LVI Calculator User Guide

Water Quality Standards Program
Florida Department of Environmental Protection

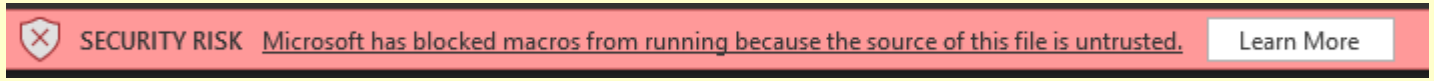
7/11/2024

Downloading the calculator

1. From the Web page click on the LVI Calculator link to download the Excel calculator.
2. The file will automatically be copied to your “Downloads” folder on your local drive.
3. Go to the “Downloads” folder and find the “LVI_Calculator_V3.0” file and copy it to the location where you want to store it.
4. Open the file first to check for the Security Warnings.
5. If the file opens as read only, click the “Enable Content” button at the top near the Security Warning.

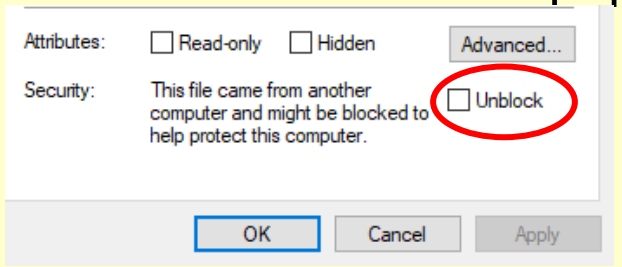
6. Make sure to save the file after you have enabled content.
7. If you get another Security Warning, follow the directions on the next slide.

Security Macros



If you receive this error after “Enabling Content”, please follow the directions below to make this a trusted file.

1. Go to the folder where you copied the calculator and right click on the file. Then go to the Properties tab. Near the bottom of the pop-up check the unblock button.



1. You can now double click on the file to use.
2. If the file opens as read only, click the “Enable Content” button at the top near the Security Warning.
3. Make sure to save the file after enabling content.

Read Me Sheet

LAKE VEGETATION INDEX (LVI) CALCULATOR

Based on FDEP-SOP-003/11 (Revision Date January 2017), LVI 2200 "Lake Vegetation Index Determination"
Calculator Created July 2024

Definition: The LVI is a regional multimetric biiological assessment of lake health using the aquatic plant community to determines how closely a lake's flora resembles that of an undisturbed lake. The LVI field method and calculations are described in "Assessing the Biological Condition of Florida Lakes: Development of the Lake Vegetation Index (LVI), 2007 Fore, Leska S.," with updates in the calculations described in "Development of Aquatic Life Use Support Attainment Thresholds for Florida's Stream Condition Index and Lake Vegetation Index, DEP-SAS-003/11." All LVI sampling and analysis shall be conducted according to the requirements of this LVI method and the LVI Primer (Sampling and Use of the Lake Vegetation Index (LVI) for Assessing Lake Plant Communities in Florida: A Primer [DEP-SAS-002/11; October 24, 2011]). In order to submit LVI data to DEP, sampling teams must demonstrate competency per the requirements in LVI 1200. Each team shall contain at least one individual who maintains "pass status" for the plant identification test per LVI 1200. Sampling for the LVI should be conducted from April 1 to November 30 in the South LVI region and May 1 to October 31 in the North LVI region. Each macrophyte taxon observed in each of four (4) lake segments is identified to the lowest practical taxonomic level as described in the LVI Primer. Those data are then entered on the LVI Taxa List tab of the calculator to calculate the LVI.

Index Calculation: The LVI has four (4) metrics:
1) Percent Native taxa
2) Percent FISC Category 1 Invasive Species
3) Percent Sensitive Taxa
4) Coefficient of Conservatism (C of C) score for Dominant Taxa

A score for each of the four metrics is calculated for each of the four lake segments based on the macrophyte taxa present in the segment. The four metric scores for each segment are averaged to give a LVI score for the segment. The four segment LVI scores are then averaged to get the final LVI score for the lake.

The equations used to calculate the individual LVI metric scores are regionalized. Therefore, the county and possibly latitude must be specified in the calculator to determine the appropriate region and obtain accurate results.

More details concerning the LVI and its calculation can be found in SOP LVI 2000.

Go to SOP LVI 2000

To use the calculator, go to the "Site Info" tab (press button on right or select tab at bottom) and enter the requested information about the lake sampled. After you have entered the Site Information, go to the "LVI Taxa List" tab and follow the instructions at the top of the sheet to select taxa found in each lake segment.

Go to Site Info Tab

1. Please make sure to read this page and the DEP SOP LVI 2000 (via the Blue Oval button) to understand the LVI and its calculation before starting.
2. Click on the green *Go to Site Info Tab* button to get started.
3. Further guidance is provided on each sheet as necessary.

Site Info Tab (fill all blue cells)

Follow numbered steps below (Cells without shading are protected from change and will be auto-populated as appropriate)

1) **Enter Site Info**

2) **Convert Coordinate to Decimal Degrees**

3) **Enter Ecoregion info, map is provided**

4) **Click on the "Go to LVI Taxa List tab" once completed**

Please Enter Site Information in Shaded Fields Below As Described		
Lake Name	Lake Talquin	
Sampling Entity	DEP	
WIN Organization ID	21WQSP	
WIN Station ID	2334	
WIN Sampling Location Description	Center of Lake	
Field ID	LEO123	Optional
County	Leon	Dropdown Menu
WBID	125	
Lake Size (area)	3467	(Optional)
Lake Size (units)	acres	(Optional) Dropdown Me
Longitude (Decimal Degrees)	80.1258	
Latitude (Decimal Degrees)	29.2548	Required for LVI Calcula
LVI Region	North	Autopopulated
Sample Date	1/1/2022	
Sample Time	13:35	
Sampler 1 Name (Check box to right if proficient* in LVI method)	ggp	☐
Sampler 2 Name (Check box to right if proficient* in LVI method)	ao	☑

1)

Clear Site Info

Geographic Coordinate Converter				
x/y	Degrees	Minutes	Seconds	Decimal Degrees
LATITUDE	30	25	40	30.427778
LONGITUDE	80	11	15	-80.187500

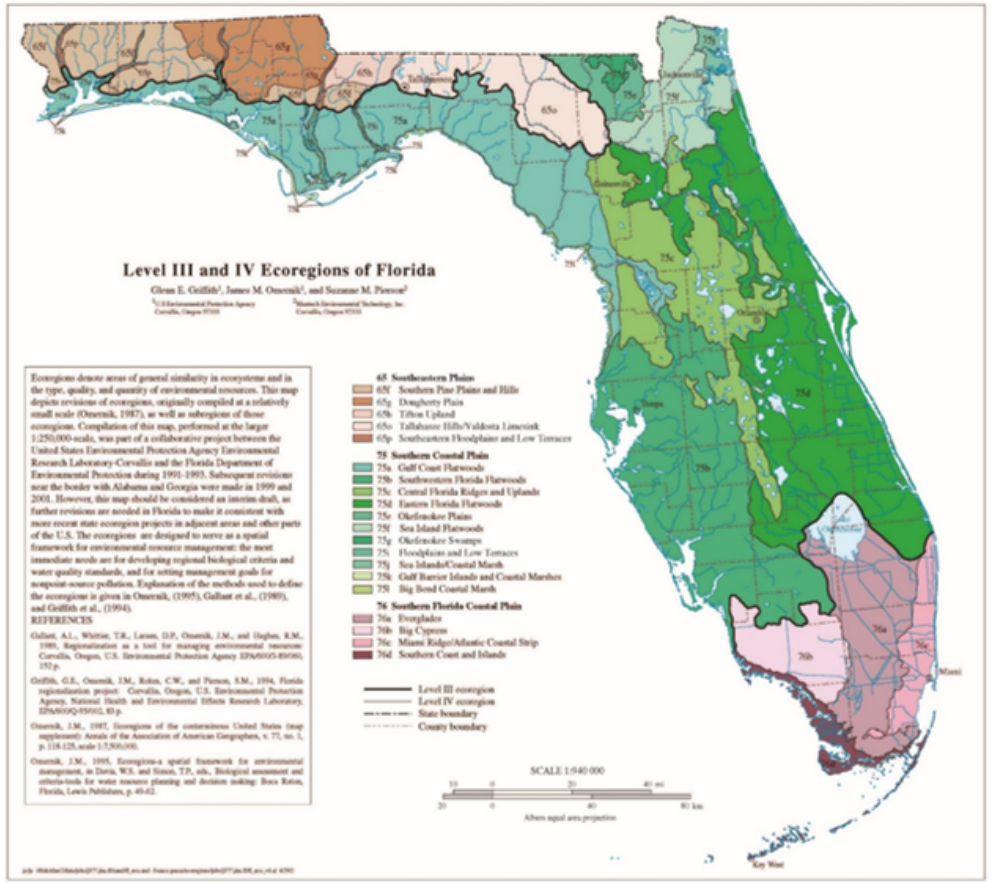
2)

4)

Go to LVI Taxa List Tab

3)

Level III Eco Region	65-Southeastern Plains	(Optional)
Level IV Eco Region	65o - Tallahasee Hills/Valdosta Limesink	(Optional)
Level IV Eco Region Name	Tallahasee Hills/Valdosta Limesink	(Optional) Autopopulate
Analyst (Person entering data)	ggp	



Link to full map

*Proficient: An individual that is in pass status with DEP for the LVI method. Pass status required passing the Check Proficiency status at the FDP Bioassessment Proficiency Registry Page.

Per DEP-SOP-003/11, LVI 1000. Lake Vegetation Index Determination. Effective date 4/16/2018
Per DEP-SAS-002/11, Sampling and Use of the Lake Vegetation Index (LVI) for Assessing Lake Plant Communities in Florida: A Primer, 10/24/2011

Site Info details

Please Enter Site Information in Shaded Fields Below As Described		
Lake Name	Lake Talquin	Clear Site Info
Sampling Entity	DEP	
WIN Organization ID	21WQSP	
WIN Station ID	2334	
WIN Sampling Location Description	Center of Lake	
Field ID	LEO123	Optional
County	Leon	Dropdown Menu
WBID	125	
Lake Size (area)	3467	(Optional)
Lake Size (units)	acres	(Optional) Dropdown M
Longitude (Decimal Degrees)	80.1258	
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LVI Region	North	Autopopulated
Sample Date	1/1/2022	
Sample Time	13:35	
Sampler 1 Name (Check box to right if proficient* in LVI method)	ggp	☐
Sampler 2 Name (Check box to right if proficient* in LVI method)	ao	☑

Go to LVI Taxa List Tab

Level III Eco Region	65-Southeastern Plains	(Optional)
Level IV Eco Region	65o - Tallahasee Hills/Valdosta Limesink	(Optional)
Level IV Eco Region Name	Tallahasee Hills/Valdosta Limesink	(Optional) Autopopula
Analyst (Person entering data)	ggp	

***Proficient**: An individual that is in pass status with DEP for the LVI method. Pass status required passing the
Check Proficiency status at the FDP Bioassessment Proficiency Registry Page.

Per DEP-SOP-003/11, LVI 1000. Lake Vegetation Index Determination. Effective date 4/16/2018
Per DEP-SAS-002/11, Sampling and Use of the Lake Vegetation Index (LVI) for Assessing Lake Plant Communities in Florida: A Primer, 10/24/201

- Information entered in the blue shaded cells will be saved when you save the calculator spreadsheet.
- Values entered in the Site Info worksheet will be used to auto populate the other worksheets in the calculator to avoid the need to re-enter information.
- Cells without shading are protected from change and will be auto-populated as appropriate.

LVI Taxa List sheet Overview
(Follow numbered steps indicated in red)

1) Clear Previous Data Entered

LAKE VEGETATION INDEX (LVI) CALCULATOR
Based on FDEP-SOP-002/01, LVI 2200 Vegetation Index
Created July 1, 2024

4) Calculate LVI

1) Start by pressing the "Clear Previous Data Entries" button to clear all data previously entered and taxa selected.

2) Select lake segments sampled. Other site information automatically copied from Site Info tab.

3) Then for each of the four lake segments sampled, select all macrophyte taxa present in the segment by entering "D" to denote a Dominant taxa, "C" to denote Co-Dominant Taxa, or a "P" to identify all other taxa present in columns C through F, respectively. Only one dominant or two co-dominant taxa are allowed per segment. (If a Taxa is not found in Column A, also search in the Column B as a synonym.)

4) When all the appropriate taxa have been identified, press the "Calculate LVI" button to calculate the Lake Vegetation index Value.

Lake Name	Field ID	WIN Organization ID	WIN Station ID	WIN Sampling Location Description	WBID	Sample Date	Notes:
Lake Talquin	LEO123	21WQSP	2334	Center of Lake	125	1/1/2022	

Sampler #1 (* = Proficient)	Sampler #2 (* = Proficient)	Sections Sampled	Longitude (Decimal Degrees)	Latitude (Decimal Degrees)	County	Region
ggp	ao	2, 5, 8, 11	80.1258	29.2548	Leon	North

2)

Total Taxa / Dominant Taxa / Co-Dominant Taxa	6 / 0 / 2	6 / 1 / 0	7 / 0 / 1	6 / 0 / 2

Sample Date is Outside Index Period for the LVI!

3) For each segment below, Use "D" to denote Dominant taxa, "C" to denote Co-Dominant Taxa, and "P" to Identify all other taxa present.

Taxon	Synonym(s)	Segment 2	Segment 5	Segment 8	Segment 11	Occurrences	Occurrences of LVI	C of C Score	FLEPPC Status	Wetland Status	Nativity	FLEPPC Code
Abildgaardia		p	p	p	p	4	0		-9		-9	-9
Abildgaardia ovata						0	0	-9.00	Not Listed	FACW	Native	3
Acalypha gracilens		p	p	p	p	4	0	3.29	Not Listed		Native	3
Acer						0	0	-9.00	Not Listed		Native	3
Acer barbatum						0	0	7.70	Not Listed		Native	3
Acer rubrum		p	p	p	p	4	4	4.65	Not Listed	FACW	Native	3
Acer saccharinum						0	0	6.89	Not Listed	OBL	Native	3
Acmella						0	0	-9.00	Not Listed	Var Genus	-9	3
Acmella oppositifolia	*Spilanthes americana*					0	0	3.00	Not Listed	FAC	Native	3
Acmella oppositifolia repens						0	0	3.00	Not Listed	FAC	*Native*	*3*

1. To clear any previous data, press the “Clear Previous Data Entered” button.
2. Select lake segments sampled using drop down.
3. For each taxon found in each segment enter whether it was dominant (D), Co-dominant (C), or present (P) in the pale-yellow shaded cells. Note: For taxon without observations, leave the columns blank. These will not be counted.
4. Once all taxa found in each segment have been entered, press the “Calculate LVI” Green button.
5. If there are any changes to the LVI taxon numbers on this sheet, make sure to click the Calculate LVI button again to calculate the new results on the next sheet.

LVI Taxa List

- The C of C Scores, FLEPPC Status, Wetland Status, and Nativity associated with each taxa as well as the total number of LVI taxon present as provided on the “LVI Taxa List” tab are used to calculate the metrics for each lake segment.
- The taxa included on the “LVI Taxa List” tab were derived from the FDEP Statewide Biological Database (SBIO) and represent the taxa typically found in Florida Lakes.
- If a taxon recorded at a lake is not included in the calculator taxa list, please contact Ashley O’Neal at Ashley.ONeal@FloridaDEP.gov to have it added.

Taxon	Synonym(s)	Segment 2	Segment 5	Segment 8	Segment 11	Occurrences	Occurrences of LVI Taxon	C of C Score	FLEPPC Status	Wetland Status	Nativity
Abildgaardia		*p*	*p*	*p*	*p*	*4*	*0*		-9		-9
Abildgaardia ovata						*0*	*0*	-9.00	Not Listed	FACW	Native
Acalypha gracilens		*p*	*p*	*p*	*p*	*4*	*0*	3.29	Not Listed		Native
Acer						*0*	*0*	-9.00	Not Listed		Native
Acer barbatum						*0*	*0*	7.70	Not Listed		Native
Acer rubrum		*p*	*p*	*p*	*p*	*4*	*4*	4.65	Not Listed	FACW	Native
Acer saccharinum						*0*	*0*	6.89	Not Listed	OBL	Native
Acmella						*0*	*0*	-9.00	Not Listed	Var Genus	-9
Acmella oppositifolia	*Spilanthes americana*					*0*	*0*	3.00	Not Listed	FAC	Native
Acmella oppositifolia repens						*0*	*0*	3.00	Not Listed	FAC	*Native*
Acrostichum		*c*	*d*	*c*	*p*	*4*	*0*		-9		-9
Acrostichum danaeifolium		*c*	*p*	*p*	*c*	*4*	*4*	5.79	Not Listed	OBL	Native
Aeschynomene						*0*	*0*		-9		-9

LVI Calculator Overview

LAKE VEGETATION INDEX (LVI) CALCULATOR
Based on FDEP-SOP-002/01, LVI 2200 Vegetation Index
Created July 1, 2024

Go to Taxa Selection Tab

Lake Name	Field ID	WIN Organization ID	WIN Station ID	Win Location Description	WBID	Sampling Date	Sampler #1	Sampler #2	Region
Lake Talquin	LEO123	21WQSP	2334	Center of Lake	6/28/1909	1/0/1900	ggp	ao*	North
Metric	**Segment 3 Metric Value**	**Segment 6 Metric Value**	**Segment 9 Metric Value**	**Segment 12 Metric Value**	**Regional Metric Score Equation**	**Segment 3 Metric Score**	**Segment 6 Metric Score**	**Segment 9 Metric Score**	**Segment 12 Metric Score**
% Native Taxa	75.00	75.00	75.00	75.00	(X-62.5)/37.5	0.3333	0.3333	0.3333	0.3333
% FLEPPC Taxa	25.00	25.00	25.00	25.00	1-(X/30)	0.1667	0.1667	0.1667	0.1667
% Sensitive Taxa	0.00	0.00	0.00	0.00	X/27.78	0.0000	0.0000	0.0000	0.0000
Dominant Taxa C of C	5.50	5.86	5.86	5.50	X/7.91	0.6953	0.7402	0.7402	0.6953
Total Taxa LVI Present	4	4	4	4					
					Segment LVI Score	29.88	31.01	31.01	29.88
								Lake LVI Score	30
Number of Total / Dominant / Co-Dominant Taxa entered	4 / 1 / 0	4 / 0 / 2	4 / 0 / 2	4 / 1 / 0					

This is the final LVI score for the lake

These are the taxa selected

Plant Taxa present as selected on the Taxa List Tab

Taxon	Segment 3	Segment 6	Segment 9	Segment 12	Occurrences	Occurrences of LVI Taxon	C of C Score	FLEPPC Status	Wetland Status
Amphicarpum muhlenbergianum	p	p	p	p	4	4	5.70	Not Listed	FACW
Bidens laevis	d	c	c	d	4	4	5.50	Not Listed	OBL
Richardia scabra	p	p	p	p	4	0	0.00	Not Listed	
Zizaniopsis miliacea	p	c	c	p	4	4	6.21	Not Listed	OBL

- After pressing the “Calculate LVI” button, you are taken to the LVI Calculator tab of the calculator, where all the necessary information has been automatically copied and the final LVI score for the lake is calculated.
- The bottom portion of the sheet provides a list of all taxa entered on the previous tab and allows you to double check your data entry.
- If any errors are found, press the green “Go to Taxa Selection Tab” Button at top to go back to the taxa list and make the necessary edits and re-run the calculation.

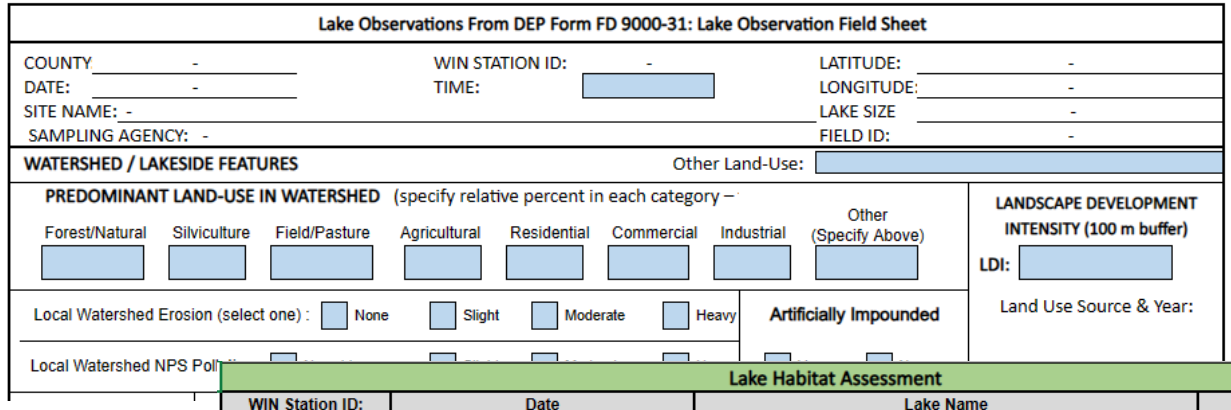
Extra information sheets - Optional

Extra Field Data sheets are provided to record extra information to support the LVI (these do not affect the LVI calculations within the calculator)

Lake and Sample information are auto-populated using the values entered in the Site Info sheet.

1. Lake Observation sheet (FD 9000-31)
2. Lake Habitat Assessment (HA) sheet (FD 9000-6)
3. Dominant Taxon Photos sheet
   - Lake sections and dominant and co-dominant taxa are auto populated from the LVI calculator sheet.
   - Samplers can submit their photographs of dominant and co-dominant taxon for verification.
4. ExternalBioFormat sheet
   - This sheet is for submitting bioassessment data to the Watershed Assessment Section at DEP

1)



Lake Observations From DEP Form FD 9000-31: Lake Observation Field Sheet

COUNTY: - | WIN STATION ID: - | LATITUDE: -
DATE: - | TIME: | LONGITUDE: -
SITE NAME: - | LAKE SIZE -
SAMPLING AGENCY: - | FIELD ID: -

WATERSHED / LAKESIDE FEATURES | Other Land-Use:

PREDOMINANT LAND-USE IN WATERSHED (specify relative percent in each category –

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify Above)

LANDSCAPE DEVELOPMENT INTENSITY (100 m buffer)
LDI:

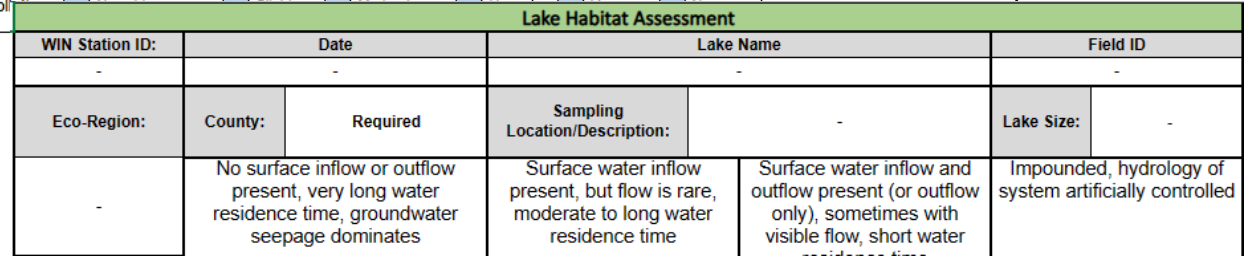
Local Watershed Erosion (select one) : None | Slight | Moderate | Heavy

Artificially Impounded

Land Use Source & Year:

Local Watershed NPS Pol

2)



Lake Habitat Assessment

WIN Station ID:	Date	Lake Name	Field ID
-	-	-	-

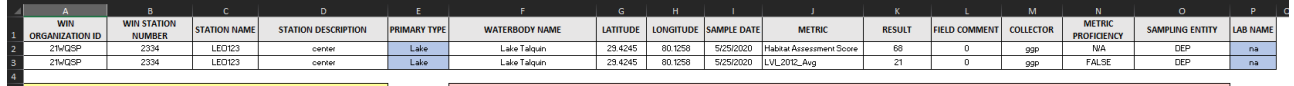
Eco-Region:	County:	Required	Sampling Location/Description:	-	Lake Size:	-

-	No surface inflow or outflow present, very long water residence time, groundwater seepage dominates	Surface water inflow present, but flow is rare, moderate to long water residence time	Surface water inflow and outflow present (or outflow only), sometimes with visible flow, short water	Impounded, hydrology of system artificially controlled

3)

Section	Dominant/Co-dominant Taxa	Co-dominant Taxa
	#N/A	NA
-		
	#N/A	NA

4)



WIN ORGANIZATION ID	WIN STATION NUMBER	STATION NAME	STATION DESCRIPTION	PRIMARY TYPE	WATERBODY NAME	LATITUDE	LONGITUDE	SAMPLE DATE	METRIC	RESULT	FIELD COMMENT	COLLECTOR	METRIC PROFICIENCY	SAMPLING ENTITY	LAB NAME
21WQSP	2334	LEO123	center	Lake	Lake Talquin	29.4245	80.1258	5/25/2020	Habitat Assessment Score	68	0	ggp	NA	DEP	na
21WQSP	2334	LEO123	center	Lake	Lake Talquin	29.4245	80.1258	5/25/2020	LVI_2012_Avg	21	0	ggp	FALSE	DEP	na

↑ All values above are auto populated from the values entered or calculated on the other worksheets.

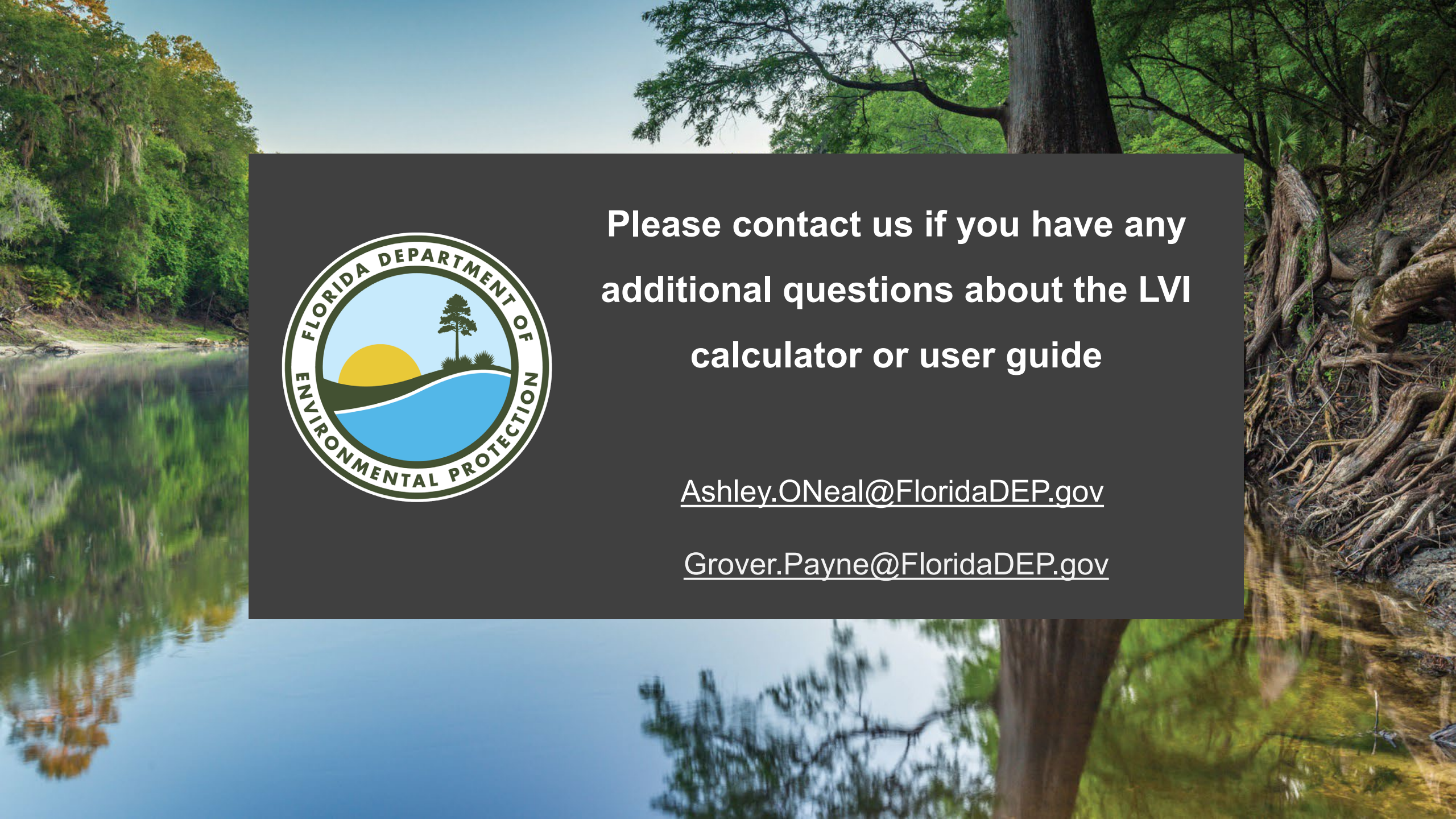
There is no need to enter anything on this sheet!

Submitting Bioassessment Data

Data providers who would like to submit LVI data to help support the Department's Impaired Waters assessment can copy the auto calculated values in this worksheet into the Watershed Assessment Sections Bioassessment Data Template.

The department is requesting external data providers who would like to submit applicable bioassessment data to help support the department's Impaired Waters assessment. Please download and complete the **Bioassessment Data Template**, available as a Microsoft Excel worksheet (.xlsx). Once the template has been completed with the required information, please submit the worksheet and any supporting documentation (field sheets, photos, etc.) by email to **Kevin O'Donnell**.

Entities submitting data to DEP must meet the applicable bioassessment proficiency demonstrations set forth on the **Bioassessment Training, Evaluation**



Please contact us if you have any additional questions about the LVI calculator or user guide

Ashley.ONeal@FloridaDEP.gov

Grover.Payne@FloridaDEP.gov