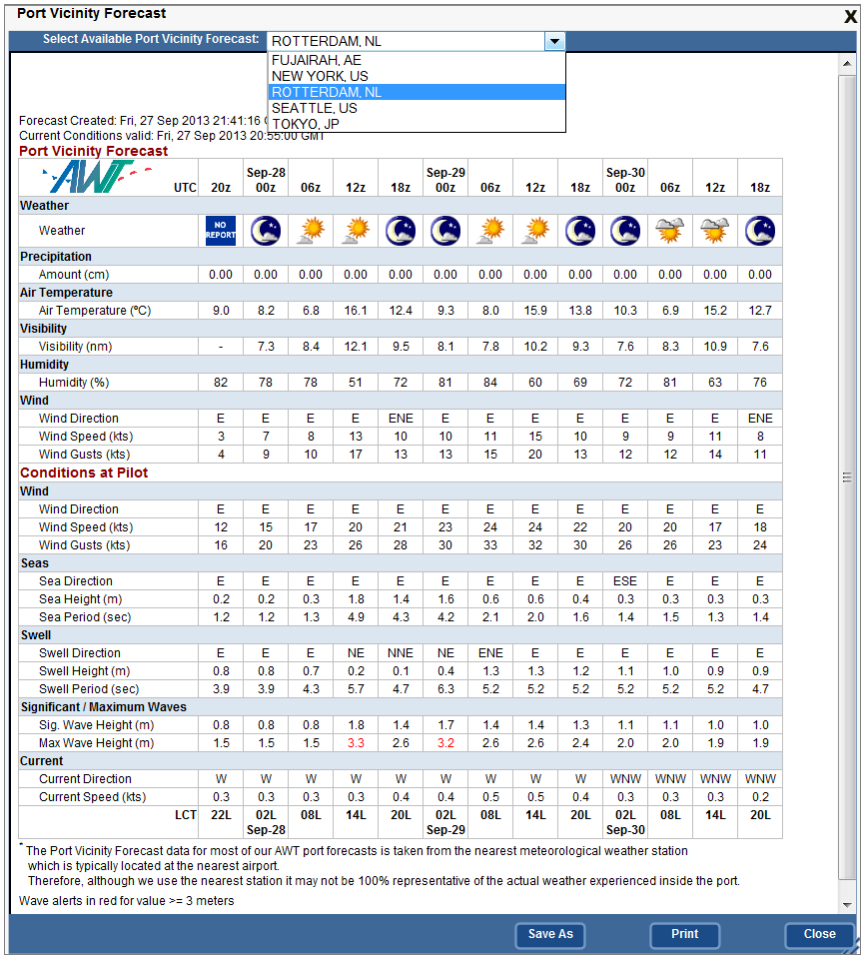
To configure your port locations for these forecast details, you’ll need to include the port names in the Weather Data Delivery Configuration or the One-Time Email Configuration dialog. The Port Forecast configuration section is a specific tab in each of these setup dialogs.

To view a Port Vicinity forecast:

1, Open the Left Panel. Select the Data Display tab.

2. Click the “**Port Vicinity Fcsts”** button to open the forecast window.

Available ports will appear in the pull down menu and all forecast details display for a 72 hour period. The image below the available forecast information:



UTC	20z	Sep-28 00z	06z	12z	18z	Sep-29 00z	06z	12z	18z	Sep-30 00z	06z	12z	18z
Weather													
Weather	NO REPORT												
Precipitation													
Amount (cm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Temperature													
Air Temperature (°C)	9.0	8.2	6.8	16.1	12.4	9.3	8.0	15.9	13.8	10.3	6.9	15.2	12.7
Visibility													
Visibility (nm)	-	7.3	8.4	12.1	9.5	8.1	7.8	10.2	9.3	7.6	8.3	10.9	7.6
Humidity													
Humidity (%)	82	78	78	51	72	81	84	60	69	72	81	63	76
Wind													
Wind Direction	E	E	E	E	ENE	E	E	E	E	E	E	E	ENE
Wind Speed (kts)	3	7	8	13	10	10	11	15	10	9	9	11	8
Wind Gusts (kts)	4	9	10	17	13	13	15	20	13	12	12	14	11
Conditions at Pilot													
Wind													
Wind Direction	E	E	E	E	E	E	E	E	E	E	E	E	E
Wind Speed (kts)	12	15	17	20	21	23	24	24	22	20	20	17	18
Wind Gusts (kts)	16	20	23	26	28	30	33	32	30	26	26	23	24
Seas													
Sea Direction	E	E	E	E	E	E	E	E	E	ESE	E	E	E
Sea Height (m)	0.2	0.2	0.3	1.8	1.4	1.6	0.6	0.6	0.4	0.3	0.3	0.3	0.3
Sea Period (sec)	1.2	1.2	1.3	4.9	4.3	4.2	2.1	2.0	1.6	1.4	1.5	1.3	1.4
Swell													
Swell Direction	E	E	E	NE	NNE	NE	ENE	E	E	E	E	E	E
Swell Height (m)	0.8	0.8	0.7	0.2	0.1	0.4	1.3	1.3	1.2	1.1	1.0	0.9	0.9
Swell Period (sec)	3.9	3.9	4.3	5.7	4.7	6.3	5.2	5.2	5.2	5.2	5.2	5.2	4.7
Significant / Maximum Waves													
Sig. Wave Height (m)	0.8	0.8	0.8	1.8	1.4	1.7	1.4	1.4	1.3	1.1	1.1	1.0	1.0
Max Wave Height (m)	1.5	1.5	1.5	3.3	2.6	3.2	2.6	2.6	2.4	2.0	2.0	1.9	1.9
Current													
Current Direction	W	W	W	W	W	W	W	W	W	WNW	WNW	WNW	WNW
Current Speed (kts)	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.4	0.3	0.3	0.3	0.2
LCT	22L	02L Sep-28	08L	14L	20L	02L Sep-29	08L	14L	20L	02L Sep-30	08L	14L	20L

* The Port Vicinity Forecast data for most of our AWT port forecasts is taken from the nearest meteorological weather station which is typically located at the nearest airport.
Therefore, although we use the nearest station it may not be 100% representative of the actual weather experienced inside the port.

Wave alerts in red for value >= 3 meters

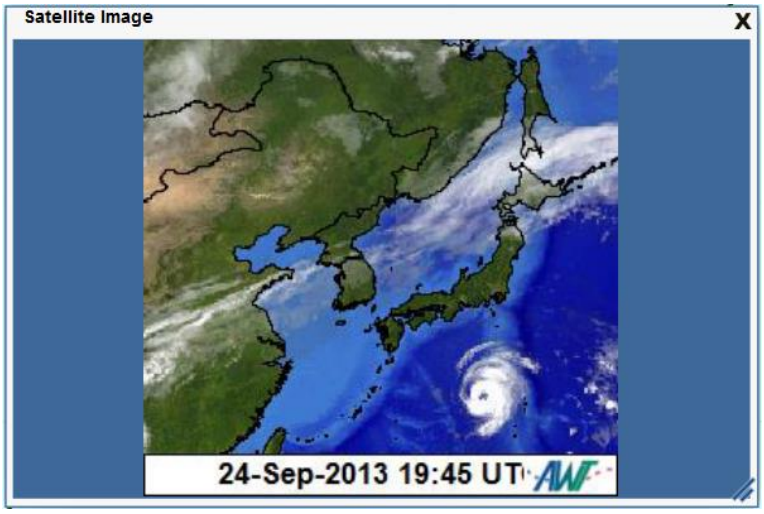
23.2.5 Satellite Image Display

When a satellite image request is included in your forecast requests, this image will display your user-defined satellite region.

To display the satellite still image:

Open the Left Panel. Select the Data Display tab. Click on the **Imagery** button.

The image window can be enlarged and decreased by dragging the bottom right corner. See example below:

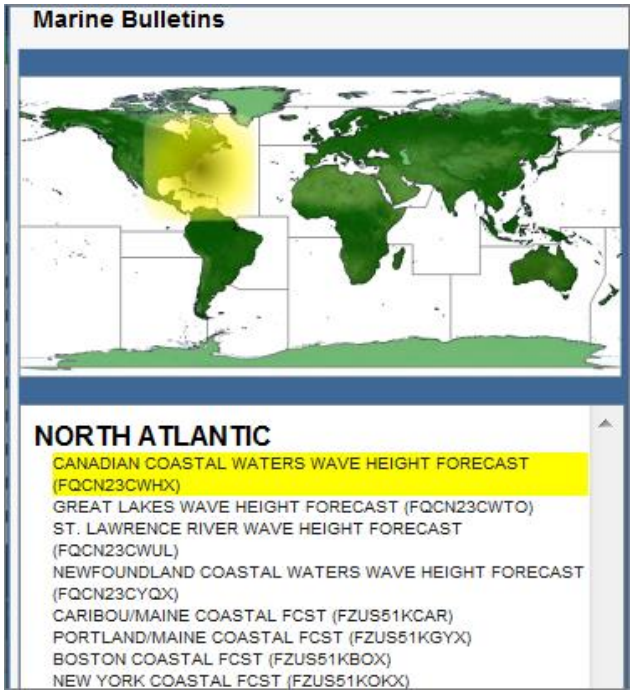


23.2.6 Marine Bulletins

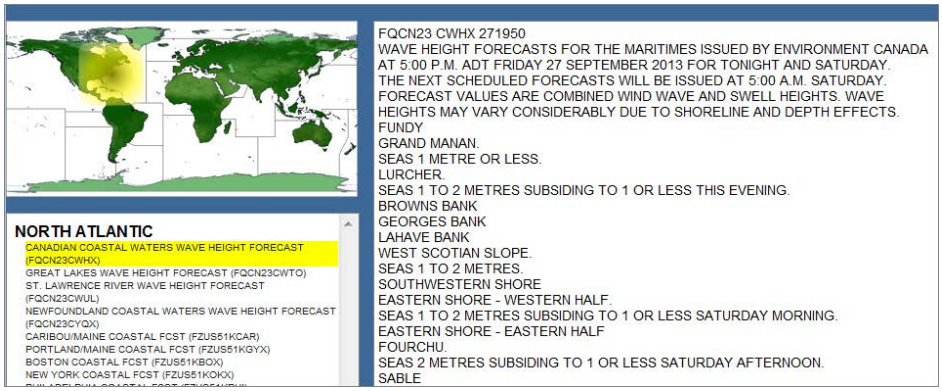
Marine Bulletins show the text forecast bulletins for your currently selected region. Examples are shown below.

Marine Bulletins must be ordered through a data request and received before you can view them. Once a bulletin has been received, you can view it using the Left Panel Data Display tab, **Bulletin** button.

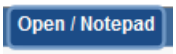
Click the appropriate region on the chart and a list of available bulletins appears at the bottom. The Northwest Atlantic is being selected in the image below:



When you select the desired bulletin, it will be highlighted in yellow. Details of the bulletin will be displayed on the right side of the bulletin window:



Using the **Open/ Notepad** button at the bottom right, the currently selected bulletin will be opened in the Windows Notepad program. From Notepad, you can copy / paste the bulletin contents.

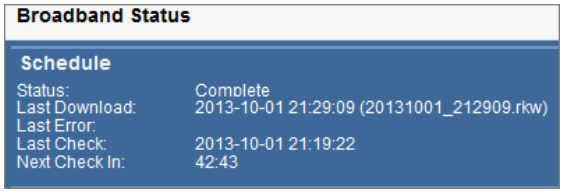


24 Managing Weather Data in Broadband-Enabled Systems

BVS users who have enabled the Broadband option have the capability of receiving near real time updates from AWT's BVS Update Server. Your onboard BVS system regularly checks for new data and automatically downloads & processes that data.

A green status icon indicates that the BVS Update Server is accessible and data is up to date:

If you click on the Broadband status Icon, you can also see details of the most recent 'download session':



You will see three options in the lower section of this dialog in the form of 3 buttons:

Request Data Now: Initiates a Broadband data request 'session'. This option should be used when vessel procedures only allow your Broadband connection to be made at specific times of the day (ie: it is NOT an 'always on' connection). While your vessel's Broadband connection is 'active', you would need to click the **Request Data Now** button.

Setup Email Request: This button opens the "Weather Data Delivery Configuration" dialog. You can manually open this dialog from the DATA menu.

Close: This option closes the Broadband Status dialog.

As a connection to the BVS Server is made and data is downloaded, you will see a yellow status icon.

Once data has been downloaded, the processing status bar appears:

IMPORTANT: When the Broadband Status icon displays in red, this signals that BVS is unsuccessful in its attempt to connect with the AWT Server. Check your Broadband connection to ensure that you have access to the Internet.

If you are no longer able to collect data by Broadband, but email is currently working, you should submit a SCHEDULED REQUEST for data. The email option allows you to receive either a one-time 'immediate data' request, or to set up scheduled requests for ongoing data deliveries. A detailed explanation of the email schedule request procedures is given in Section 25.2.1, Creating a Scheduled Data Request.

If you have been collecting scheduled email deliveries because of recent Broadband connection troubles and thereafter your **Broadband connection resumes**, BVS will automatically halt the emails on the AWT Server, reverting back to "Broadband only" data collection. If in the future you wish to reinitiate email deliveries, you'd need to resend a scheduled request to bvs7@awtworldwide.com. For the email delivery schedule to remain active (and to eliminate the Broadband option), please be sure to UNCHECK the Broadband data collection option in the menu SETUP | DATA / COMMUNICATIONS. See section 32.2.1, Broadband Users: Configuration Instructions for more details.

25 Managing Weather Data in Email-Enabled Systems

This section describes weather data management for users who have email as the primary communications method. It also applies to those who are required to switch from broadband to email to receive BVS forecast updates.

Email Data Requests

There are two types of email data delivery requests:

- A One-Time Request: Invoked from the menu **Data| One Time Email Delivery of Weather Data**, or from the Broadband Status dialog's Setup Email Request button. This type of request generates a forecast delivery within 10 minutes of being transmitted to the BVS Data Server.
- A Scheduled Request: Invoked from the menu **Data | Weather Data Delivery Configuration**, this request will generate a delivery schedule with set dates and times which are defined by the user.

These two delivery methods are explained in 25.1 and 25.2 below.

25.1 One-Time Data Report Requests

A one-time email delivery request is a single email message which results in an immediate & one-time email delivery from the BVS Data Server with up-to-date weather information. If an email schedule already exists, note that this one-time request will not change the parameters of the existing schedule. You can, however, submit a one-time request with a different region and with varying data parameters and that data will be returned to you as requested, allowing you to "temporarily" see alternate forecast region and data details when compared to your ongoing scheduled deliveries.

25.1.1 How to Create a Weather Data One-Time Request

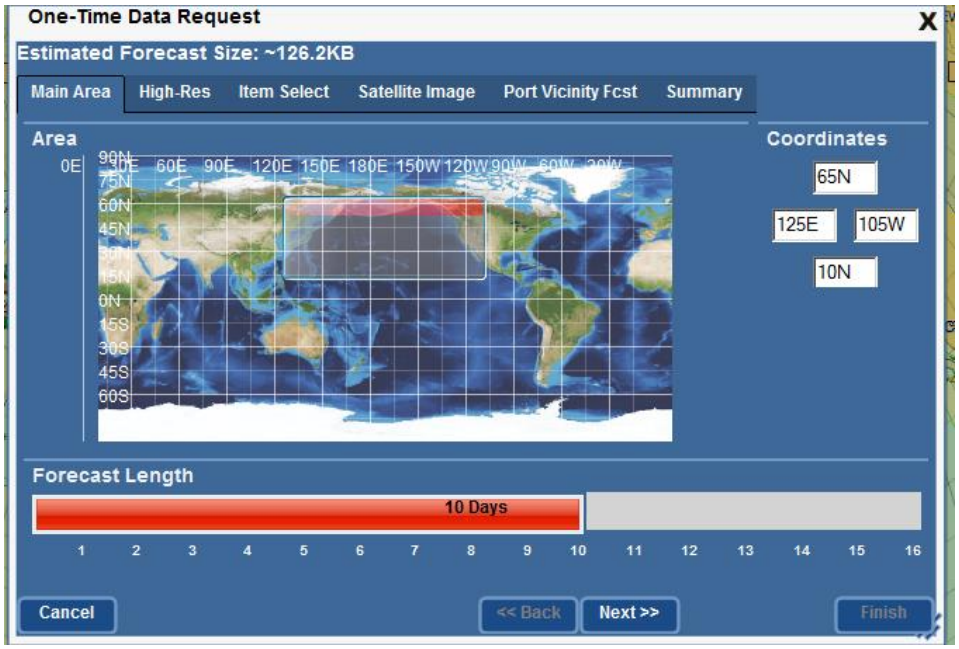
There are two ways to access the set up dialog for a one-time data request:

Method 1.

On the Data menu select item One-Time Email Delivery of Weather Data. The "Main Area" tab of the dialog will appear.

Method 2.

Click the Broadband Status Icon on the Menu Bar. The Broadband Status dialog will appear. Click the Setup Email Request button on the dialog and the "Main Area" tab of the One-Time Data Request dialog will appear.

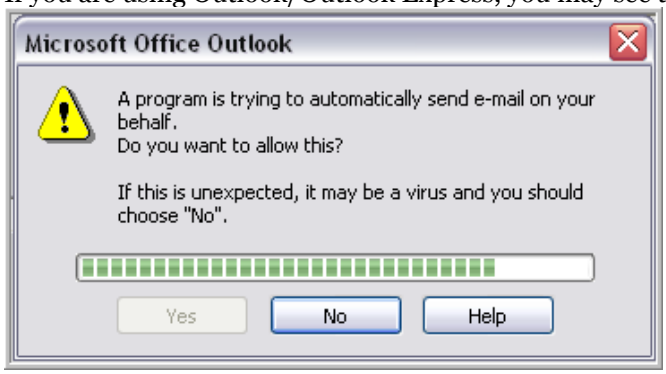


1. Enter your required forecast region and data parameters as you step through each of the forecast configuration tabs. The last tab is a summary which gives you an overview of your request.

2. When done filling in setup information, click the Finish button.

3. An Email Message is automatically created if your settings under the menu option **Data/Communications** are for MAPI (automatic email creation), an email message will be generated and placed on your desktop. Click SEND and the message will be placed in your Outbox to await your next email exchange.

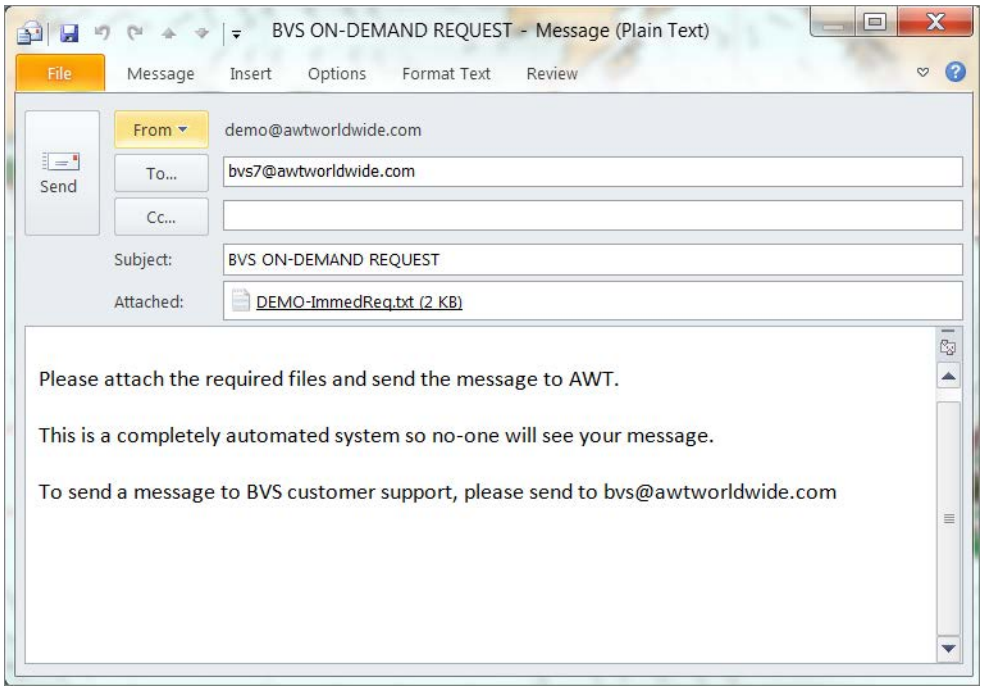
If you are using Outlook/Outlook Express, you may see the following message:



Choose yes to send email data request. If you choose no, the email will not be sent and you will see the following error report:

Click OK to close the above dialog.

If your Windows configuration will not allow for automatic message creation, you will need to create an email message and attach the required file. Below is an example of an email message to the BVS 7 Automated Server:



Note that the email attachment is a text file. The Subject line can contain whatever you prefer but is not required when your data request is sent. The destination email and the attachment that automatically appear **ARE REQUIRED**. Do not modify or remove them from the message.

The file name is **[call sign]-ImmedReq.txt**. It can be found in the following default folder: **C:\BVS7\data**

If you are manually creating an email message, attach the above file to your message and send to BVS7@awtworldwide.com.

After sending the One-Time Data Request attachment, the AWT server will immediately process your request and data should be received within approx. 10-15 minutes. The timeliness of data delivery is also dependent on the efficiency of the vessel's email service provider in sending your outgoing message.

25.1.2 Estimating File Sizes in Your One-Time Data Requests

When you create an One-Time Data Request, BVS shows a forecast data size estimate, as shown below, at the top of the Data Request dialog.

This value is recalculated automatically as you adjust the desired region for the forecast and select weather products.

The message may change color as follows:

Orange: The estimated forecast size is reaching the user-defined maximum allowed.

Red: The estimated forecast size exceeds your defined size limit.

A user-defined limit can be set in the **Data/Communications** menu option. See Section 32.2.2,

Email Users: Configuration Instructions.

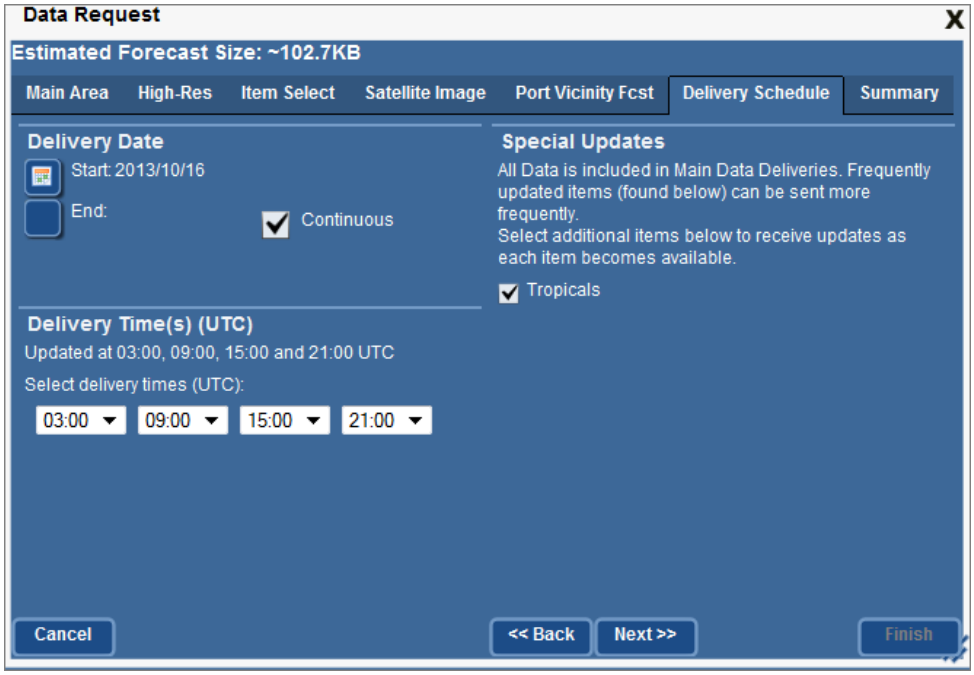
25.2 Scheduled Weather Data via Email

A scheduled data request is a single request message that generates an ongoing delivery schedule in which the BVS data server automatically generates new forecast emails at the user-defined times.

25.2.1 Creating a Scheduled Data Request

1. From the Menu bar, select **Data | Weather Data Delivery Configuration**.

Set the desired parameters on each tab—all of which are similar to the Immediate Request dialog, with an addition of the "Delivery Schedule" tab.



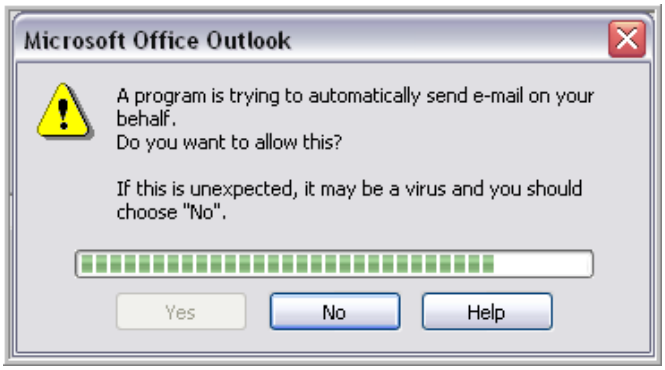
Select a START and END date. If you desire an 'ongoing' delivery, check the "CONTINUOUS" box. Set your delivery times. To the right, choose "TROPICALS" if you wish to receive additional emails with tropical storm updates.

When done, click Finish.

If you have previously configured BVS to use a MAPI compliant email program, your BVS request will automatically be created and sent to your email outbox.

If you have selected the manual send method, BVS will display the Send Data to AWT dialog. Follow the instructions on that dialog to send your message.

If you are using Outlook/Outlook Express, you may see the following message:



Choose yes to send email data request. If you choose no, the email will not be sent and you will see the following error report:

Click OK to close the above message.

Important

Note that you can change a Schedule Data Request at any time.

As mentioned at the beginning of this section, a new request will overwrite your previously existing request.

We recommend you set up a conservative forecast area.

For example, use a forecast area which is just larger than your present navigation area, or the current ocean region of your first leg of the voyage.

By the time you are mid-voyage, you might submit a request that removes the previously sailed area. This will help minimize email file size.

You might also consider requesting mid-voyage a shorter forecast length which only covers the remaining voyage time.

25.2.2 Estimating File Sizes in Your in Your Scheduled Data Requests

When you create a scheduled Data Request, BVS shows a forecast data size estimate, as shown below, at the top of the Data Request dialog.

This value is recalculated automatically as you adjust the desired region for the forecast and select weather products.

The message may change color as follows:

Orange: The estimated forecast size is reaching the user-defined maximum allowed.

Red: The estimated forecast size exceeds your defined size limit.

A user-defined limit can be set in the **Data/Communications** menu. See Section 32.2.2,

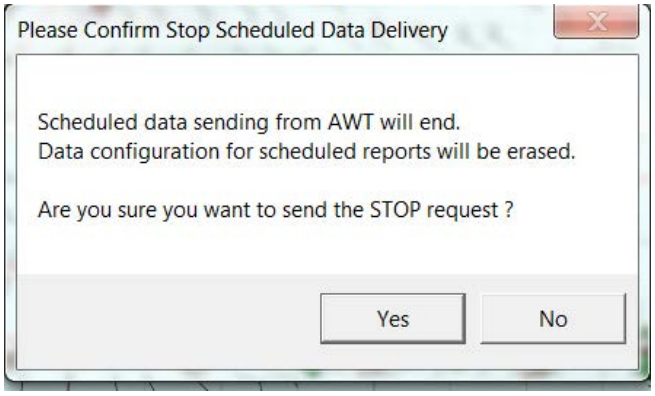
Email Users: Configuration Instructions.

25.2.3 How to Stop Receiving Scheduled EMAIL Data

This option should be used when you need to halt your delivery schedule for a length of time. The email that is created from this process should be the only BVS REQUEST MESSAGE sent during that particular email exchange. If you wish to create a new schedule for a start date sometime in the future, you may do this any time AFTER the stop request has been sent to the BVS Server.

Note that if you do not need to halt data deliveries for any period of time, but only want to update your delivery area (region), you can send a scheduled request instead. A scheduled request will overwrite your original parameters and will update your forecast to the new parameters on the date/time that you indicate in the request.

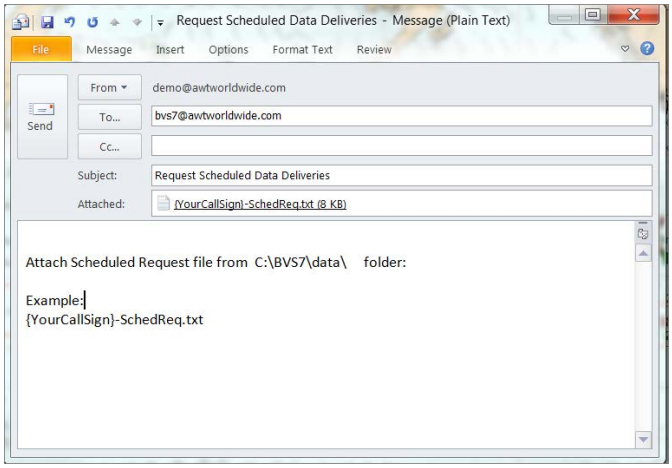
To stop receiving scheduled data. select Data menu item Stop Scheduled Delivery. BVS will display this dialog:



If you click Yes, BVS will create a Stop Request file so it can be emailed to AWT.

25.2.4 How to Manually Send a Weather Data Request by Email

If your Windows configuration will not allow for automatic message creation, you will need to create an email message and attach the required file. Below is an example of an email message:



Items for the email:

- The email recipient line is required. If you are manually creating an email message, type in the "To:" line: **BVS7@awtworldwide.com**
- The attachment text file is required. BVS will automatically create the file when you use the Data menu to set-up report requests. Its file name is **[call sign]-SchedReq.txt**. It can be found in the following default folder: **c:\BVS7\data**

  If you are manually creating an email message, attach the above file to your message.
- The Subject line can optionally contain whatever you prefer but it is not required to send your data request.

After sending the Scheduled Data Request attachment, the AWT server will immediately process your request and a message will be sent to you confirming your delivery schedule and data parameters.

25.2.5 Processing an Emailed Weather Forecast File

AWT sends email with forecast files to your inbox with the forecast as a file attachment. The .RKW file attachment will be named as follows:

ABCD_yyyymmdd_hh.RKW

where ABCD is the vessel call sign, and the forecast delivery time is included in the filename.

You can process an RKW file in any one of these ways:

1. Save the file in a folder on your hard drive, such as C:\BVS7\Weather\Import. When BVS is opened or while it remains opened, it will instantly process each weather file it finds in the IMPORT folder. Files are processed in chronological order. **If you have several files to process, close BVS first, then save the desired files in the IMPORT folder. Now, when BVS is opened, the forecast information will be processed in the correct chronological order.**

2. Double-Click (or Open) the RKW file in the email message. This will automatically open BVS and process the forecast file. The new data will now be available on the BVS chart.

3. Save the RKW file to any desired folder on your hard drive. Then to process that file, click **Data | Import** on the BVS Menu. Use the Windows Browser to locate the file. Click **Open**.

If you are processing several RKW files, be sure to open the oldest first and continue in order of age, with the most recent file being opened last. This will ensure the proper storing of Analysis data, Historical data and Forecast data in your BVS weather folders.

25.2.6 Checking the Date/Time of the Forecast

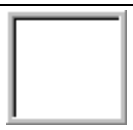
The forecast base time can be verified in the top right corner of the BVS program window. This is the basis of the forecast model run and the analysis TAU (time step) of your forecast data is displayed at (from the start of) this hour.

26 Reference Information

26.1 Weather Data Symbols

When the “Precip” option is toggled on in the Weather Bar, these symbols appear on the chart to show presence of their specific weather type at a location. For them to show, their corresponding Weather Data product has to have been selected by you in a data request, and then been received in a report, and the product enabled for display using the Weather Bar.

For some types, if you hover the cursor over the symbol on the chart, BVS will display further details. For example, with cursor over the Rain symbol, BVS may show ‘Heavy’ or ‘Light’.

Symbol	Definition/Description
	Clear
	Showers
	Rain
	Thunderstorms
	Sleet
	Freezing Rain
	Snow

26.2 Data Sources for AWT's BVS Forecast Data

From the most accurate sources available, data is gathered by Applied Weather meteorologists, who meticulously review and submit it into the BVS system. We carefully draw the fronts and input the most recent information on tropical storm development and movement. The list below details some of our significant data sources.

Data	Source
Surface Pressure Surface Wind 500 Millibar Height	NOAA's National Centers for Environmental Prediction, GFS Model
Significant Wave	WAVEWATCH III
Seas	WAVEWATCH III
Swell	WAVEWATCH III
Tropical	National Hurricane Center, JMA, JTWC & regional local sources.
Satellite	Meteosat, MTSAT & GOES
Current (Specific)	HYCOM Data is displayed for first 4 days of forecast. Thereafter, AWT Climatological data is displayed.
Iceberg and Pack Ice	JMA, National Ice Center & Local Governments
General Current	Dynamic Current, Pilot chart & Admiralty Routing Chart
Sea Surface Temperature	NCEP/MMAB, using Real Time Global Sea Surface Temperature High Resolution (RTGSSTHR) analysis
Air Temperature	GFS model.
Weather Type or 'Precip'	AWT Model using GFS parameters as input.
Cloud Forecast	GFS model.
Humidity	GFS model.
Visibility	NCEP/MMAB using GFS output as input
Vessel Icing	NCEP/MMAB using GFS output as input
Piracy	IMB supplemented with NATO reports
Rogue Waves	Proprietary AWT model

26.3 Weather Data Resolution Description

What data resolution is currently provided in the BVS data?
Data is provided at different levels of resolution throughout the forecast length. In addition, Broadband users are provided with much higher resolution since they do not have the same restrictions regarding the size of the forecast file, whereas email users typically try to keep their email file attachments under 250 KB or 300KB.

BROADBAND USERS—Here is an explanation of the data resolution:

Climatological Data			
Product	**Resolution (degrees)**	**After 2 days**	**After 7 days**
Wind	1 x 1	n/a	n/a
Swell	1 x 1.25	n/a	n/a
Seas	1 x 1.25	n/a	n/a
Current	1/2 x 1/2	n/a	n/a
High Resolution Forecast Data			
Product	**Initial (Resolution)**	**After 2 days**	**After 7 days**
Wind	1/2 x 1/2	1/2 x 1/2	n/a
Sig. Wave	1/2 x 1/2	1/2 x 1/2	n/a
Seas	1/4 x 1/4	1/4 x 1/4	n/a
Swell	1/4 x 1/4	1/4 x 1/4	n/a
Current	1/4 x 1/4	1/4 x 1/4	n/a
Standard Forecast Data			
Product	**Initial (Resolution)**	**After 2 days**	**After 7 days**
Wind	1x1	1x1	1x1
Sig. Wave	1x1	1x1	1 x 1.25
Seas	1x1	1x1	1 x 1.25
Swell	1x1	1x1	1 x 1.25
Rogue Wave	(shown as filled contours)	n/a	n/a
Current	1/2 x 1/2	1/2 x 1/2	n/a
Pressure	1 x 1	1 x 1	1 x 1
500 mb	1 x 1	1 x 1	1 x 1
Sea Temp	1/2 x 1/2	n/a	n/a
Sat Image (pixels)*	2400x 1200	n/a	n/a
Additional Forecast Data			
Product	**Initial (Resolution)**	**After 2 days**	**After 7 days**
Cloud Forecast	1 x 1	1 x 1	n/a
Visibility	1 x 1	1 x 1	n/a
Vessel Icing	1 x 1	1 x 1	n/a
WX Type	1 x 1	1 x 1	n/a
Humidity	1 x 1	1 x 1	n/a
Air Temperature	1 x 1	1 x 1	1 x 1

* Satellite Image— 6.66 pixels = 1 degree

EMAIL USERS—Here is an explanation of the data resolution provided:

Climatological Data			
Product	**Resolution (degrees)**	**After 2 days**	**After 7 days**
Wind	1 x 1	n/a	n/a
Swell	1 x 1.25	n/a	n/a
Seas	1 x 1.25	n/a	n/a
Current	1/2 x 1/2	n/a	n/a
High Resolution Forecast Data			
Product	**Initial (Resolution)**	**After 2 days**	**After 7 days**
Wind	1/2 x 1/2	1 x 1	n/a
Sig. Wave	1/4 x 1/4	1 x 1.25	n/a
Seas	1/4 x 1/4	1 x 1.25	n/a
Swell	1/4 x 1/4	1 x 1.25	n/a
Current	1/4 x 1/4	1/2 x 1/2	n/a
Standard Forecast Data			
Product	**Initial (Resolution)**	**After 2 days**	**After 7 days**
Wind	1 x 1	2 x 2	2.5 x 2.5
Sig. Wave	1 x 1	2 x 2	2.5 x 2.5
Seas	1 x 1	2 x 2	2.5 x 2.5
Swell	1 x 1	2 x 2	2.5 x 2.5
Rogue Wave	(shown as filled contours)	n/a	n/a
Current	1 x 1	1 x 1	n/a
Pressure	1 x 1	2 x 2	3 x 3
500 mb	2 x 2	3 x 3	3 x 3
Sea Temp	1 x 1	n/a	n/a
Sat Image (pixels)*	2400x 1200	n/a	n/a
Additional Forecast Data			
Product	**Initial (Resolution)**	**After 2 days**	**After 7 days**
Cloud Forecast	1 x 1	1 x 1	n/a
Visibility	2 x 2	3 x 3	n/a
Vessel Icing	1 x 1	2 x 2	n/a
WX Type	1 x 1	1 x 1	n/a
Humidity	2 x 2	2 x 2	n/a
Air Temperature	2 x 2	3 x 3	n/a

* Satellite Image— 6.66 pixels = 1 degree

27 Voyage Planning and Setup

27.1 Introduction to BVS Enroute Activities

This section provides instructions for the use of BVS for your voyage planning.

BVS supports strategic planning for your voyage by providing automated route-planning tools that incorporate advanced weather data covering your sailing region. BVS can automatically optimize a route based on lowest fuel consumption or on quickest arrival time along with other user-defined factors.

At installation, you customize BVS for your ship. Then, prior to departure, you define voyage-specific information (departure and arrival points, key waypoints, etc., and required arrival time, for example).

You will need to create a weather data request configuration which covers your current ocean region & includes desired weather parameters.

You may also enter voyage-related parameters corresponding to the voyage:

Sailing restrictions (NoGo areas)

Weather restrictions (example: maximum allowed wave height & wind speed, etc.)

Roll Resonance constraints (such as wave thresholds in meters, Roll Period, draft, etc.)

Fuel costs

You can review the planned route. checking the 6-hourly calculated positions and the corresponding weather for each position. You can turn on the voyage animation feature to help visualize expected conditions along your future DR points.

27.2 BonVoyage Pre-Voyage Actions

The following steps are needed in preparation for departure

- Route Entry: This would include master's intended voyage and any alternatives. Alternate routes can be manually created or generated by using the Track Optimization feature. You may also open a track template that you have previously saved as one of your common sailing tracks.
- Resonance/hazard specification : This is done by entering resonance parameters for the voyage using the Left Panel Snapshot tab.

  Critical Note: Each time a new voyage is created, you MUST enter resonance limits for each of the four resonance threshold fields in the Left Panel Snapshot tab, and several other parameters, such as ROLL PERIOD and DRAFT (draft is input in the Route Input panel).

- Weather Data Configuration: Before departure, you will need to configure your weather display region so that it corresponds with your sailing region. You'll also need to select the specific data parameters which you wish to receive.
    - Broadband: Once you have defined your weather data configuration, data transmissions will automatically occur if you have a constant Broadband connection. If you have pre-determined connection times, you will need to initiate the BVS update by clicking the "Request Data Now" button in the Broadband Status dialog.
    - Email: Define your weather and data parameters, and email the resulting "{CallSign}SchedReq.txt" file to bvs7@awtworldwide.com. This will initiate daily email updates. When the weather update file arrives in your email inbox, double-click the RKW file attachment and the BVS chart should update with the latest weather information. During the voyage weather data should be configured for regular delivery and the chart should be updated to ensure that a valid forecast is displayed.

Additional Program Configuration Options

Additional options include:

- Set alarm thresholds/constraints as needed to ensure that alarms will display when undesirable conditions are predicted by BVS.
- Optimize route for least time or to minimize fuel cost/ fuel consumption. During the voyage, re-optimize if conditions change significantly.

27.3 During the Voyage: Entering Reported Position

While underway, it is recommended that you enter your actual position once a day.

Move the mouse curser approximately to the present position. Right-click the mouse and select **Insert Reported Point** from the popup menu.

Enter required details in the Position, and Time fields. Click OK, or press the keyboard's ENTER key to accept the report details.

A new reported point appears on the voyage track. 

Note: The default speed is the iterated calm sea speed between the two recent actual positions. This figure will be used for the onward voyage simulation but can be edited. To edit, right-click on the reported point and edit the speed as desired. Hit the keyboard's ENTER key to save the updated information.

27.4 Setting Speed From a Waypoint

Similar to entering a reported point, the speed can be set at a given waypoint as well.

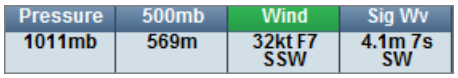
To edit, right-click on the waypoint and edit the speed as desired, hitting the ENTER key to save the updated information.

27.5 Weather Display for Dead-Reckoned (DR) Position

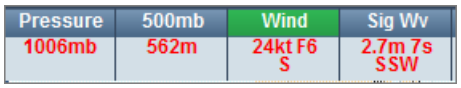
When a voyage track is selected in BVS, you can view weather details that are specific to each DR position along the track as you click on the time step control buttons at the top right of the BVS Chart:

The values shown on the Weather Bar in each weather parameter change from black to red:

Black: Data corresponds to mouse movement on the chart:



Red: Data corresponds to DR position along the selected voyage track by clicking Display (Time) Step button.



27.6 Stationary Point Weather Display

Weather details can be displayed in both the Route Snapshot panel and in the top horizontal tool bar using the Stationary Point display option.

1. Right-Click on the BVS chart and select: **Set Stationary Point**.

2. The stationary point will be placed at the location of the mouse cursor when the chart was right-clicked. You can move the stationary point by:

   a. Click and hold the mouse on the center of the stationary point.

   b. Drag the mouse to the desired location.

   c. Release the left mouse button to set the location.

3. Click through the forecast time steps using the desired button.

4. Note that the position of the stationary point will be displayed in the Lat/Long Position readout in the upper right Menu Bar once you begin clicking the buttons in the Forecast Display Time-Step controls

5. As you click on the Time Step buttons, data in the Weather Bar and the Left Panel route snapshot will reflect the corresponding date/time shown in the Forecast Valid Date readout.

6. To turn off the Stationary Point feature, right-click the chart and select “Clear Stationary Point”.

28 Voyage Optimization

An optimized track is a route created by BVS to optimize the voyage in regard to your current sailing intentions. It takes into account weather conditions, user-defined goals and constraints, and calculated vessel performance within the program.

Additionally, optimization will take into consideration hazard avoidance (Defined NoGo areas & Weather Constraints).

Please note that when optimizing for fuel, BVS generates a route which takes into account:

Minimum Fuel Cost—when that cost is defined in the left panel's TOOLS tab, and after clicking the "FUEL COST THRESHOLDS" button. There are four entries available:
FO (Fuel Oil)
MDO (Marine Diesel Oil)
LSFO: Low Sulfur Fuel Oil
LSMDO: Low Sulfur Marine Diesel Oil

BVS optimization uses the following logic for creating a track:

1) Start Point: By default, BVS uses the voyage departure point. If a reported point exists along the track (for example, during mid-voyage), BVS will use the most recent reported point.
Please note that if you have a VIA point, the first leg of the voyage (or the section before the VIA) will be optimized UNLESS you have placed a reported point AFTER the VIA or you have assigned the Optimization Start Point to a waypoint that is found at a position in the future past the VIA point location.

2) End Point: The default end point is the voyage arrival point. If a VIA exists, it would be the arrival point of that VIA.

3) Optimizing with Via Points: Please see section 28.2 below.

   Note: Specific costs and/or constraints which you define may greatly affect the optimization output. These constraints are found by clicking the "Thresholds/Constraints" button in the Left Panel's 'TOOLS' tab. There are two sections (tabs) in this dialog:

   Thresholds/Constraints: Significant Wave, Seas, Swells, and Wind 'maximum allowed' thresholds can be entered & BVS optimization will try to avoid conditions greater than those which are defined herein.

   Fuel Cost Thresholds: When values are entered in these four fields, the overall (daily) cost of fuel is considered by BVS when creating an optimized track. If no values are found in these fields, BVS will create a track with minimal fuel consumption.

28.1 Creating an Optimized Track

BVS can generate a voyage track having a route optimized for:

A) TIME: **Least time**: the most efficient arrival **time** along a track with acceptable weather conditions;

B) FUEL: **Least fuel /cost**; or

C) FUEL/ETA: **Least fuel /cost with fixed ETA**

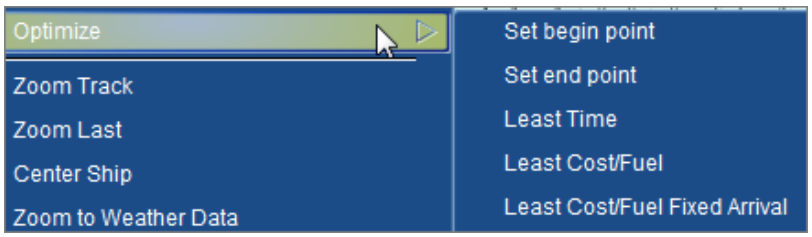
There are five ways to access optimization-related activities:

1. Through the Left Panel's Tools tab
2. By right-clicking the chart or the voyage track
3. Using the Least Time button on the Chart controls
4. Through the Left Panel's Route Input tab
5. Using a Keyboard Shortcut

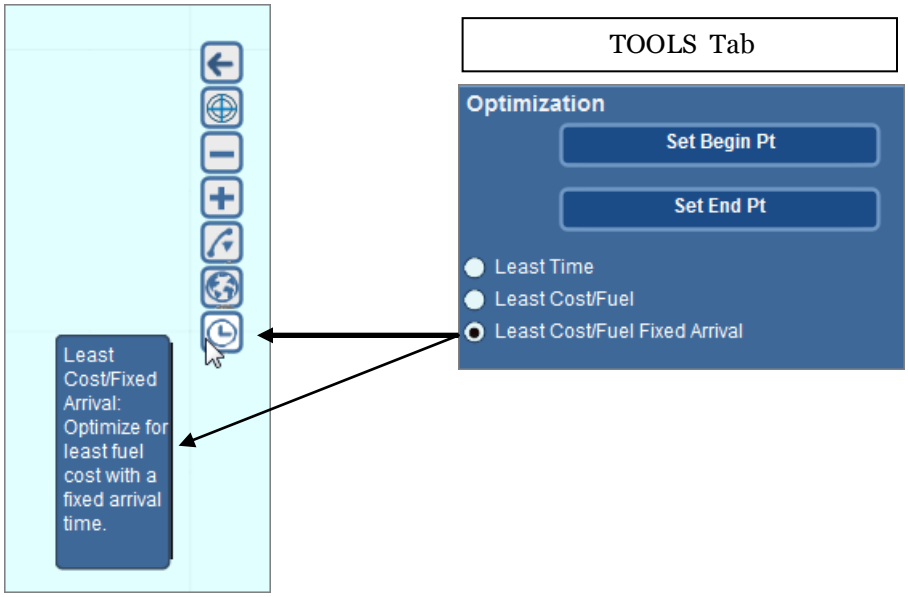
Method 1: the Tools tab, allows you to:

- Set begin point for a route
- Set end point for a route
- Select one of the three optimization types.

Method 2: right-clicking the track, brings up a pop-up menu with the Optimization menu option, which displays the same options as Method 1, above:



Method 3: use of the Optimize icon, the lowest button in the Chart's vertical button row in the upper right area of the chart:



Note that this button's function is dynamically set to the user-defined setting found in the Left Panel Tools tab under the Optimization section.

Method 4: the Left Panel Route Input tab, has one icon, which is also dynamically set according to the setting in the Left Panel's Tools tab. 

Method 5, KEYBOARD SHORTCUTS:

Ctrl + T : Optimize for Least Time

Ctrl + F : Optimize for Least Fuel Cost or Consumption

Ctrl + L : Optimize for Least Fuel Cost/Consumption with a Fixed Arrival Time

When optimizing a voyage track before your actual departure, the default starting point is the departure waypoint. If you are mid-voyage, it would be the most recent reported point along the selected voyage track. A user-defined starting point can be created by right-clicking on the desired waypoint and by clicking **Optimize | Set Begin Point.**

The default end point is the arrival port of the selected voyage track, unless you have created a track with multiple VIA's. In this case, the end point would be the arrival of the currently selected VIA. A user-defined end point can be created by right-clicking the desired way point, and choosing **Optimize | Set End Point**.

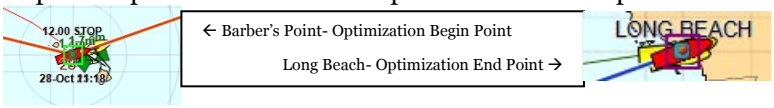
28.2 Optimizing with VIA Points

When a via point exists, as previously explained, BVS will only optimize the first leg of the voyage—the voyage departure to the (first) VIA arrival point.

An example is found below of a voyage: Tokyo to Long Beach via Barber's Point:

1. First Leg—Set your start time: Right-click the starting point and select OPTIMIZE | Set Begin Point. Set an end point at either the VIA arrival point, or at a waypoint before the VIA arrival point. Start BVS Optimization. The first leg of the voyage will be optimized:

2. Second (additional) Leg(s): Using the left mouse button, click on the newly optimized track to ensure that it is selected. Set the Begin Point at the VIA Departure point and set the end point at the arrival point of the next VIA.



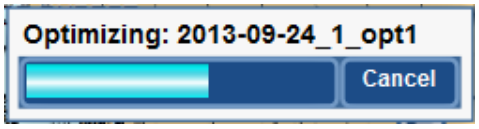
If there are no other VIA's, set the end point at the final arrival point of the voyage. Note that if you do not set an end point, BVS (by default) will use the Voyage Arrival point as the optimization end point. Start BVS optimization. The final leg of the voyage will now be optimized as well.

28.3 Optimizing for Time

If optimizing for "TIME" will be your primary option, be sure to configure the BVS default optimization option in the TOOLS tab of the LEFT PANEL, described in section 28.1 above. This will ensure that the shortcut buttons on the chart are set to 'optimize for time'.

Alternatively, you may optimize for time using the shortcut keys **CTRL-T**.

The following status bar appears at the top right of the chart:



The file name will be shown in the title bar. If applying various weather constraints and therefore creating several time optimization files, the naming process would be as follows:

[OriginalTrackName]_opt (1st file)

[OriginalTrackName]_opt1 (2nd file), etc.

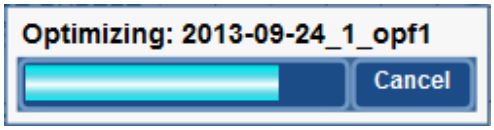
The .BVS extension is not displayed on the chart but will be added to the file name in the Windows directory. Each track file can be renamed as desired: click **File| Save As| Track** (or **Template**), type the desired filename and click **Save**.

28.4 Optimizing for Least Fuel

If your primary optimization option will be for "Least Cost/Fuel", be sure to configure BVS in the Left Panel's 'TOOLS' tab. This will ensure that the shortcut buttons on the chart are set to 'optimize for Least Cost/Fuel'.

Alternatively, you may optimize for time using the shortcut keys **CTRL-F**.

The following status bar appears at the top right of the chart:



The file name will be shown in the title bar. If several time optimization files are created—for example, if you are applying various weather constraints—the naming process would be as follows:

[OriginalTrackName]_opf (1st file)

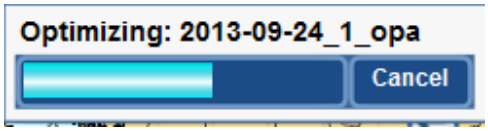
[OriginalTrackName]_opf1 (2nd file), and so on.

The .BVS extension is not displayed on the chart, but will be added to the file name in the Windows directory. Each track file can be renamed as desired: click **File| Save As| Track** (or **Template**), type the desired filename and click **Save**.

28.5 Optimizing for Least Fuel (Fixed ETA)

If your primary optimization option will be for "Least Cost/Fuel with a Fixed Arrival", be sure to configure BVS in the TOOLS panel of the LEFT PANEL. This will sure that the shortcut buttons on the chart are set to 'optimize for Least Cost/Fuel with a Fixed Arrival'.

Alternatively, you may optimize for time using the shortcut keys **CTRL-L**.



The file name will be shown in the title bar. If several time optimization files are created, the naming process would be as follows:

[OriginalTrackName]_opa (1st file)

[OriginalTrackName]_opa1 (2nd file), and so on.

The .BVS extension is not displayed on the chart, but will be added to the file name in the Windows directory. Each track file can be renamed as desired: click **File| Save As| Track** (or **Template**), type the desired filename and click **Save**.

As explained above, the name extension of each BVS 7.0 track file is .BVS and the default location of the saved file is:

Voyage Tracks: C:\BVS7\data\track\

Track Templates: C:\BVS7\data\template\

After optimization, waypoints can be adjusted to suit particular navigational needs.

28.6 Optimization Mid-Voyage

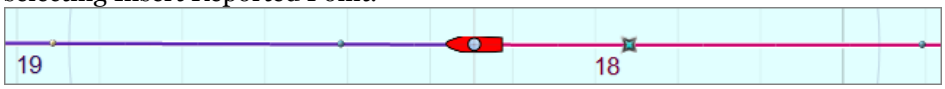
Optimization generally is done before voyage departure. BVS will use your departure point as the begin point for optimization and the arrival point as the end point.

After departure, however, certain factors may occur that will warrant the need for a new optimized route.

- A change in the forecast may bring to light potential adverse conditions which you now expect to encounter along your current voyage track.
- A change to your port rotation requires new arrival location
- An unplanned stoppage may occur

How do create an optimized route when sailing mid-voyage?

You'll first need to input a reported position by right-clicking the chart and selecting Insert Reported Point.



In the example above of a westbound voyage, the 18th shows a noon position that has been entered just east of vessel's current position. BVS will use this most recent position report as the START point for optimization by default.

If you wish to designate a starting point manually, Right-click either on the last reported point or somewhere in the future from this point along the track line. Now click **Optimize|Set Begin Point**.

If an end point is required, Right-click on the desired position along the track and click **Optimize|Set End Point**. The default End Point is the arrival position – if this is acceptable then no End Point needs to be set.

Right-click anywhere along the track and click **Optimize**. Select one of the three optimization options. Note that the option "Least Cost/Fuel Fixed Arrival" requires that you enter a specific arrival time for the "optimization end point".

Name the track as desired and click **Save**.

28.6.1 Track Alarms and Thresholds in BVS

BVS track alarms are designed to alert you to situations that might require your thoughtful consideration, possibly warranting tactical maneuvering of the vessel to avoid those unfavorable conditions. The Left Panel Snapshot tab allows you to set resonance-related thresholds.

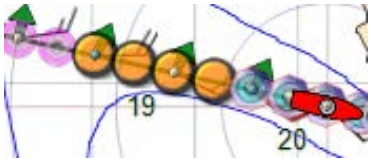
The Left Panel's TOOLS tab contains a "Thresholds/Constraints" button which opens a dialog to:

1) Display weather alarms along the voyage track. This is done in the "Alert Thresholds" section, on the left side of the dialog.
2) Apply sailing constraints to the Optimization feature, by entering the 'maximum allowed' values in each of the fields to the right, in the "Wx Optimization Thresholds" section.

Track Alarms

Regarding item 1 above, if track alarm settings have been entered and weather conditions along the track exceed those entered thresholds, a warning circle will be displayed at that specific point on the corresponding voyage track.

A track alarm will also display if the BVS track traverses a NoGo area or restricted sailing area. Alarms are displayed at 6-hour intervals along the track.



Once you have defined specific alarm constraints, any voyage track that is displayed on the chart will automatically be updated to display conditions that exceed the maximum allowed.

Optimization Constraints

Regarding item 2 above, values which are entered into the ""Wx Optimization Thresholds" section will define optimization restrictions such as Significant Wave Height, Seas, Swell and Wind Speed.

Each field can be input for the corresponding conditions: Head, Forward Quartering, Beam, Rear Quartering, and Following. The fields in the two sections apply to both PORT and STARBOARD sides of the vessel. The values entered are immediately saved.

Weather and optimization constraints are disabled when they are set to ZERO or left BLANK.

All future optimized routes will utilize these user-defined constraints.

29 Resonance

29.1 Introduction – BVS Resonance Features Basics

NOTE: Explanations of roll resonance conditions in this manual reference IMO Documents 016, 707, and 1228.

BVS's resonance feature analyzes each point of the active track for potential heavy rolling of your vessel. It uses your vessel's key parameters and calculates resonance values using current weather data for each calculated 6-hour position.

Resonance information is displayed in two areas on the BVS chart:

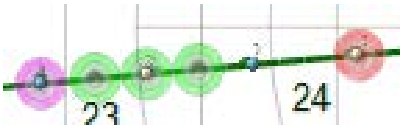
1) In the Left Panel Snapshot tab

2) Along the voyage track, as warning circles or 'alarms'

The displays and alarms provide information allowing you to adjust your route to reduce hazards.

29.1.1 Resonance Warnings Along the Voyage Track

BVS shows areas of higher probability for potential rolling as colored circles (ie: alarms) along the voyage track as shown in the image below:



Each color indicates a resonance type:

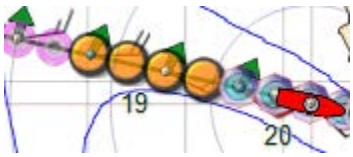
RED—Parametric Rolling

PINK—Synchronous Rolling

GREEN—High Wave Groups

BLUE—Surf-Riding/Broaching

An orange disk along a track means that multiple alarms exist for that position:



To see all related alarms for a specific position and time, right-click on one of the orange colored disks:

A menu will appear, with the alarm at the top. You can hover the cursor over an alarm icon to see a popup message describing that alarm.

BVS refreshes the displayed resonance information each time a new DR (Dead-Reckoned) Position is clicked on the Chart.

For example, when you select one of the other warning circles along the selected voyage track.

You can also move along the voyage track by using the Chart's Display Step Controls buttons "Previous Time Step" and "Next Time Step").

See also Section 19.1.3, Track Weather and Alarms.

29.2 Snapshot Tab: Resonance Graph and Controls

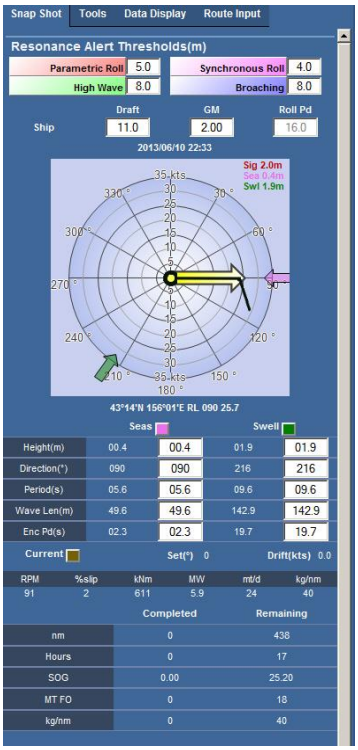
This section discusses the aspects of the Left Panel Snapshot tab.

The resonance display graph and resonance configuration items are on the Left Panel's Snapshot tab.

You can access the Left Panel Snapshot tab in either of two ways:

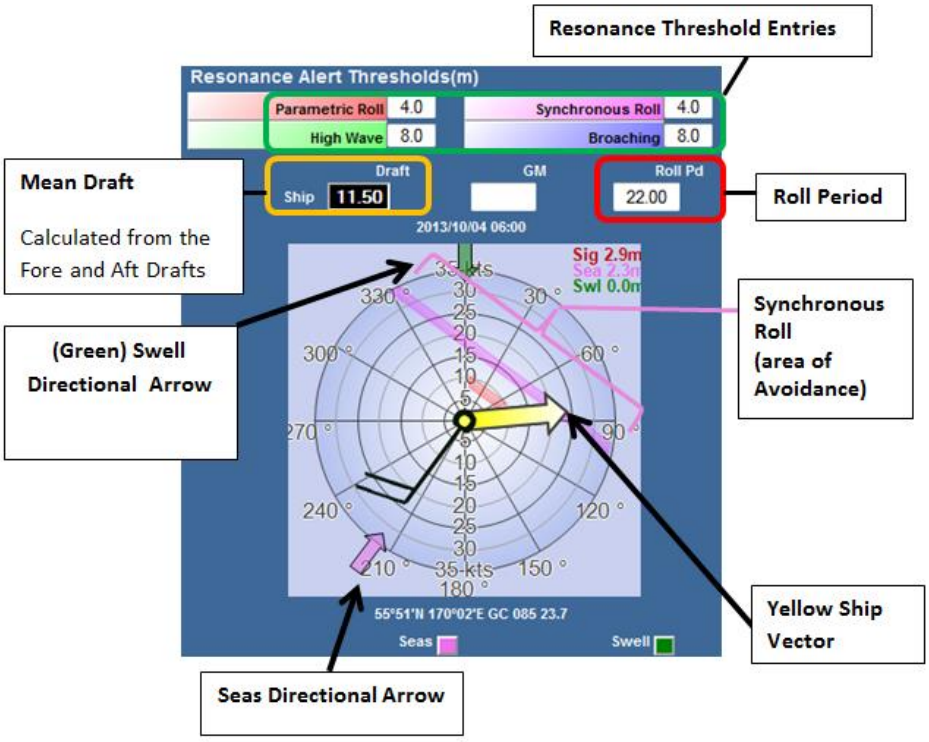
1. select menu option, View | Snapshot, or

2. on the chart, expand the Left Panel and select the Snapshot Tab.



29.3 Snapshot Tab Upper Area Elements

This section reviews the elements on the Snapshot tab. Their use is covered in other sections in this chapter.



Resonance Threshold Entries – Four user-defined fields identify the wave height threshold in meters for each potential roll resonance condition.

Roll Period – Used to calculate potential roll resonance. To the left is the GM entry field. This should only be used if the roll period is NOT KNOWN.

Synchronous Roll area – The pink colored band indicates an area of synchronous roll likelihood, IF the ship vector's point is encountered within the shaded area. Corresponding colors appear for each resonance type when the likelihood exists for that condition.

Yellow Ship Vector – Indicates vessel speed and heading at the current DR position.

Directional Arrows for Seas and Swell – The seas arrow appears in pink and the swell arrow is shown as green, indicating the direction of each.

Mean Draft – After the user defines the fore and aft draft for the Departure Point of the currently selected voyage, BVS will calculate the mean draft in the Snapshot tab.

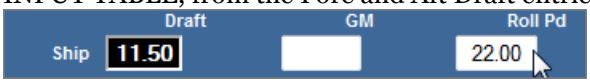
Date/Time – Date/Time of current DR position is shown above the graph.

Position/Heading/Speed – Below the graph you'll find lat/long position along with navigation type (GC/RL) from last waypoint as well as heading and speed.

29.4 Resonance: Voyage-Specific Settings

Prior to each voyage, details regarding DRAFT, ROLL PERIOD and ROLL RESONANCE THRESHOLDS should be entered.

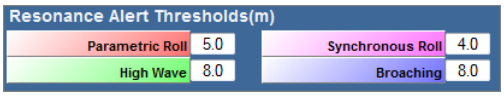
1. In the SHIP section, enter the Roll Period of the ship to calculate potential roll resonance. The display of the GM field will remain blank. The Mean Draft is automatically displayed by BVS & this data is taken from the ROUTE INPUT TABLE, from the Fore and Aft Draft entries.



   If the Roll Period is UNKNOWN, you may enter the GM. When the GM is entered, a calculated Roll will be displayed in Gray. **As mentioned in the prior paragraph, please be sure to enter the Fore and Aft Draft in the Route Input Table.**

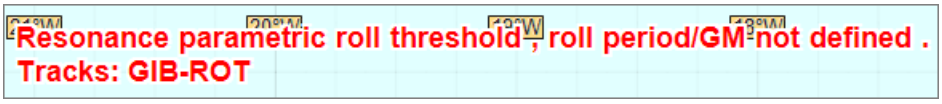
   The Roll Period should be updated as required to accurately predict potential roll resonance conditions. Ultimately, the user-defined Roll Period, or the BVS-generated Roll Period (derived from the GM) is used to predict potential roll resonance conditions.

2. Enter the appropriate details in the four Alerts/Thresholds fields:
   Parametric Roll
   Synchronous Roll
   High Wave Groups
   Surf-Riding/Broaching



3. If any of the threshold fields are left blank, 0.0m will be displayed and BVS will interpret each corresponding threshold as a full risk. This may cause an unreasonably high number of Full Risk resonance warnings to appear along the voyage track and in the resonance graph.

4. Also, If you have not entered any Resonance thresholds, BVS will display a red warning message at the upper left of the chart until they are supplied. The warning marquee is similar to the image below:

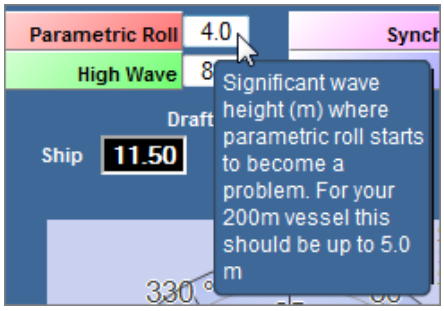


   In the above example, the resonance parameters for the track “GIB-ROT.BVS” are missing various values.

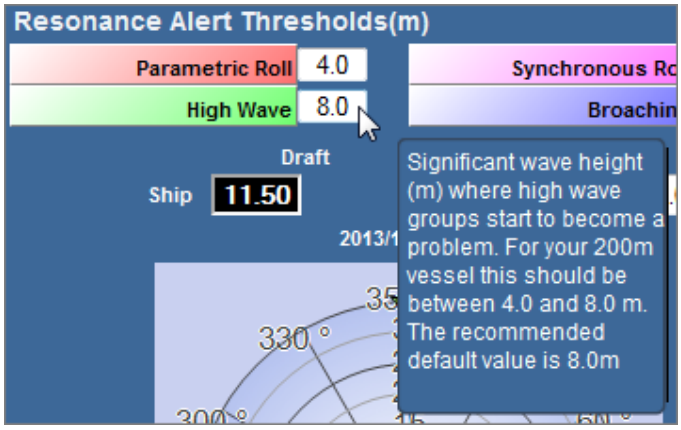
29.4.1 Resonance Tool Tips

Resonance tool tips (informational balloons) will appear when you hover over a specific entry field in the Resonance Thresholds area at the top of the Snapshot tab.

The tool tip will give a recommended value or range of values for that corresponding field, as in the parametric roll example below:

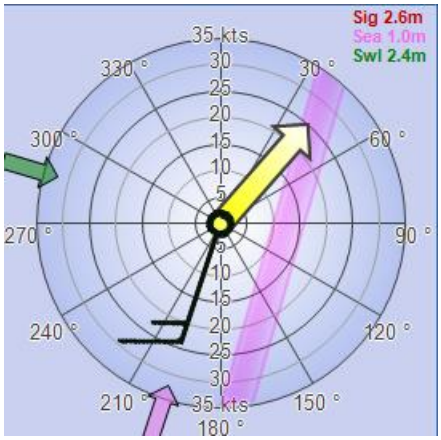


For the High Wave Groups and Surf Riding/Broaching fields, the IMO recommended maximum entry value is shown in the tooltip, as well as the suggested range of values and the 'recommended default value':



29.5 Resonance Graph Details

This section discusses the interpretation of data found within the Resonance Graph.



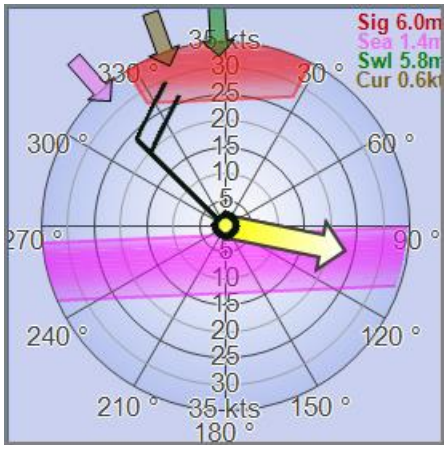
1. The yellow arrow in the center of the display represents your own ship vector. The direction of the arrow indicates the vessel's heading and the tip of the arrow shows the vessel's speed. In the example above, the vessel's heading is 041 degrees and speed is 26.0 kts. These values also displayed numerically, just below the graph, in white text. The example above shows the tip of the yellow vector in one potential area of concern, indicated by the dark pink risk area on the graph. This indicates that there is a high likelihood for synchronous rolling, due to the combined factors of the vessel's heading, speed and stability corresponding to one of the encountered wave trains.
2. The graph also shows Wind, Significant Waves, Swell and Surface Currents at the displayed vessel position.

   Wave arrows are also displayed on the chart to indicate the direction of Wind/Wave and Swell.

   The wind-wave (seas) arrow is pink: 

   The swell arrow is green: 

   These are shown in this example:



The following table also lists the symbols and measurements shown in the graph:

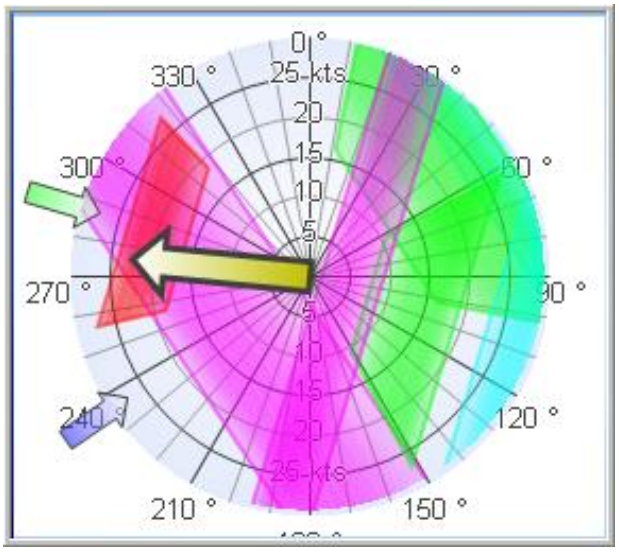
Data	Symbol
Significant Wave	Upper right, red text
Wind Seas	Pink Arrow & text
Swell	Green Arrow & text
Current	Brown Arrow & text
Wind barb	Black prong
Ship Vector	Yellow arrow

The value for each weather parameter is represented in the graph by the position of the arrow's tip. Swell and Wind/Wave information are displayed in the legend on the upper right side of the resonance graph.

Additional information regarding vessel performance at the current position are found in the table below the Snapshot graph.

29.5.1 Resonance Risk Types and Graph Interpretation

The colored resonance bars correspond with each type of risk. The width of the resonance fields indicate the course and speed restrictions. For example, this resonance graph shows a higher likelihood for Parametric and Synchronous rolling:



The resonance fields are color shaded with a darker color in the center of each area and a slightly lighter color towards the area's borders.

Parametric Rolling: The darker area indicates $T_E \approx 0.5 \times T_R$. The rolling amplitude will be higher when the tip of the vessel's vector is found in a darker area of the resonance bar as opposed to a lighter area near the border.

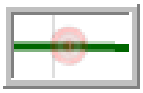
Synchronous Rolling: The darker area indicates $T_E \approx T_R$. The rolling amplitude will be higher when the tip of the vessel's vector is found in a darker area of the resonance bar as opposed to a lighter area near the border.

The resonance risks are displayed on the graph as follows:

Lighter Colored Bars appear when the wave height is between 50% and 100% of the threshold for parametric and synchronous rolling and when the wave height is between 80% and 100% for High Wave Groups and Surf Riding/Broaching conditions. This indicates a MARGINAL RISK.

Darker Colored Bars appear when the wave height is in excess of the threshold. This indicates a FULL RISK.

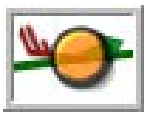
Warning circles will also appear along the voyage track on the BVS chart when the wave height is in excess of the threshold.

A marginal risk will display a smaller, lighter colored circle: 

A full risk display will show a darker colored circle: 

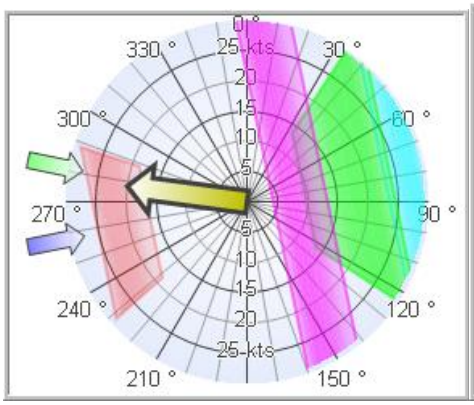
The graph on the left below shows from 229-289 degrees (lighter shading) indicates less likelihood of parametric rolling.

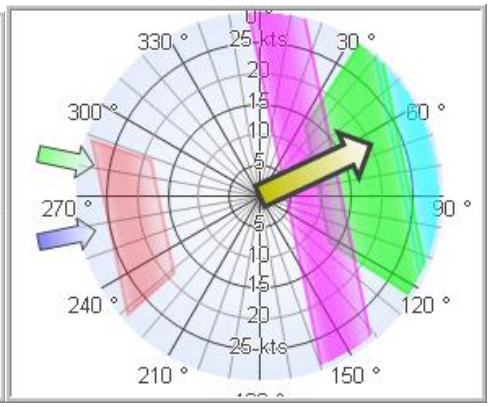
As shown in the waypoint image at the left below, when there is a potential for more than one roll resonance condition or weather alarm at the same track point, the alert will display as an orange disk. Upon right-clicking the orange alert, all corresponding items will display at the top of the popup menu as shown in the below right image.



The situation below indicates a marginal risk for that specific forecast period and for the displayed vessel speed & heading.

The example on the right (darker shading) indicates high likelihood of severe motions from High Wave Groups if vessel were traveling 14-25kts. There is full risk of synchronous rolling if vessel were sailing 5-13 kts.





In the example on the left, speed would need to decrease to less than 16kts or heading would have to be adjusted to less than 229 or greater than 289 degrees to avoid moderate parametric roll risk.

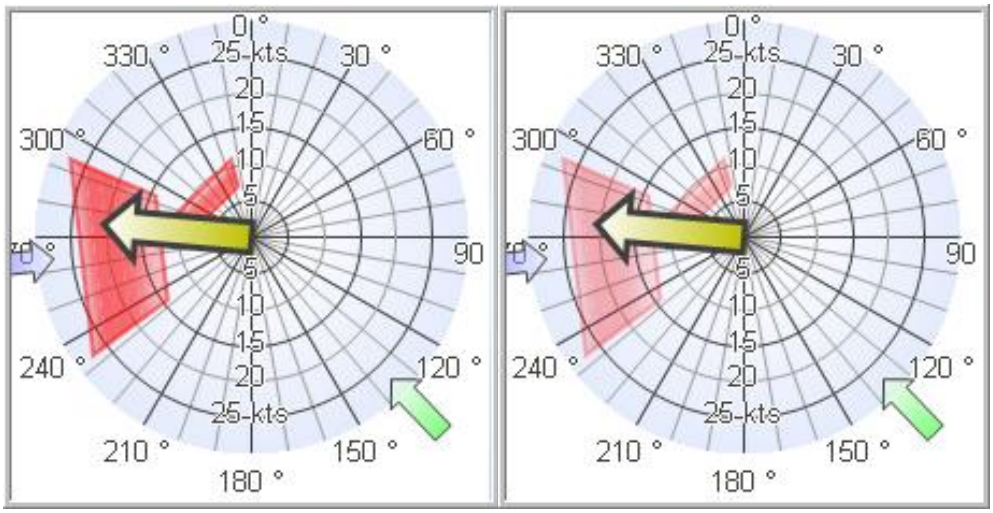
In the example on the right both course and speed would most likely need to be adjusted to avoid full risk of severe vessel motions.

NOTE: If there is a higher likelihood of rolling, the colors on the chart will appear with darker shading. You will also see 'colored warning circles' along the voyage track on the BVS Chart.

29.5.2 Parametric Rolling

This occurs when the encounter period (T_E) is half of the vessel's natural roll period (T_R), or ($TE \approx 0.5 \times T_R$). Furthermore, the vessel would be traveling with a small heading angle to the predominant wave direction (head or stern seas), wavelength would be comparable to ship length, wave height would be large and the roll damping characteristics of the vessel would be low.

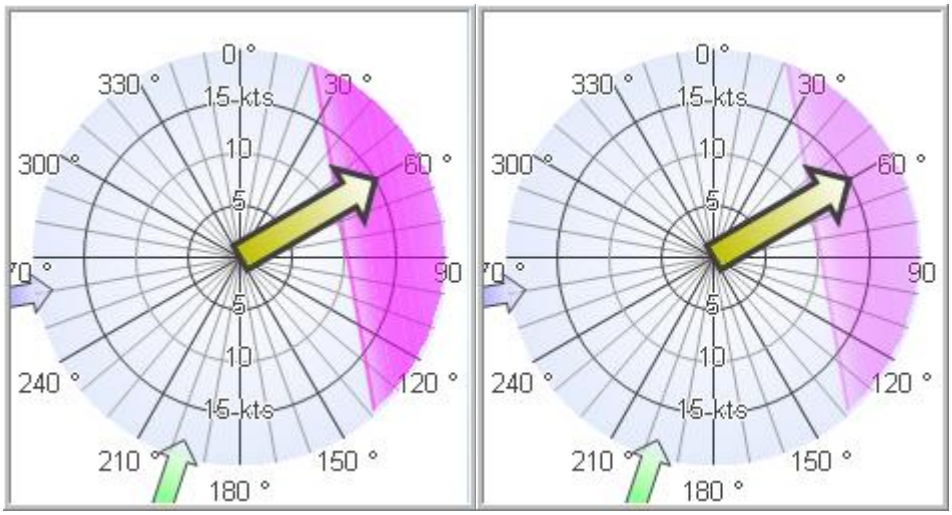
The graphs below show a likelihood of parametric rolling conditions during that period if the vessel maintains the displayed calculated speed and heading



The graph's display of either full risk or marginal risk conditions is directly influenced by the defined values which are entered in the SHIP; PARAMETRIC, SYNCHRONOUS, HIGH WAVE GROUPS AND SURF RIDING/BROACHING THRESHOLDS; and WEATHER PARAMETER fields (see 'Initial Settings'). **Therefore it is extremely important to ensure that all data fields have been properly defined**.

29.5.3 Synchronous Rolling

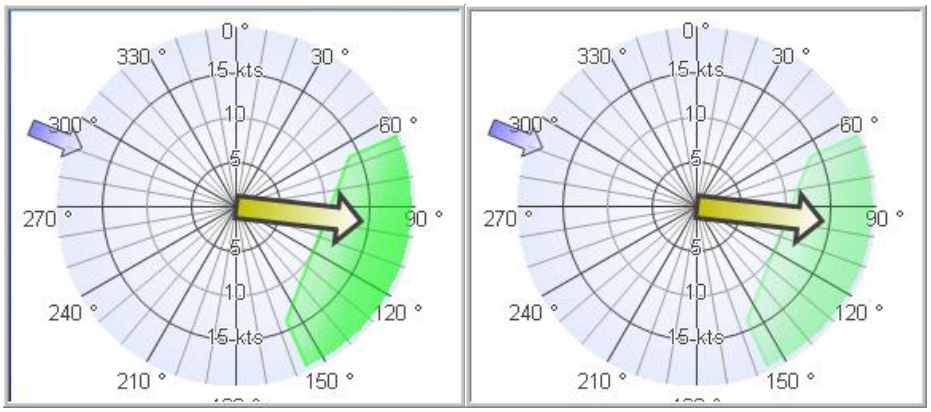
This usually occurs when the ship's natural roll period coincides with the encounter wave period, increasing the effects of the roll ($T_E \approx T_R$).



The graph on the left shows a high risk and the graph on the right shows less likelihood of synchronous rolling conditions during the displayed period.

29.5.4 High Wave Groups

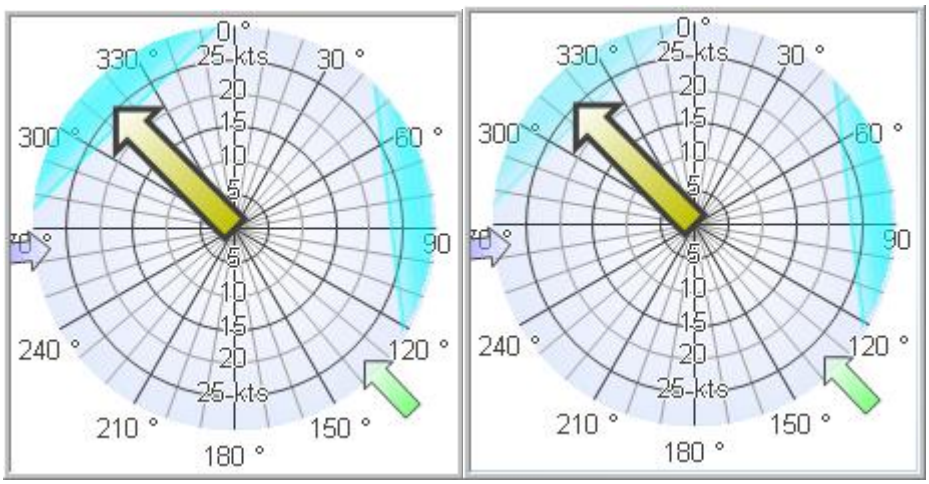
The ship will encounter successively high waves when the ship speed is nearly equal to the wave group velocity, which is a half of the phase velocity of the dominant wave components. The **maximum wave** height can reach almost twice the **observed wave** height of the sea state concerned.



The graph on the left shows a high risk and the graph on the right shows less likelihood of potential roll resonance from high wave groups during the displayed period and for the corresponding vessel speed/heading.

29.5.5 Surf-Riding / Broaching

When a ship is situated on a steep forefront of high wave in following and quartering sea condition, the ship can be accelerated to ride on the wave; this is known as surf-riding. When a ship is surf-ridden, the so-called broaching-to phenomenon may occur, which puts the ship in danger of capsizing as the result of sudden change of ship's heading and unexpected large heeling.



The graph on the left shows a high risk and the graph on the right shows less likelihood of potential surf-riding / broaching conditions during the displayed period.

29.5.6 Risk Factors Control Resonance Display

If the wave height is equal to or in excess of the individual wave threshold for a certain risk then the risk will be considered as a full risk (high likelihood) by BVS and the color of the risk zone will be brighter and a larger/darker warning circle along the track will appear.

For **SYNCHRONOUS** AND **PARAMETRIC ROLLING**: If the wave height is between 50% and 100% of the threshold wave height then the risk will be considered by BVS as a marginal risk (less likelihood) whereas a smaller and lighter colored warning circle along the track will appear and the corresponding risk zone(s) will be filled by a lighter color. If the wave height is less than 50% of the threshold, BVS will not indicate any risk. Hence, the need for proper thresholds settings.

For **HIGH WAVE GROUPS** and **SURF-RIDING/BROACHING**: If the wave height is between 80% and 100% of the threshold wave height then the risk will be considered by BVS as a marginal risk (less likelihood) whereas a smaller and lighter colored warning circle along the track will appear and the corresponding risk zone(s) will be filled by a lighter color. If the wave height is less than 80% of the threshold, BVS will not indicate any risk.

Synchronous Rolling Example: If the threshold limit were set to **4 meters**:

Full Risk = a wave height that is **above 4 meters**

Marginal Risk = a wave height that is **2 to 4 meters**

No Risk Displayed = a wave of **less than 2 meters**

BVS calculates the potential roll resonance display using the wind wave and swell data that is processed in each new forecast update (RKW) file.

Wind data comes from the GFS model and is updated four times per day.

Windwave is generated by BVS from the wind, swell and significant wave height data.

Swell data is generated when our WaveWatch III model is run on the incoming GFS model data. This is also updated four times per day.

For more information regarding the origin of AWT's forecast data, see Section 26.2, Data Sources for AWT's BVS Forecast Data.

29.5.7 Resonance Table: Calculator Functions

The Table below the Resonance Graph contains user-editable fields:

	Seas		Swell	
Height(m)	02.4	02.4	03.8	03.8
Direction(°)	182	182	220	220
Period(s)	04.6	04.6	11.5	11.5
Wave Len(m)	33.7	33.7	207.1	207.1
Enc Pd(s)	03.2	03.2	15.6	15.6
Current		Set(°) 154		Drift(kts) 0.6

The 'white' fields above are automatically filled with the BVS calculations for the corresponding computed point along the voyage track, but can be temporarily modified by the user. The **seas** column is on the left and the **swell** column is on the right side of the table.

The information displayed on the graph and in the **seas** and **swell** tables will return to BVS-calculated data when you either click on Next Timestep/Previous Timestep icon or when you click on a new position on the voyage track.

29.5.8 Printing the Resonance Graph

The resonance graph can be printed by holding down the ALT button and hitting the PRINT SCREEN key in the top row of the keyboard. This will copy the resonance graph to the clipboard, and will allow you to paste it to another program, such as Microsoft Paint, or a Word document.

29.6 Resonance FAQs

How do I determine the values to be used in the resonance thresholds fields?

Below, we have included a set of suggested values for the user. Please evaluate the suggested settings and ensure to choose an appropriate value for each of the threshold limit fields.

Here is a set of approximate calculations for suggested threshold input:

Highwaves(in green) & Broaching (in turquoise)
Threshold = **0.04 * shiplength (M) for vessels less than 275M.**
Threshold = **0.035 * shiplength (M) for vessels 275M and above.**

The **parametric** threshold (in red) is from the following table, based on ship-length in meters:

Vessel LOA	Threshold Limit
0 – 124.99M	3.0M
125 – 149.99M	3.5M
150 – 229.99M	4.0M
230 +	4.5M

Example: a 220 Meter vessel would use a setting of **4.0**.

The **synchronous** threshold (in violet) is from the following table, based on ship-length in meters:

Vessel LOA	Threshold Limit
0 – 124.99M	3.0M
125 – 149.99M	3.5M
150 – 229.99M	4.0M
230 +	4.0M

Example: a **140** Meter vessel would use a setting of **3.5**.

When making modifications to the Resonance Threshold Limit, please ensure to stay within the suggested range for each field.

What is considered a “Marginal Risk”?

Parametric & Synchronous Rolling:

A marginal risk is 50% to 100% of the user-input wave threshold value.

High Waves and Surf Riding/Broaching:

A marginal risk is 80% to 100% of the user-input wave threshold value.

What is considered a “Full Risk”?

Parametric & Synchronous Rolling, High Waves and Surf Riding/Broaching:

A full risk is when the wave or swell conditions meet or exceed the threshold value (found in the Alert Limit (m) field).

What is the impact when the threshold is dramatically changed?

If the threshold values are adjusted outside of the recommended values for your vessel, there is a potential for two possibilities:

Excessive false alarms if the threshold is set too low

The occurrence of severe motions without being detected by BVS when the threshold values are input too high.

How does BVS determine Marginal and Full Risk Roll Resonance likelihood?

When the wave length is significantly less than the vessel length, the wave train will be ignored by BVS to prevent false alarms from being displayed.

30 Additional Hazards

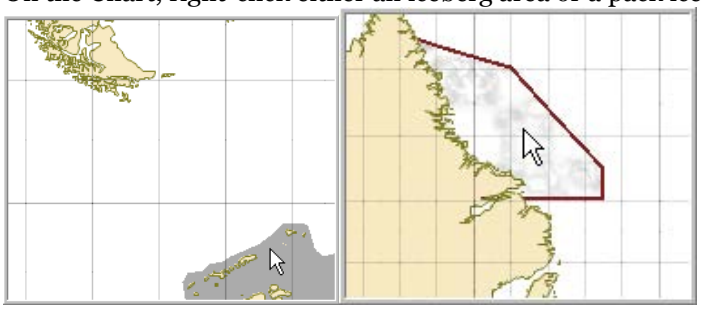
Vessel Icing and **Pirate activity** can be displayed on the BVS chart if these items are designated by the user in the One Time Email Delivery request configuration or in the Weather Data Delivery Configuration (for Broadband data collection and alternatively for Scheduled/Ongoing Email deliveries).

Pack Ice & Icebergs (similar to surface pressure, tropical storm tracks and fronts) are automatically included in your weather updates and the option to change the selection of this items appears 'grayed out' in the list of selections.

30.1 Pack Ice and Iceberg Display

Pack ice (image below, left) and iceberg regions (image below, right) can be viewed as follows:

1. On the Chart, right-click either an iceberg area or a pack ice area:



2. In the popup menu, you will see the option to "VIEW ICE REPORT":

   Select this option and the ice bulletin will appear in text format. Click the large "Open Notepad" button at the bottom of the text screen to view and/or print this bulletin in Windows Notepad.

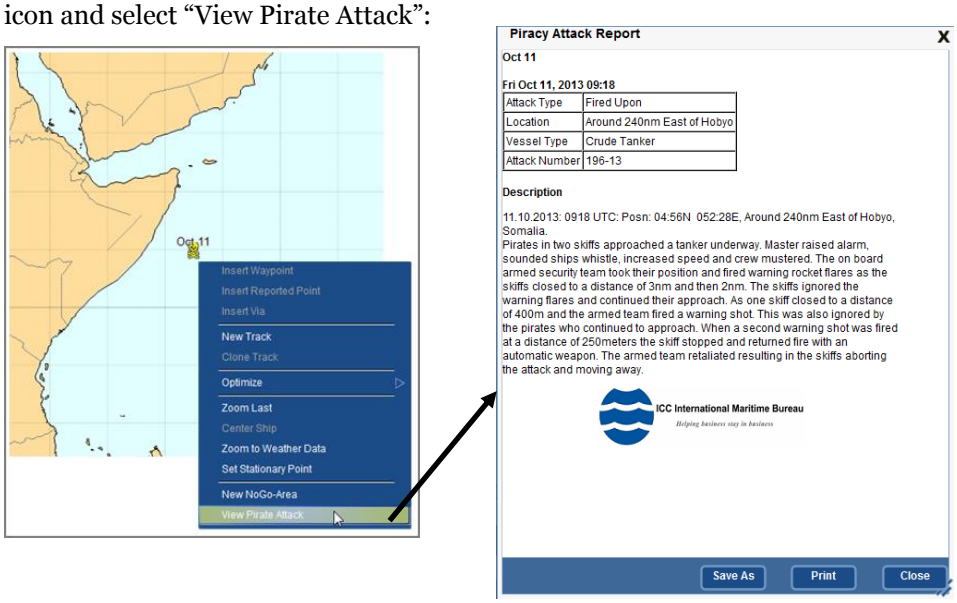
30.2 Pirate Activity

BVS supports display of up-to-date piracy information.

Piracy activity is shown on the chart as a skull and crossbones icon.

To enable the chart display of current locations for pirate activity, open the Data Display tab in the Left Panel, clicking **View | Data Display**. In the upper "Geographical" section, locate the "Pirate Attacks" option and place a check in the corresponding checkbox.

To view the details of a specific pirate event, right-click the corresponding pirate icon and select "View Pirate Attack":



31 Program Installation

BVS can be installed on one or more computers on a vessel. Note that in order for a BVS computer to access weather data reports sent by AWT, you must register the computer's hardware key with AWT, preferably at installation time or soon after.

31.1 Installing on Main Computer

(Program installation instructions are also given in the separate two-page "BVS Installation Guide")

For installation, you must be logged in as Administrator or have Administrator privileges. (If you do not have this status, Windows may present you with a message as in Step 8: "This program may not have installed correctly")

1. Insert BVS installation CD in your CD drive. Windows Autoplay should initialize the installation program.

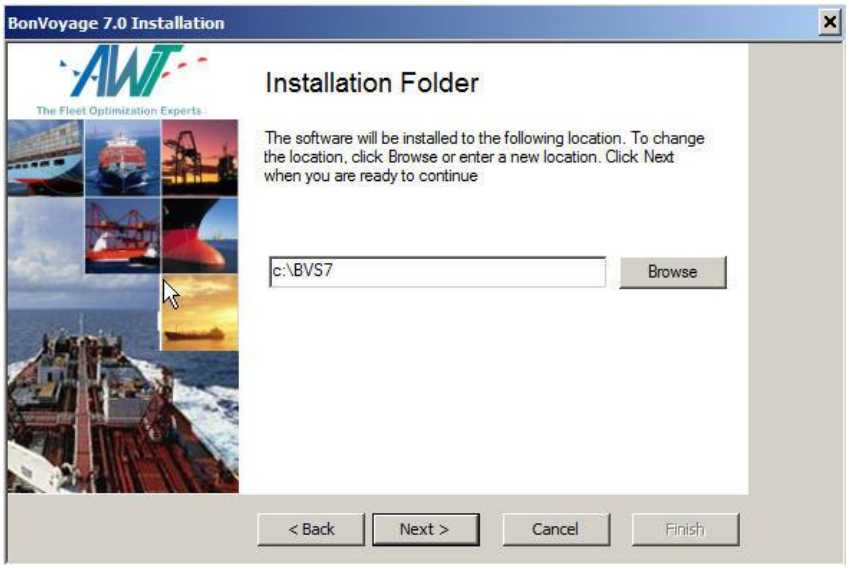
2. The first screen to appear is:

Click 'Next'.

3. The second screen appears:

Check the checkbox for "I accept the Agreement', then click "NEXT.

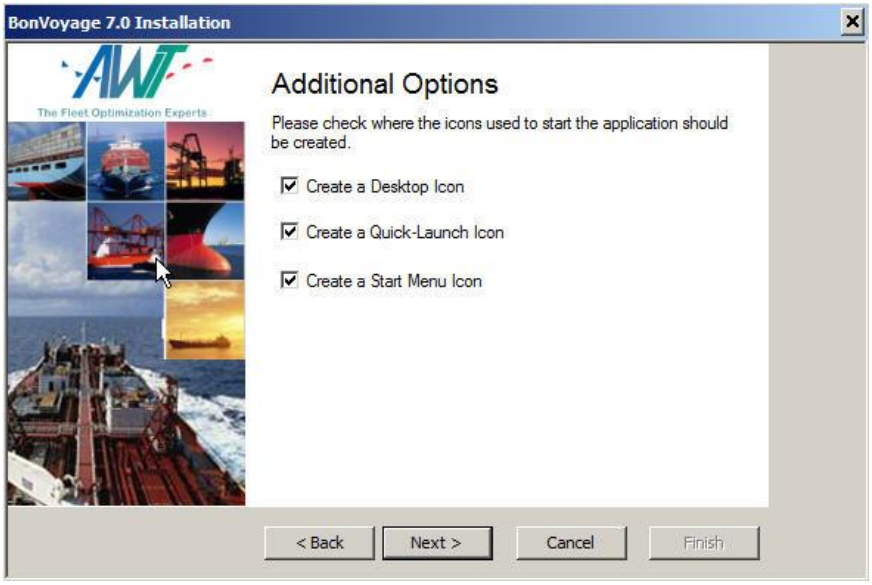
4. The third screen appears:



For a standard installation leave the default path unchanged, otherwise enter an alternate location on your computer or your Network using the "Browse" button. Then click 'Next'

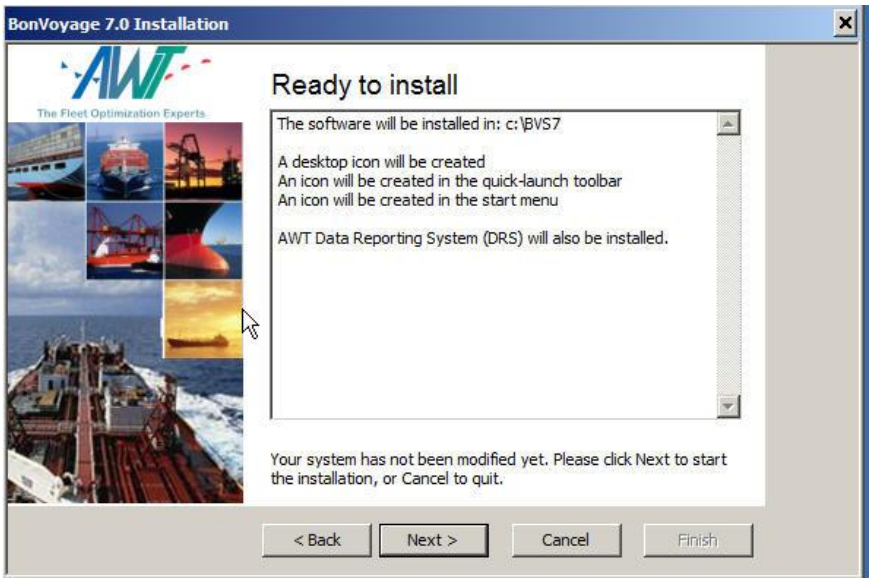
Note: BVS Requires a local installation on each BVS computer. Unfortunately, it is not possible to run the executable from an alternate computer, although weather and track data can be stored and shared on a Network.

5. The fourth screen appears:



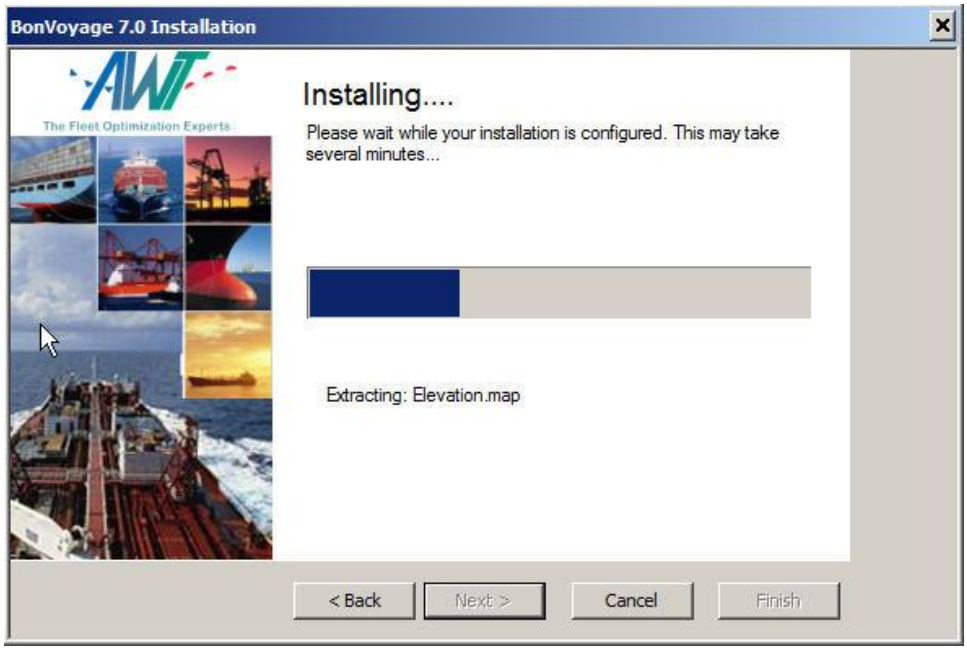
Default options are shown above. Modify if needed, then click 'Next'.

6. The fifth screen appears:



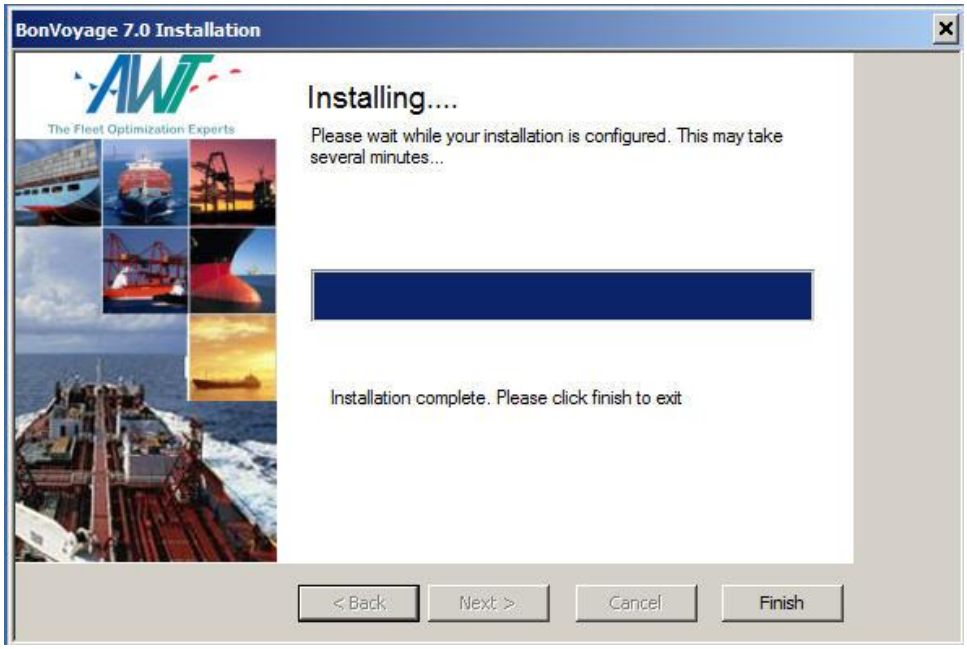
Click 'Next' to proceed.

7. The sixth screen appears:



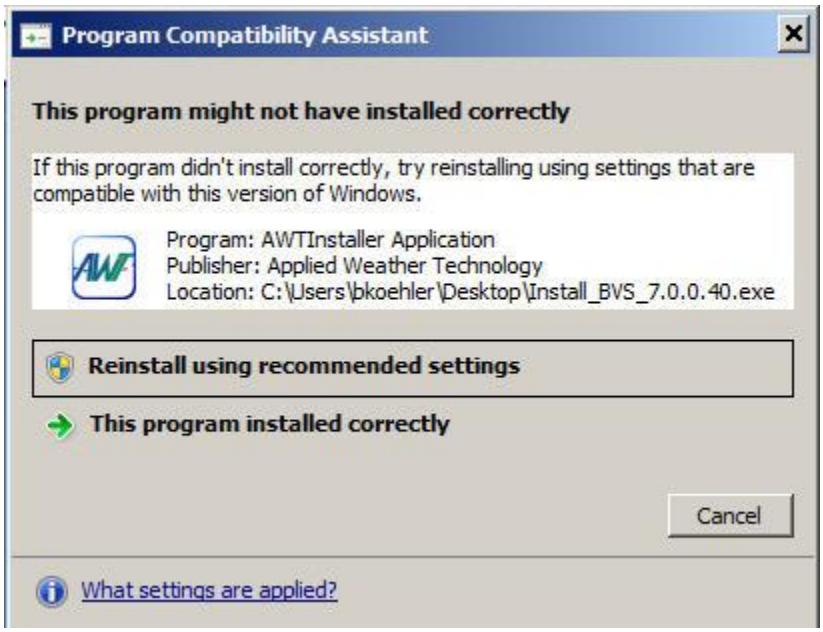
Installation may take between several minutes.

8. Once installation is completed, the seventh screen appears, displaying the **Finish** button:



Click ‘Finish’

At this point, if you were not logged on as an Administrator and this is Windows 7, the following message appears:



If you installed as a User with limited permissions/privileges, click “This program installed correctly’. (If you installed under Administrator status, this window does not appear.) You may be required to do the following:

a) Assign ‘all users’ read/write privileges to the folder “C:\BVS7” and it’s subfolders

b) Create a file association for the RKW file, so that it is opened in BVS 7.

If needed, send a request for support to bvs@awtworldwide.com for assistance. You will likely need assistance from your vessel management’s I.T. department as well.

9. Installation is complete.

You may now run BVS for the first time, using the Windows program menu or by clicking on its desktop icon. Proceed to Chapter 32 for initial setup instructions.

31.2 Installing on Additional Computers

To install BVS on a second computer, first follow the instructions in Section 31.1. Thereafter, you’ll need to ensure that you have created a Network Setup, using the instructions in Section 32.4 for additional BVS Computers.

Note that when you install BVS on more than one computer, there are several requirements for setup on the additional machines. These are:

1. Only the primary BVS system should make Broadband requests from AWT.

All Broadband data requests sent to AWT should come only from a single computer. Therefore secondary machines should not be enabled in BVS for broadband requests. The instructions in the initial setup procedure for Data Communications Options will guide you in implementing this.

2. Secondary BVS computers must create a "Network Setup" to access weather and track data from a designated location.

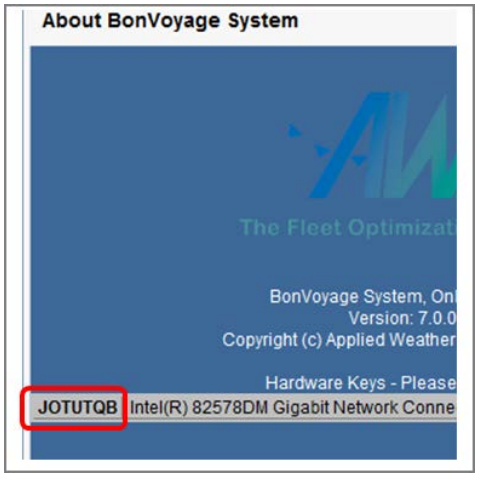
If you desire to have all computers access the same weather and track information, you will need to use the NETWORK SETUP option on any secondary BVS computer(s). It is expected that the primary computer will download and store incoming weather files and anyone who edits the active track file will be able to modify it.

The instructions in the initial setup procedure for Network Installation Options, Section 32.4, will guide you in implementing this.

3. Ensure that the Hardware keys for any secondary BVS machines are sent to AWT.

Because each computer that uses BVS must be identified by the BVS Data Server, any PC that needs access to the incoming forecast files must be registered with AWT. The hardware key can be accessed by clicking HELP | ABOUT, from the BVS menu.

An example of a hardware key is shown below:



32 BVS Initial Setup

This chapter provides instruction regarding the initial setup procedure, performed when you first install BVS.

After installation, a series of three dialogs appear to assist you in the proper 'initial configuration' of BVS.

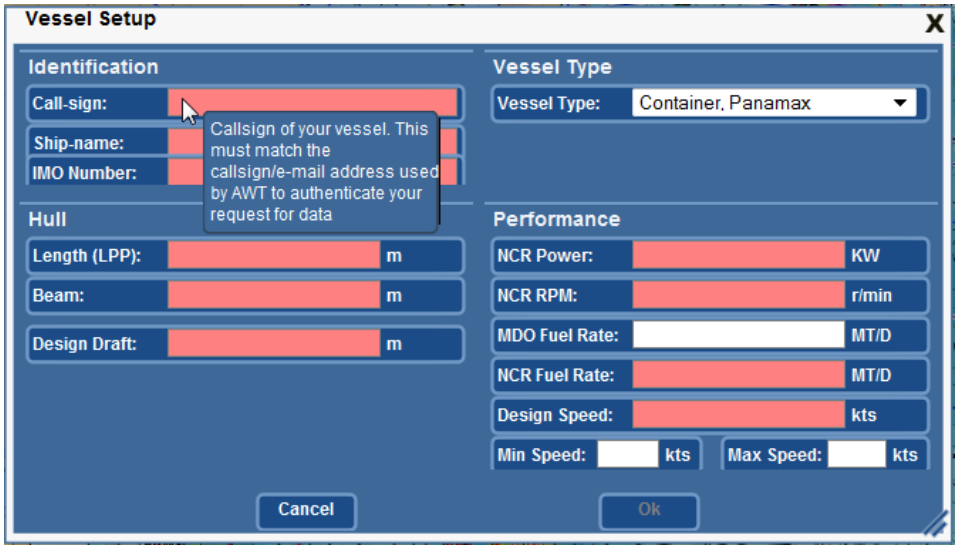
These three configuration steps (in bold) are explained below, along with three additional steps:

Item	Purpose
Vessel Setup	Provides BVS with the key operating characteristics of your vessel; used to calculate fuel consumption, roll resonance factors, speed down characteristics, etc.
Data/Communications	Used to configure the Broadband data collection option as well as email configuration options, data purging (from the hard drive), data size limit warning (for email option) and the track-send reminder.
Weather Data Delivery Configuration	Provides an interface for requesting weather region (for standard & high resolution data), specific weather parameters & delivery options.
Send Hardware Key to AWT	The Hardware KEY (also known as the CERTIFICATE) is generated from the MAC ID of your computer's Ethernet card. The KEY for each computer is unique and when multiple computers are running BVS, you need to send the KEY information for each computer to BVS Support. This will ensure that all computers can successfully access the incoming forecast updates.
Network Setup (optional)	The Network setup allows you to create support folders for storing: Weather data Track Files Administrator privileges are required and the "Weather" and "Data" folders for the above must allow 'all users' access so that weather and route data can be successfully accessed and written to these folders.
Speed Down Curves (optional)	Click the menu, SETUP | SPEED CURVES to access and modify the speed down configuration for your vessel.

All of the above configuration windows, with the exception of the Hardware Key dialog, are accessible from the **SETUP** menu. The Hardware Key dialog can be accessed from the menu option **HELP | ABOUT**. The settings can be modified, at any time, where appropriate.

32.1 Vessel Setup

1. Enter all vessel parameters below.



The Vessel Type is selected from a drop-down list. Every field requires a value to be entered.

Note: If you place the cursor over an empty data field, BVS will display a tool tip (help message), describing the corresponding field, as shown below.

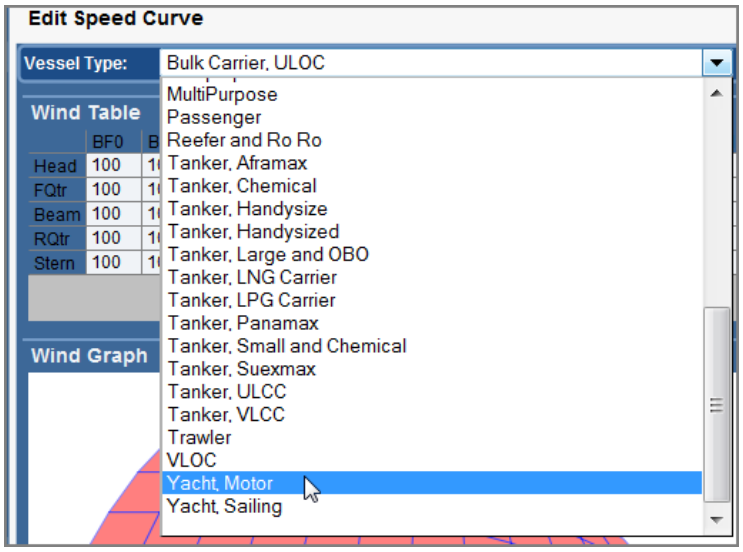
All fields require input and as you input information, the field's background will change from red to white.

Once all fields have been filled out, you will click "NEXT" (in the case of initial setup), or "OK" if accessing vessel setup after program is installed and configured.

32.1.1 Vessel Speed Curve Setup

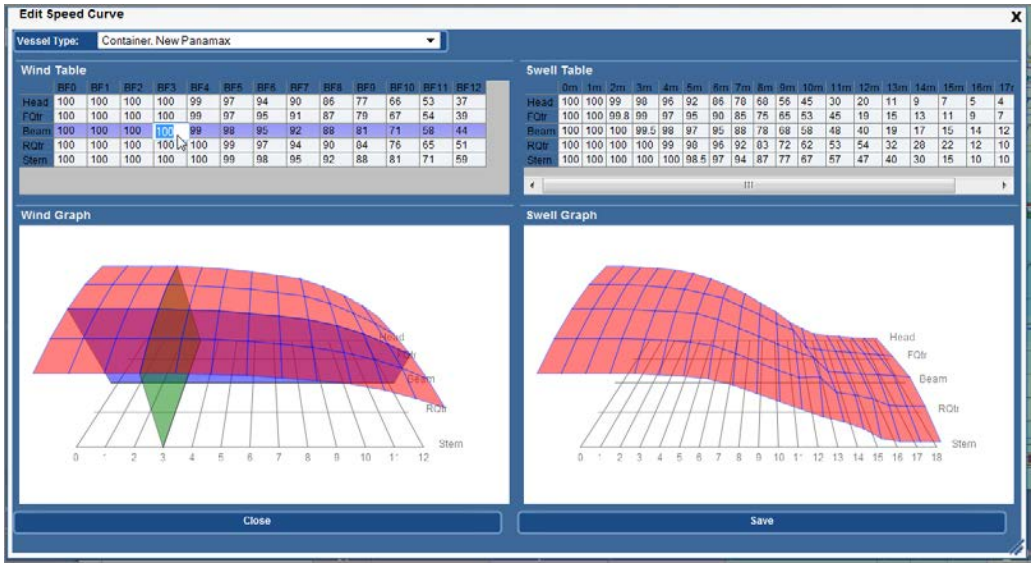
After the initial vessel setup is performed, the user has the ability to further adjust calculated performance in the Speed Curve configuration dialog.

BVS contains wind and swell speed down curves for each vessel type which can be accessed from the menu option, **Setup | Speed Curves**. The Vessel Type is selected from a drop-down list. In the example below, “Yacht, Motor” is currently highlighted by the mouse cursor.



The program provides the user with editable tables, allowing detailed adjustment of wind and swell speed down curves for increased accuracy in performance and in ‘future DR position’ calculations.

Every field requires a value to be entered. Clicking twice on an individual cell opens the edit option, as shown below:

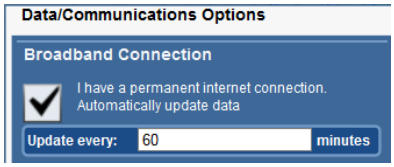


32.2 Initial Data/Communications Setup

The Data communications dialog allows you to configure BVS

32.2.1 Broadband Users: Configuration Instructions

BROADBAND USERS: The significant portion of the Data/Communications dialog is found in the upper left:



1. Check the box for "I have a permanent internet connection."

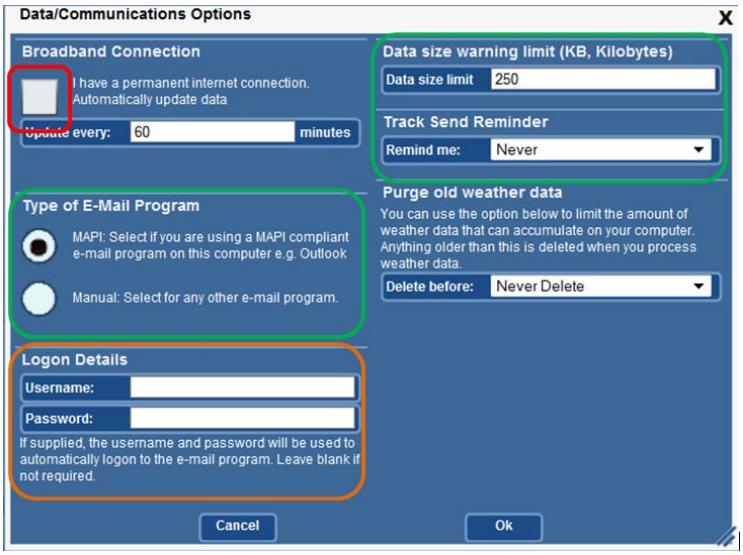
2. Set the update interval for requests to the desired value or leave the default value of 60 minutes.

3. Configure the PURGE OLD WEATHER DATA option, if you wish to remove accumulating historical weather data and free up space on your hard drive. The default setting is to NEVER DELETE archived data.

If you were to set this option to 30 days, then only the past 30 days of data would be maintained. Each time a new data set is processed by BVS, this setting is checked and old data (which is older than the user-defined setting) is removed.

32.2.2 Email Users: Configuration Instructions

EMAIL USERS: If you do not have broadband but will be using email to receive forecast updates:



1. **Broadband**—REMOVE the check from the box: "I have a permanent Internet connection."

2. **Type of Email Program**—Select the type of email program your system is using.

MAPI

If you are using Outlook/Outlook Express or other MAPI client email software, click on the MAPI checkbox. With this selection, BVS makes data requests by automatically placing an outgoing message in your email outbox; the message has the required file attachment for requesting a forecast update from the BVS Server.

Manual

If you are using a third party email program or if you experience any difficulties with the automatic method configuration, click on the Manual checkbox.

Note: if you select Manual method, BVS will open a special dialog window for an email when you are in the final stage of the Forecast Data Request setup process.

IMPORTANT NOTE: In order to receive the BVS forecast emails from AWT, you will need to ensure that your email service does not block the following email address domains:

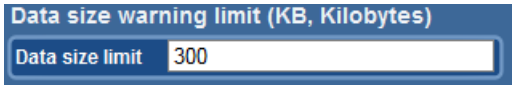
awtworldwide.com and

appliedweather.com

These two domains should be placed on your vessel's '**Whitelist'**.

3. **Logon Details**—Enter logon details for your "Windows Email Profile". **By default, this is usually left blank.** The logon details should only be used if you have multiple email profiles and are required to switch from one to the other for accessing various email accounts.

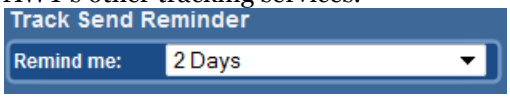
4. **Data Size Warning Limit**—Enter maximum allowed email size in Kilobytes (KB).



This will allow BVS to alert you when APPROXIMATE email file size is over this limit in the SCHEDULED request and ONE-TIME EMAIL DELIVERY request.

Note: because of the variations in weather patterns, seasons and ocean regions, this is only an approximation and actual forecast size may vary.

5. **Track Send Reminder**—This option defaults to "NEVER". Setting this option to every "ONE", "TWO" or "THREE" days will generate a kind reminder on the BVS chart to submit your active BVS track to bvstrack@awtworldwide.com. This is only required if your vessel operator has agreed to FULL WEATHER ROUTING, PERFORMANCE MONITORING, or AWT's other tracking services.



6. **Purge Old Weather Data**–Configure the PURGE OLD WEATHER DATA option, if you wish to remove accumulating historical weather data and free up space on your hard drive. The default setting is to NEVER DELETE archived data.

If you were to set this option to 30 days, then only the past 30 days of data would be maintained. Each time a new data set is processed by BVS, this setting is checked and old data (which is beyond the user-defined setting) is removed.

32.3 Forecast Configuration Instructions

There are three types of request configuration files:

1) **Scheduled/Continuous Deliveries**

   This option is found in the BVS menu: **Data | Weather Data Delivery Configuration.** The dialog contains seven steps, or tabs and is used to configure forecast region & length, data paremeters and delivery schedule (for email scheduled deliveries).
   The default file that is created is C:\BVS7\data\{callsign}-SchedReq.txt.
   This file is used for either:
   Broadband—when the Broadband check is enabled; or
   The BVS Server, for Scheduled Email Deliveries—when the above text file is sent to bvs7@awtworldwide.com and when the Broadband option is DISABLED.

2) **One Time Email Requests**

   This option is found in the BVS menu: **Data | One-Time Email Delivery of Weather Data**—The dialog contains six steps, or tabs and is used to configure forecast region & length, data paremeters.
   Note that the "delivery schedule" step is omitted—this option is only a request for one-time data delivery.

   The default file that is created is C:\BVS7\data\{callsign}-ImmedReq.txt.

   The sending of this file to bvs7@awtworldwide.com generates a ONE-TIME immediate delivery by email.

   Sending a One-Time request does not affect Broadband data collection nor your Scheduled Email Deliveries. If you wish to update your ongoing schedule, you need to create a new Weather Data Delivery Configuration (see Description 1- Scheduled/Continuous Deliveries, above).

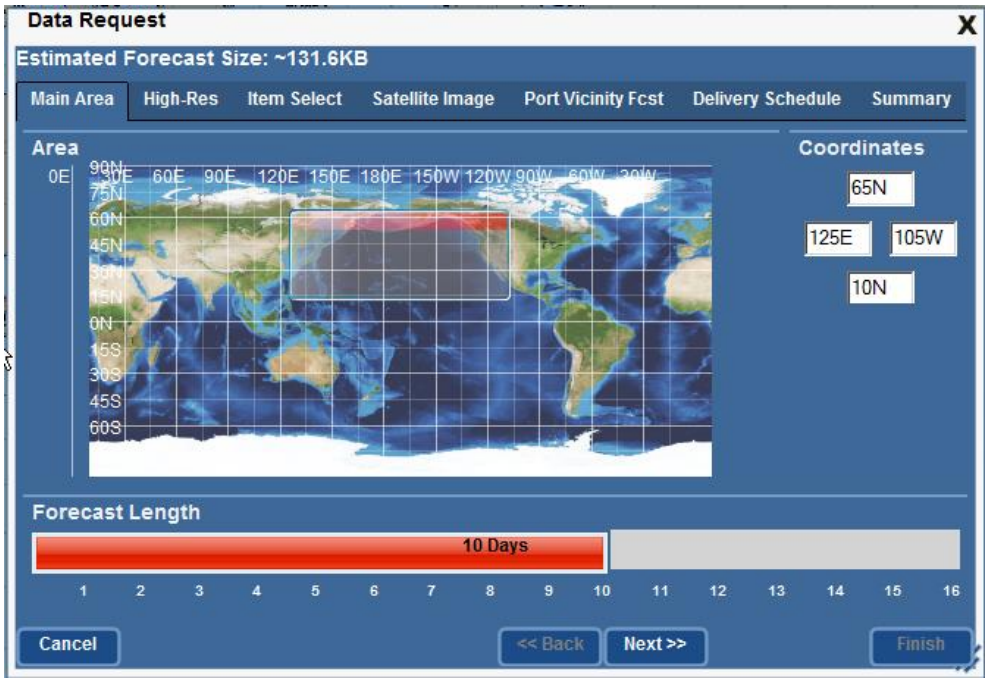
   NOTE: Section 32.3.1 below should be referenced when creating either a one-time email delivery, or when configuring your Weather Data Delivery Configuration (for either Broadband or for Scheduled Emails). For One-Time deliveries, you would disregard the tab titled "Delivery Schedule" (page 170, below) since a one-time request does not offer a 'scheduling' option.

3) **Stop Scheduled Email Deliveries**

   This option is found in the BVS menu: **Data | Stop Scheduled Data Delivery**—Selecting this from the menu will generate a popup message asking for confirmation that you do indeed wish to stop scheduled email deliveries. Click yes to generate an email message (if set up for MAPI email configuration).
   The default file that is created is
   C:\BVS7\data\{callsign}-StopSchedReq.txt

32.3.1 Weather Data Delivery Configuration

This is the next dialog to appear in the initial setup. It is called the Weather Data Delivery Configuration dialog. Access to this option is also found in the BVS menu: **Data | Weather Data Delivery Configuration**:

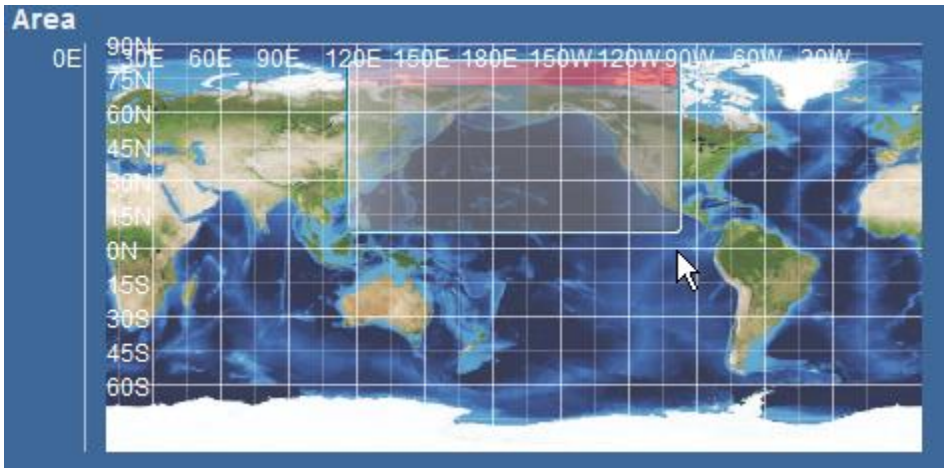


This dialog has seven tabs and opens with the "Main Area" tab. As you step through each tab, carefully consider the required region, forecast area size and required weather parameters, keeping in mind that lengthier forecasts and additional products will increase your forecast file size.

Below, you will find additional instructions for your guidance.

Main Area

The purpose of this tab is to select the "Main" forecast coverage area. This bounded area is used when selecting your weather parameters. This tab also contains a red slider which allows you to adjust the forecast length. When you adjust the forecast length (from one to 16 days), each 'main forecast file' will contain forecast information extending out to this specified length of time.



1. To define the main area of your forecast:

a) Place the cursor at the upper left edge (northwest corner) of the desired region. Click and hold the left mouse button, and drag the cursor down to the lower right. Let go of the mouse button in the desired southeast coordinate to designate the region. A selection grid, similar to the one above, will be displayed. With a left mouse click-and-hold on the grid, you can reposition it on the chart. You may also resize the grid as needed by dragging the edges of the grid.

The Coordinate values for the boundaries are displayed on the right side of the chart. Notice that the Estimated Forecast Size value shown at the top of the dialog will change to show the data size required for the region. This is useful when file size restrictions have been imposed by your vessel operator or email service, or to reduce monthly email costs.

2. Select a forecast duration, using the red selector bar at the bottom of the dialog:

To do this, HOVER the mouse over the red or gray area of the Forecast Length area WHILE holding down the LEFT MOUSE BUTTON. This will adjust the red slider to the desired forecast length. Notice again at the top of the chart that the Estimated Forecast Size varies as the forecast length changes.

3. Now, click the **Next** button to advance to the High Resolution grid selection tab.

High Res

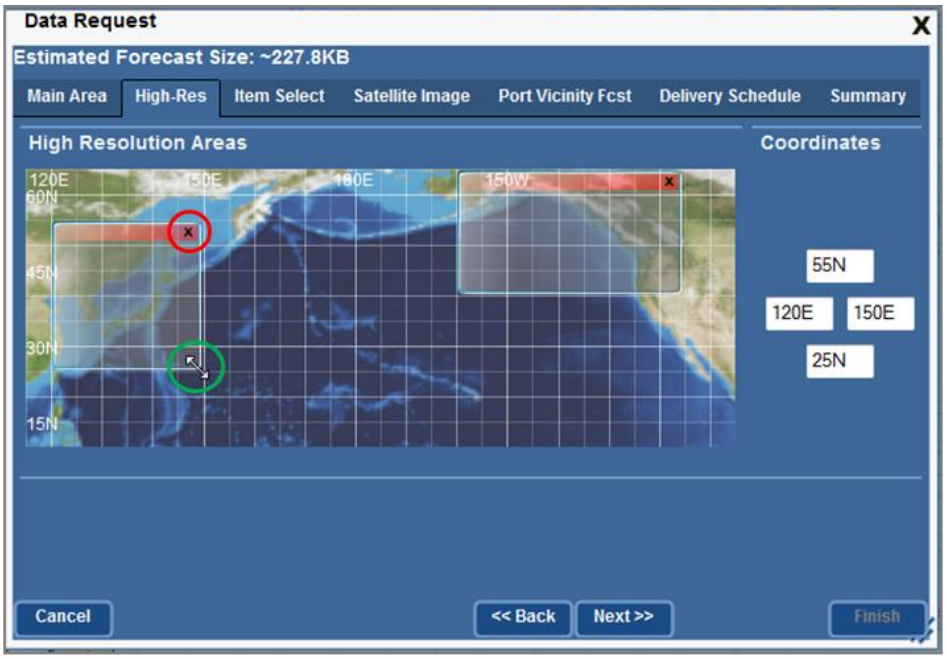
High Resolution nested grids are designed to provide you with a higher level of detail than that which the main forecast area provides, while minimizing overall file size, which would be greatly increased if High Resolution data were provided for your entire forecast region

Note that the amount of nested grids and their associated sizes will affect the overall size of your forecast files and keep in mind that a large amount of nested data can increase your forecast file size approximately 3 to 4 times, compared to the standard resolution data that is provided in your selected data region.

To select a high-res region:

1. Click and drag your cursor on the map; a small selection box will appear. The nested grid that appears can be moved or resized using the mouse, or by adjusting the lat/long coordinates to the right.

Below, the small 'X' in the upper right corner (identified in the red circle) can be used to delete the grid. If you position your mouse along the edge or at the corner of the grid, a resizing arrow will appear, as shown in the green circle below. Drag the mouse to adjust the size of the grid.



Note that you can create more than one high resolution grid.

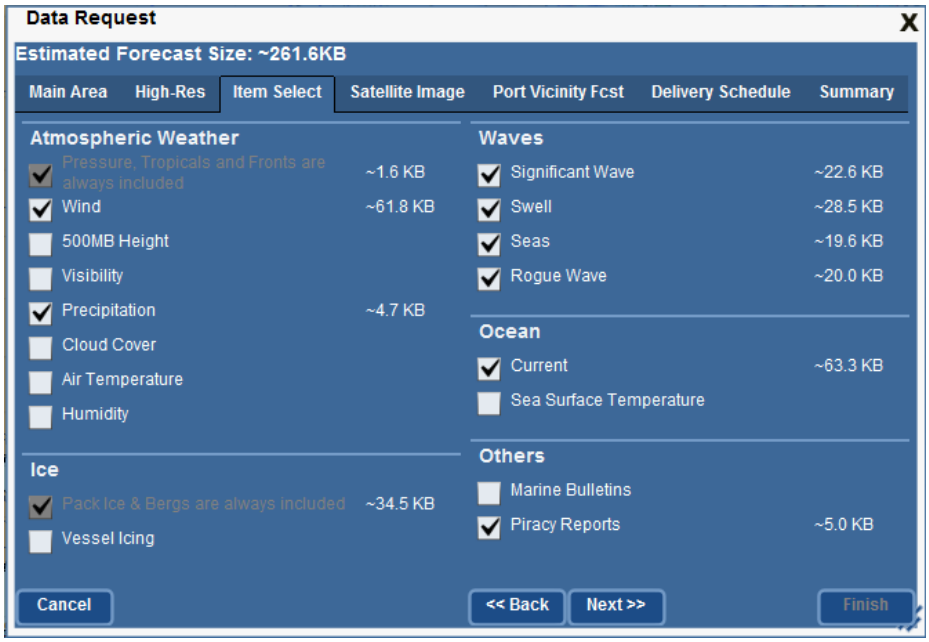
Each grid square is approximately 1600 square degrees (example: 40°x 40°; 50° x 32°, etc.).

2. When finished, click the Next button to advance to the Item Selection tab.

Item Select

The Item Selection tab allows you to designate the specific forecast and data items you wish to display on the BVS chart.

In the example below, all 'selected' items would be included in the forecast updates.



Note that the following items are ALWAYS included with your forecast updates, and appear 'grayed out' and with an irremovable checkmark:

Surface Pressure

Fronts

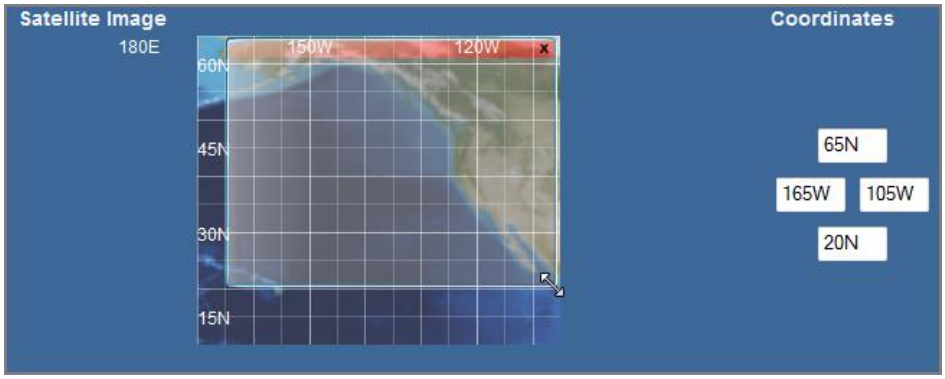
Tropical Storm Tracks

Pack Ice Areas

Ice Berg Areas

Satellite Image

The purpose of this tab is to set the boundaries for a satellite image display region.



To select a region:

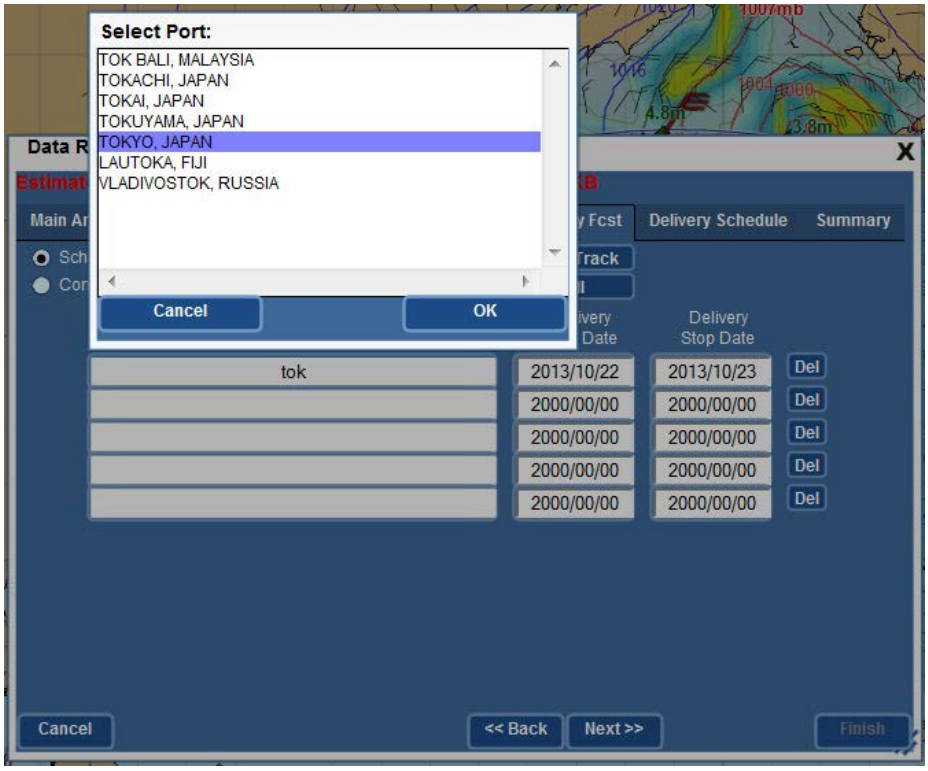
1. Click and drag your cursor on the map; a small selection box will appear. The nested grid that appears can be moved or resized using the mouse, or by adjusting the lat/long coordinates to the right.

Note that you will receive a 'still' (non-animated) image.

2. To proceed to the Port Vicinity Forecast tab, click the **Next** button.

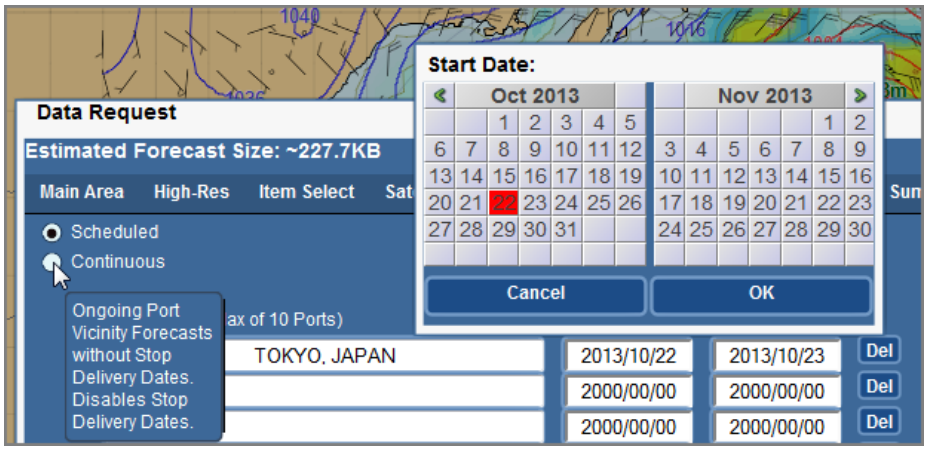
Port Vicinity Forecast

The Port Vicinity Forecast tab allows you to select specific ports whereby an extensive forecast is provided for the associated port location. In most cases, the data is based on a nearby airport or it will be for the closest weather reporting station to the port, so actual port conditions may vary.



To configure Port Vicinity Forecast locations:

1. Type in the Port Name. As you type, if the port is available, it will be displayed on the "Select Port" list (see image above). Select the desired name from the list and click OK.



2. Next you will need to select a START date, then a delivery END date if you wish only to receive port forecast information during your port stay. The START and END date calendars appear sequentially. Note that if you click on the "Continuous" radio button to the left (as shown in the tooltip description, in the above image) the port forecast information will be continuously delivered.

3. Up to 10 ports can be entered. When you have finished with this configuration, click Next.

Delivery Schedule

The Delivery Schedule tab allows you to configure the **email** start and stop dates, as well as the **email** delivery frequency. You may request that the Forecast data be delivered up to four times per day.

Note: The delivery times in this dialog apply only to email deliveries. If you have setup your system for Broadband data collection, you will automatically receive forecast updates immediately after they become available on the BVS Forecast Server.

To configure your scheduled data deliveries:

1. Select a Start Date. Click the Start icon. A calendar appears. Select the desired start date.

2. Place a check in the "Continuous" box if you wish to have ongoing deliveries (with no end date). Otherwise,

3. Click the End button and select a termination date for forecast deliveries. This will halt deliveries on the specified date (You will eventually need to resubmit a schedule to reinitiate email data deliveries).

4. Set up Delivery Time(s). **Recommended times**, when data is most up-to-date is shown above the drop-down delivery hour fields (**03z, 09z, 15z & 21z**).

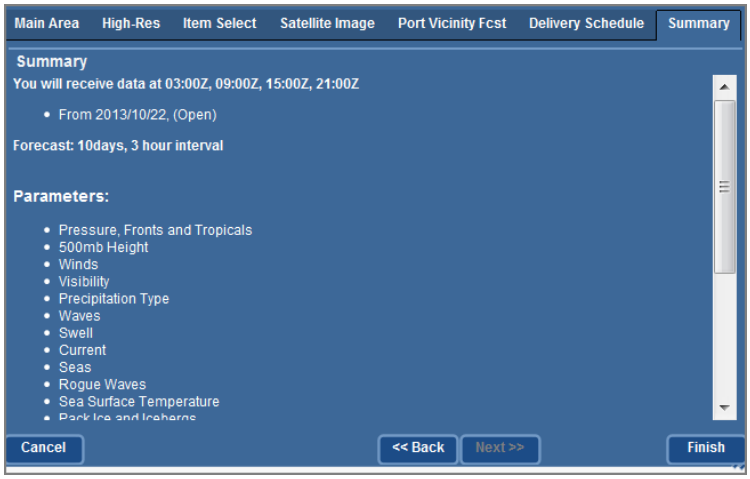
5. Special Updates / Tropicals

This option allows you to receive by email the most recent tropical storm forecasts. The files sent to you would be quite small, about two to three Kilobytes in size, but would ensure that you have the most recent information regarding storm intensity and movement.

When finished, click the 'Next' button.

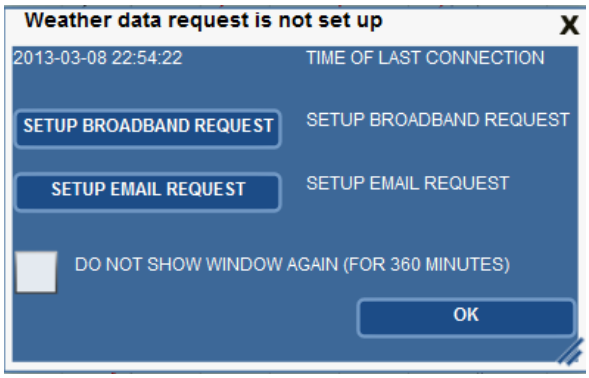
Summary Tab

The summary provides you with an overview of your forecast selections.



Click 'Finish'.

If you have activated the Broadband data collection option and you are not currently connected to the Internet, BVS will display this dialog.



Click OK to continue, then ensure that your Broadband connection is established, or if you are only receiving EMAIL UPDATES, disable the Broadband connection checkbox in the **Data / Communications** dialog found in the **Setup** menu.

For the email users, you will need to send the Scheduled Request file to bvs7@awtworldwide.com.

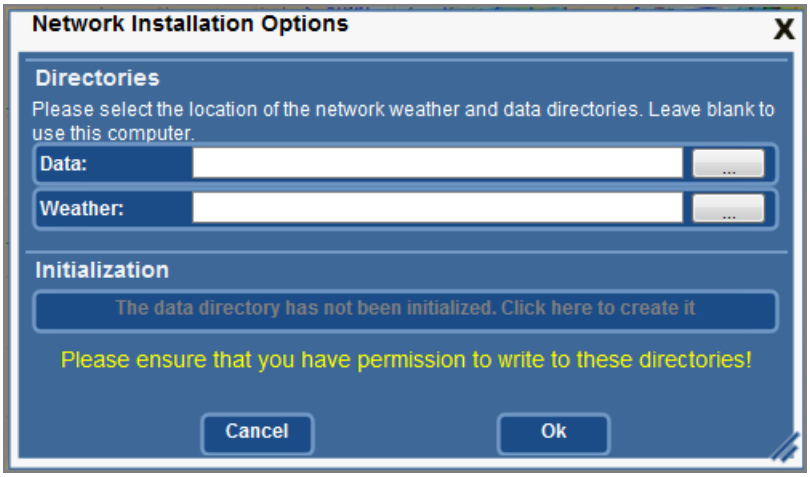
The default file location is: C:\BVS7\data\{callsign}SchedReq.txt.

32.4 Network Setup

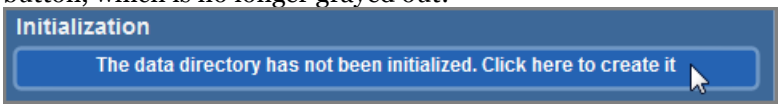
BVS 7 can be configured to share route files and weather data across your computer Network. Voyage Tracks are saved to and accessed from a common location. Weather data is stored on both the local machine and on the assigned Network location. Creating 'dual location access' to weather data ensures that it is not only up-to-date, but also it is more efficiently rendered on the local user machine. The Network Setup dialog will appear when BVS 7 is first opened. The Network configuration can be found in the Menu bar, selecting **Setup | Network Installation**.

To customize the Network settings:

1. From the Menu bar, select Setup | Network Installation.
2. The following window appears:



3. Enter the folder location for each category: Data & Weather. You must use the browse button to locate a Network folder—the 'browse' dialog does not allow you to type in the path from the keyboard.
   It is recommended that subfolders are created for each of the two categories above. This will help organize storage of this BVS data.
   NOTE: THE TWO "DIRECTORIES" FIELDS SHOULD BE LEFT BLANK if you want to maintain the default file storage locations:
   C:\BVS7\data
   C:\BVS7\weather
4. The Network folders should have been created in advance. Once you select the two directories, you will need to click the following 'long' initialization button, which is no longer grayed out:



5. The OK button will not be accessible until you have created the required folders and clicked the initialization button. Click OK to save your settings.

32.5 BVS 7 Display Options

32.5.1 Weather Data and Chart Data Display Options

The Data Display tab in the Vertical, or Left Panel contains controls for viewing and for modifying certain items and features. These include:

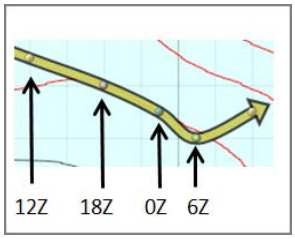
- NoGo Areas
- ECA zones, Time Zones, & Load Lines
- Port Name, Pilot Drop Points, Capes and Straits
- Hazards- War Risk and areas of recent Piracy incidents
- Dialogs for Port Vicinity Forecasts, Bulletins and Satellite Imagery
- Size and Visibility controls for track and chart symbols & display items.

To open the Data Display tab:

1. Click the BVS menu option: **View | Data Display**.
2. The Geographical and Weather items mentioned in the bullet points above are controlled with a checkbox, which enables the display on the chart of each corresponding item.

3. Adjust Geographical or Weather settings as needed.

4. The Low Track option controls the length of the directional arrows found in the center of the low surface pressure systems. Sliding the controls to the right will lengthen the track arrows & sliding to the left will shorten them. The arrows are show in 6-hour increments. Example:



32.5.2 Track Display Options

These settings customize the display of track symbols and of the chart grid.

Adjust parameters as needed, using the slider for each corresponding item. The Left Side Panel can be collapsed or you may open an alternate tab when you are finished.

32.6 Hardware Key Setup

Background

AWT provides BVS with a “site license”, allowing you to install the program on any local computer. However, each computer must be identified so that the forecast updates can be accessible by each.

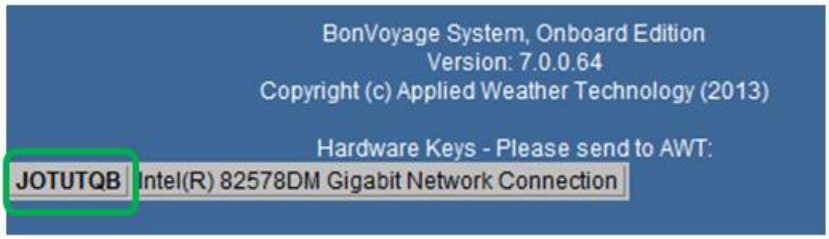
AWT is able to verify your BVS account and maintain accessibility for you, using two specific items:

1) Your Vessel (or account) email address.

2) Your Hardware Key(s)

The BVS Hardware Key (or "Certificate") is a special 7-digit code that is created from the existing MAC ID of your Ethernet hardware and/or your Wireless Network hardware on your BVS computer. It allows AWT to identify each computer.

Below is an example of the Hardware Key, which can be found in the BVS menu: **Help | About**.

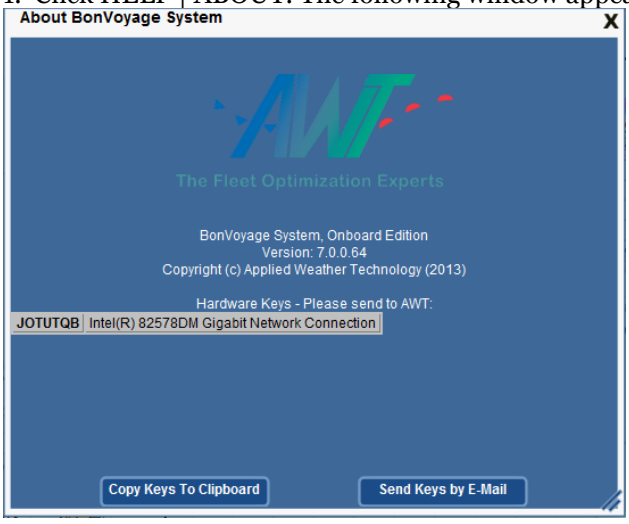


After installation and initial setup of BVS, you should submit your Hardware Keys to AWT.

How to register a Hardware Key with AWT

For email based systems you must manually report the machine key to AWT, using either of two methods, to obtain registration.

1. Click HELP | ABOUT. The following window appears:



Option 1: Send the Key(s) automatically by email.

1. If you are configured for MAPI email (using Outlook or Windows Live Email), click the button, “Send Keys By Email”.
2. This will generate an email message with the required text in the message body (including the 7-digit key).
3. The email should be sent to the support team: bvs@awtworldwide.com

Option 2. Manually send the key

1. Click the “Copy Keys to Clipboard” button.

2. Create a new email message, then put the cursor in the text body area and paste your BVS key information in from the clipboard, using CRTL-V or the Edit | Paste menu item.

3. In the message header line put : Key registration

4. Send the email to: bvs@awtworldwide.com

32.7 Hardware & (BVS) Software Upgrades

Hardware Changes: If you have upgraded your computer or the motherboard, you will need to send in the new Hardware Key.

Upgrading software, from a previous version of BVS: If you are upgrading from BVS 6 to BVS 7, no special additional key registration action is needed.

Running BVS 6 and BVS 7 simultaneously: BVS 7 installs in a separate folder and will not overwrite nor affect the BVS 6 installation, although at a certain point when you feel comfortable, you may want to remove BVS 6 from your Windows computer.

Processing Weather Data: BVS 6 data will open in BVS 7, however new or modified products will not be found in the BVS 6 forecast files, such as:

Piracy Information
Port Vicinity Forecasts
Rogue Waves
Seas
Humidity, etc.

You will need to submit a new data request (either through Broadband or by email) to receive all BVS data options.

Appendices

Appendix A Glossary

Term	Definition
Active Voyage Track	An Active Voyage Track is the route that has been given the "active track" assignment in the BVS program.
Alert or Alarm	An on-screen display signaling presence of a specific condition of concern
Broadband	High-speed and high capacity Internet-based data communications means.
Email	Electronic mail with file attachment capabilities
ETA (estimated)	A computed estimated time of arrival
ETA (fixed)	A defined time of arrival, usually identified by vessel operator as your RTA (Required Time of Arrival)
Forecast length	This is the length of the weather data forecast, that is, how far ahead it stretches.
High wave groups	A risk condition where the ship will encounter successively high waves when the ship speed is nearly equal to the wave group velocity.
Interpolated points	Computed points found at 6-hour intervals along the voyage track
Optimized track	A BVS-generated track that has been optimized according to the user-selected criterion (least cost/fuel consumption, or least time enroute),
Parametric rolling	Rolling that occurs when the encounter period ($\mathbf{T_E}$) is half of the vessel's natural roll period.
Piracy symbols	Piracy symbols (colored skull and crossbones indicating various types of pirate activity) are placed by BVS on the chart at specific locations where recent pirate activity has been reported.
Port forecast	Predicted weather conditions for the port vicinity.
Region	A user-defined area of the BVS chart submitted to AWT. Used to generate corresponding weather & chart data
Resonance	Severe motions, caused by sudden large roll amplitudes, which have the potential of causing cargo loss or damage.
Restricted Areas	Mandatory NoGo areas.
Route	A route is the pathway from a geographical starting point to a specified end point.
Slamming	Predictions of slamming are not shown in the BVS resonance display. However, this explanation is provided for your reference: Slamming is a risk condition from wave impact in the bow section of the ship, at flat bottom sections, and at the upper bow flare. For modern container ships, slamming may also occur at the stern section due to flat bottom design. The impact loads are highly

Term	Definition
	concentrated in a very short time period and may result in damage of local structure and accentuate structural vibration throughout the hull, also known as whipping.
Surf-riding	A risk condition where a ship is situated on a steep forefront of high wave in following and quartering sea conditions—the ship can be accelerated to ride on the wave.
Synchronous rolling	A resonance condition where the ship's natural roll period coincides with the encounter wave period, increasing the effects of the roll.
TAU	The forecast time step, TAU zero being the "NOW TIME". TAU 12 would be twelve hours into the future, etc.
Track	A track is route data in the form of a set of waypoints. It is displayed on the chart in graphical form, and the data appears in table format in the Left and Bottom panels.
Track alarms	A track alarm indicates a condition over a set limit and is displayed on the track as a warning circle. Typical alarms are displayed for roll resonance, weather conditions exceeding user-defined limits and crossing through NoGo areas.
Track Input Table	Table for editing and display of the currently selected voyage track
Track template	A track template is created by the user for commonly sailed routes. It contains departure & arrival points, and any additional waypoints that have been input by the user. It is saved with an XML extension.
Track symbols	The symbols shown at each track point, including the ship symbol, waypoints, computed points, weather symbols, etc.
Waypoint	A key navigation point along a route.
Waypoint symbol	A BVS graphic (icon) identifying a waypoint on the BVS track
Weather symbols	Symbols on the chart which indicate specific weather conditions at the corresponding location.

Appendix B Communications

B.1 AWT Communications

What address should I use for email communications?

AWT provides various services. To help expedite your messages, please ensure to send your email to the appropriate address identified below:

BVS Software Support: BVS@awtworldwide.com

For program troubleshooting and BVS-software related issues

BVS Automated Forecast Requests: BVS7@awtworldwide.com

For sending immediate and scheduled forecast data requests

BVS Voyage Track Send: BVStrack@awtworldwide.com

For sending your intended route from the BVS program interface

AWT Data Reporting System (DRS): awtdrs@awtworldwide.com

Send noon positions using the DRS software interface.

AWT Route Operations Staff: ops@awtworldwide.com

Used for route discussions, requesting route assistance, etc.

As shown in the above email addresses, please note that our email domain is now also: **AWTWORLDWIDE.COM**. Please ensure that, along with appliedweather.com, your mail service adds this new domain to your white list (of authorized email senders).

Appendix C BVS Directories and Files

C.1 BVS Directories

BVS uses two main data directories to store updated information:

1 . Data directory

The main data directory's default location is on the computer's C: drive at C:\BVS\BVS7\data

This directory contains various subdirectories, each for a specific data file type. The subdirectory most relevant for the user is the Track Directory, where BVS stores all your tracks. It will contain .BVS track files.

2. Weather Data directory

The main weather data directory's default location is on the computer's C: drive at C:\BVS\BVS7\weather

This directory contains various subdirectories, each for a specific weather data file type. .RKW files are containers for the many sets of different weather data that go here.

C.2 BVS File Types

There are two key types users should recognize. They are:

File Suffix: .BVS

Type Name: Voyage track file

Purpose: Contains all track information, including waypoints, speed, departure and arrival times, etc. BVS stores these files in the default folder: C:\BVS7\Data\Track

In addition, if you are subscribed to AWT's *Full Weather Routing Service*, AWT will email a recommended sailing track to subscribers with each message sent out to you. Simply open the track from your email program to load the route recommendation into BVS 7.

File Suffix: .RKW

Type Name: Weather forecast update file

Contents: An .RKW file is a 'shipping container' holding the selection of weather data type files you have requested,

Purpose: The RKW file is compressed and contains all requested weather parameters available at the specific delivery time.

Broadband users: If you have broadband, BVS will automatically receive the file and extract the weather data. A copy of the file is stored in the default location:

C:\BVS7\weather\import\backup\

Email users: When checking your email, be sure to process incoming RKW files in chronological order, with the oldest file being processed first. You can either double-click the RKW file (or select "Open" from the email attachment 'options'), or you might alternatively store the RKW file in the import folder, where it will be automatically opened and processed. The default location is:

C:\BVS7\weather\import\

If the file is located on your hard drive, you can click the BVS menu **Data | Manually Import Weather Data**, selecting the desired file so that it can be processed by BVS.

Appendix D

Disclaimer and Limitation of Liability

D.1 WARRANTY STATEMENT

In no event shall AWT be liable for any indirect, incidental, special or consequential damages or damages for loss of profits, revenue, data or use incurred by the customer or any third party, whether in an action in contract or tort, even if AWT or any other person has been advised of the possibility of such damages. The BVS Software and Services are provided "AS IS" and the customer, and its user, assumes the entire risk when using them.

Further, AWT reserves the right to change the BVS Software and Services formats without any obligation by AWT to notify any party of such revision or changes.

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