



BonVoyage System (BVS) 8.5

- // Installation Guide // Quick Reference Guide
- // Track Optimization Guide // Severe Motions Avoidance
- // Tropical Cyclone Probability // Track Send Procedures

// Contents

// Installation Guide	01
// Quick Reference Guide	07
// Track Optimization Guide	12
// Severe Motions Avoidance	18
// Tropical Cyclone Probability	23
// Track Send Procedures	25

// On board more than 5000 vessels

Designed with Masters and bridge environment in mind, StormGeo's BonVoyage System™ (Classic BVS) provides you with user-friendly route optimization, voyage planning and reliable weather forecast in a simple-to-install, intuitive application.

The BVS 8.5 Installation Guide will provide you with details to assist you in the installation and initial configuration of the program.

// Installation Guide

BVS 8.5

Upgrade from Previous Versions

Although it is recommended that you eventually remove BVS 7.x and/or earlier versions, BVS 8.5 is installed in a distinct location on your hard drive, and previous versions are not required to be removed from your computer prior to the installation of this version. Previous versions are found in the default location C:\BVS6\, whereas BVS 8.5 is installed in C:\BVS8\

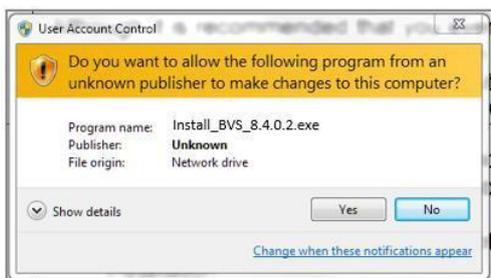
Note: The BVS 8.5 installation will overwrite BVS 8.0 in the "C:\BVS8\" folder.

BVS 8.5 Installation

Installation process should start automatically upon running the downloaded installation file or by inserting the CD. If it does not, double-click the file BVS 8 Setup File (Install_BVS_8.5.0.xx.exe. Example: Install_BVS_8.5.0.00.exe) on the CD:

- 1) Previous versions of BVS should not be running. Please close them before starting this installation.
- 2) If a window appears showing "Unknown Publisher", click "YES" or "RUN".
- 3) A Welcome screen appears. Click NEXT.
- 4) Review the license agreement and click "I Accept the Agreement", and click NEXT.
- 5) Select destination folder (default folder is C:\BVS8). If this needs to be modified, click BROWSE and choose or create desired destination folder (and click OK). Click NEXT.
- 6) The Additional Options screen allows you to create program icons and to associate the forecast update (RKW) files with BVS 8. Ensure that the appropriate items are checked and click NEXT.
- 7) A "Ready to install" (configuration summary) will display. Click NEXT to begin the installation process. All necessary files will be written to the BVS installation folder.
- 8) A progress bar will appear and details regarding the installation process will be displayed on the screen.
- 9) When installation is complete, click FINISH.

NOTE: It should NOT be necessary to restart your computer.

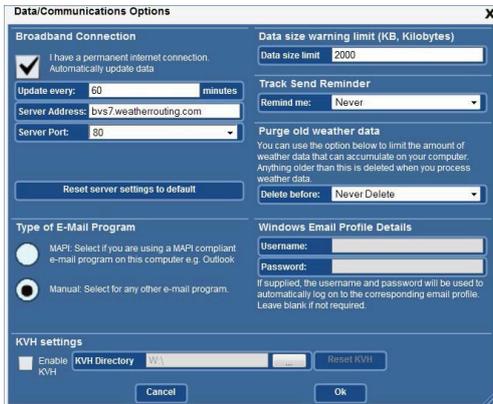


Initial Configuration

Vessel Setup:

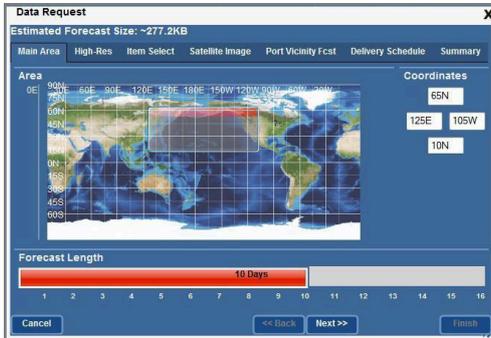
Start BVS 8 and begin the initial program configuration by entering the following information:

- 1) Enter the following: Call-sign, Ship Name.
- 2) Enter the IMO Number. If there is no IMO number assigned, enter 7 zeros (0000000).
- 3) Enter Length, Beam, Design Draft
- 4) Enter NCR (Nominal Constant Rate) Power and RPM, Aux Engine daily fuel rate, and NCR FUEL RATE (or the main engine Fuel Oil consumption per day (at NCR power).
- 5) Enter Design Speed, as well as vessel Minimum & Maximum speeds.
- 6) Once these items are filled in, the background field of each entry should be white.
- 7) Click OK button.



Data/ Communications Setup Options:

- 1) Place a check in the Broadband Connection box ONLY IF you have a broadband connection. **Please review the user manual regarding Broadband and the Email Backup option, in section D-4 of the Appendix. The default Server address and port are shown. These should not be changed unless instructed to do so by your IT Dept. or by BVS Support.**
- 2) If you have an email program such as Windows MAIL, Outlook, Thunderbird, etc., set the Email Program Type to MAPI. Otherwise, check MANUAL.
- 3) Data Size Warning limit should be added if you wish to monitor potential email size to stay below corporate or email service size restrictions which are currently being enforced.
- 4) Track Email Send Reminder allows you to observe a BVS message, prompting you to send your active BVS track to **bvstrack@awtworldwide.com**
- 5) Purge Old Weather data assists the user in setting a purge function to remove older weather data, thereby freeing up hard drive space on the BVS computer.
- 6) Windows Email Profile Details should remain blank, unless you have multiple email profiles set up (in the Windows Control Panel, MAIL option).
- 7) KVH should only be enabled if you are subscribed to the Data Broadcast through the KVH System. If needed, update the KVH Directory.
- 8) CLICK OK when all configuration fields are appropriately edited.



Initial Configuration (cont)

Weather Data Delivery Configuration:

Go through this SIX-STEP process, selecting data delivery parameters. When done, click **FINISH**. The result is a configuration file which is used for either Broadband or (if emailed to **bvs8@awtworldwide.com**) for scheduled email deliveries.

NOTE to NEW USERS: To receive forecast updates, you will be required to send a hardware key or Installation ID to BVS Support. This key is automatically generated when the program is installed and it can be viewed by clicking HELP, ABOUT on the BVS Menu. Send this "hardware key" to **bvs@awtworldwide.com** ASAP for each NEW onboard BVS computer.

IF YOU SEND A SCHEDULED REQUEST by email using the BVS Interface, your KEY will be included in the ...SchedReq.txt file that we receive.

Therefore, you would only need to send a separate message with KEY information IF:

- 1) You are a BROADBAND user, installing BVS on a new computer
- 2) You have additional onboard BVS 8 computers.

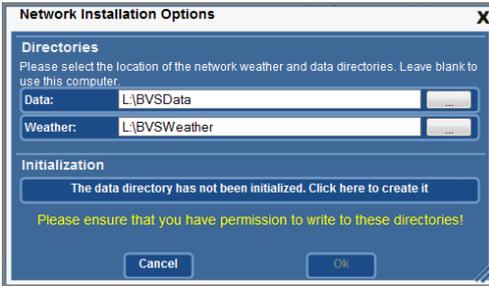
Sharing BVS files through a Network Configuration

BVS 8 can be configured to share weather and voyage track files from a Network location.

- 1) **IN WINDOWS EXPLORER:** Ensure that you have ADMINISTRATOR privileges. Create a Shared location on your computer Network and ensure that all BVS computers have full control of this folder. This can be done in the SECURITY section of the properties screen.
- 2) You need to create two subfolders, one for DATA (route data), and another for WEATHER data.
- 3) **IN BVS PROGRAM:** You can access the configuration dialog from the help menu: **Setup, Network Installation**. For each BVS computer, you should create a mapped drive to the shared location, then type in that location, including the subfolder. Example:

DATA Location: L:\BVSData WEATHER Location: L:\BVSWeather

The names of the locations are not important. Just insure to correctly point to the folders that you create on your Network. **DATA and WEATHER must be different locations.**



- 4) If needed, set the folder for exporting eNavigator Route files: C:\ProgramData\e-Navigator\ECDIS_UserData\Routes
- 5) In the INITIALIZATION section of the Network Installation Options screen, click the Initialization button to create the above directories, if they do not already exist. If you choose to click this button to create these folders, you will thereafter be required to follow STEP 1 above to properly set up the WINDOWS PERMISSIONS.
- 6) Click OK to save the configuration and to close the Dialog Box.

Requesting BVS Weather Updates

Even if data is already being received in scheduled deliveries for a previous BVS version, you must send in a new scheduled request using BVS 8 interface to unlock all features of BVS 8.

A forecast delivery schedule and immediate deliveries of data can be configured by clicking on the DATA menu.

Data requests are sent to an automated Server (**bvs8@awtworldwide.com**).

Please review the Quick Reference Guide for further details.



BVS Weather Data Processing

Weather updates are received from the origin **bvs@awtworldwide.com**. The attached file appears as: "ABCD_weather_YYYYMMDD_HR.RKW", where ABCD is vessel call sign and year, month, day and hour refer to the delivery time (UTC) of the email update.

When processing data, a status bar will appear at the top right of the BVS Chart (See image on left). The status bar will be replaced with the "Forecast Base Time" when processing is completed.

BVS Weather Data NOT Received

Please ensure that your email provider will allow messages from **bvs@awtworldwide.com**, and that your email filter will allow the required file size for your data request. Forecast file size can vary depending on various request parameters:

Forecast Length: Up to 16-days can be requested.

Satellite Image: This can be up to 30-40KB for your requested ocean region.

High Resolution Nested Grids: Each 1600 sq. degree grid is approximately 200KB in size.

StormGeo Contact Information

Troubleshooting and discussions regarding BVS should be directed to: **bvs@awtworldwide.com**.

The BVS 8 Quick Reference Guide provides details of the most common features of BonVoyage in a concise format to help familiarize you with the program.

// Quick Reference Guide

BVS 8.5

Program Start

Click the BVS 8 icon on your desktop.



Initial Setup

Open BVS, click OPTIONS | VESSEL SETUP. Enter call sign, vessel name, IMO number, length (LPP), beam, vessel type, NCR power, & NCR fuel rate and click OK.

Create New Track

Right-Click on the chart and choose NEW TRACK, or from the program menu click FILE|NEW. Enter Track Name and click OK, and follow steps below:

- 1) Right-click departure point and edit track type: Choose NAVIGATE GC or NAVIGATE RL.
- 2) Position Details: Click on the first character in the POSITION field and edit as desired. Numeric value or Port Name can be entered. Port names can only be entered for DEP/ARR point, not for WAYPOINTS.

Note: position format 53°42'N 16°32'W can be entered as 53 42N 16 32W or 53.70N 16.53W
- 3) Departure Date / Time: Click the TIME field and enter desired information.
- 4) Speed: Click the SPEED field, type the desired value and select the appropriate entry (SC, RPM, SOG, etc.)
- 5) Click on the chart after editing is finished to close the popup menu. Modify also the arrival point accordingly.

Alternate Editing

Route Points can be edited in a table format by selecting from the menu: View | Track Input Table

Track Editing

Select Track

Click the desired voyage track. It will become highlighted.

Make Track Active

Right-click the desired voyage track and select Make Track Active. The Active Track is considered to be the intended sailing track.

Insert Waypoint

Right-click on the chart. Choose Insert Waypoint.

Delete Waypoint

Right-click the specific waypoint & choose Delete Point.

Change Track Type

Right-click desired waypoint and choose Navigate GC or Navigate RL. Navigation from this waypoint will be updated.

Edit Waypoint Position

Right-click the waypoint to be edited and modify the position, time & speed fields.

Note: position format 53°42'N 16°32'W can be entered as 53 42N 16 32W or 53.70N 16.53W

Input Position Report

Right-click on the chart and choose Insert Reported Point. Right-click the new point and enter required position and time details. Click OK.

Chart Manipulation

Scrolling

Hold down the left mouse button and drag the cursor to adjust the chart to a desired location. Double-click a location on the chart to center the chart to the cursor position.

Re-Frame

Drag the right mouse button over a selected area of the chart. This will create a new zoom area.

Zoom Out

Roll the mouse wheel forward to zoom in. The DOWN arrow on the keyboard can also be used to zoom out.

Zoom In

Roll the mouse wheel backwards to zoom out. The UP arrow on the keyboard can also be used to zoom in.

Optimization

Please review the next two pages of this document for additional information regarding dual speed optimization.

Set Begin Point

Right-click on one of the positions and click Optimize | Set Begin Point or use the "B" key on the keyboard. (The default Begin Point is the departure point or the last reported point.)

Set End Point

Right-click on the desired position and select Optimize | Set End Point or use the "E" key on the keyboard. (The default

End Point is the arrival point.)

Optimize Time (Best Arrival)

Right-click on the track (or the chart). Select OPTIMIZE|TIME.

Optimize Least Fuel Consumption (or Cost)

To create a route with least fuel cost (or least fuel consumption), right-click on the track (or the chart). Select OPTIMIZE | LEAST COST/FUEL.

Optimize Least fuel with a Fixed ETA

Ensure that a fixed time has been entered for your Arrival Point. Right-click on the track (or the chart). Select OPTIMIZE | LEAST COST/FUEL FIXED ARRIVAL.

Data Request

Even if data is already being received in scheduled deliveries for a previous BVS version, you must send in a new scheduled request using BVS 8 interface to receive new BVS 8 data items.

Broadband Data Collection

This feature allows you to collect data immediately if you have an Internet connection. There is also an Email Backup option which provides you with an emailed forecast update when Broadband access is not available. **Please review the User Manual for more information: Appendix, Section D-4.**

Scheduled Data Request

Click DATA|WEATHER DATA DELIVERY CONFIGURATION. Select forecast region, Forecast Length. In the next several tabs, select High-Res area(s), desired forecast items, etc. and click NEXT until the schedule tab appears. Select delivery hours and active calendar days and click FINISH. If receiving data by email, submit the resulting file to **bvs4data@awtworldwide.com** each time you require changes to your ongoing deliveries. The file is: C:\BVS8\data\ABCD-SchedReq.txt ("ABCD" would be with your actual call sign).

Immediate Delivery of Data

Click DATA|ONE-TIME DELIVERY OF WEATHER DATA. Follow same procedures as above, except you will not be prompted to create a delivery schedule. Submit the resulting file to **bvs4data@awtworldwide.com**. This will generate a ONE-TIME, Immediate forecast delivery. An Immediate request will not modify your active schedule. The resulting file is: C:\BVS8\data\ABCD-ImmedReq.txt ("ABCD" is replaced with actual call sign).

Processing Incoming Forecast

A forecast update file will be delivered as an email attachment with the file extension ".RKW". This file can be double-clicked (or 'opened') to update your BVS chart.

If collecting data by Broadband, the RKW files are automatically processed.

Resonance Feature

For more details see the Resonance Quick Reference Guide.

Ensure that a voyage track is created and displayed on the chart to view resonance settings and potential alerts.

Accessing Resonance Display

From the menu click View| Snapshot.

Resonance Configuration

Insert appropriate values in the Alert Thresholds fields and insure that the appropriate Roll Period is entered. Draft should be input in the ROUTE INPUT tab, in the Departure Point row.

Keyboard Shortcuts

BonVoyage provides some keyboard shortcuts to give quick access to some of the programs functions. See table below (also, the User Manual gives additional shortcuts):

Key combination

Insert

Inserts the point over which the mouse cursor is hovering

E Key

Selected waypoint (mouse hover) becomes the Optimization End Point

Delete

Removes the point over which the mouse cursor is hovering

Ctrl+T

Optimizes for Time.

G Key

Changes navigation to a great circle (mouse-hover waypoint).

Ctrl+F

Optimizes for Least Fuel Cost/Cons.

R Key

Changes navigation to a rhumbline (mouse-hover waypoint).

Ctrl+L

Optimizes for Least Fuel Cost/Cons. with a FIXED arrival.

B Key

Selected waypoint (mouse hover) becomes the Optimization Begin Point

Left Arrow

Moves back in forecast time step

Right Arrow

Advances forecast time step

Contact Applied Weather

bvs4data@awtworldwide.com

Send TXT request files to this automated Server.

bvstrack@awtworldwide.com

Send BVS TRACKS (your 'active track', or actual sailing track) to StormGeo

bvs@awtworldwide.com

Send All program inquiries to the BVS Staff at this address.

ops@awtworldwide.com

To request shore-based routing services.

The BVS 8 Track Optimization Feature can provide the user with an optimum sailing track. The optimization outcome varies according to the configuration used.

// Track Optimization Guide

BVS 8.5

This guide will provide details for each optimization type and will assist the user in understanding the required steps to create the desired track.

There are several optimization options:

Single Speed, Least Time

Creating a track with the best arrival time option

Single Speed, Least Cost or Fuel Consumption

Creates a track with minimum fuel consumption

Single Speed, Least Cost/Fuel Consumption with a Fixed Arrival Time

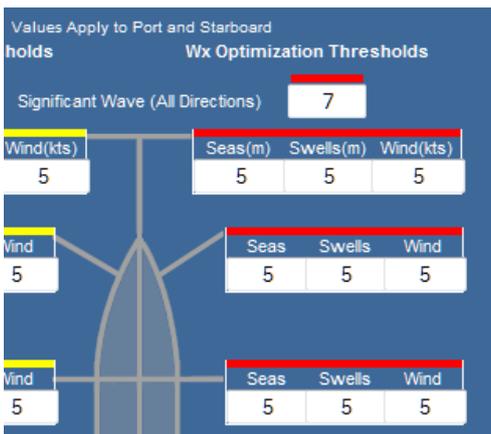
With an RTA (Required Time of Arrival) input, a track is created with minimum fuel consumption.

Dual Speed, Least Cost with a fixed arrival time

Similar to the previous option, but with an economical speed down in ECA zones while maintaining required arrival time.

Dual Speed (Least Time or Least Cost) with an open arrival time

A BVS-calculated arrival time is given along with reduced speed in ECA areas for a more economical sailing option.



Wx Thresholds

The Wx Thresholds tab is displayed next to the Costs tab. Note that BVS creates an optimized track based on both:

- 1) the optimization option that you choose and
- 2) the values in the WX THRESHOLDS tab

With the values that are entered in the example shown on the left, the optimization process would try to avoid Significant waves over 7 meters and Seas/Swells/Wind over 5 meters.

Please adjust these values accordingly, or leave blank if you wish to optimize without weather constraints.



Single Speed Optimization

To generate a track using Single Speed Optimization, the Costs fields would remain blank.

Least Time

Least Cost/ Least Fuel Consumption

From the Route Input tab (left panel), ensure that no fixed arrival has been entered for the Arrival Point. This will allow BVS to calculate the arrival time.

● | ROTTERDAM | | | 2015/03/16 15:56 |

Note: the date/time is NOT BOLD for desired outcome.

Least Time

From the tools menu, click the "Least Time" radio button

Click the Optimization icon in the route input panel or in the upper right are of the chart display.

Route Input Panel Upper Right Section of Chart



A least time optimized route will be created with the filename ending in "_opt"

Alternatively, Select the "Least Cost/Fuel" radio button.

Least Cost/Fuel

Click Optimize icon and an optimized route will be created with the filename ending in "_opf", taking into consideration least fuel consumption. BVS will calculate the arrival time.

Route Input Panel Upper Right Section of Chart



Least Cost/Fuel with a Fixed Arrival.

Similar to Least Cost/Fuel Single Speed optimization described above, this option allows the user to enter a fixed arrival time.

In the track file, adjust the date and time of the Arrival Point to the required arrival and the field now becomes bold. Note that this point could be the end of voyage, or the end of a specific VIA (mid-port arrival point). The optimization process will use the appropriate calm sea speed to achieve the required arrival time.

● | ROTTERDAM | | | **2015/04/04 10:00** |

Note: the user-defined date/time is now bold and should show required arrival time.

Select the "Least Cost/Fuel Fixed Arrival" radio button.

Least Cost/Fuel Fixed Arrival

Click the Optimize icon and a fixed arrival optimized route will be created with the filename ending in "_opa"

Route Input Panel Upper Right Section of Chart



Wx Thresholds		Costs	
Costs			
ME/outside ECA fuel	350		\$/MT
AE/outside ECA fuel			\$/MT
ME/inside ECA fuel	670		\$/MT
AE/inside ECA fuel			\$/MT
<small>Enable Dual Speed Optimization of Open Arrivals</small>			
Daily Hire Rate:			\$/Day
MISC Daily Costs:			\$/Day

Dual Speed Optimization

This option is made available once you enter Main Engine Fuel costs in the COSTS dialog.

Dual Speed, Least Cost with a Fixed Arrival Time

The first step is to enter Fuel Costs.

The example to the left shows the minimum required entries:

- Main Engine Fuel cost per Metric Ton in US Dollars (outside of ECA). Example: IFO cost
- Main Engine Fuel cost \$USD/MT (within the ECA area): Example: LSFO cost

Next, Enter a fixed arrival.

ROTTERDAM | | **2015/04/04 10:00**

In the track file, adjust the date and time of the Arrival Point to the required arrival and the field now becomes bold. Note that this point could be the end of voyage, or the end of a specific VIA (mid-port arrival point).

Note: the user-defined date/time is now bold and should show your required arrival time.

Click Optimize and a fixed arrival optimized route will be created with the filename ending in “_opa”.

Least Cost/Fuel Fixed Arrival

The optimization process will use the appropriate calm sea speed to achieve the required arrival time. You should notice an economical speed adjustment will be shown in ECA areas.

Route Input Panel Upper Right Section of Chart



Wx Thresholds	Costs
Costs	
ME/outside ECA fuel	350 \$/MT
AE/outside ECA fuel	\$/MT
ME/inside ECA fuel	670 \$/MT
AE/inside ECA fuel	\$/MT
<input checked="" type="checkbox"/> Enable Dual Speed Optimization of Open Arrivals	
Daily Hire Rate:	10000 \$/Day
MISC Daily Costs:	1 \$/Day

Dual Speed (Least Time or Least Cost) with an open arrival time

NOTE: When using this option, BVS will control all speed entries at every waypoint. A user-attempt to modify the speed value at any given waypoint, BVS will revert the speed to the calculated value.

However, Reported Points will not be modified.

This example shows Daily Hire Rate of \$10000 / day. The minimum entries should be:

Daily Hire Rate: \$1
Misc. Daily Costs: \$1

Enter data in at least one of these fields then click another field for the program to accept your update.

This will give you access to the checkbox "Enable Dual Speed Optimization of Open Arrivals".

However note that more realistic daily costs will provide BVS with required information to compare daily costs vs. ECA fuel costs (and thus generate a least-cost voyage) when creating a track that passes through an ECA zone.

From the Route Input tab (left panel), ensure that no fixed arrival has been entered for the Arrival Point. This will allow BVS to calculate the arrival time.

■ | ROTTERDAM | | | 2015/03/16 15:56 |

Note: the date/time is NOT BOLD for desired outcome.

From the tools menu, click the "Least Time" radio button

Least Time

Click the Optimization icon in the route input panel or in the upper right are of the chart display.

Route Input Panel Upper Right Section of Chart



A least time optimized route will be created with the filename ending in “_opt”

The optimization process will use the appropriate calm sea speed to achieve the required arrival time. You should notice an economical speed adjustment will be shown in ECA areas.

Alternatively, Select the “Least Cost/Fuel” radio button.



Click Optimize icon and an optimized route will be created with the filename ending in “_opf”, taking into consideration least fuel consumption. BVS will calculate the arrival time.

Route Input Panel Upper Right Section of Chart



The optimization process will use the appropriate calm sea speed to achieve the required arrival time. You should notice an economical speed adjustment will be shown in ECA areas.

From the Route Input tab (left panel), ensure that no fixed arrival has been entered for the Arrival Point. This will allow BVS to calculate the arrival time.



Note: the date/time is NOT BOLD for desired outcome.

Keyboard Shortcuts

BonVoyage provides some keyboard shortcuts to give quick access to some of the programs functions. See table below (also, the User Manual gives additional shortcuts):

Key combination

B Key

Selected waypoint (mouse hover) becomes the Optimization Begin Point

Ctrl+T

Optimizes for Time.

E Key

Selected waypoint (mouse hover) becomes the Optimization End Point

Ctrl+F

Optimizes for Least Fuel Cost/Cons.

Ctrl+L

Optimizes for Least Fuel Cost/Cons. with a FIXED arrival.

Contact Applied Weather

bvs4data@awtworldwide.com

Send TXT request files to the BVS automated Server for weather updates.

bvstrack@awtworldwide.com

Send BVS TRACKS (your 'active track', or actual sailing track) to StormGeo

bvs@awtworldwide.com

Send All program inquiries to the BVS Staff at this address.

ops@awtworldwide.com

To request shore-based routing services.

In recent years, vessels have on a seemingly regular basis encountered the phenomena of sudden large roll amplitudes. These severe motions are particularly dangerous for vessels carrying high deck cargo, such as container or heavy lift vessels, and may cause cargo loss damage.

// Severe Motions Avoidance QRG

BVS 8.5

The Bon Voyage System (BVS) assists by predicting the potential for severe motions by means of a tool for avoiding roll resonance and wave impact.

This feature is valuable for both the strategic voyage planning and the tactical handling of the vessel. The implemented method, as proposed by the International Maritime Organization (IMO), takes into account the vessel roll period, course and speed as well as the encountering wave trains as forecast by StormGeo-AWT. It then calculates the potential for heavy oscillations with high amplitudes, capsizing and sudden course deviations of the vessel.

The results are depicted graphically in a polar diagram.

The objective of this method is not to calculate any roll period, but to predict the potential of severe motions. The resonance function does not require any sensors, as the system is based on the physical approach that the vessel is an oscillating system which may be excited at, or in the neighborhood of, resonance frequency. This method is available in the Bon Voyage System (BVS). The Master can use the polar diagram as a guideline to derive reasonable course and speed adjustments to avoid these dangerous situations, thereby preventing cargo losses and damages. Furthermore, Storm-Geo- AWT is applying this method for its shore-based Optimum Ship Routing service to generate severe motion alerts. This objective evaluation of safety takes Optimum Ship Routing a higher level. So, if your vessel is routed by StormGeo-AWT, please report the roll period of your vessel to their Route Operations team.

You now have the ability to carefully analyze the route ahead and thereby predict potentially dangerous conditions well before they occur. Please review the guidelines below.

BVS RESONANCE DISPLAY:

FREQUENT ACCESS IS STRONGLY RECOMMENDED

Each time your voyage track is edited and after each download and processing of new weather data, you should open the resonance graph and review the route points along the track to check for the display of potential vessel resonance conditions.

This will allow you to make well-informed tactical decisions regarding your route planning.

Hull

Length (LPP): m

Beam: m

	Position	Nav	Speed	Time	Fore	Aft
*	YOKOHAMA	RL	24.8 SC	2013/09/24 21:34	11.00	12.00

Draft GM Roll Pd

Ship

Resonance Alert Thresholds(m)

Parametric Roll	<input type="text" value="4.0"/>	Synchronous Roll	<input type="text" value="4.0"/>
High Wave	<input type="text" value="8.0"/>	Broaching	<input type="text" value="8.0"/>

Significant wave height (m) where high wave groups start to become a problem. For your 200m vessel this should be between 4.0 and 8.0 m. The recommended default value is 8.0m

VESSEL CONFIGURATION

Two of the vessel specifications used by the resonance feature are initially configured during installation. The Length between Perpendiculars (LPP) & Breadth should be entered.

This information can be accessed/ modified by clicking Setup | Vessel Setup. Enter the appropriate data and click OK.

Each time a voyage track is created, the Fore and Aft Draft should be entered as well as the Roll Period. Note that a GM entry ‘calculates’ roll period & does not need to be entered unless roll period is NOT known.

- 1) To create a voyage track, click File | New, choose a track name and click OK. Enter Departure details, including draft. Example:
- 2) In the Snapshot tab of the Left Panel, Enter the roll period. This example shows a roll period of 22.00. Note: the mean draft is automatically calculated from the previous departure point entries: 11.50.
- 3) Enter reasonable wave thresholds into each of the four resonance limit fields. The thresholds define the corresponding wave height for each specific risk.

Place your mouse over one of the four resonance entry fields & BVS will display a tooltip which will give you a recommendation for each of the corresponding threshold settings.

Example—High Wave Groups.

NOTE: If one of the four fields is left blank, or shows 0.0 (zero), you will see a warning marquis at the top left of the BVS Chart that says: **“Resonance threshold not defined”**:

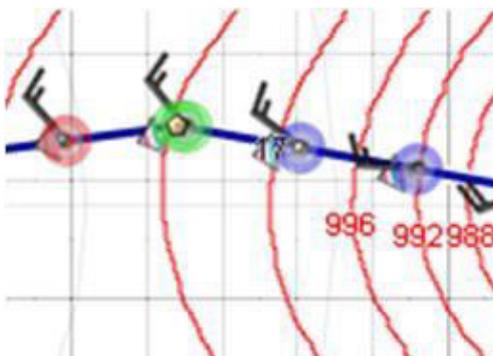
DATA INTERPRETATION

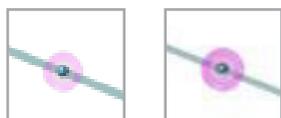
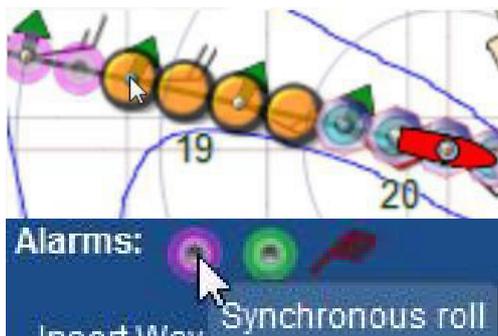
Resonance Data Shown Along the Voyage Track

Areas of potential rolling are indicated along the voyage track as colored warning circles as shown in the image below left:

Each color indicates the resonance type:

- RED:** Parametric Rolling,
- PINK:** Synchronous Rolling,
- GREEN:** High Wave Groups,
- BLUE:** Surf-Riding/Broaching.





Multiple Alarms appear as orange disks along the track.

Right-click an orange disk to display all symbols of the various corresponding alarms.

Hover over an alarm to see a description.

The example shows "synchronous roll".

When the wave height is in excess of the user-defined threshold, two types of warning circles appear along the BVS voyage track.

- A marginal risk will display a smaller, lighter colored circle.
- A full risk display will show a darker colored circle.

The display information on the resonance graph can be reset to display information for a new location by clicking on one of the other route points along the voyage track. You can also move along the voyage track by using the "Previous Time Step" and "Next Time Step" icons on the top right of the chart.

SYNCHRONOUS AND PARAMETRIC ROLLING:

Wave height above the threshold limit = High Risk/ High Likelihood
 Wave height that is 50% to 100% of the threshold limit = Marginal risk
 Wave height that is < 50% of the threshold limit = No risk indicated on BVS display.

SURF-RIDING AND BROACHING:

Wave height above the threshold limit = High Risk/ High Likelihood
 Wave height that is 80% to 100% of the threshold limit = Marginal risk
 Wave height that is < 80% of the threshold limit = No risk indicated on BVS display.

Synchronous Rolling Example: If the threshold limit were set to 4 meters.

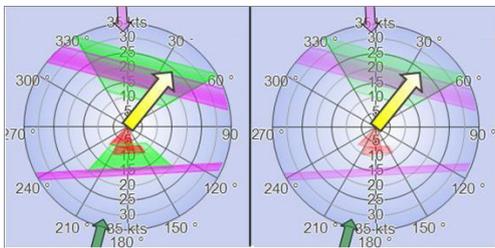
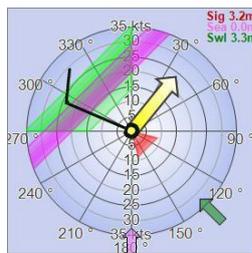
Full Risk = a wave height that is above 4 meters
 Marginal Risk = a wave height that is 2 to 4 meters
 No Risk Displayed = a wave of less than 2 meters
 For your reference:

Parametric Rolling: $T_E \approx (0.5) (T_R)$. (T_E is Wave Encounter Period)

Synchronous Rolling: $T_E \approx T_R$. (T_R is ROLL Period)



	Seas		Swell	
Height(m)	00.0	00.0	03.2	03.2
Direction(°)	357	357	195	195
Period(s)	07.3	07.3	12.5	12.5
Wave Len(m)	83.5	83.5	242.1	242.1
Enc Pd(s)	04.1	04.1	29.7	29.7



Interpreting Graph Vectors & Symbols

Wind Wave and Swell can be interpreted in the following manner:

Information is found in the legend below resonance graph in the snapshot panel (see above right). Small arrows also display Sea and Swell direction on the outer edge of the graph. In this example, the Sea arrow appears from 357° and swell is from 195°.

The vessel position and speed appear as a yellow vector. A wind bard depicts wind direction as well.

Interpreting the Resonance Graph

The shaded alert areas indicate potential risks. They appear when any combination of vessel's course and speed fulfills the physical condition that defines a corresponding risk

The tip of your ship's vector should be well out of any shaded alert area.

Synchronous Roll: See the examples below of the darker (full risk) and lighter (marginal risk) shaded areas. If the tip of the ship vector points into any location within the magenta area, then $T_E \approx T_R$ is valid.

Additional Resonance Information

Surf Riding and High Waves: The IMO suggests that either of these two risks becomes a concern when the wave height is higher than 4% of the vessel's length (LPP). However, we feel that for large vessels with a length of more than 300 m this suggestion may result in thresholds which are too extreme. Therefore we apply the 4% rule to vessel with LPP less or equal to 275m and only 3.5% to vessels with LPP > 275m. If the vessel's LPP is 281m or greater, the default thresholds for these risks should be entered as 9.8m.

The thresholds are calculated by means of LPP, not the freeboard.

BVS will consider Surf Riding and High Waves as a FULL RISK when the wave height is in excess of the defined threshold for the particular risk and as a MARGINAL RISK when the wave height is within 80% up to 100% of the threshold. If the wave height is less than 80% of the threshold then there would be no warning. These thresholds can be edited by the user if it is felt that they are too high by simply modifying the threshold field with the desired value.

Unfortunately, the IMO is not suggesting any threshold for Parametric Roll and Synchronous Roll. The physical model is only taking into account the roll period and the encountering period. So, theoretically there would be alerts even for very low wave heights which potentially would be false alarms. Therefore, although there are no default definitions, we have introduced the thresholds for these two risks as well.

It is up to the Master to define the wave height when parametric or synchronous roll becomes a concern for him. All thresholds are based on the Master's experience!

BVS will consider Parametric Roll and Synchronous Roll as a FULL RISK when the wave height is in excess of the defined threshold for the particular risk and as a MARGINAL RISK when the wave height is within 50% up to 100% of the threshold.

The threshold ranges have been defined by us on an empirical basis of what we consider as reasonable in relationship to the vessel's length.

NOTE: The concept of the MARGINAL RISK ensures that there is not just a simple yes/no decision. It provides a reasonable safety margin below the wave thresholds.

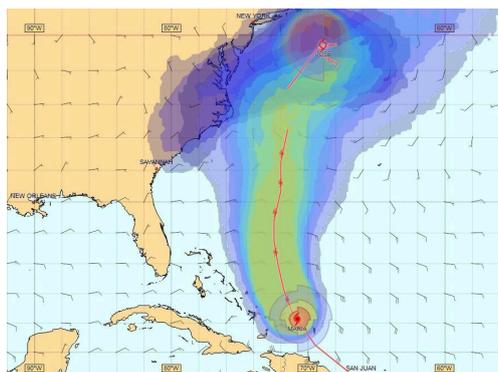
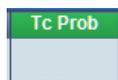
Questions? Email bvs@awtworldwide.com

// Tropical Cyclone (TC) Probability QRG

BVS 8.5

TC Probability: Introduction

StormGeo’s BVS program now provides our users with a new forecast display option, “TC Probability”, which can be enabled by clicking the “Tc Prob” field at the top of the chart in the “Weather Bar” selection area:



BVS Displaying “TC Probability” filled contours for Hurricane Maria 2017/09/22 12Z

TC forecast uncertainty, or “TC probability” using an ensemble-based probability method can provide the BVS user with a better understanding of the forecast confidence of the storm track displayed in the program.

Measuring uncertainty

Traditional Process:

The standard “cone of uncertainty” is calculated using the historical errors from the past five years of forecasts. Some of the drawbacks are:

- The cone size is the same for all tropical cyclones regardless of the forecast confidence.
- The cone is easily misinterpreted/misunderstood.
- It is possible for the TC’s path to be well away from the “cone of uncertainty” area.
- Current 5-day forecasts are subject to errors of more than 400km.
- The Tropical Storm tracks tend to stay within the boundaries of the cone approx. 66% of the time (over the past 5 years).

StormGeo’s Ensemble-Based Probability:

The TC Probability data consists of ensembles from the following models:

ECMWF

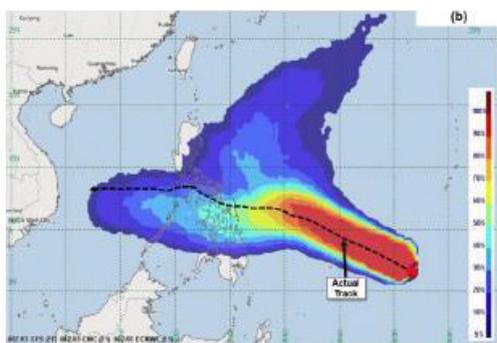
European Center for Medium-Range Weather Forecasting

GFS

Global Forecast System from the National Center of Environmental Prediction (NCEP)

CMC

Canadian Meteorological Center



Traditional forecast with standard error cone (a), ensemble probability swath (b) plus actual track (dashed black line) for Hagupit from 0000 UTC December 3, 2014.

Model ensembles are multiple runs of operational forecast models with tweaks made to the initial conditions or the model physics. The ensembles create multiple track forecasts. Probabilistic forecasts can be generated from these forecasts, which can create an objective estimate of the forecast uncertainty based upon the current state of the atmosphere.

In the image below, the ensemble-based probability forecast to the right predicts more accurately the extended track of Typhoon Hagupit.

Some of the benefits of StormGeo's TC Probability forecast:

- The ensemble can be used to estimate TC track forecast uncertainty.
- It provides an objective estimate as to where the TC may move.
- A probability swath indicates the most likely path of the TC
- 71% of the tracks remained within the 20% region (a significant improvement over the 'cone of probability'), while 98% remained within the 5% region.

This information will provide vessels and fleet owners/operators, who require several days of lead time for decision

making purposes, more accurate information regarding their level of risk on which their decisions can be based.

Contact Information

If you have questions regarding this service, you should contact StormGeo Support:

AWT Support (24/7) Description

info@stormgeo.com

For inquiries regarding StormGeo's products and services

bvs@awtworldwide.com

Send all program inquiries to the BVS Staff at this address.

bvs4data@awtworldwide.com

Send TXT request files to this automated Server.

bvstrack@awtworldwide.com

Send BVS TRACKS (your 'active track', or actual sailing track) to AWT

ops@awtworldwide.com

To request shore-based routing services.

USA +1 408-731-8600

Phone Support

// BVS Track Send Procedures

BVS 8.5

A shore-based program, called FleetDSS (Fleet Decision Support System), is a fleet management tool created by StormGeo. It is now being used by your company and allows the display of your BVS track information on a global chart.

Hello Captain,

We are pleased for your continued support of BonVoyage, our voyage optimization software.

A shore-based program, called FleetDSS (Fleet Decision Support System), is a fleet management tool created by StormGeo. It is now being used by your company and allows the display of your BVS track information on a global chart.

It is therefore requested that effective immediately, your current voyage track be: up-to-date & sent on a regular basis (minimum: every two days) to **bvstrack@awtworldwide.com**.

This document contains instructions regarding the sending of BVS Tracks.

If you are sailing a multi-leg voyage, please input your FULL ROTATION, as opposed to sending each individual leg.

Examples: Ft. Lauderdale, Florida—Labadee, Haiti—Falmouth, Jamaica—Cozumel—Ft. Lauderdale Richard's Bay—Zhanjiang—Lianyungang Santos—Port Elizabeth—Singapore—Taichung

In the Ft. Lauderdale voyage above, Labadee, Falmouth and Cozumel should be included as intermediate ports, or "vias".

OVERVIEW

- A) Please enter your full voyage rotation on the BVS voyage track.
- B) Please enter daily a BVS reported point (ie: Daily Position).
- C) Please consistently send us your BVS Track file (to bvstrack@awtworldwide.com) to ensure that route information is up-to-date in our System. File should be sent every two or three days.
 - a) Newer versions of BVS allow you to right-click the track file on the chart and select "E-Mail Track". This should generate an email to the aforementioned address with your .BVS track file attached.

Please also note that your PORT ARRIVALS and STOPPAGES should all have FIXED ETAs. If you are sailing to multiple intermediate ports and have trouble displaying this in BVS, please advise us and we'll send additional instructions on how to enter those details.

Your efforts in this are greatly appreciated as this will allow the vessel's track to be displayed on our shore-based FleetDSS fleet management system.

DETAILED INSTRUCTIONS

TRACK DETAILS:

- 1) DEPARTURE, ARRIVAL & INTERMEDIATE PORTS: When entering Departure/Arrival/Intermediate Ports, either port names lat/lon values can be used. Regarding BVS ports, we realize that your BVS port database does not display your actual port/berth location—the program instead uses ‘pilot drop points’. Therefore, your desired LAT/LON position can be used in place of PORT NAME if you require for more accurate voyage tracking in the BVS track file.
- 2) DAILY POSITIONS: Please input a daily position using the “BVS on-chart ‘right-click’ option”.
 - a. Right-click the chart.
 - b. Select “Insert Reported Point”
 - c. Enter position & date/time details
 - d. Click “OK”

	25°18'N 079°56'W	RL	17.0 SC	2012/03/18 07:30
	25°29'N 079°57'W	RL	17.0 SC	2012/03/18 08:05
	MIAMI			2012/03/18 09:00

You will also see the calculated time for that track interval be automatically adjusted by BVS in the SPEED/POWER fields of previous waypoints to ensure arrival at the user-specified time.

- 3) You have the option of allowing BVS to calculate an ETA for your arrival point, or you can input a fixed ETA. If you require a fixed ETA, you’ll want to input date and time at the ARRIVAL Point. Your choice of ETA entry (either FIXED or BVS-calculated) will appear in FleetDSS as the ETA for that specific track. Click on the “TIME” cell of the specific point and modify the arrival time. This changes the BVS generated/calculated time to a fixed time. Thereafter, the cell should appear in **bold** when compared to other cells (example: MIAMI: 2012/03/18 09:00)

FILE LOCATION:

If you are unable to send the file automatically, you’ll need to locate it in the track folder. The BVS 8 default location is C:\BVS8\data\track\

FILE SEND INSTRUCTIONS:

You should be able to send the file automatically by right-clicking the active track, then by selecting “E- mail Track”. This should generate a message with the track file attached.

Email Address: **bvstrack@awtworldwide.com**

Note: Only one voyage track is stored in our system at any given time. Therefore, any new track sent will overwrite the previous track on file. Therefore, the track file for an upcoming voyage should only be sent as your departure time approaches—approximately 6-12 hours in advance of departure. This will ensure that the track details for a new voyage are available in our FleetDSS system upon your departure.

Please feel free to email or call if you have any questions.
 BVS Support
 BVS@awtworldwide.com
 USA: 408-731-8600



s-Suite™

Simply Integrated

s-Suite is an integrated solution for voyage planning, navigation, ship routing and fleet performance management—all from StormGeo.

stormgeo.com/s-suite

// For more information or to schedule a call with
a representative email us at info@stormgeo.com
stormgeo.com