# HaviStat v2.0

Introduction

HaviStat v 2.0 is a freeware designed to perform basic analyses about niche breath, habitat preference and use. The application is the outcome of an intensive and extensive literature review about theory, experimental design, and mathematical, statistical and graphic method to estimate animal preference.

The application has a user-friendly interface that incorporates 25 different mathematical ways to evaluate preference for habitat/resources, 3 confidence intervals and 22 indices, 8 indices to estimate niche breath and 2 different ways to present graphical contrast between potential and observed use. Also includes important information about habitat preference and how the different mathematical methods incorporated in the application were design.

Requirements

- *Microsoft Office Excel (1997 or Later version) for Windows.*
- *Allow Macros inside HaviStat v2.0 workbook. (Enable contents).*
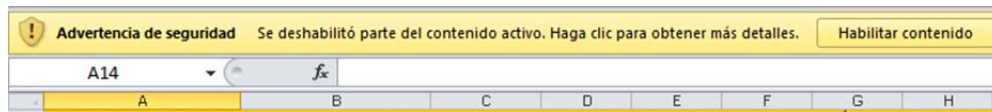
- *PDF Reader or a similar application.*

| Adobe Reade | Evince | Foxit Reader | Mendeley | Okular |

Also can be used with GSview, Xpdf, DigiSigner, PDF-XChange Viewer, Google Chrome and others.

Layout of the Application

Sheet "Data":
This is the principal page of the application, containing the major part of the functions.

Button:
1. Repair: restart the program to initial conditions.
2. Generate Template: generate a template for the data using the parameters in "Cells 1".
3. Clear all: erase the contents in all sheets and restart the application.
4. Erase saved Indices: erase the contents of the sheet "Saved Indices".
5. Export Indices to a New Document: copy the contents of the sheet "Saved Indices" to a new Excel-workbook.
6. Apply: apply the selected index in "List 2", Niche Breadth Indices.
7. Apply: apply the selected index in "List 3", Preference Indices. Using some test of the confidence level selected in "List 1" and the alpha associated in "Cells 2".
8. Export Graph to a New Document: export the contents of the sheet "Graphics" to a new Excel-workbook, erasing the contents of this page.
9. Graph: graph the dependent variable indicated in "Cells 3" using the graphic type selected in "List 4".
10. Graph All: graph all the dependent variables using the graphic type selected in "List 4".

Sheet "Breadth Indices":
This page shows the result of the Niche Breadth Indices applied from the Sheet "Data".

Button:
1. Save this Index: copy the applied index to the sheet "Saved Indices".
2. Erase the Saved Indices: erase the contents of the sheet "Saved Indices".

Sheet "Preference Indices":

This page shows the result of the Preference Indices applied from the Sheet "Data".

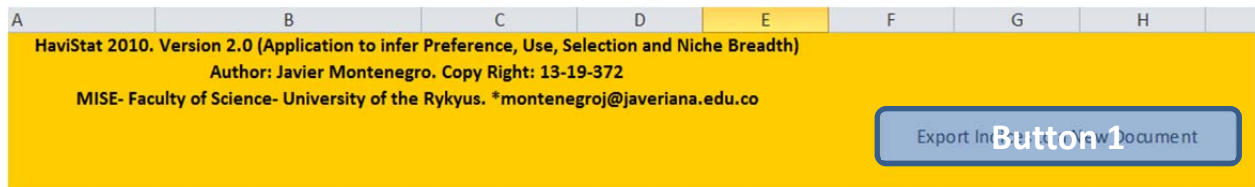| A	B	C	D	E	F	G	H
HaviStat 2010. Version 2.0 (Application to infer Preference, Use, Selection and Niche Breadth)							
Author: Javier Montenegro. Copy Right: 13-19-372							
MISE- Faculty of Science- University of the Rykyus. *montenegroj@javeriana.edu.co				**Button 1**		**Button 2**	

Button:
1. Save this Index: copy the applied index to the Sheet "Saved Indices".
2. Erase the Saved Indices: erase the contents of the sheet "Saved Indices".

Sheet "Saved Indices":

This page shows, below each other, the indices that have been saved from the sheets "Breadth Indices" and "Preference Indices". Also the results corresponding to the options "The Most Important" and "All" in the "List 3", and "All" in the "List 2"of the Sheet "Data" are shown.

A	B	C	D	E	F	G	H
HaviStat 2010. Version 2.0 (Application to infer Preference, Use, Selection and Niche Breadth)							
Author: Javier Montenegro. Copy Right: 13-19-372							
MISE- Faculty of Science- University of the Rykyus. *montenegroj@javeriana.edu.co					**Button 1**		

Button:
1. Export Indices to a New Document: copy the contents of the sheet "Saved Indices" to a new Excel-workbook.

Sheet "Graphics":

This page shows, below each other, the graphs generated from the Sheets "Data".

Sheet "References":

This page shows the most relevant literature used in the development of the application, and about the different tests and indices.

Sheet "Manuals":

This page shows the manuals required for the proper use of this application.

Organizing Data Matrix

In "Cell 1" the number of Dependent Variables that we are working with should be indicated, for example the number of species. In the template this will be equal to the number of rows plus one. In "Cell 2" the number of Independent Variables, for example, number of categories of habitat, should be indicated. In the template this will be equal to the number of columns.

Once these parameters have been entered, press "Button 1", to generate a template for your data.

In "Cell 1" the name of what we are measuring in the Independent variables (IndVar), eg. Habitat, Sponge, etc., should be entered. In "Cells 2" the names of the categories of the IndVar that we are working with, eg. Habitat 1, Habitat 2, etc are input. In "Cells 3" the value (eg. Frequencies, covertures, etc.) that each category of the IndVar have in the sample should be input.

In "Cells 4" the names of what we are measuring in the Dependent Variable (Dep.Var.) should be input; in general these are species names, eg. *Palythoa tuberculosa*. In "Cells 5" the value that the Dep.Var. have in each category of the IndVar are entered.

Applying statistics, Preference and Niche Breath Indices

4						n-Sample (Cherry, 1996)	
Mp4	Totals	G-test¨Chi¨	G-test¨p¨	Chi-test¨p¨	Stn. Error	n*pi>5	n*(1-pi)>5
100	400		**Cells 1**	6.85537E-18	0.004	**Cells 2**	
90	233	138.112		6.85537E-18	0.004	No	Yes
98	227	41.185	5.97562E-09	1.34051E-09	0.004	Yes	Yes
43	264	32.705	3.71695E-07	3.17362E-07	0.003	Yes	Yes

Each time that any one of the available indices is applied, a basic statistical analysis for preference will be done automatically and presented in "Cells 1", to the right of the data matrix. In "Cells 2" a basic analysis of the sample size will be done to assess if is the data are adequate to use for confidence intervals. The sample size should pass the boot test.

Preference Indices:

| List 1 | ▼ | Button 1 |

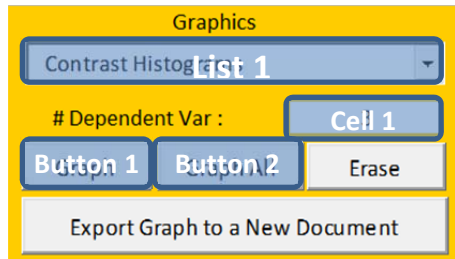**Niche Breadth Indices:**

| List 2 | ▼ | Button 2 |

The Preference of Index that will be applied should be selected in "List 1" and performed using "Button 1". The same methods apply for niche breadth indices but using "List 2" and "Button 2". The interpretation of the preference index is done automatically by the program, using color and following the criteria indicated in the upper left corner of the results.

Range: -1 to +1					Save this Index		Erase Saved
If -1 < Index Value < -0.5 Strong Avoidance						Habitat Preference Index	
If -0.49 < Index Value < -0.26 Moderate Avoidance							
If -0.25 < Index Value < 0.25 Indifference			Baltz(1990) Interpretation of II -Jacop (1974)				
If 0.26 < Index Value < 0.49 Neutral Selection			Categories of the Indep. Var.				
If 0.50 < Index Value < 1 Strong Selection			1	2	3	4	
		Name	Mp1	Mp2	Mp3	Mp4	
Potential Use of Indep.Var. x Category		Sponge	100	100	100	100	
Indice X Var.Depe	1	Sp1	-1	0.1	0.2	0.3	
	2	Sp2	-0.3	-0.2	0	0.4	
	3	Sp3	-0.2	0.1	0.3	-0.3	

In the case of Niche Breadth Indices the result for each index is shown together with the data table in the corresponding sheets.

Generating Graphics

Graphics	
Contrast Histogram **List 1**	▾
# Dependent Var :	**Cell 1**
Button 1 **Button 2**	Erase
Export Graph to a New Document	

The types of graphics that can be generated are listed in "List 1". Depending if the graphic is to be generated for one Dep.Var. or all variables, either "Button 1", Graph, or "Button 2", Graph all, respectively, should be used. If only one Dep.Var. is to be made, the corresponding number should be indicated in "Cell 1", the numbers for each Dep.Var. can be found at the left of the corresponding name in the data table.