

# **Introduction to Idrisi Kilimanjaro**

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# Introduction

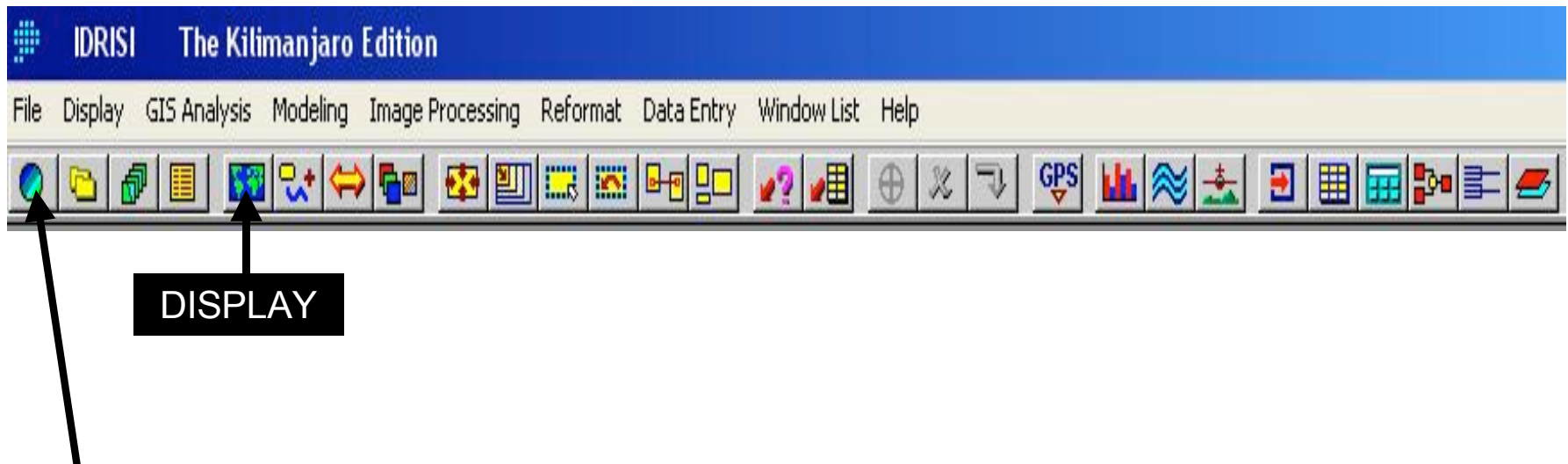
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- IDRISI is a raster-based GIS and Image Processing software with very strong analytical capabilities.
- It consists of a rich suite of functions called modules.

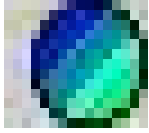
# Getting to know Idrisi Kilimanjaro

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- There are menus on the top of the screen as well as a toolbar of icons, located just below the menus

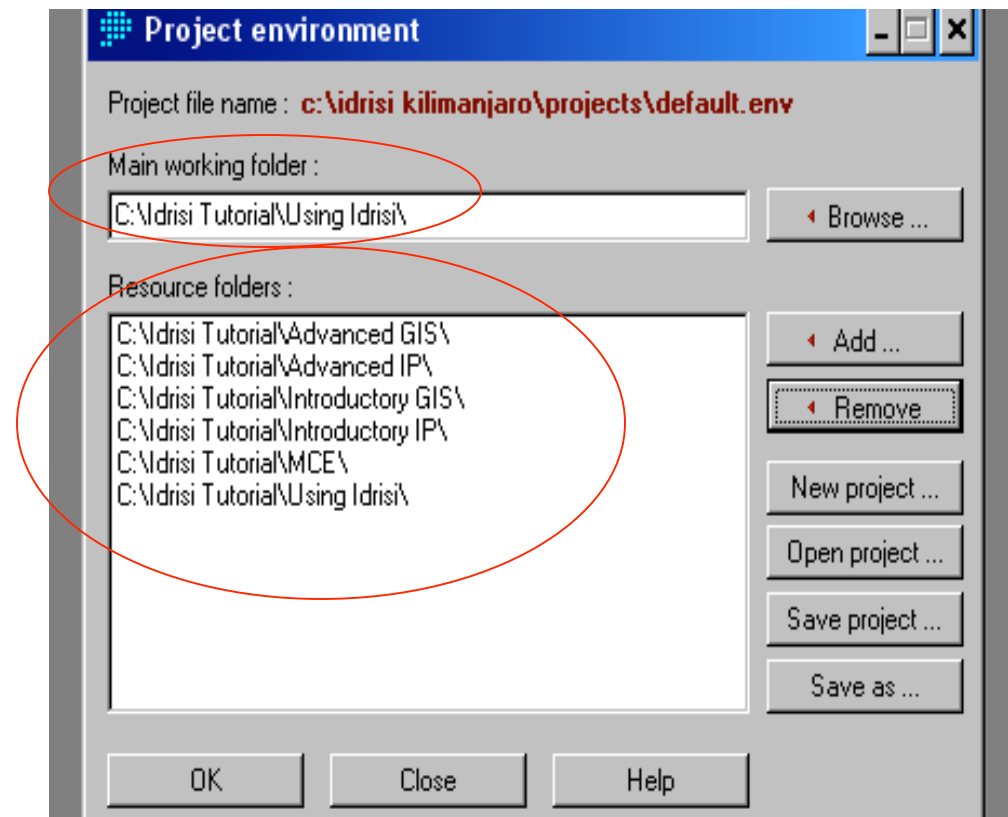


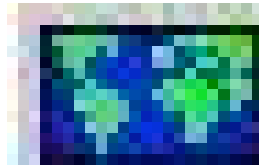
- Icons provide a short-cut to functions found in the menus
- As you point your cursor to different icons, they are described on the lower left of your screen.



## Project Environment and data path

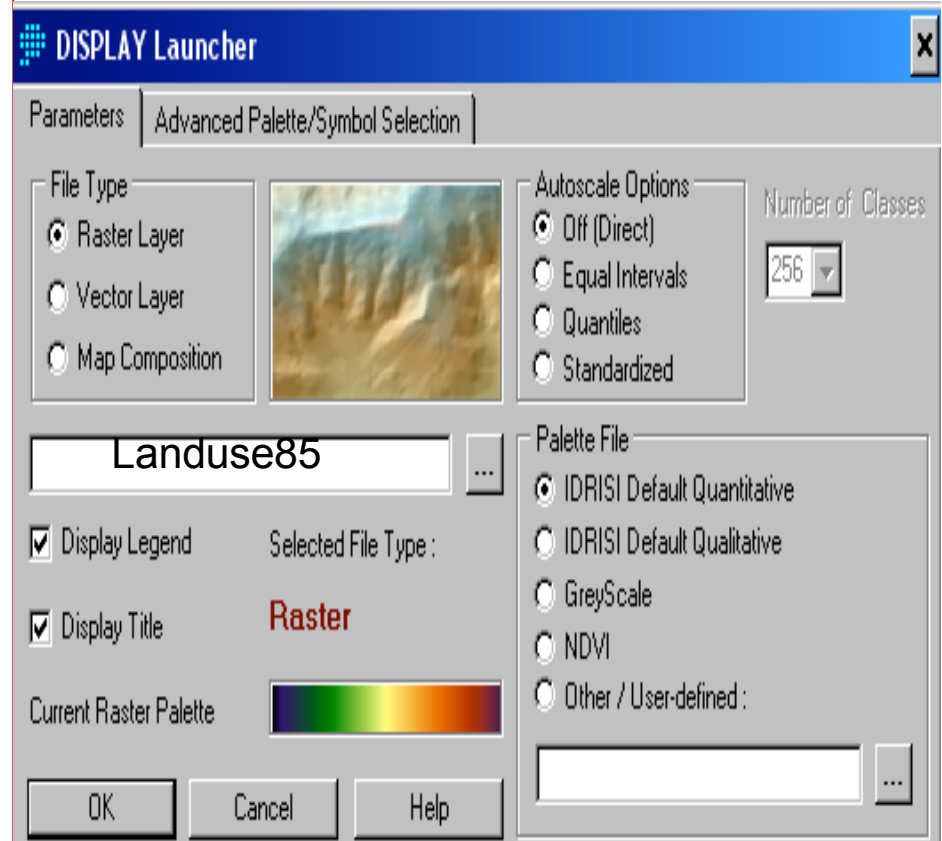
- This dialog allows the user to specify a set of data paths to be used for a particular project
- Specify the folder where output will be written to (*working folder*) and folder holding the original input data (*resource folder*.)





# DISPLAY launcher

- **DISPLAY Launcher** is the entry point into IDRISI's extensive display (raster image and vector layer) and map composition system.



# Predictive Change Modeling

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- Knowing the changes that have occurred in the past may help predict future changes.
- MARKOV Chain Analysis and Cellular Automata provide the basic tools for predictive land-cover change modeling.
- A Markovian process is one in which the state of a system at time 2 (e.g. landuse85 for Westboro in MA) can be predicted by the state of the system at time 1 (e.g. landuse71 for Westboro in MA)
- MARKOV module provides the following output:
  - A transition probability matrix.
  - A transition areas matrix.
  - A set of conditional probability images (Can be used to run other modules like STCHOICE - a stochastic choice decision module)

# Procedures and output using Markov Module

The screenshot displays the Markov Chain Analysis software interface. The main window is titled "Markov Chain Analysis (Outputs transition probabilities and conditional probability maps)". The "Markov - Markovian transition estimator" dialog box is open, showing the following settings:

- First (earlier) land cover image: landuse71
- Second (later) land cover image: landuse85
- Prefix for output conditional probability images: 7185
- Number of time periods between the first and second land cover images: 14
- Number of time periods to project forward from the second image: 14
- Background cell option:
  - Assign 0.0
  - Assign equal probabilities
  - Assign relative frequency
- Proportional error: 0.15

The "Composer" panel on the right shows a layer named "7185class\_1". The "Module Results" window displays the transition matrix:

Given : Probability of changing to :

	Cl. 1	Cl. 2	Cl. 3	Cl. 4	Cl. 5	Cl. 6	Cl. 7	Cl. 8	Cl. 9
Class 1	0.8500	0.0187	0.0187	0.0187	0.0187	0.0187	0.0187	0.0187	0.0187
Class 2	0.0000	0.8264	0.1460	0.0276	0.0000	0.0000	0.0000	0.0000	0.0000
Class 3	0.0000	0.0512	0.8384	0.1023	0.0000	0.0000	0.0000	0.0000	0.0081
Class 4	0.0000	0.0000	0.0000	0.8394	0.0000	0.1606	0.0000	0.0000	0.0000
Class 5	0.0187	0.0187	0.0187	0.0187	0.8500	0.0187	0.0187	0.0187	0.0187
Class 6	0.0000	0.0505	0.1941	0.0157	0.0000	0.7335	0.0000	0.0000	0.0061
Class 7	0.0052	0.0761	0.0810	0.0206	0.0000	0.0155	0.7798	0.0026	0.0192
Class 8	0.0000	0.0268	0.1552	0.0000	0.0000	0.0000	0.0000	0.8181	0.0000
Class 9	0.0321	0.1517	0.1312	0.0085	0.0000	0.0007	0.0000	0.0089	0.6669

The "C:\cell\_auto\7185transition\_areas.txt" window displays the transition areas table:

Expected to transition to :

Cells in :	Cl. 1	Cl. 2	Cl. 3	Cl. 4	Cl. 5	Cl. 6	Cl. 7	Cl. 8
Cl. 9								
Class 1	3117	69	69	69	69	69	69	69
Class 2	0	15089	2666	505	0	0	0	0
Class 3	0	509	8342	1018	0	0	0	80
Class 4	0	0	0	3827	0	732	0	0
Class 5	121	121	121	121	5472	121	121	121
Class 6	0	854	3280	265	0	12392	0	103
Class 7	311	4546	4937	1228	0	925	46577	157
Class 8	0	339	1963	0	0	0	0	10349
Class 9	300	1418	1226	80	0	6	0	84

Annotations on the image include:

- A box labeled "Conditional probability" with an arrow pointing to the map window.
- A box labeled "Prob. matrix" with an arrow pointing to the "Module Results" window.
- A box labeled "Transition areas" with an arrow pointing to the "C:\cell\_auto\7185transition\_areas.txt" window.

# Using CELLATOM module

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CELLATOM (module) provides for cellular automata in Idrisi.

A cellular automaton is a cellular entity that independently varies its state based on its previous state and that of its immediate neighbors according to a specific rule.

Cellular Automata gives spatial character to the model

Cellular automata transition rules are governed by a combination of FILTER and RECLASS modules.

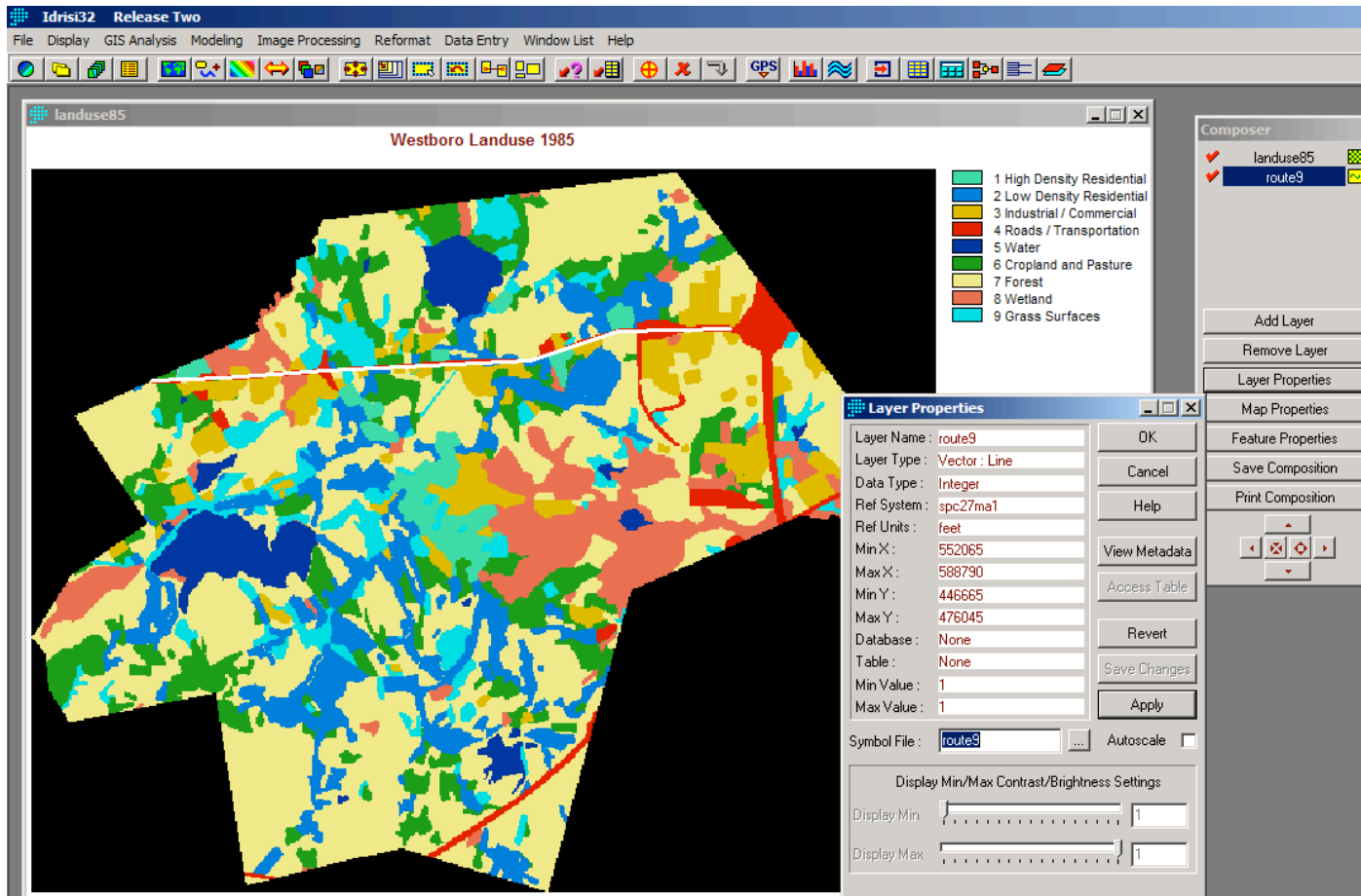
Filter (example) - 3 x 3 Kernel

1	1	1
0	1	1
0	1	0

RECLASS (example)

0	0	5
1	5	9
2	9	999

# Composer



This is activated after displaying a map (e.g. Landuse 1985 – Westboro, MA).

The composer has the following:

*Add layer, Remove layer, Layer properties, Map properties, Feature properties, Save composition, Print composition*

# Conclusion

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- These are the basic aspects to GIS in relation to Idrisi for Windows
- This does not represent all the necessary knowledge available on Idrisi Kilimanjaro
- Use on-line Tutorial accessible in Idrisi:
  - on the toolbar menu, click on Help, On-line Tutorial

Thank you