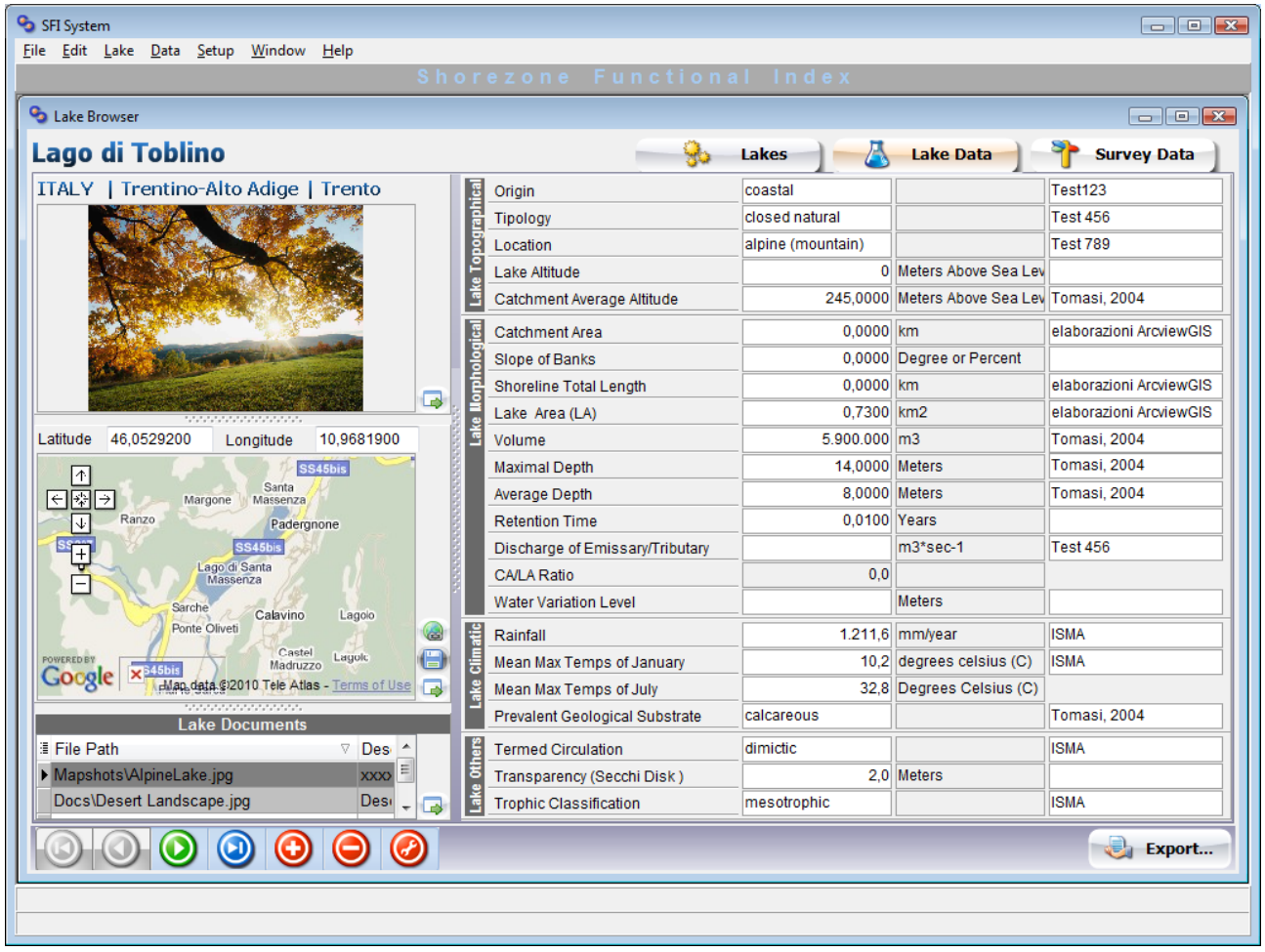
The Shorezone Functional Index

Software Application [beta version – 2010.06.18]

The **Shorezone Functional Index** software application is a yet-to-be-finished Windows™ program designed to archive survey data collected on lakes shorezones and to perform their SFI index calculation based on select ecological parameters, as defined by an original scientific model proposed by the group led by prof. Maurizio Siligardi of Agenzia Provinciale per la Protezione dell'Ambiente – Provincia Autonoma di Trento – Italy.



Main Features

- User-friendly data navigation, SFI index calculation and export interface
- Classification tree diagram generation
- Google Maps integration with persistent snapshot functionality
- Simple attached files manager
- Comprehensive back-end forms for data entry
- Multi-language functionality [currently English and Italian]
- Stand-alone application [no installer needed]

Setup

Unzip the contents of the SFINX.zip archive to any directory of your choice and double click on SFI.exe.

Database structure

Each Survey belongs to a Shorezone that belongs to a Lake.

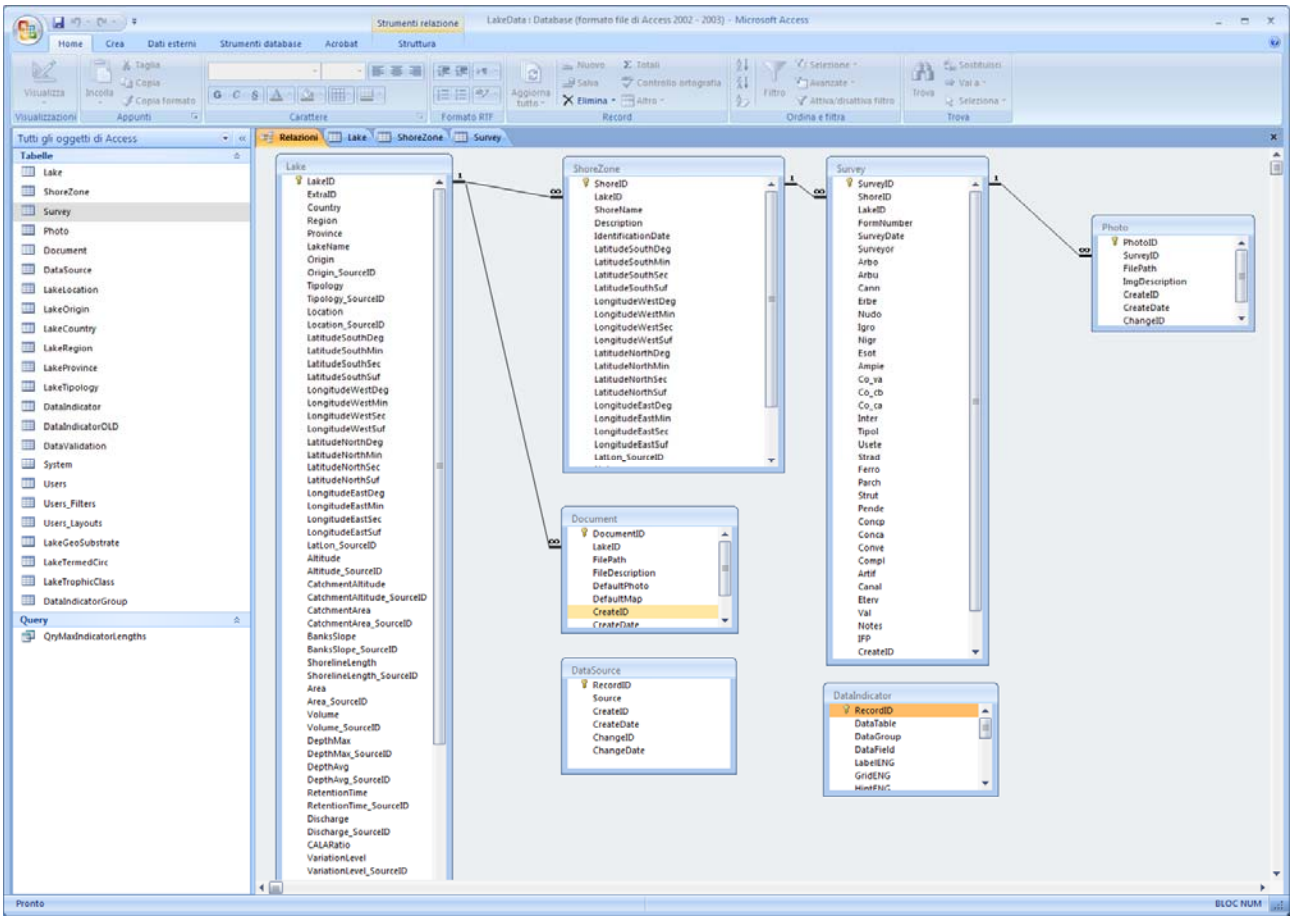
The **Lake** table contains all sorts of topographical, morphological, climatic and other information about lakes. Each parameter can be labeled with **units of measurement** and **data source** values. All this data is not currently used in the SFI index calculation, its purpose is to aggregate all available knowledge on water bodies.

The **ShoreZone** table contains lake shorezones as identified by a survey campaign. If shorezones substantially change in topographical data over time, it's up the user to define new shorezones or add current survey data under the originally identified shorezones.

The **Survey** table contains all ecological and structural data collected on a specific shorezone at a given time using the researchers' survey form. A few of this parameters go into the Shorezone Functional Index calculation.

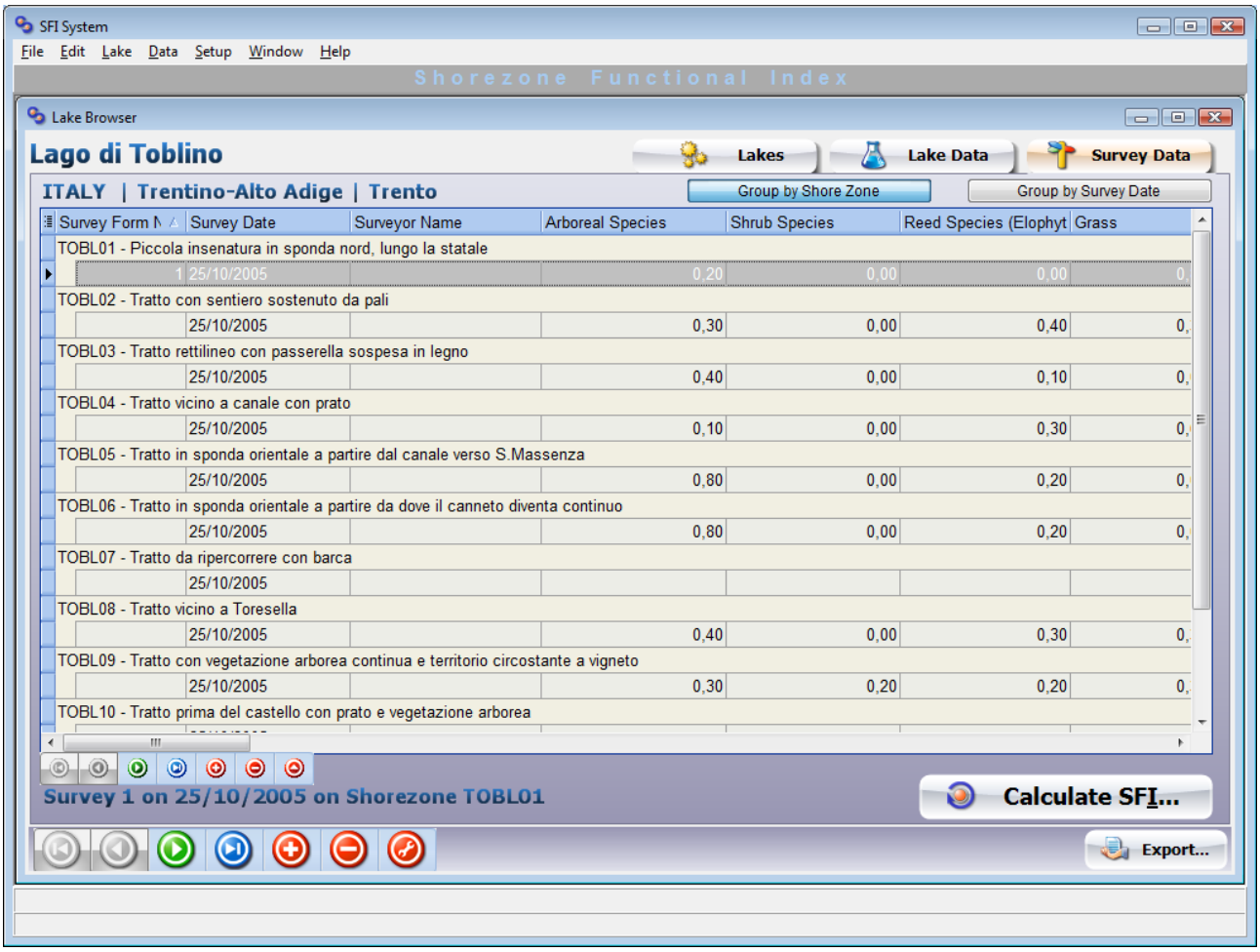
All other tables are look-up tables have to do with metadata, translations, user preferences, etc.

The database file can be opened with **Microsoft® Office Access** version 2002 or later.



User Interface (Lake Browser)

At startup the MDI application opens by default the **Lake Browser** window, which sports a rather self-explaining tabbed interface that can minimize the use of the drop-down menus.

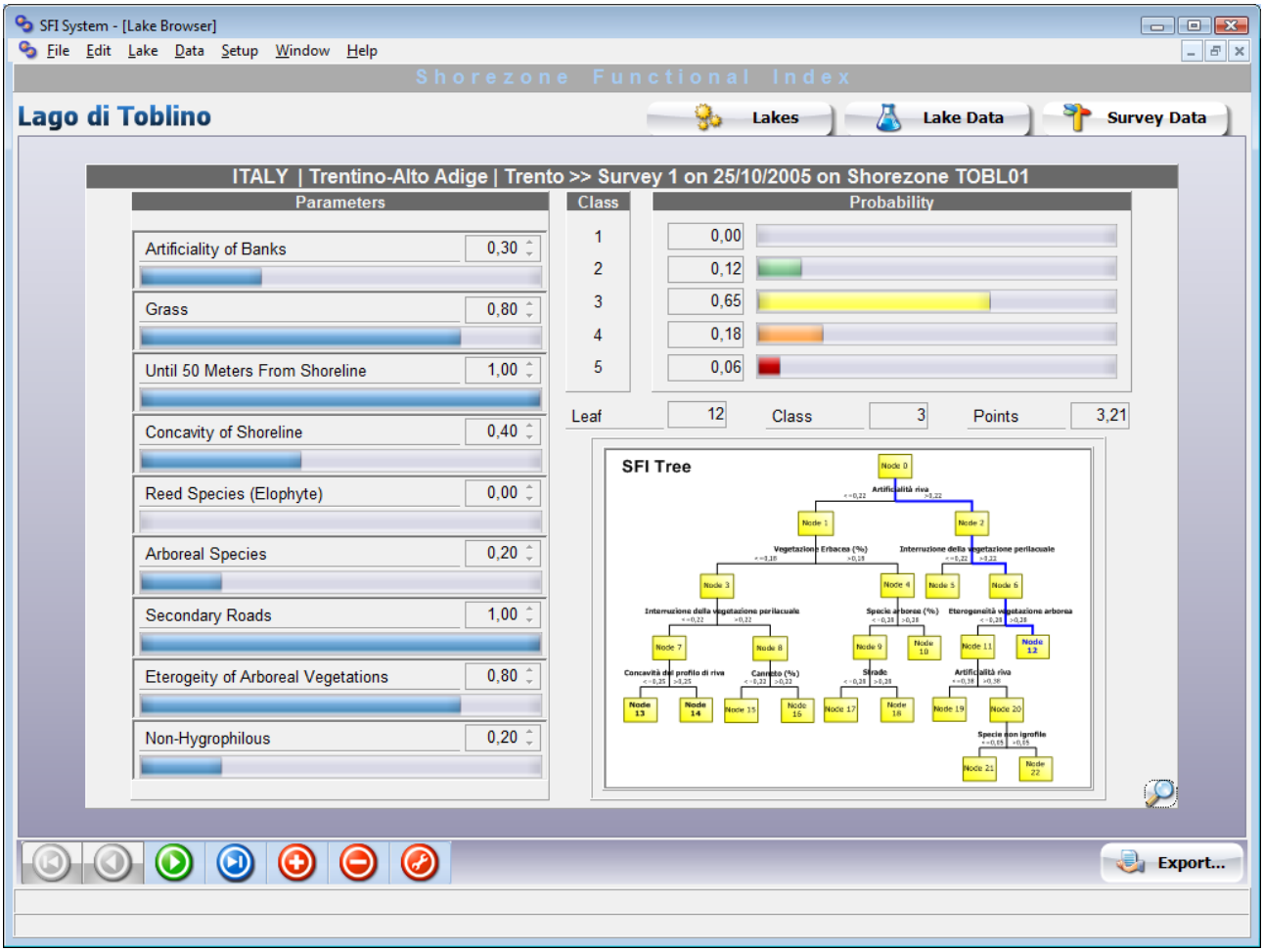


The main **record navigator** in the window's left corner can be used to browse through **lakes** and invoke the Add, Delete or Modify lake master forms.

The **smaller navigator** below the data grid can be used to browse through **shorezones** and **surveys**; the Add, Delete or Modify red buttons apply to either shorezones or surveys depending on the selected grid row.

The **Calculate SFI** button activates itself only when a survey row is selected; if pressed, the **Shorezone Functional Index** results are shown with probability percentages and a zoomable **classification tree** diagram.

The **Export** button can output the currently viewable data in **Microsoft® Office Excel®** .xls format: when pressed within the Lakes tab it will output the list of lakes; in the Lake data tab all of lake's information; in the Survey Data tab all surveys grouped by shorezone; in the SFI results mode the Shorezone Functional Index probabilities and the SFI tree diagram.



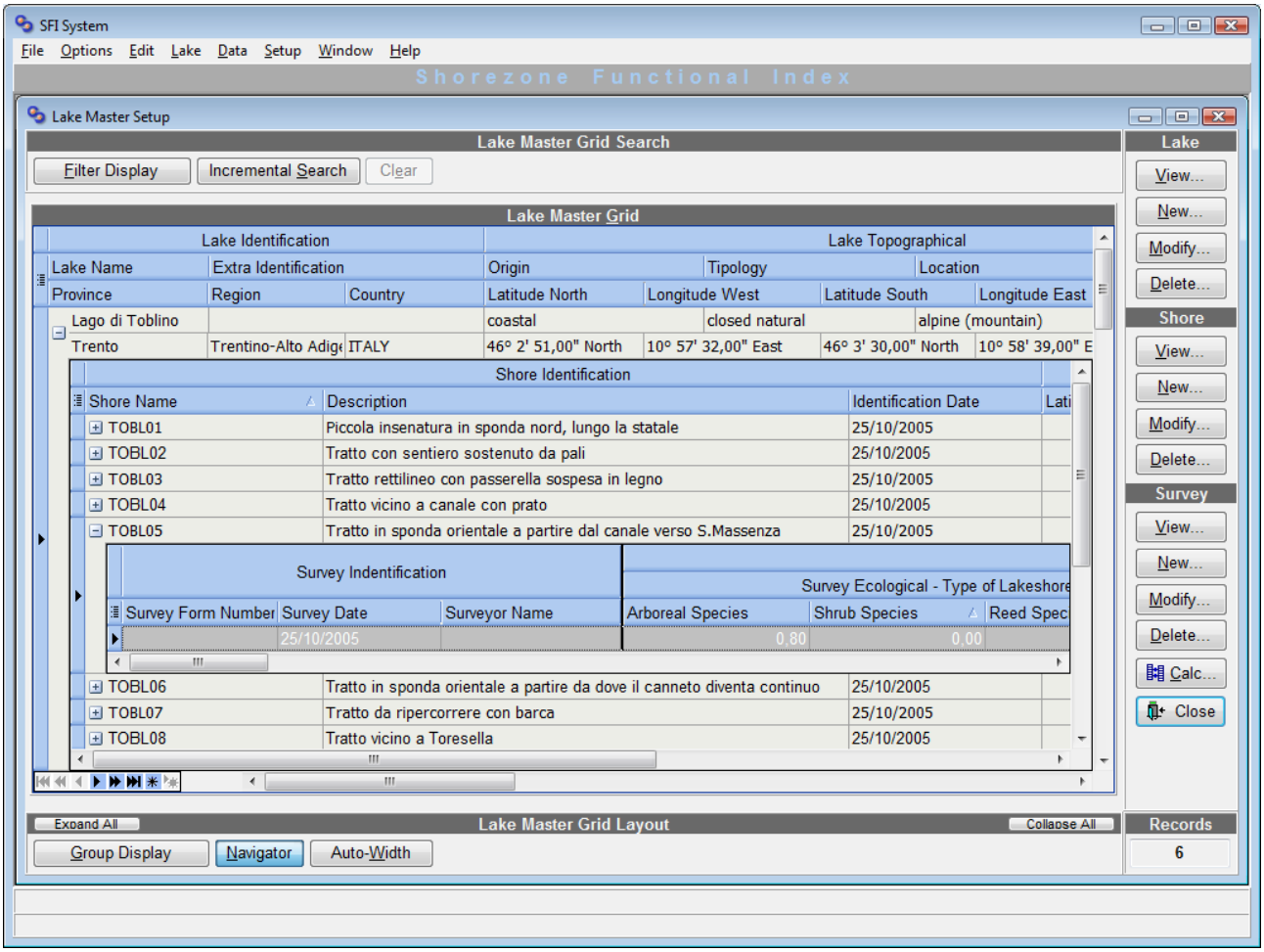
Back-end (Lake Data Entry)

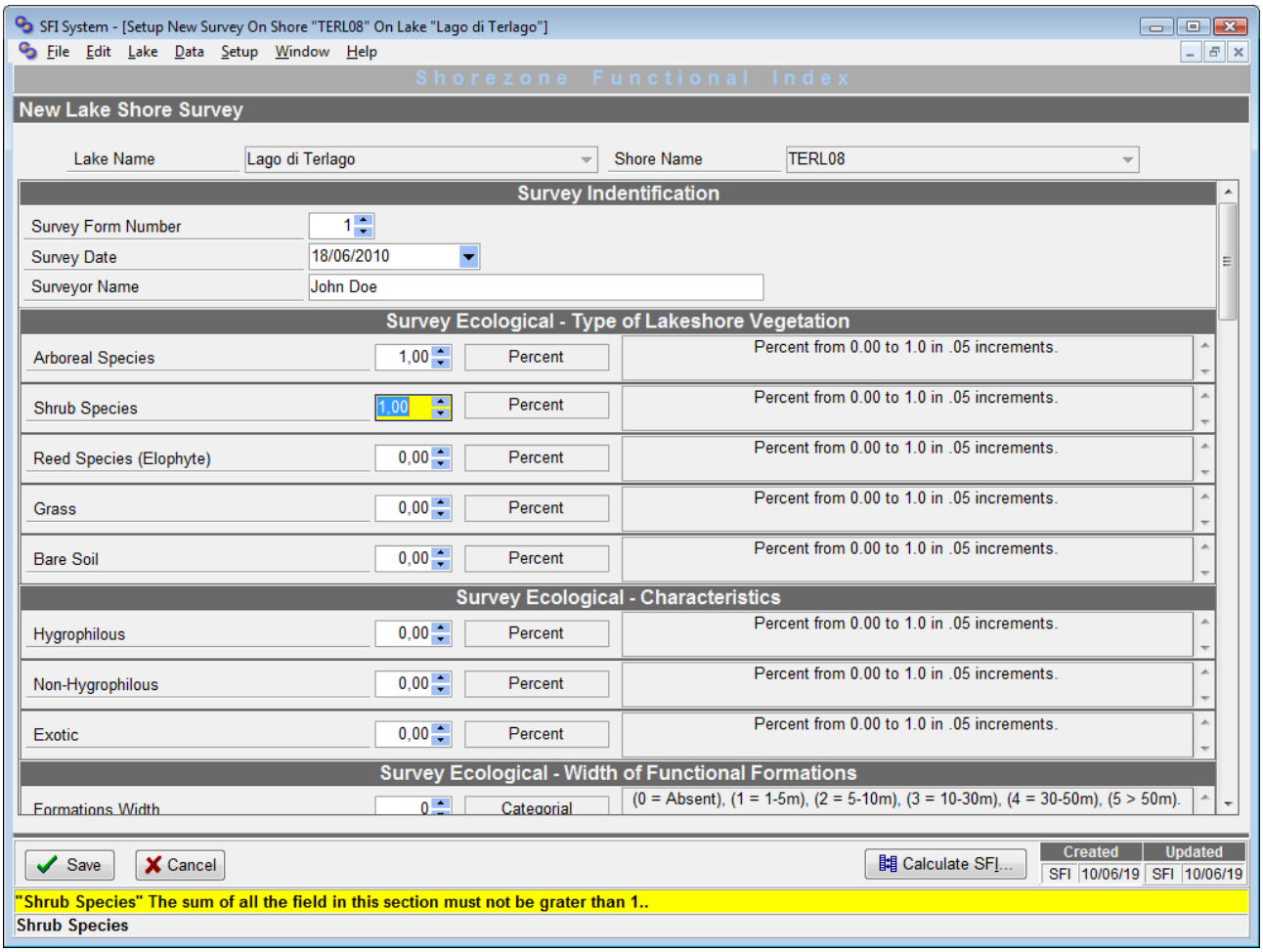
Data entry and editing forms can be invoked either from the Lake Browser interface, using the navigators' red buttons, or by means of the **three-level hierarchical grid** contained in the Lake Master Setup form, called by the Lake -> **Lake Data Entry** menu command.

Here the **View**, **New**, **Modify** and **Delete** buttons are smartly enabled or disabled depending on the currently selected grid row: for instance a Survey cannot be created at the Lake level, since the parent Shorezone information would be missing.

The **New Lake Shore Survey** data entry form is the most important one: here the user can input the survey data from which the SFI index is calculated. Most fields are required, special validation rules apply to their values and extensive explanation about each parameter is given "in place".

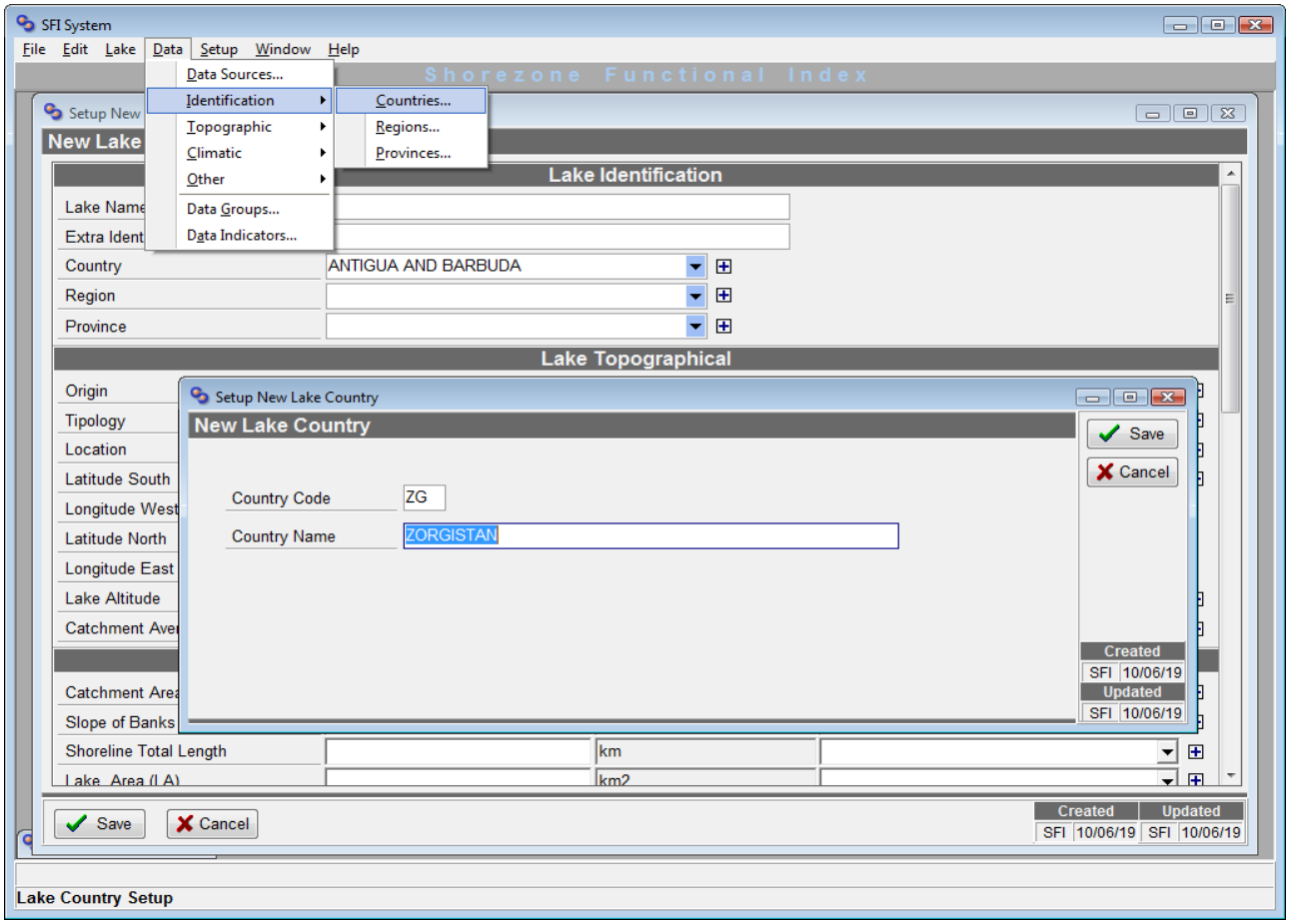
Optionally **survey photographs** can be attached to the survey record: at present the system only stores a relative file path in the database; this means that if the user wants to make the external data "portable", he or she needs to physically store it into a subdirectory of the program's own directory.


SFI System
File Options Edit Lake Data Setup Window Help
Shorezone Functional Index
Lake Master Setup
Lake Master Grid Search
Filter Display
Incremental Search
Clear
Lake Master Grid
Lake Identification
Lake Topographical
Lake Name
Extra Identification
Origin
Tipology
Location
Province
Region
Country
Latitude North
Longitude West
Latitude South
Longitude East
Lago di Toblino
coastal
closed natural
alpine (mountain)
Trento
Trentino-Alto Adige
ITALY
46° 2' 51,00" North
10° 57' 32,00" East
46° 3' 30,00" North
10° 58' 39,00" E
Shore Identification
Shore Name
Description
Identification Date
TOBL01
Piccola insenatura in sponda nord, lungo la statale
25/10/2005
TOBL02
Tratto con sentiero sostenuto da pali
25/10/2005
TOBL03
Tratto rettilineo con passerella sospesa in legno
25/10/2005
TOBL04
Tratto vicino a canale con prato
25/10/2005
TOBL05
Tratto in sponda orientale a partire dal canale verso S.Massenza
25/10/2005
Survey Indentification
Survey Ecological - Type of Lakeshore
Survey Form Number
Survey Date
Surveyor Name
Arboreal Species
Shrub Species
Reed Spec
25/10/2005
0,50
0,00
TOBL06
Tratto in sponda orientale a partire da dove il canneto diventa continuo
25/10/2005
TOBL07
Tratto da ripercorrere con barca
25/10/2005
TOBL08
Tratto vicino a Toresella
25/10/2005
Lake
View...
New...
Modify...
Delete...
Shore
View...
New...
Modify...
Delete...
Survey
View...
New...
Modify...
Delete...
Calc...
Close
Expand All
Lake Master Grid Layout
Collapse All
Group Display
Navigator
Auto-Width
Records
6

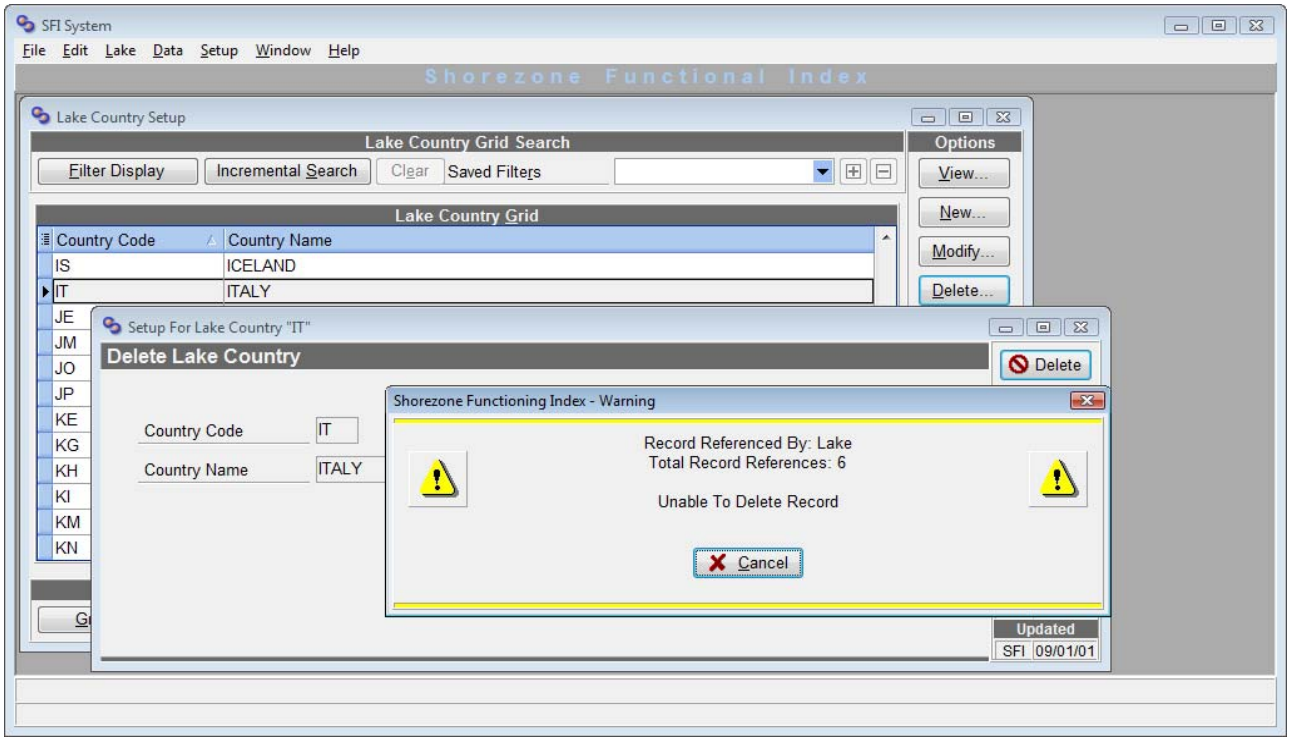

SFI System - [Setup New Survey On Shore "TERL08" On Lake "Lago di Terlago"]
File Edit Lake Data Setup Window Help
Shorezone Functional Index
New Lake Shore Survey
Lake Name
Lago di Terlago
Shore Name
TERL08
Survey Indentification
Survey Form Number
1
Survey Date
18/06/2010
Surveyor Name
John Doe
Survey Ecological - Type of Lakeshore Vegetation
Arboreal Species
1,00
Percent
Percent from 0.00 to 1.0 in .05 increments.
Shrub Species
1,00
Percent
Percent from 0.00 to 1.0 in .05 increments.
Reed Species (Elophyte)
0,00
Percent
Percent from 0.00 to 1.0 in .05 increments.
Grass
0,00
Percent
Percent from 0.00 to 1.0 in .05 increments.
Bare Soil
0,00
Percent
Percent from 0.00 to 1.0 in .05 increments.
Survey Ecological - Characteristics
Hygrophilous
0,00
Percent
Percent from 0.00 to 1.0 in .05 increments.
Non-Hygrophilous
0,00
Percent
Percent from 0.00 to 1.0 in .05 increments.
Exotic
0,00
Percent
Percent from 0.00 to 1.0 in .05 increments.
Survey Ecological - Width of Functional Formations
Formations Width
0
Categorial
(0 = Absent), (1 = 1-5m), (2 = 5-10m), (3 = 10-30m), (4 = 30-50m), (5 > 50m).
Save
Cancel
Calculate SFI...
Created
Updated
SFI 10/06/19
SFI 10/06/19
"Shrub Species" The sum of all the field in this section must not be grater than 1..
Shrub Species

Look-Up tables

Quite a lot of **auxiliary data** is contained in look-up tables that are often made available to the user through drop-down lists in the main data entry forms; new values can be inserted by means a **[+]** button close to the lists. All this data can be maintained using the forms that open via the **Data menu and submenu items**.

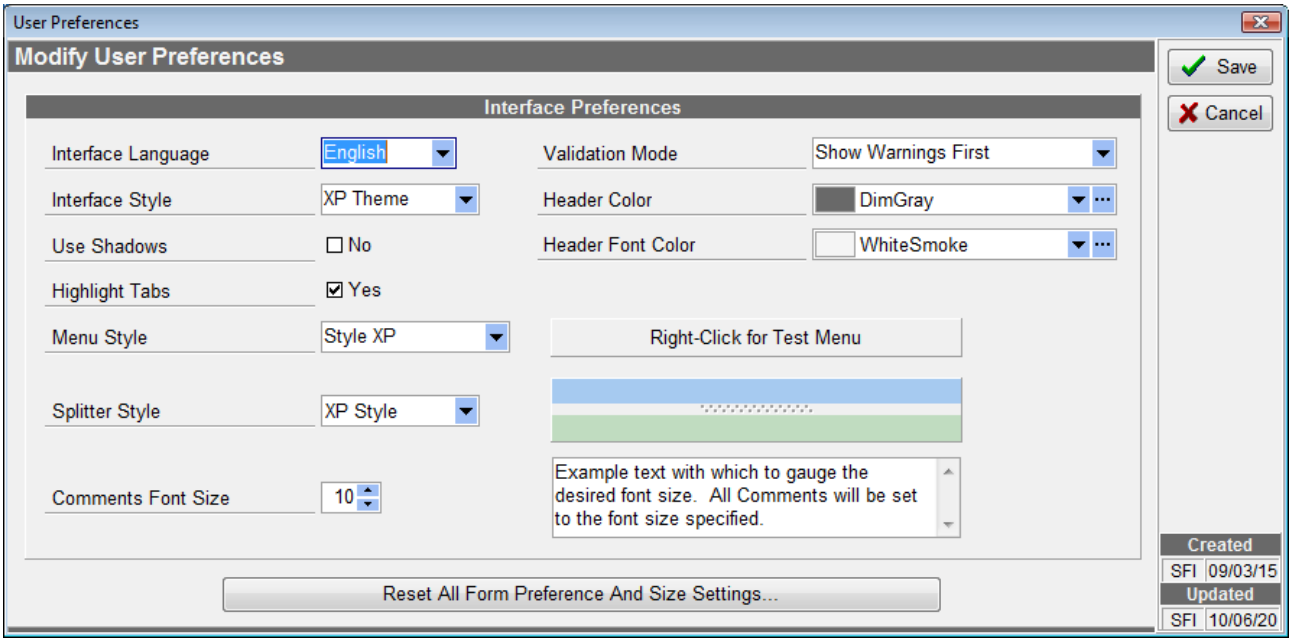


Referential integrity is applied to this related data, so values that are linked in the master tables can't be deleted until the relation is removed from them.



User Preferences

A number preferences can be changed by the user at runtime; the **Interface Language** option requires the application to be closed and restarted to be effective. Please note that that data is not translated, so the language choice is preferably to be expressed before actual data entry.



Known Issues

- The database backup functionality seems to be broken in the current beta release
- The SFI index calculation does not work when invoked from the CRUD back-end forms; please use the Lake Browser form instead.

Developer's contacts

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