



Palestinian National Authority
PALESTINIAN WATER AUTHORITY



السلطة الوطنية الفلسطينية
سلطة المياه الفلسطينية

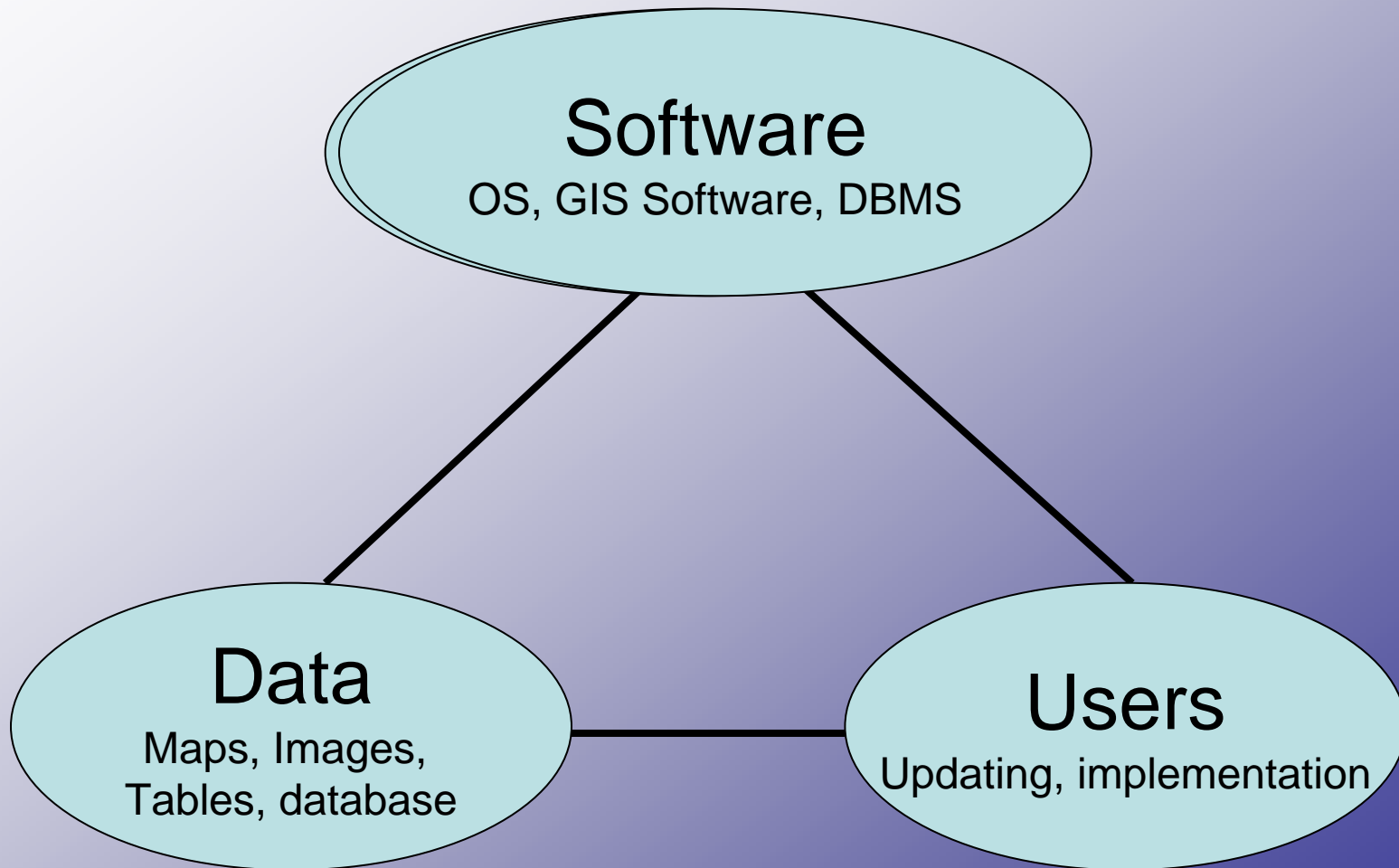
GIS and Water Information

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NFP-Data Manager

What is GIS

GIS is information system to input, retrieve, process, analyze and output geographically referenced data or geospatial data to support decision making for planning and management

GIS Components



Why GIS for PWA

- Geospatial data better maintained in a standard format
- Revision and updating easier
- Search, analysis and output easier
- Better decision making
- Sharing and exchanging data
- Time and cost saved

GIS and Water Data

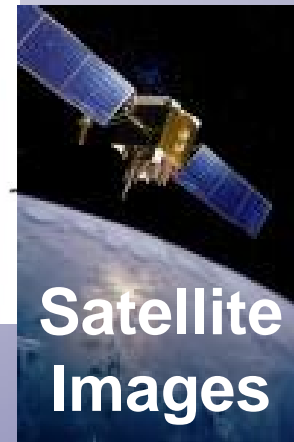
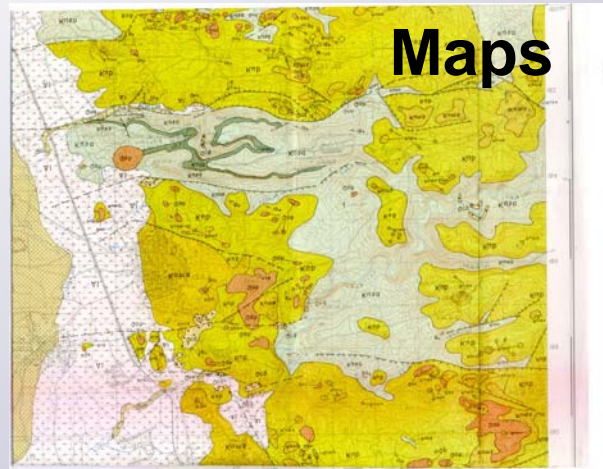
- Data Input
- Data Management
- Data Manipulation
- Data Analysis
- Spatial Data Output

Data Input

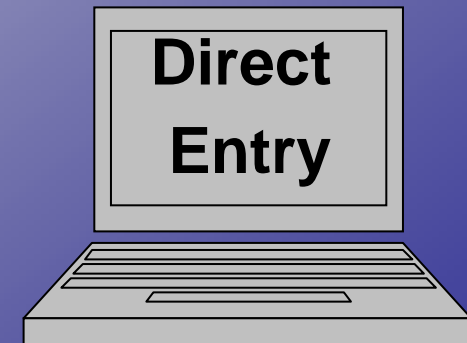
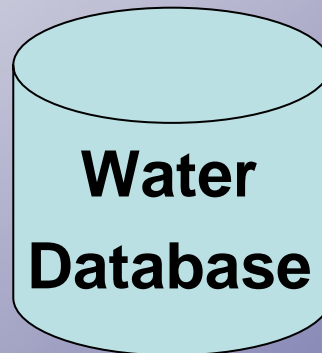
- o Input data by digitizing, scanning, or direct coordinate entry
- o Correct errors and add features
- o Identified a spatial features (codes, names)

Data Input

Manual Digitizing
Scanning

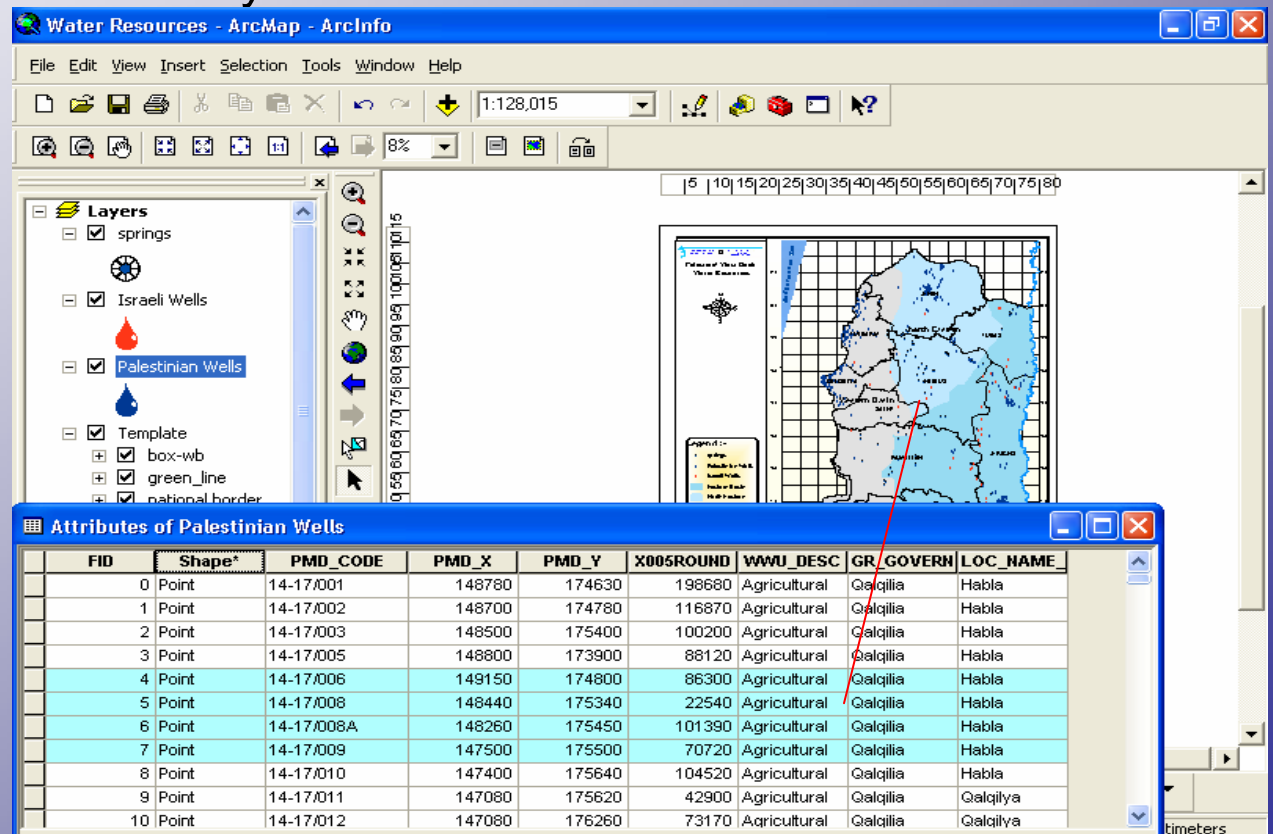


Data Transfer



Data Management

- o Link attribute data to objects
- o Link to databases
- o Make changes in existing db
- o Import/export form other systems

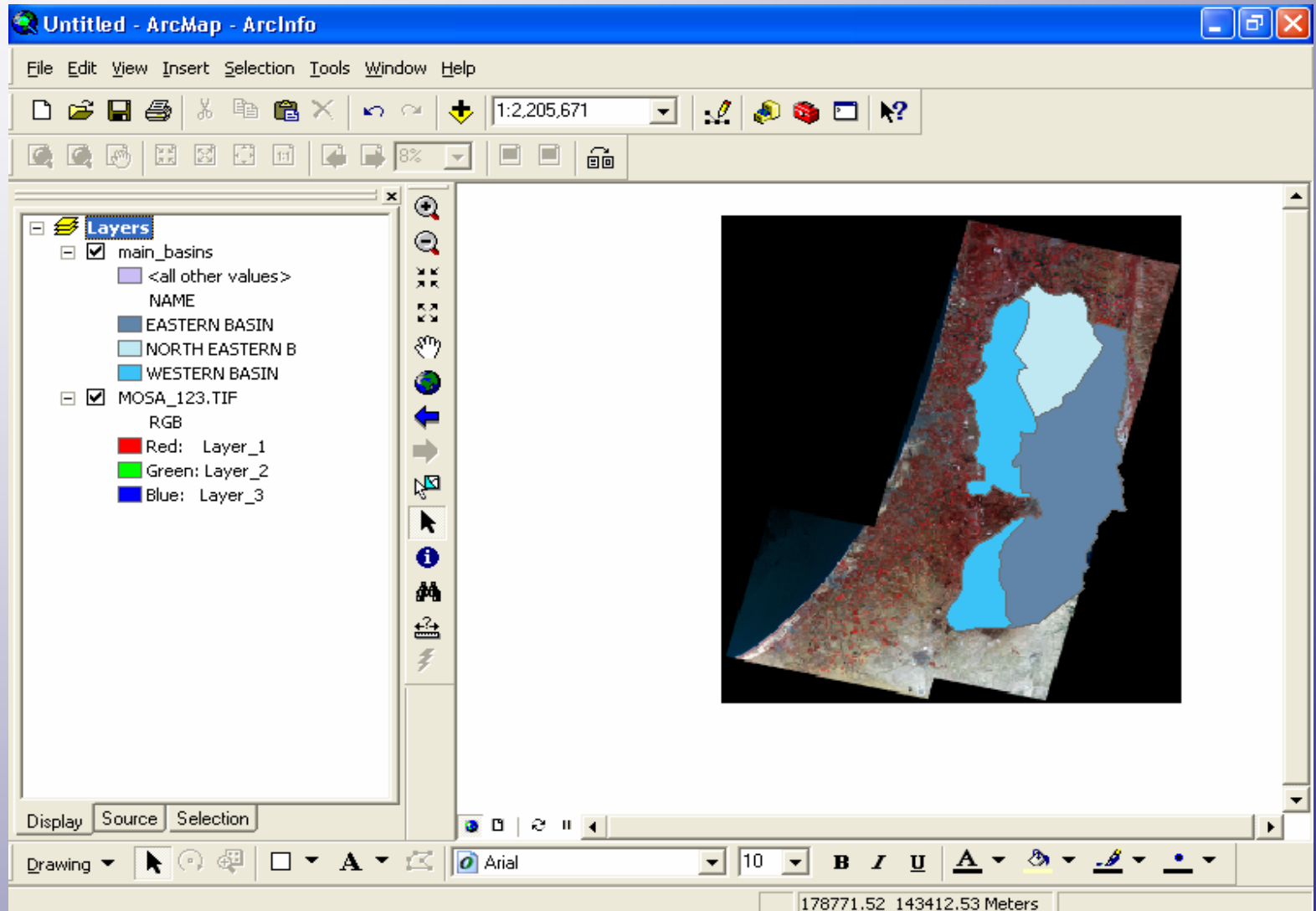


The screenshot displays the ArcMap interface with a map of wells and an open attributes table for 'Palestinian Wells'. The map shows a grid overlay and a legend with categories like 'Agricultural Wells', 'Industrial Wells', and 'Public Wells'. The attributes table lists well details including FID, Shape, PMD_CODE, PMD_X, PMD_Y, X005ROUND, WWU_DESC, GR_GOVERN, and LOC_NAME.

FID	Shape	PMD_CODE	PMD_X	PMD_Y	X005ROUND	WWU_DESC	GR_GOVERN	LOC_NAME
0	Point	14-17/001	148780	174630	198680	Agricultural	Qalqilia	Habla
1	Point	14-17/002	148700	174780	116870	Agricultural	Qalqilia	Habla
2	Point	14-17/003	148500	175400	100200	Agricultural	Qalqilia	Habla
3	Point	14-17/005	148800	173900	88120	Agricultural	Qalqilia	Habla
4	Point	14-17/006	149150	174800	86300	Agricultural	Qalqilia	Habla
5	Point	14-17/008	148440	175340	22540	Agricultural	Qalqilia	Habla
6	Point	14-17/008A	148260	175450	101390	Agricultural	Qalqilia	Habla
7	Point	14-17/009	147500	175500	70720	Agricultural	Qalqilia	Habla
8	Point	14-17/010	147400	175640	104520	Agricultural	Qalqilia	Habla
9	Point	14-17/011	147080	175620	42900	Agricultural	Qalqilia	Qalqilya
10	Point	14-17/012	147080	176260	73170	Agricultural	Qalqilia	Qalqilya

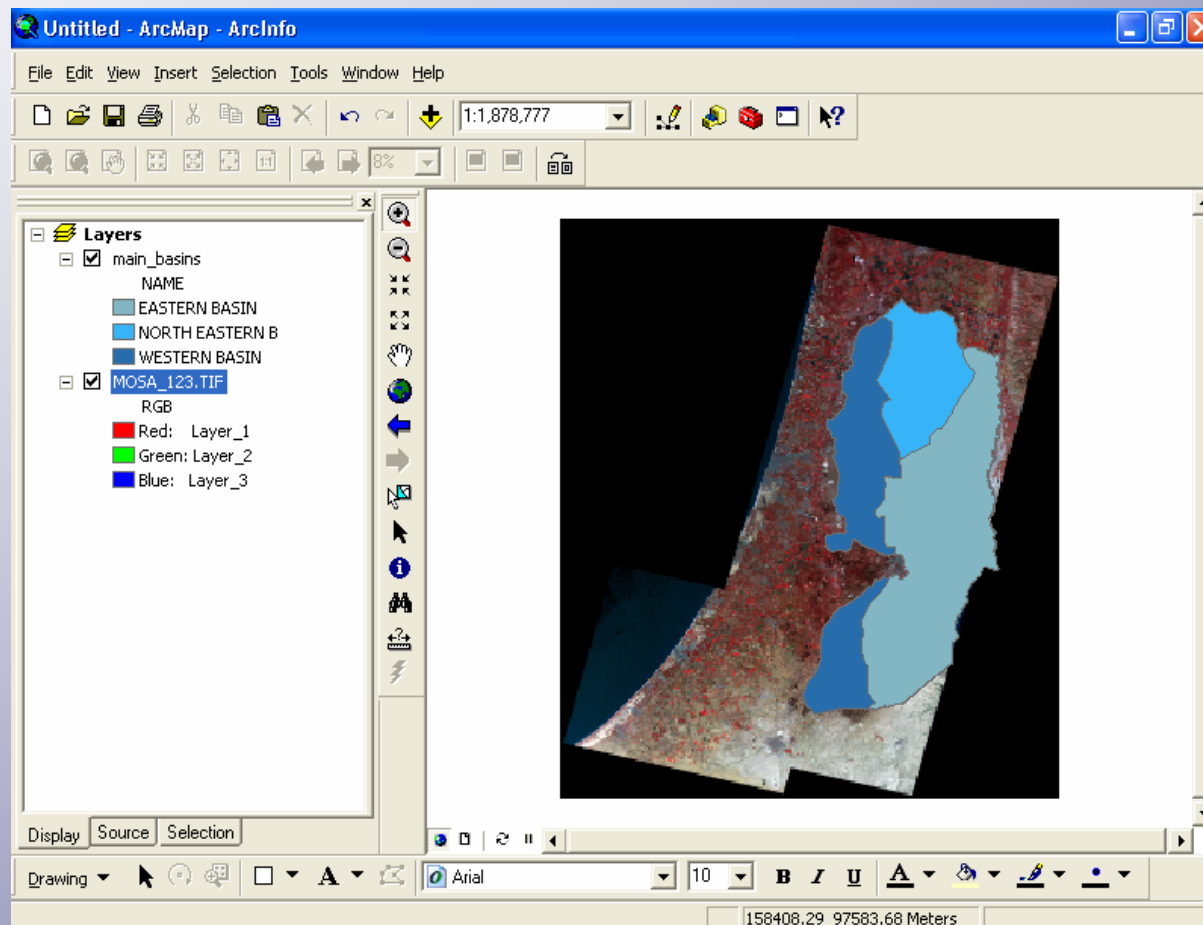
Data Manipulation

- o Make maps from different sources

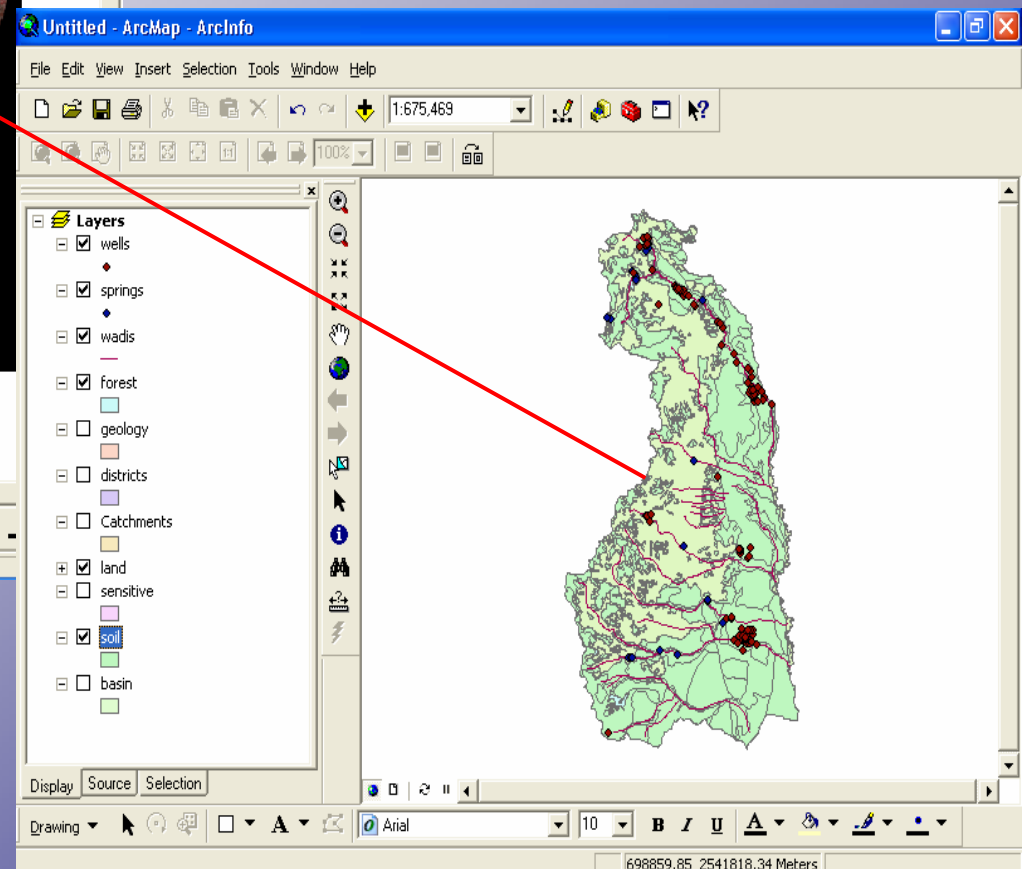
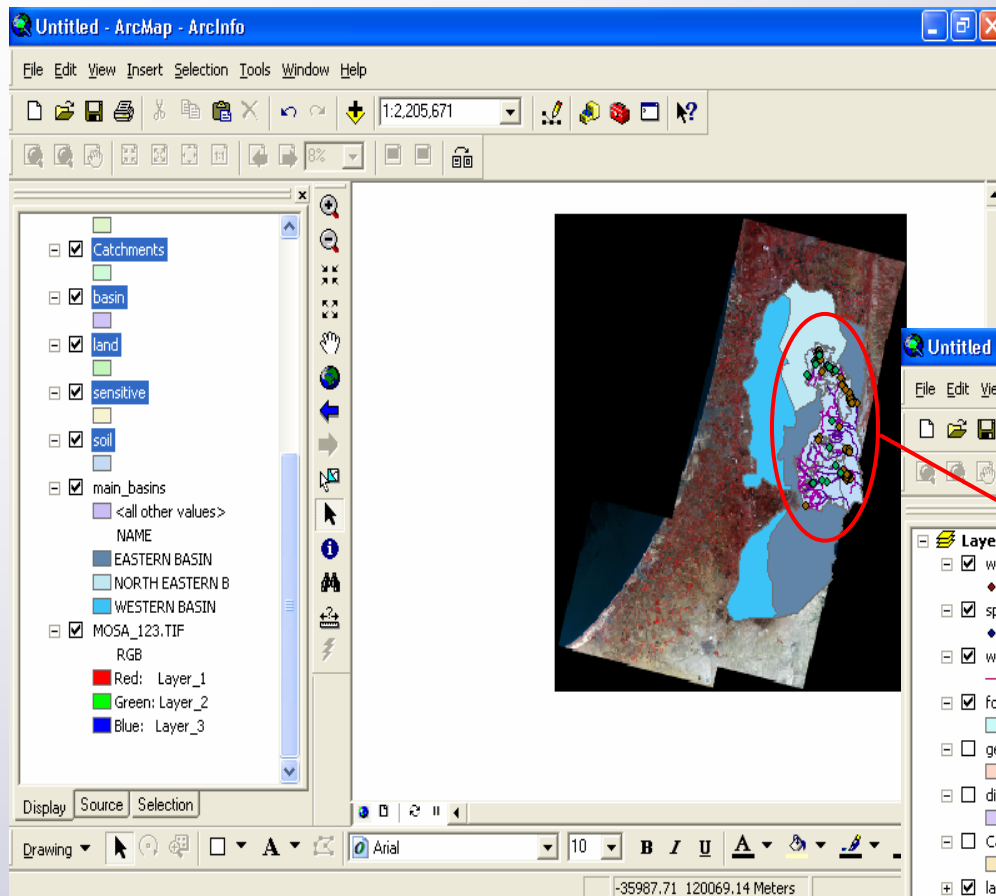


Data Manipulation

- o Transformation of coordinates
- o Projection change



Data Manipulation



Data Analysis

- o Query: retrieve data according to the operator specifications
- o Reclassification: reassign new thematic values to spatial feature
- o Coverage rebuilding: is a boundary operation to create new coverage identify by users
- o Connectivity analysis: to analyze the connectivity between points, lines and areas in terms of distance, area...

Query

The screenshot shows the ArcMap interface with the following components:

- Layer Properties Dialog:** The 'Definition Query' tab is active, showing the query: `"NAME" = 'Western Basin'`. This query is circled in red.
- Table of Contents:** Lists layers including 'Basin' (with sub-layers: Eastern Basin, North Eastern, Western Basin), 'wb-grid-5km', and 'grid Wb A4.dxf Annotation'.
- Map View:** Displays a map of the region with a grid overlay. A legend on the left identifies symbols for 'Palestinian Wells', 'Jordan River', and 'Mediterranean Sea'.
- Scale and Coordinates:** The scale bar at the bottom indicates 131.93 and 172.06 Kilometers, and 23.96 and 77.04 Centimeters.

Query

Water Resources - ArcMap - ArcInfo

Select by Attributes

Enter a WHERE clause to select records in the table window

Method: Create a new selection

"FID"
"PMD_CODE"
"PMD_X"
"PMD_Y"
"X005ROUND"
"wWU_DESCRI"

= <> Like
> >= And
< <= Or
_ % () Not

'Agricultural'
'Domestic (wBWD)'
'Domestic'
'domestic'

Is Get Unique Values Go To:

SELECT * FROM wells2005 WHERE:
"wWU_DESCRI" LIKE 'Domestic'

Clear Verify Help Load... Save...
Apply Close

Selected Attributes of Palestinian Wells

FID	Shape*	PMD_CODE	PMD_X
30	Point	14-17/034	146900
44	Point	14-17/051	148400
45	Point	14-17/052	147920
47	Point	15-09/010	156280
48	Point	15-09/012	156320
55	Point	15-17/004	154700
80	Point	15-18/015	156800
87	Point	15-18/024	155500
94	Point	15-19/010	154800
101	Point	15-19/017	152400

Record: 1 Show: All Selected Records (41 out of 324 Selected)

Display Source Selection

Drawing Arial 10 B I U A

170.91 166.24 Kilometers 52.84 72.72 Centimeters

Reclassification

Water Resources - ArcMap - ArcInfo

File Edit View Insert Selection Tools Window Help

1:135,000

Layer Properties

General Source Selection Display Symbology Fields Definition Query Labels Joins & Relates

Show: **Draw categories using unique values of one field.** Import...

Value Field: NAME Color Ramp: [Color Ramp]

Symbol	Value	Label	Count
[Symbol]	<all other values>	<all other values>	?
[Symbol]	Eastern Basin	Eastern Basin	?
[Symbol]	North Eastern	North Eastern	?
[Symbol]	Western Basin	Western Basin	?

Basin

- Eastern Basin
- North Eastern
- Western Basin

Add All Values Add Values... Remove Remove All Advanced

OK Cancel Apply

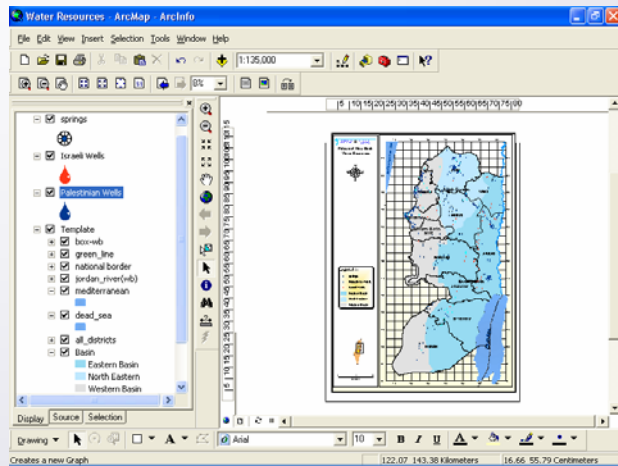
Display Source Selection

Drawing Arial 10 B I U A

-37.78 81.35 Centimeters

Spatial Data Output

Displays



Tables

A screenshot of a report viewer window titled 'Report Properties'. It displays a table with the following data:

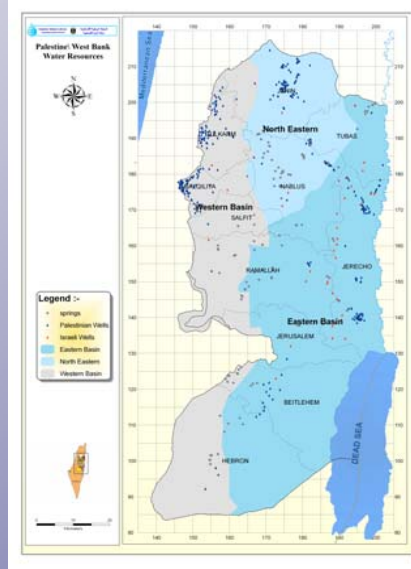
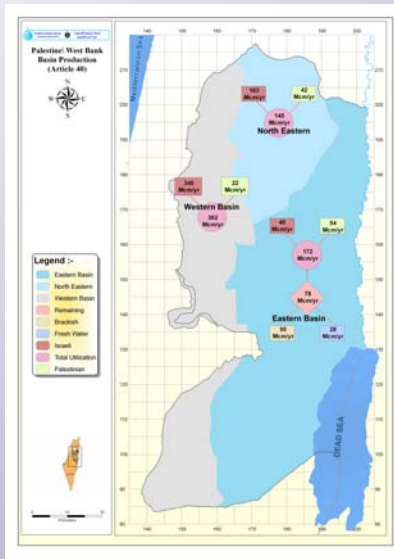
Well Code	Water Use	Governorate
14-17/034	Domestic	Qalqilia
14-17/051	Domestic	Qalqilia
14-17/052	Domestic	Qalqilia
15-09/010	Domestic	Hebron
15-09/012	Domestic	Hebron
15-17/004	Domestic	Qalqilia
15-18/015	Domestic	Tulkarm
15-18/024	Domestic	Tulkarm
15-19/010	Domestic	Tulkarm
15-19/017	Domestic	Tulkarm
15-19/018	Domestic	Tulkarm
15-19/046	Domestic	Tulkarm
15-19/047	Domestic	Tulkarm
15-19/048	Domestic	Tulkarm
15-20/008	Domestic	Tulkarm
16-11/001.A	Domestic	Hebron
16-11/008	Domestic	Hebron
16-11/010	Domestic	Bethlehem
16-11/011	Domestic	Bethlehem

Reports

A screenshot of a Microsoft Excel spreadsheet titled 'Export Output'. It contains a detailed table of well data with columns for PMD CODE, PMD_X, PMD_Y, X006ROUND, and WAMU_DESCRI. The data includes well codes, coordinates, and descriptions of water use.

PMD CODE	PMD_X	PMD_Y	X006ROUND	WAMU_DESCRI
14-17/034	146900.00000	177300.00000	1223000.00000	Domestic
14-17/051	148400.00000	177450.00000	746900.00000	Domestic
14-17/052	147900.00000	174640.00000	0.00000	Domestic
15-09/010	156200.00000	98110.00000	0.00000	Domestic
15-09/012	156300.00000	98110.00000	577310.00000	Domestic
15-17/004	154700.00000	177000.00000	0.00000	Domestic
15-18/015	156600.00000	161200.00000	0.00000	Domestic
15-18/024	155500.00000	169500.00000	0.00000	Domestic
15-19/010	154800.00000	199960.00000	0.00000	Domestic
15-19/017	152400.00000	190520.00000	577070.00000	Domestic
15-19/018	152400.00000	191900.00000	1341700.00000	Domestic
15-19/046	152900.00000	191840.00000	606100.00000	Domestic
15-19/047	157500.00000	195450.00000	0.00000	Domestic
15-19/048	159050.00000	192800.00000	0.00000	Domestic
15-20/008	158140.00000	204280.00000	0.00000	Domestic
16-11/001.A	169800.00000	115100.00000	0.00000	Domestic
16-11/008	168350.00000	113100.00000	536800.00000	Domestic
16-11/010	167367.00000	112391.00000	0.00000	Domestic
16-11/011	169106.00000	116304.00000	0.00000	Domestic
16-12/004	169378.00000	121401.00000	0.00000	Domestic
16-18/003A	186750.00000	184750.00000	1138000.00000	Domestic
16-19/001	161100.00000	190400.00000	109130.00000	Domestic
16-19/002	160970.00000	190650.00000	340540.00000	Domestic
16-20/003	167000.00000	205380.00000	0.00000	Domestic

Maps



Beneficiary of GIS

- Provide different types of information in water sector for
 - ❖ PWA Staff
 - ❖ Students
 - ❖ Projects
 - ❖ Researchers
 - ❖ Different institution in water sector
- Provide the decision makers the necessary information

The Future

- Develop a Web Based system to be linked to NFP web site

The Future

**EMWIS
NFP_Palestine
(Web Client)**



Web server

ArcIMS Server

**PWA
Water
DB**

Application

The beginning...

