



DANUBE WATER

GIS training course

26-28 February 2014

Lecturer: dr. ing. Maria Cheveresan

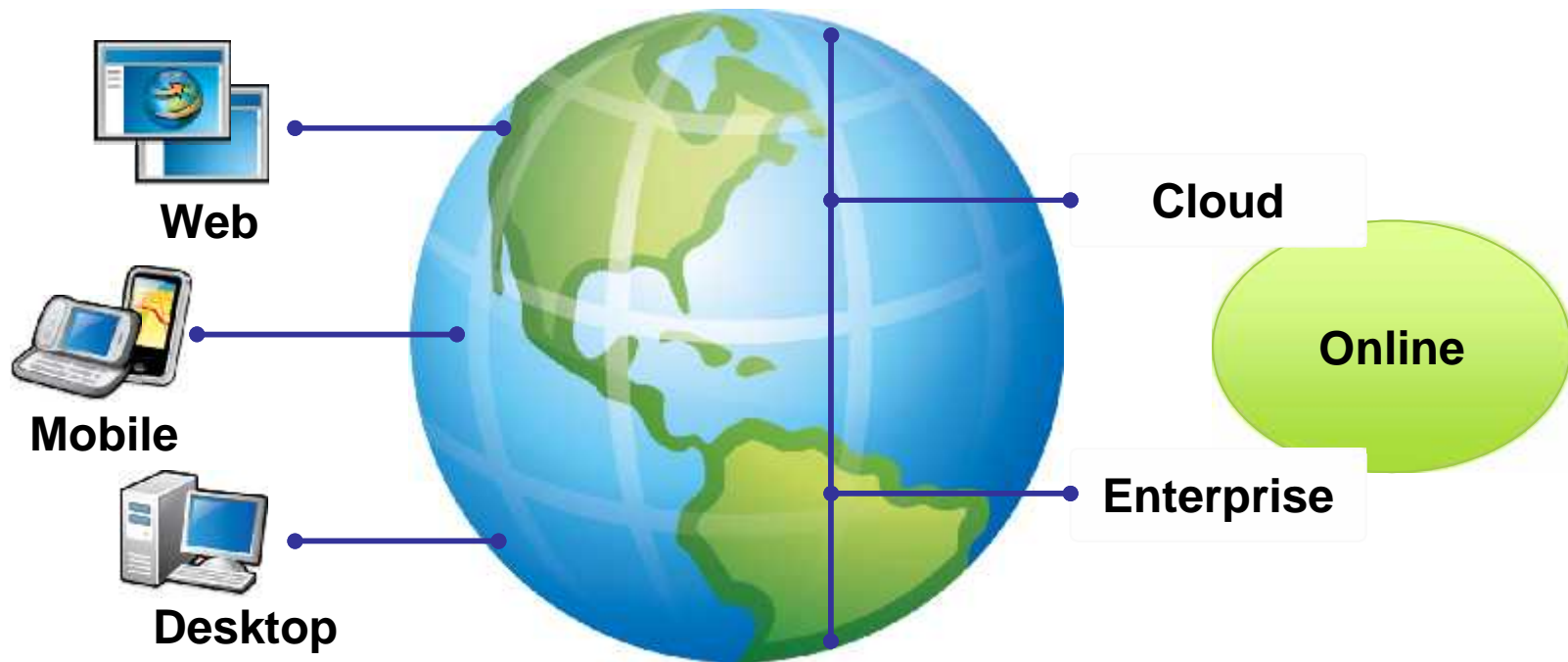
Bine ati venit !



Support

- ESRI software – Help
 - www.esri.ro
- www.esri.com -> resources-> industries
 - www.support.esri.com
 - Notite!!!

ArcGIS



Ce inseamna GIS?

- **Geographic Information Systems**
 - Ce reprezinta “geographic information”?
 - Ce inseamna “systems”?



Hardware



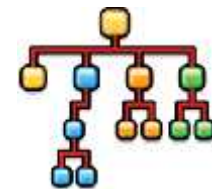
Software



Date



Oameni



Flux de lucru

Ce putem face cu GIS?

Harta pentru localizare

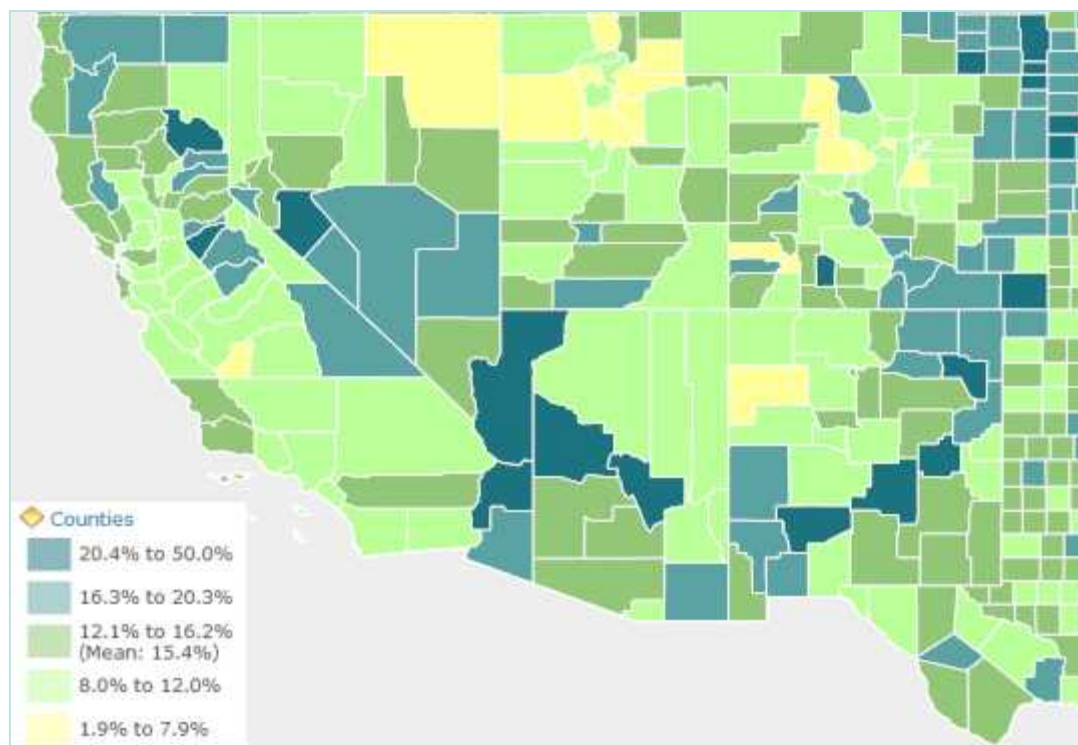
Exemplu: **Golful St. Lawrence in SE Canadei**



Ce putem face cu GIS?

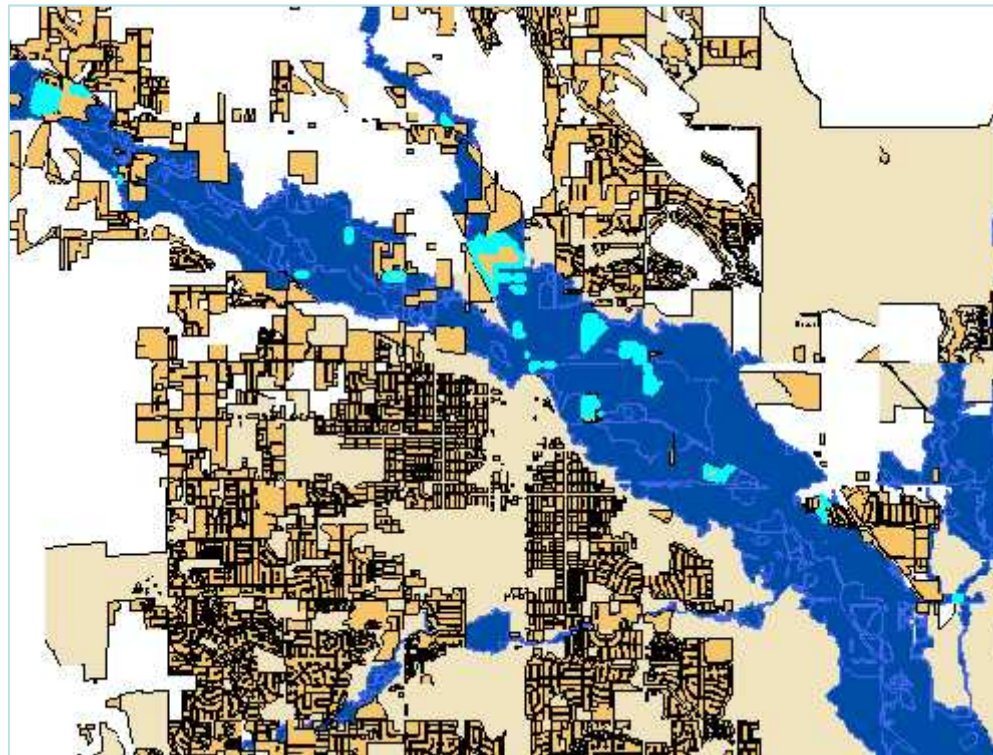
Punerea pe harta a unor cifre

**De exemplu: populatia peste varsta de 70 de ani din SV
SUA**



Ce putem face cu GIS?

Sa gasim ce se afla in interior
De exemplu: parcelele din zona inundata



Ce putem face cu GIS?

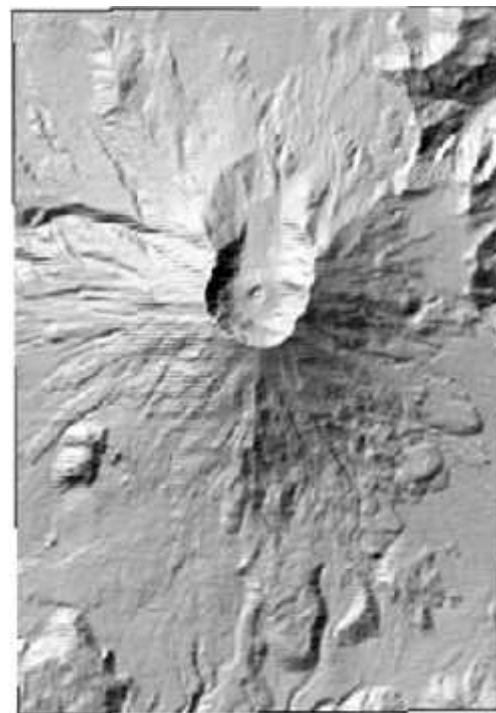
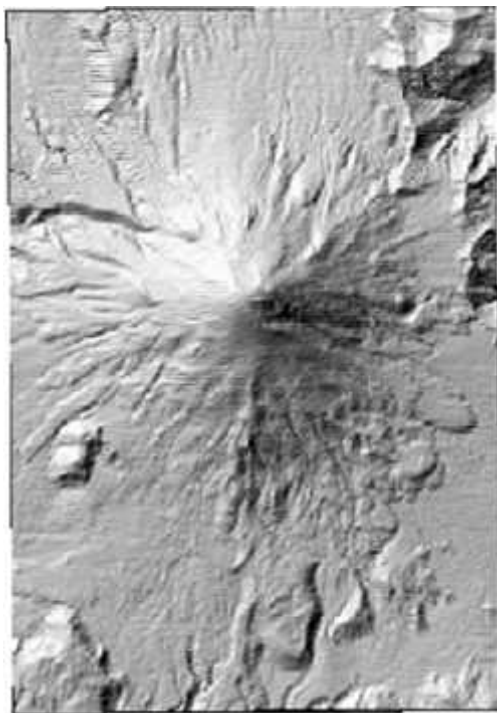
Sa gasim ce se afla in apropiere
De exemplu: nave scufundate in apropierea unui recif de corali



Ce putem face cu GIS?

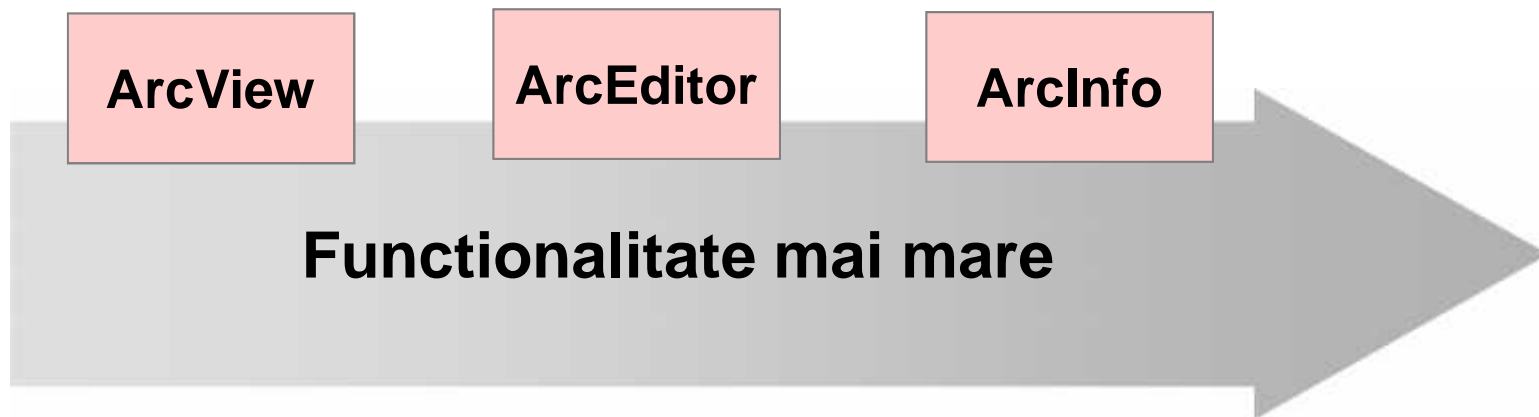
Modificari de relief

De exemplu: Muntele Sfanta Elena inainte si dupa eruptia din 1980



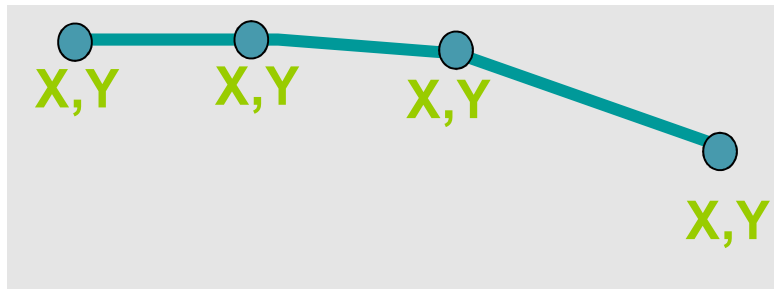
Produsele ArcGIS Desktop

- Instrumentele si functionalitatile bazei de date variaza intre produsele ArcGIS

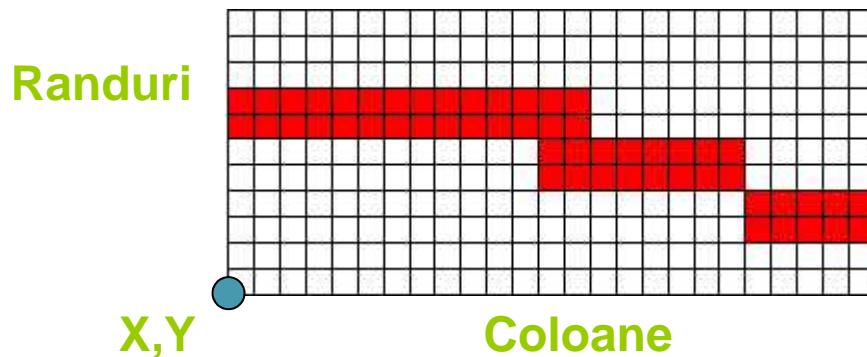


Reprezentarea datelor spatiale

- Formate vector
 - Reprezentari discrete ale realitatii



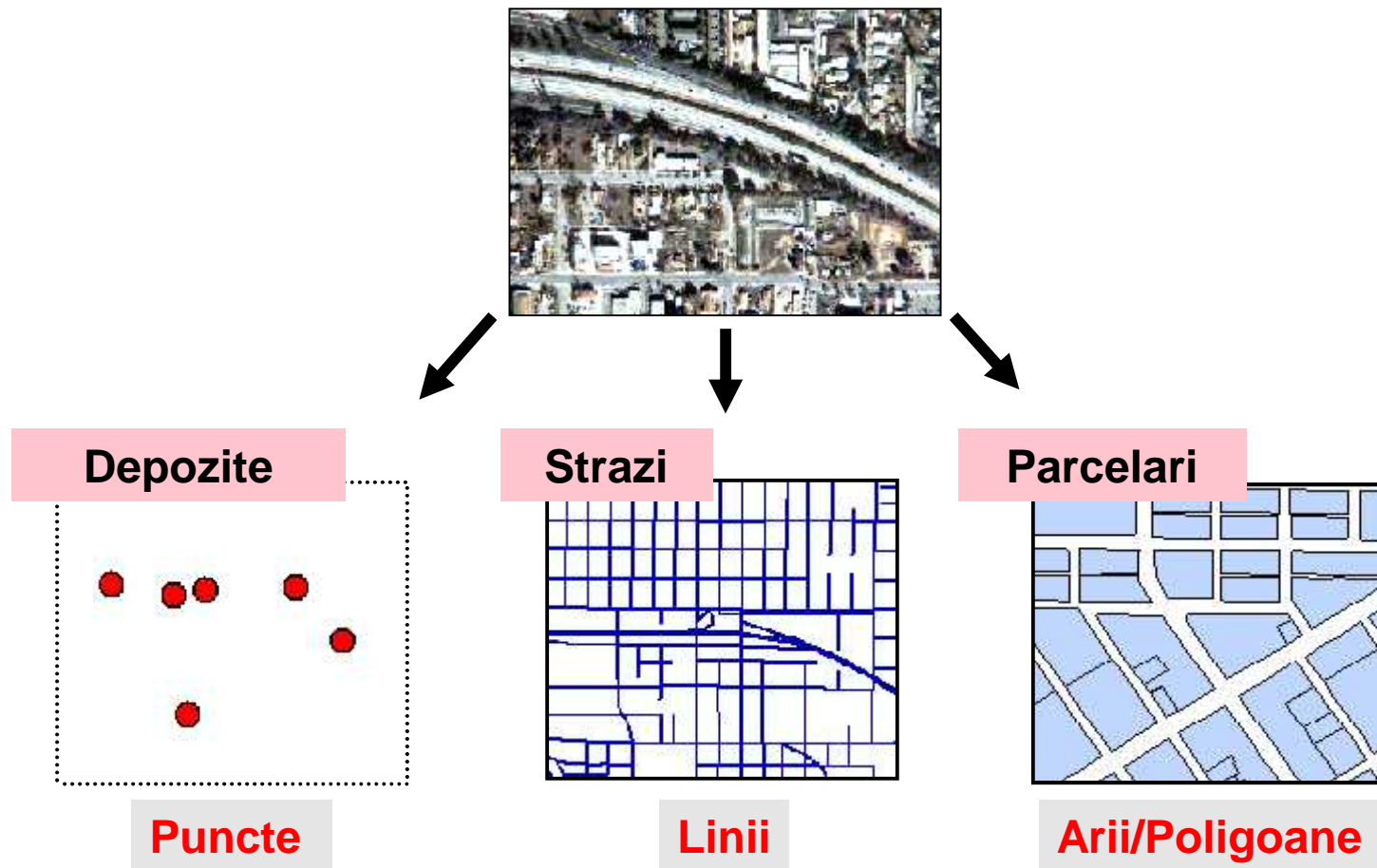
- Formate raster
 - Utilizarea celulelor pentru modelarea realitatii



Realitatea
(Autostrada)

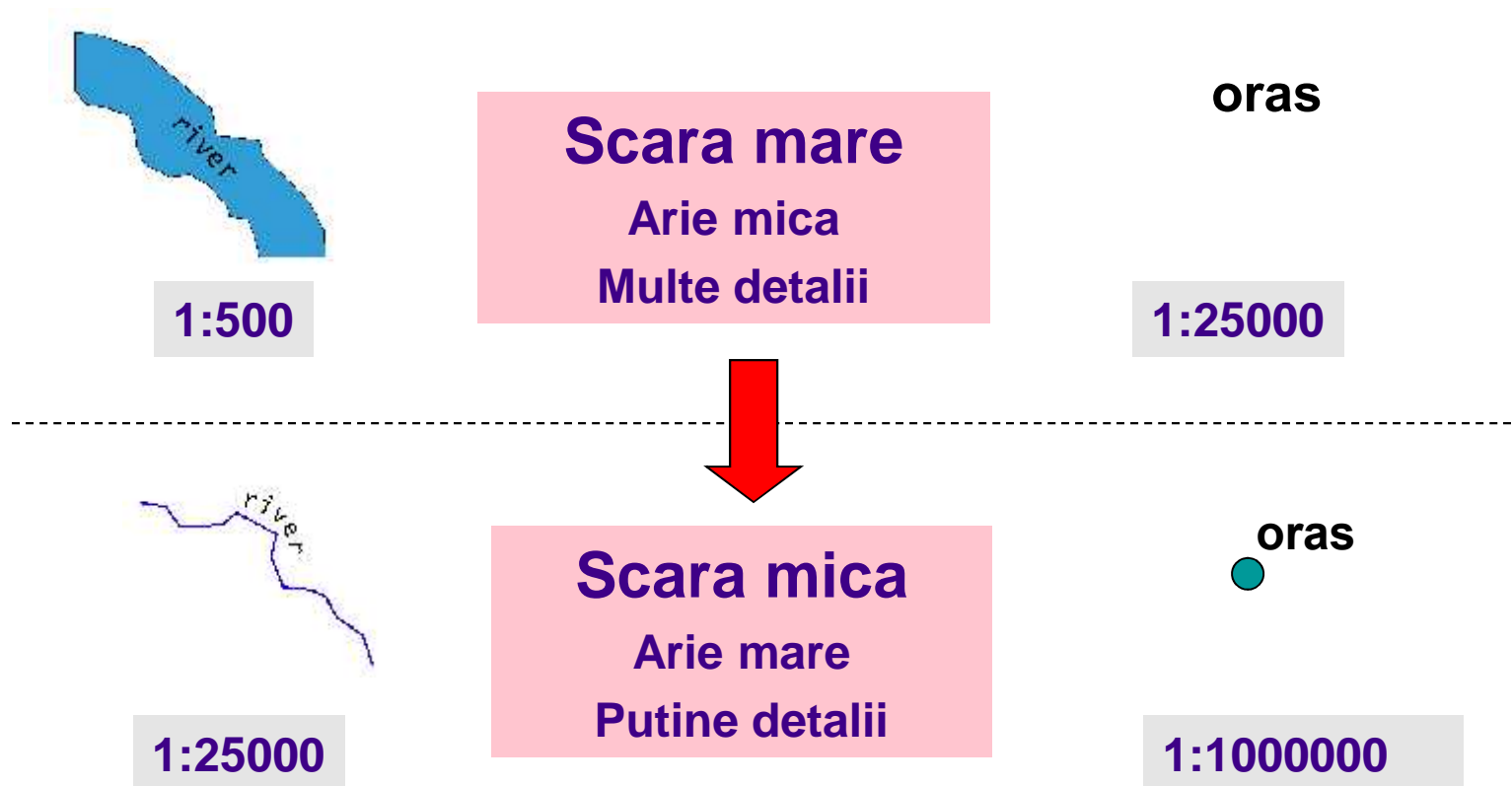
Reprezentarea obiectelor spatiale in format vector

- Entitatile lumii inconjuratoare sunt abstractizate in **trei forme** de baza



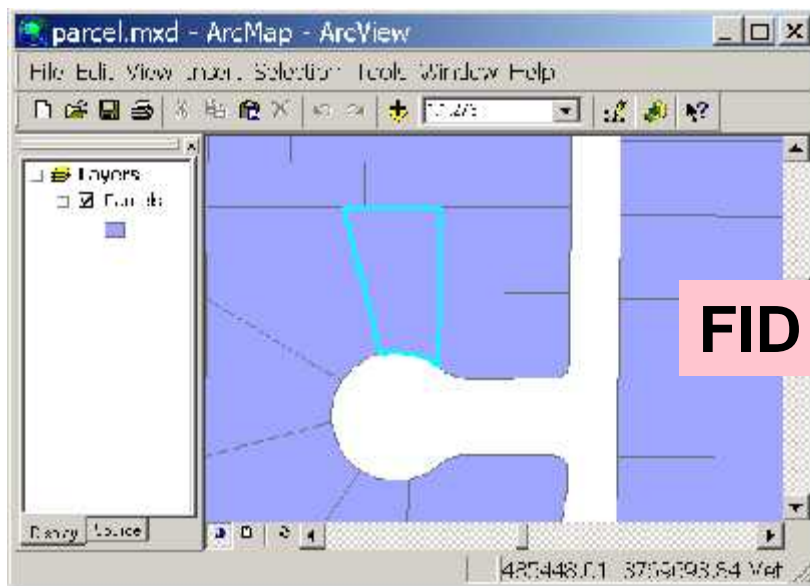
Scara hartii

- Scara hartii este determinata de marimea si forma obiectelor spatiale



Legarea obiectelor spatiale cu attribute

- Clasele de obiecte spatiale sunt structuri (tabele) care stocheaza date spatiale
- Fiecarui obiect spatial ii corespunde o inregistrare (rand) in tabel
 - Identificatorul unic leaga obiectul spatial de attribute



FID*	Shape*	Shape_Length	Shape_Area	ZONE_CODE
5050	Polygon	103.252517	652.528667	LMDR
5051	Polygon	143.502533	1283.718518	MDR
5052	Polygon	114.577362	683.234491	MDR
5053	Polygon	103.002127	673.327357	LMDR

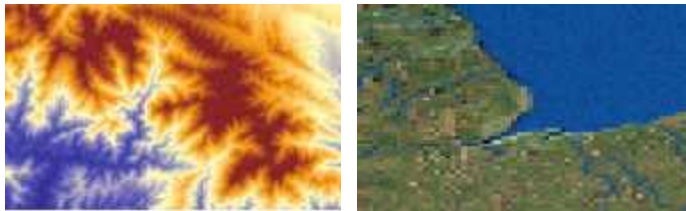
Record 4 of 634 | Show: All Selected | Records (1 out of 6100 Selected)

FID = 5052

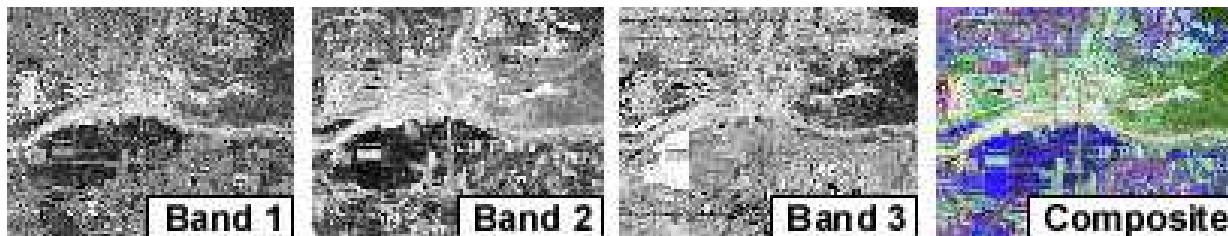
Identificatorul obiectului spatial

Administrarea “Raster Datasets”

- Randurile si coloanele sunt celule de aceeasi marime
 - Fiecare celula stocheaza o valoare
 - Detaliile depind de marimea celulei
- GRID (formatul nativ ESRI pentru raster)



- Imagini (TIFF, BMP, SID, JPEG, ERDAS)



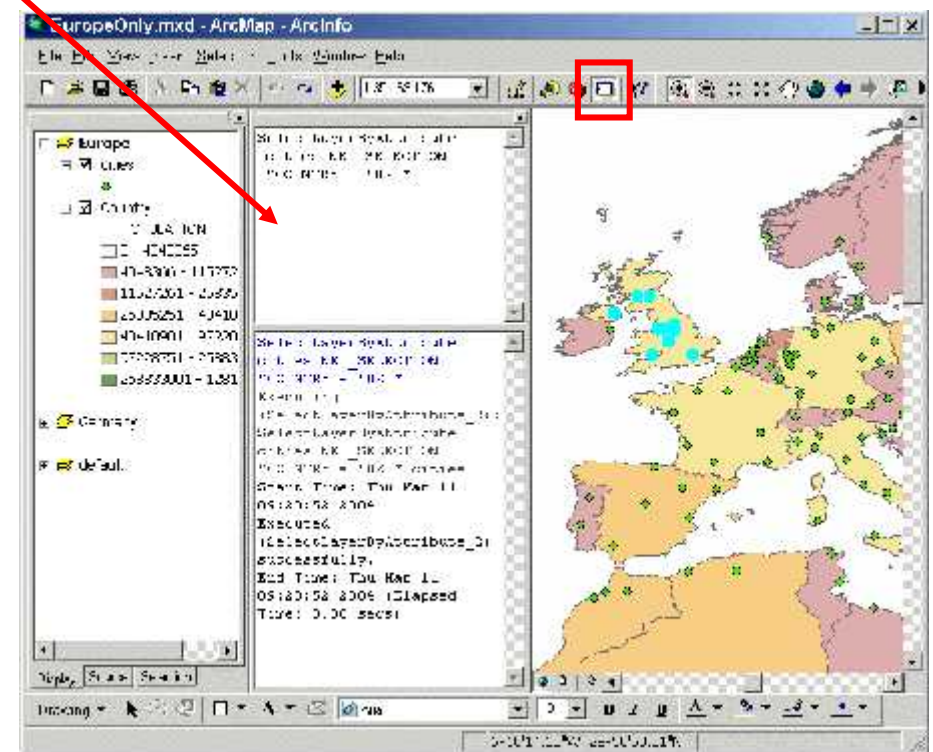
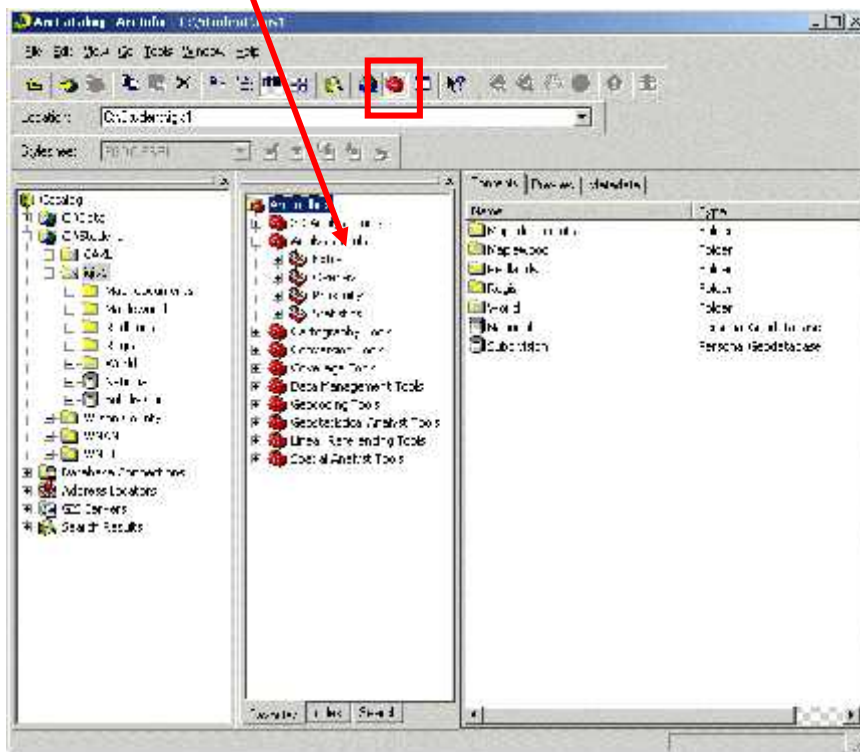
Aplicatiile ArcGIS

- Toate produsele ArcGIS contin 2 aplicatii:

ArcCatalog

ArcMap

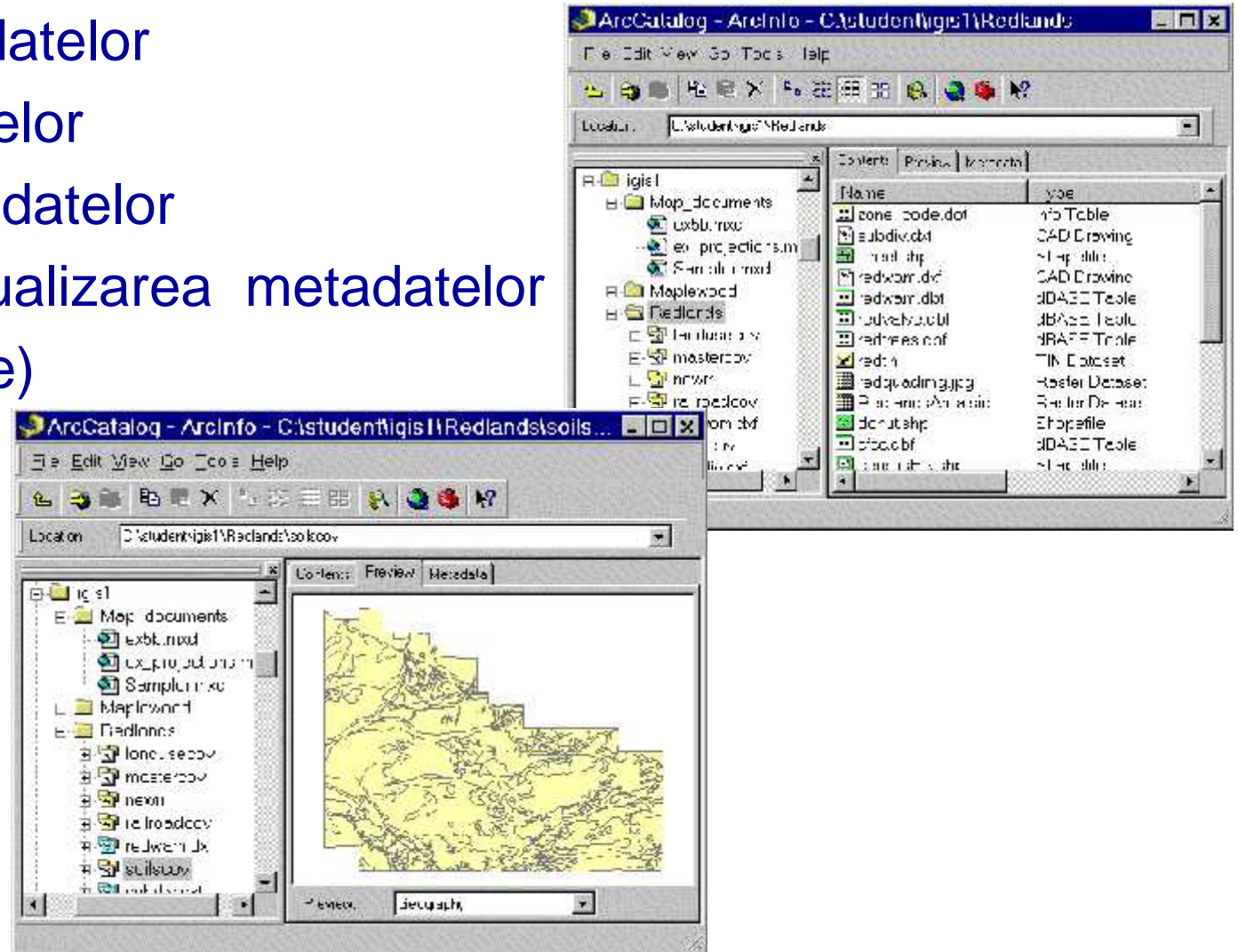
- Toolbox si Linia de comanda windows



ArcCatalog

O aplicatie pentru:

- Vizualizarea datelor
- Navigarea datelor
- Administrarea datelor
- Crearea si vizualizarea metadatelor (date despre date)



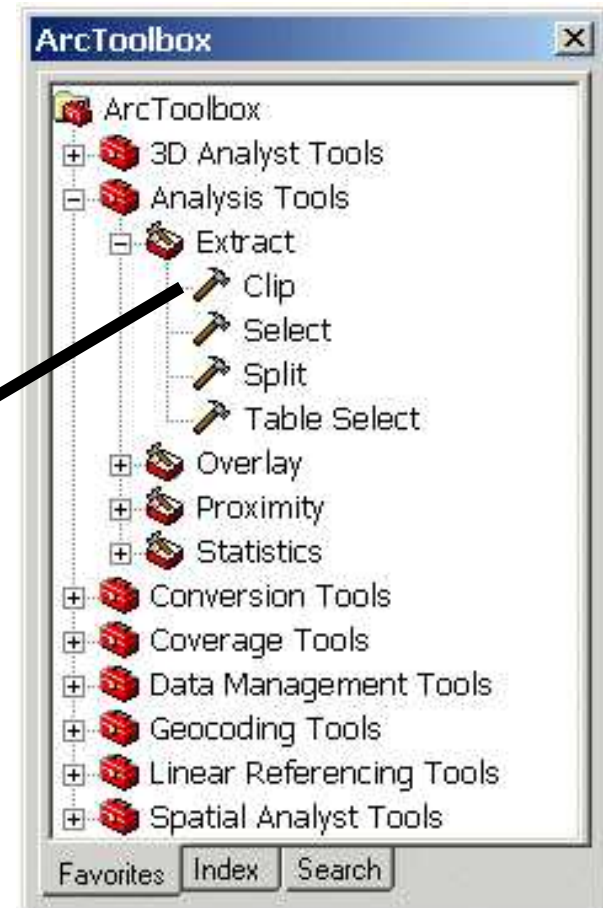
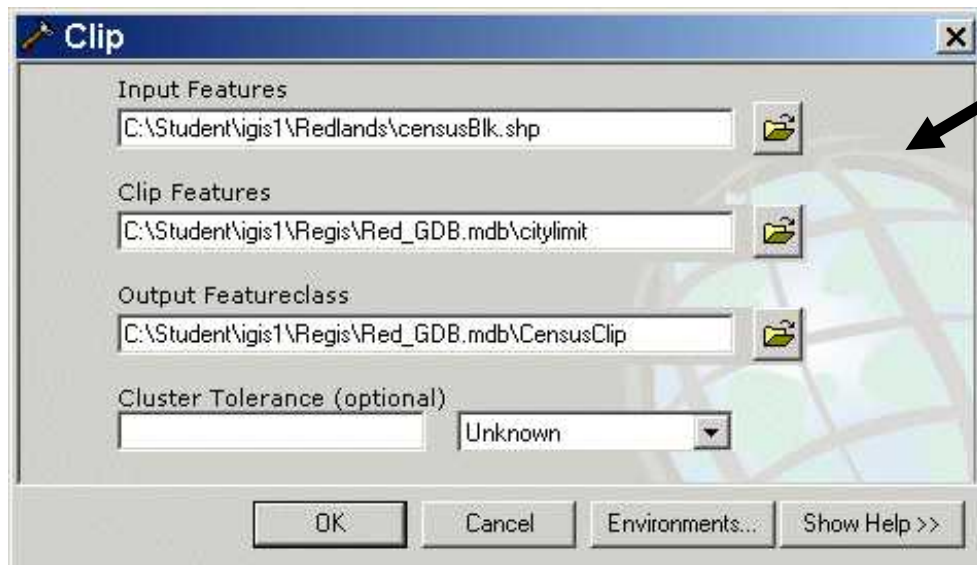
ArcMap

- Aplicatia primara ArcGIS
- Realizarea hartii – “operatii” de baza
 - Vizualizare
 - Editare
 - Interogare
 - Analiza
 - Realizarea graficelor
 - Realizarea rapoartelor



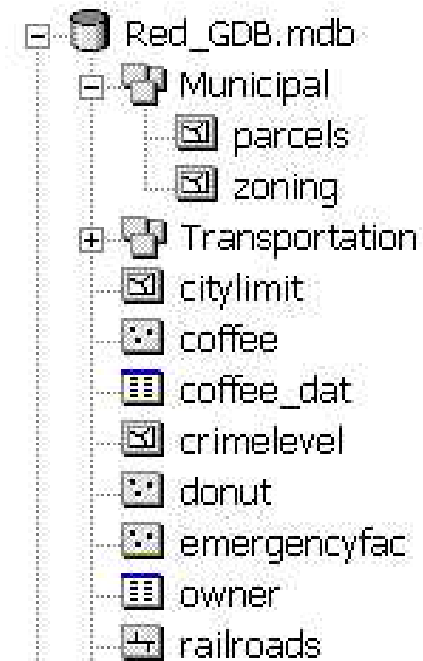
Fereastra ArcToolbox

- Disponibila in ArcCatalog si ArcMap
- Functii de procesare geografica
 - Managementul datelor, analize si conversii
 - Instrumente functie de produsele ArcGIS



Formatul de date spatiale **GEODATABASE**

- Stocheaza obiecte spatiale si attributele acestora in acelasi RDBMS
- “Feature datasets” modeleaza relatiile spatiale
- “Feature classes”- Stand-alone (independente)

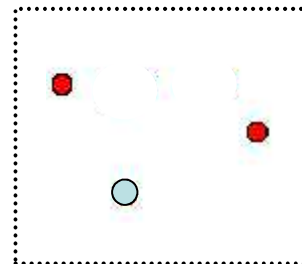


RDBMS table

FID	Shape	NAME
1	Point	Grounds-R-Us
2	Point	Melissas Coffee Place
3	Point	Coffee and Sons

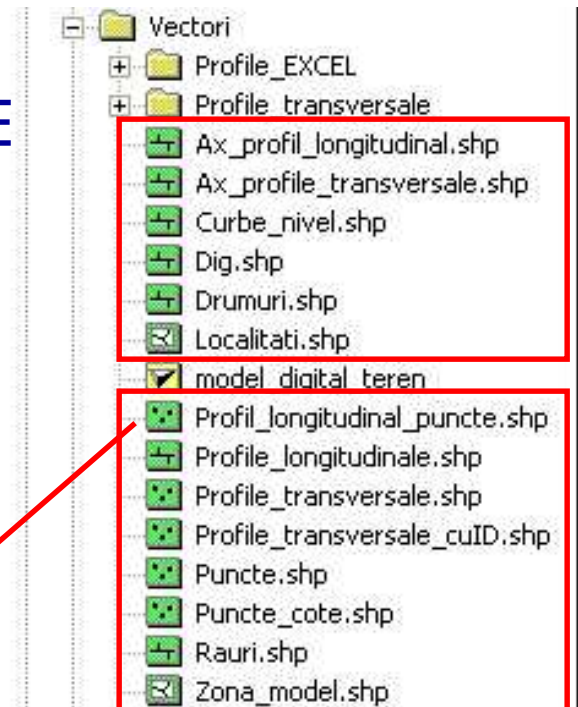
Campul **Shape** acceseaza tabela de coordonate separat

Cafenele
“feature classes”
de tip punct



Formatul ESRI de date SHAPEFILE

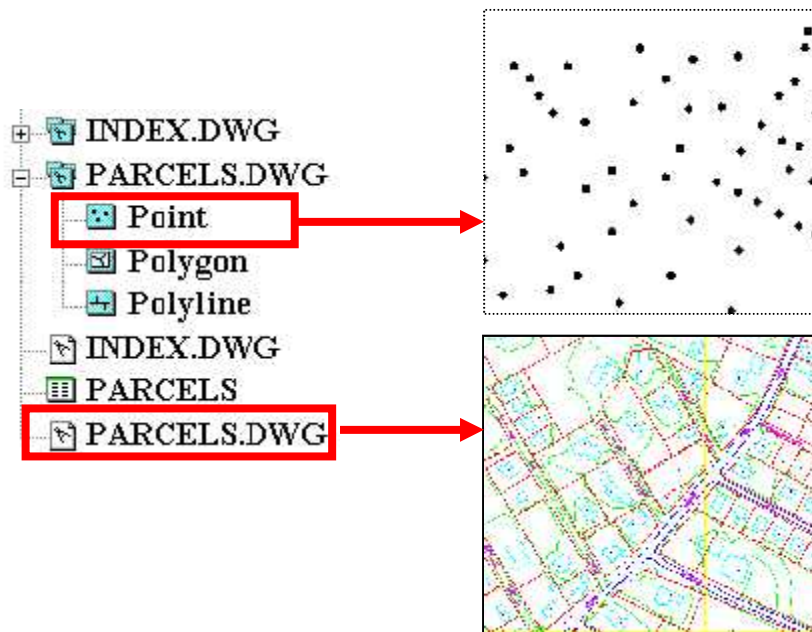
- Shapefile
 - O singura clasa de obiecte spatiale
 - Atributele sunt stocate in tabela dBASE
 - Integrate in fisiere separate
 - Pot fi create sau editate cu ArcGIS sau ArcView 3.x
- Se utilizeaza doar ArcCatalog pentru administrarea shapefile-urilor



Profil_longitudinal_puncte.dbf	3 KB	DBF File	15/06/2004 11:07 AM
Profil_longitudinal_puncte.sbn	1 KB	SBN File	15/06/2004 11:07 AM
Profil_longitudinal_puncte.sbx	1 KB	SBX File	15/06/2004 11:07 AM
Profil_longitudinal_puncte.shp	3 KB	AutoCAD Shape So...	15/06/2004 11:07 AM
Profil_longitudinal_puncte.shx	1 KB	AutoCAD Compiled ...	15/06/2004 11:07 AM

Formatul de date CAD

- Computer Aided Design files (DXF, DWG, DGN)
- Colectie logica
 - Afisarea uneia sau mai multor clase de obiecte spatiale
- Editarea dupa exportul in geodatabase FC sau shapefile



The image shows a table titled "Attributes of PARCELS.DWG Point". The table has the following columns: FID, Shape, Entity, Handle, Layer, Color, Linetype, Elevation, and Thickness. The data rows are as follows:

FID	Shape	Entity	Handle	Layer	Color	Linetype	Elevation	Thickness
1	Point	Insert	311	100	7	CONTINUOUS		0
2	Point	Insert	E300	100	7	CONTINUOUS		0
3	Point	Insert	305	100	7	CONTINUOUS		0
4	Point	Insert	E304	100	7	CONTINUOUS		0
5	Point	Insert	306	100	7	CONTINUOUS		0

At the bottom of the table, there is a "Records" section with a search box and a "Show" dropdown menu set to "All". A red arrow points from the "Shape" column header to a text box below.

Campul **Shape** acceseaza doar citirea coordonatelor

Locatiile tabelare ale unei clase de obiecte spatiale de tip punct

Tabel cu coordonatele brute

X_COORD	Y_COORD
480585.5	3769234
483194.094	3768432
485285.813	3768391

Un nou "feature class"

