

## Appendix 24. Indices and ranks for the Summary Map.

### I. Indices derived from the habitat maps in each grid.

No. of base map	1	2	3	4	5	6	7	8	9	10	11
	Extent of areas shallower than 20m depth	Numbers of habitat categories	Extent of habitat (1*2)	Extent of coral	Extent of colonies of seagrass	Extent of colonies of algae	Extent of mangrove communities	Extent of colonies of Cyano-phycea	Extent of tidal flat	Existence of plants (factory)	Number of fishing boats
342711	16.02	9	144.2	1.01	0.32	1.2					
342714	80.87	9	727.86		6.95	3.93			0.11		
342822	78.44	15	1176.68		0.75	2.52		0.49	10.25		
342823	146.17	16	2338.82	9.97	1.75	6.63		3.17	10.35		7
352611	62.54	15	938.17	2.47	0.11	1.42	0.04	0.07			
352713	5.27	10	52.74	3.11		2.08				1	6
352721	2.76	7	19.38	4.83		0.98					
352722	63.78	19	1211.89	49.51	6.63	6.74	0.37	0.19	1.65		4
352723	31.31	10	313.16	30.82	0.59	4.25					
352724	8.63	16	138.19	5.7	0.11	4.81	0.08			3	50
352741	55.64	14	779.09	8.57	0.23	3.26					5
352742	61.83	13	803.91	2.68	0.16	1.78					
352744	116.91	14	1636.76	76.96	1.75	4.12					6
352833	137.43	19	2611.28	49.45	17.54	7.95		0.34	6.36		62
362611	0.99	6	5.95					0.01	0.73		
362512	265.44	19	5043.36	61.4	13.31	18.12	6.59	1.2	20		35
362513	353.66	19	6719.61	168.88	15.25	28.31	6.1	1.39	1.96		
362514	275.48	19	5234.3	124.23	6.75	19.67	0.85	0.61	9.45		3
362521	314.08	18	5653.59	132.35	19.61	23.12	14.12	2.17	6.27		
362524	68.76	8	550.1	48.02	0.1	3.53					
362542	3.05	9	27.47	1.05		1.61					
362623	27.31	16	437.01	11.81	1.57	4.28	0.24	0.49	0.53		18
362631	10.09	12	121.13	4.85	0.01	3.67					
362632	38.65	16	618.53	28.18		10.79					37
362642	0.77	8	6.21	1.88		0.88			0.15		
362643	160.34	15	2405.13	3.6	0.32	3.39	0.02		0.02		18
362644	23.63	17	401.73	6.27	0.65	3.87	0.21	0.34			2
372311	8.7	7	60.92	3.99		2.87					
372312	0.01	1		0.43		0.12					
372421	0.99	7	6.97	0.04		0.3			0.61		
372422	50.5	19	959.5	13.21	3.24	12.86	0.61	0.44	7.8		83
372423	27.21	11	299.41	3.45	0.06	3.61			0.35		
372424	45.25	18	814.57	13.15	0.93	6.88	0.05	0.17	6.95	1	85
372431	65.38	7	457.7	38.73	2.84	14.65			1.68		105
372441	20.23	16	323.73	10.08	2.42	1.55			2.3		
372442	31.82	13	413.78	8.21	0.2	7.43			1		3
372443	16.52	9	148.74	1.75		1.08		0.01	0.2		
372444	222.76	20	4455.34	173.96	20	16.09	0.34	0.95	8.39		20
372532	11.4	15	171.03	15.6	0.06	0.47		0.03	2.74	2	91
372533	197.45	17	3356.68	181.32	10.86	13.1	0.13		2.47		26
372534	165.25	18	2974.64	89.47	9.55	10.76	2.04	0.24	8.74		18
372543	0.23	3	0.69		0.01				0.23		
382313	58.34	18	1050.13	17.55	7.25	5.73		0.37	13.15	1	128
382321	0.18	2	0.37								
382322	63.08	20	1261.74	15.78	7.06	8.28	0.82	0.12	4.6	1	155
382323	74.59	16	1193.54	17.35	0.69	4.18	0.08		1.14		9
382324	217.13	18	3908.41	76.44	4.02	9.73	0.63	5.15	16.72		
382341	64.41	19	1223.8	9.69	2.73	12.15	1.4	0.17	2.22	4	112
382342	88.19	17	1499.26	4.98	1.09	2.16		0.22	4.3		
382344	72.24	16	1155.92	8.07	0.07	3.66	1.22	0.36		1	
382433	33.09	21	694.99	9.72	2.25	8.26	0.13		1.72	1	436

### 2. Rank of indices.

Rank of indices	1	2	3	4	5	6	7	8	9	10	11
	Extent of areas shallower than 20m depth	Numbers of habitat categories	Extent of habitat (1*2)	Extent of coral	Extent of colonies of seagrass	Extent of colonies of algae	Extent of mangrove communities	Extent of colonies of Cyano-phycea	Extent of tidal flat	Existence of plants (factory)	Number of fishing boats
1	0.1-70	1-4	0.1-1350	0.1-38	0.1-4.9	0.1-6.9	0.1-1.9	0.01-1.00	0.1-3.9	-	1-10
2	71-141	5-9	1351-2701	39-77	5.0-9.9	7.0-13.9	2.0-4.9	1.01-2.00	4.0-7.0	-	11-40
3	142-212	10-14	2702-4052	78-116	10.0-14.9	14.0-19.9	5.0-8.9	2.01-3.00	8.0-12.9	-	41-100
4	213-283	15-19	4053-5403	117-155	15.0-19.9	20.0-26.9	9.0-12.9	3.01-4.00	13.0-17.9	-	101-200
5	284-354	20-24	5404-6754	156-194	20.0-24.9	27.0-33.9	13.0-15.9	>4.01	18.0-22.9	exist=-5	201-500

Appendix 24 (cont.). Indices and ranks for the Summary Map.

3. Rank in each grid.

No. of base map	1 Extent of areas shallower than 20m depth	2 Numbers of habitat categories	3 Extent of habitat (1*2)	4 Extent of coral	5 Extent of colonies of seagrass	6 Extent of colonies of algae	7 Extent of mangrove communities	8 Extent of colonies of Cyano-phycea	9 Extent of tidal flat	10 Existence of plants (factory)	11 Number of fishing boats	12 summary map (summing up 1-11)
342711	1	2	1	1	1	1	1					8(2)
342714	2	2	1		2	1	1	1				10(2)
342822	2	4	1		1	1	1	1	3			14(2)
342823	3	4	2	1	1	1	1	4	3		-1	19(3)
352611	1	4	1	1	1	1	1	1				11(2)
352713	1	3	1	1	1	1	1			-5	-1	2(1)
352721	1	2	1	1		1	1					7(1)
352722	1	4	1	2	2	1	1	1	1		-1	13(2)
352723	1	3	1	1	1	1	1					9(2)
352724	1	4	1	1	1	1	1			-5		2(1)
352741	1	3	1	1	1	1	1				-1	8(2)
352742	1	3	1	1	1	1	1					9(2)
352744	2	3	2	2	1	1	1				-1	11(2)
352833	2	4	2	2	4	2	1	1	2		-3	17(3)
362611	1	2	1				1	1	1			7(1)
362512	4	4	4	2	3	3	3	2	5		-2	28(4)
362513	5	4	5	5	4	5	3	2	1			34(5)
362514	4	4	4	4	2	3	1	1	3		-1	25(4)
362521	5	4	5	4	4	4	5	3	2			36(5)
362524	1	2	1	2	1	1	1					9(2)
362542	1	2	1	1		1	1					7(1)
362623	1	4	1	1	1	1	1	1	1		-2	10(2)
362631	1	3	1	1			1	1				8(2)
362632	1	4	1	1	1	2	1				-2	9(2)
362642	1	2	1	1		1	1		1			8(2)
362643	3	4	2	1	1	1	1				-2	11(2)
362644	1	4	1	1	1	1	1	1			-1	10(2)
372311	1	2	1	1			1	1				7(1)
372312		1		1			1	1				4(1)
372421	1	2	1				1	1	1			7(1)
372422	1	4	1	1	1	2	1	1	2		-3	11(2)
372423	1	3	1	1		1	1	1	1			9(2)
372424	1	4	1	1	1	1	1	1	2	-5	-3	5(1)
372431	1	2	1	1	1	3	1		1		-4	7(1)
372441	1	4	1	1	1	1	1		1			11(2)
372442	1	3	1	1	1	2	1	1	1		-1	10(2)
372443	1	2	1	1	1	1	1	1	1			9(2)
372444	4	5	4	5	5	3	1	1	3		-2	29(5)
372532	1	4	1	1		1	1	1	1	-5	-3	3(1)
372533	3	4	3	5	3	2	1		1		-2	20(3)
372534	3	4	3	3	2	2	2	1	3		-2	21(3)
372543	1	1	1				1		1			5(1)
382313	1	4	1	1	2	1	1	1	4	-5	-4	7(1)
382321	1	1	1				1					4(1)
382322	1	5	1	1	2	2	1	1	2	-5	-4	7(1)
382323	2	4	1	1	1	1	1		1		-1	11(2)
382324	4	4	3	2	1	2	1	5	4			26(4)
382341	1	4	1	1	1	2	1	1	1	-5	-4	4(1)
382342	2	4	2	1	1	1	1	1	2			15(3)
382344	2	4	1	1		1	1	1		-5		6(1)
382433	1	5	1	1	1	2	1		1	-5	-5	3(1)

Numbers of summing up 1-11 were ranked again as follows:  
rank 1:1-7, rank 2:8-14, rank 3:15-21, rank 4: 22-28, rank 5:29-36.

## Appendix 25. List of literature.

### 1. General

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## Arc View Database operation manual

### I Introduction

This manual offers detailed explanations for the custom application made for Red Sea Coast Project.

Custom application made for this project are as follows.

- Update data
- Mesh
- Search
- Area analyse
- GPS locus
- Make Layout
- Information
- Zoom in Mesh

Each custom application program is implemented by clicking on the button added to Arc View window.

## Appendix 26 (cont.). Manual for GIS / Database Operation.

### 2 Starting Arc View

From the file menu choose "RedSea.apr" then click "OK". The main Arc View application window opens (Fig.1).

With the View icons highlighted, select the RedSea and click "OPEN" button.

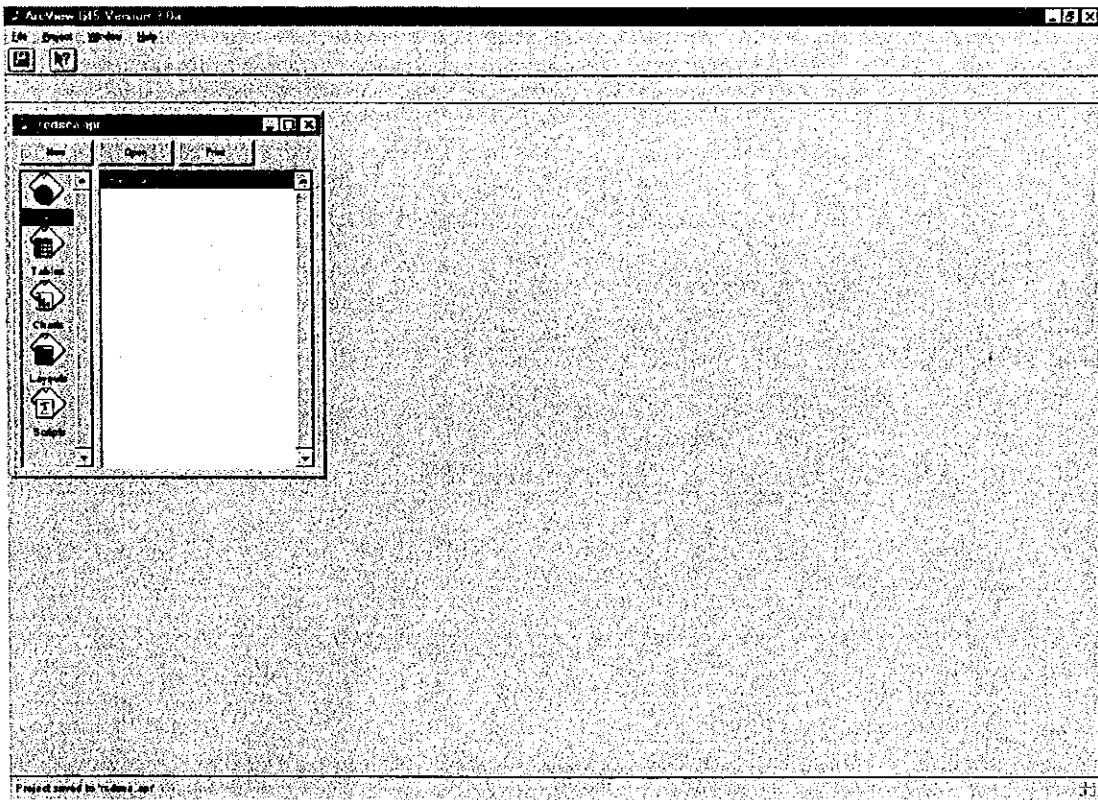


Fig. 1. The main Arc View window.



Appendix 26 (cont.). Manual for GIS / Database Operation.

On the right side of the menu bar, new buttons customised for this project is placed (Fig. 2).

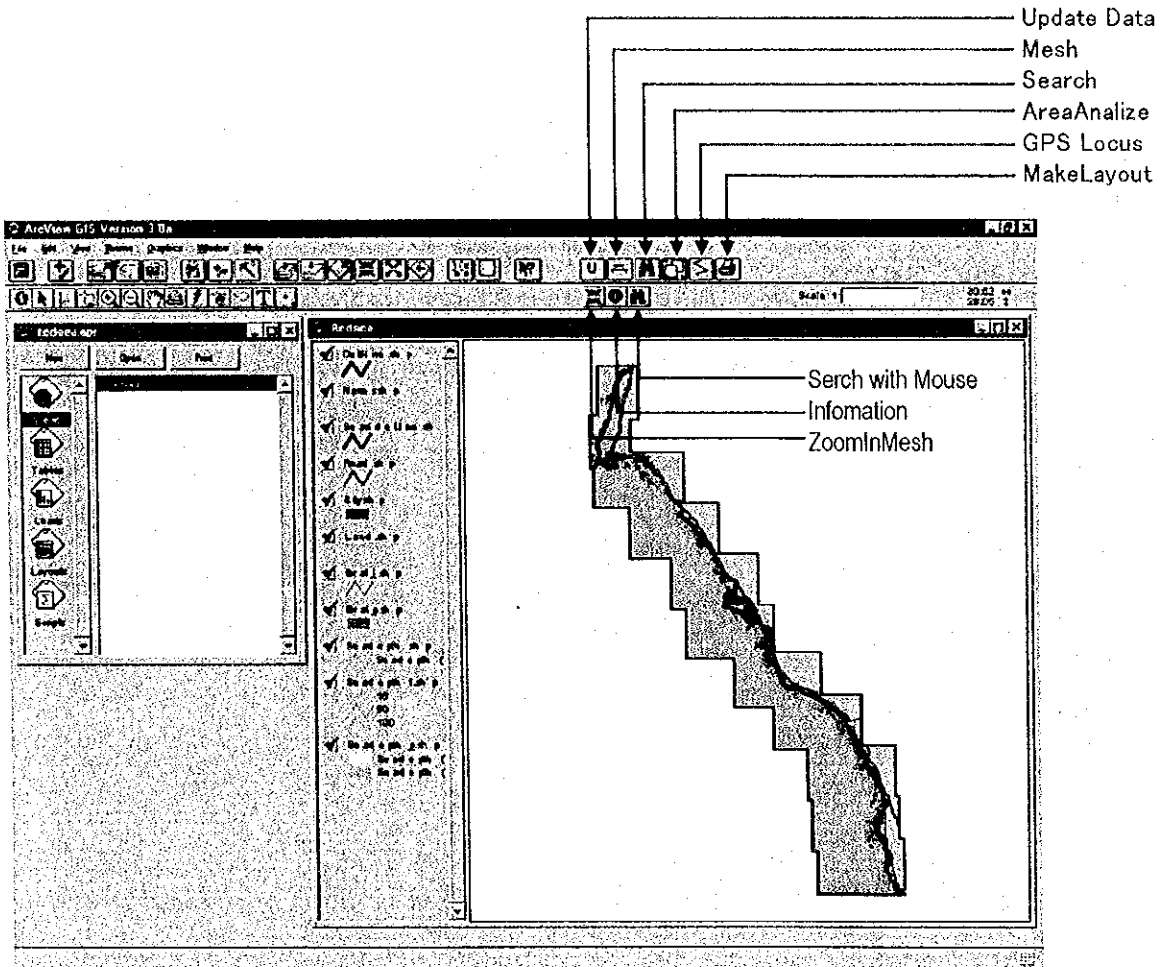


Fig. 2. Overview of the customise button.

## Appendix 26 (cont.). Manual for GIS / Database Operation.

### 3 Definition for each buttons

With the Views icon highlighted, click OPEN button to make the View window active. You are ready to use the custom application.

#### 3.1 Update data

To use the MS-Access file containing x,y locations as an Arc View table, use the update button.

- (1) Click update button, Select Window will appear (Fig.3).
- (2) To add new data, select <<New Theme>> and click OK.
- (3) Input a file name to create new data (Fig.4).
- (4) Data will be updated automatically.

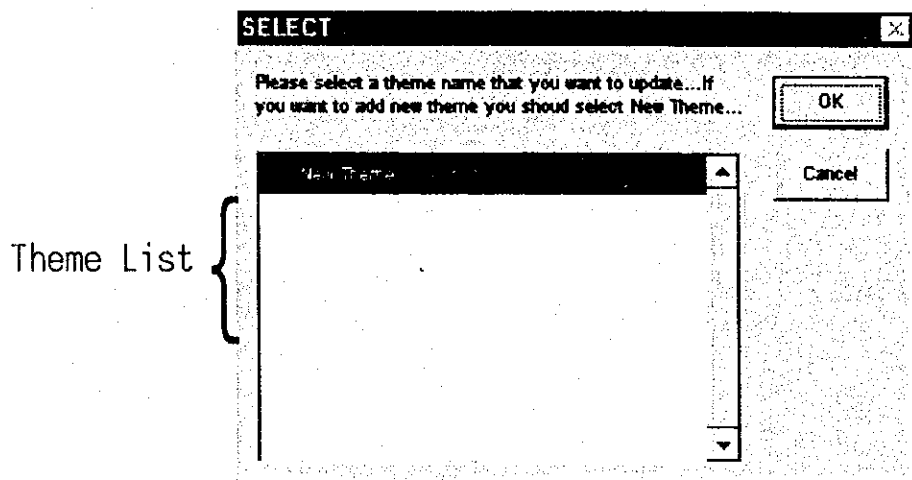


Fig. 3. SELECT dialog box.

- (5) To update old data, select inventory name from the Theme List (Fig.4). Data will be updated automatically.

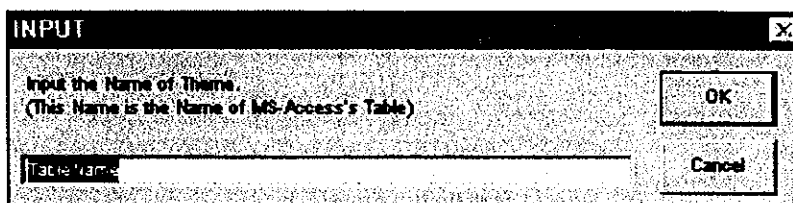


Fig. 4. Input Table name dialog box.

## Appendix 26 (cont.). Manual for GIS / Database Operation.

### 3.2 Generate Mesh

- (1) Click Mesh button to open "Making Mesh" dialog box.
- (2) Input lower left point data (Longitude, Latitude) in decimal degrees. Next, input upper right point data (Longitude, Latitude) in decimal degrees.
- (3) Input mesh size (width, height) in decimal degrees and click OK button to create grid mesh. New Mesh.shp theme will be added to the View.

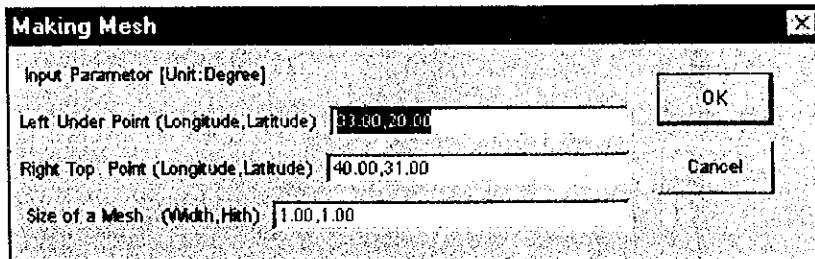


Fig. 5. Making Mesh dialog box.

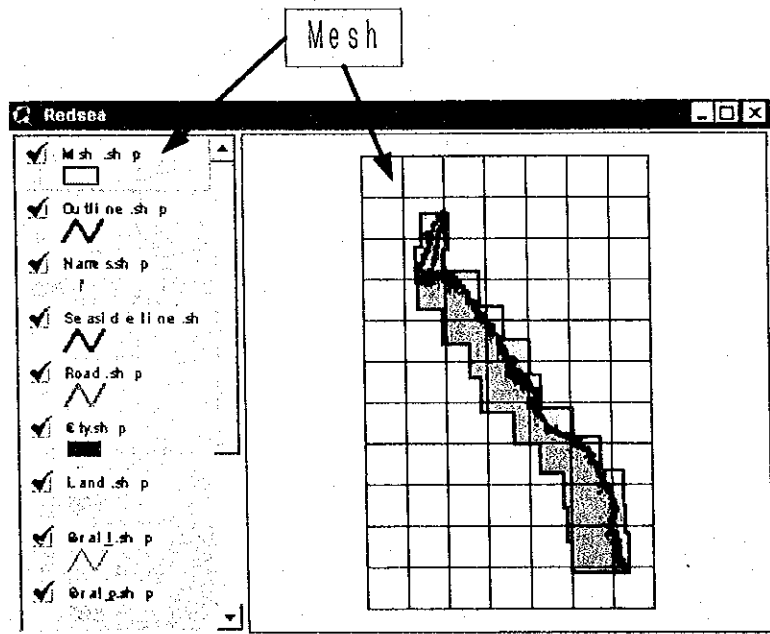


Fig. 6. Sample of Grid Mesh.

### 3.3 Search

By clicking Search button, you can get inventory data based on following categories.

- Inventory code
- Classify
- Scientific name
- Date
- Location

As for the location, you can also use mouse to find inventory data. Fig.7 show the flow diagram of selecting features in a view.

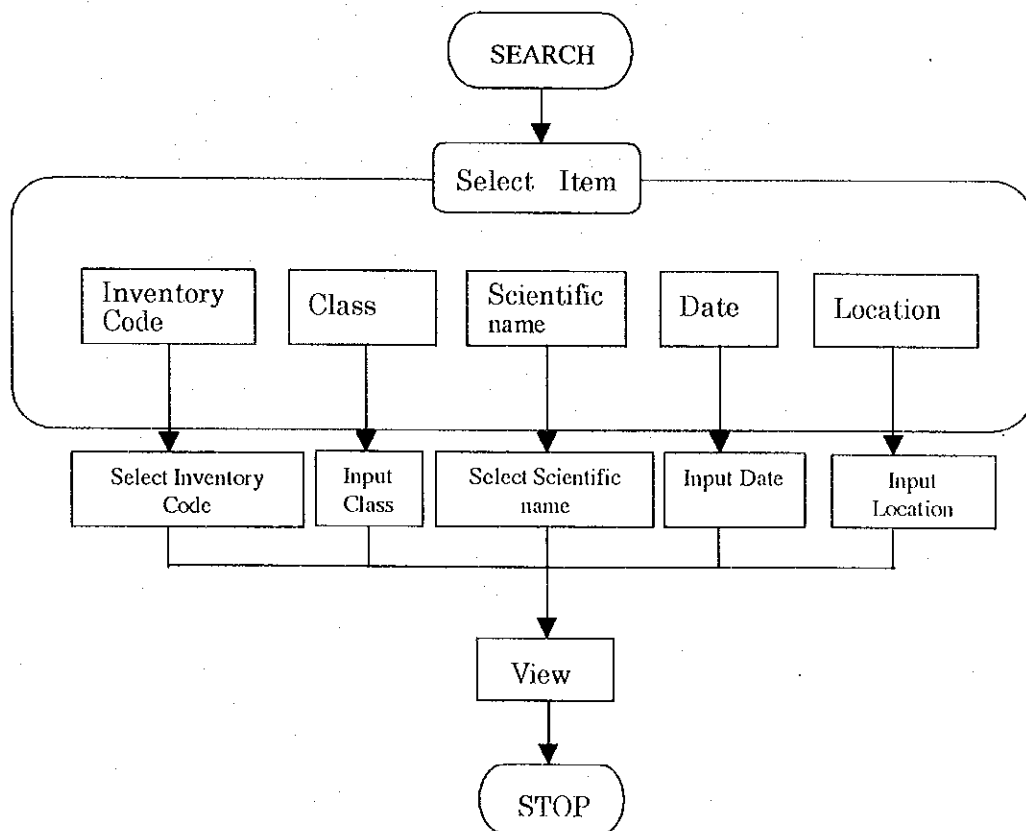


Fig. 7. Flow diagram for selecting map features.

Appendix 26 (cont.). Manual for GIS / Database Operation.

- (1) Click SEARCH button to open SELECT dialog box (Fig.8 a).  
From the drop down-list, select Search item (Fig.8 b).

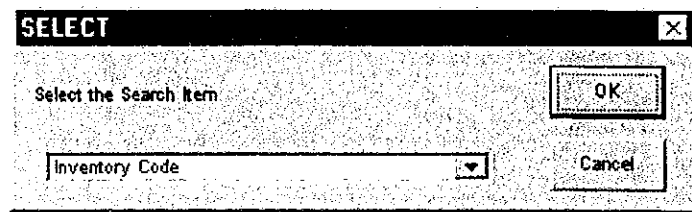


Fig. 8a). Select the Search Item.

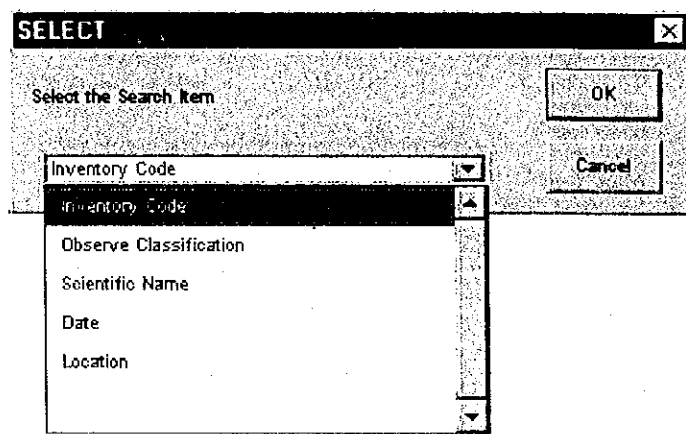


Fig. 8.b). Select the Search Item.

Appendix 26 (cont.). Manual for GIS / Database Operation.

■ Inventory code

Select Inventory Code and click OK and SELECT dialog box display the inventory code (Fig.9). Click OK and Arc View zooms out so you can see all the selected features.

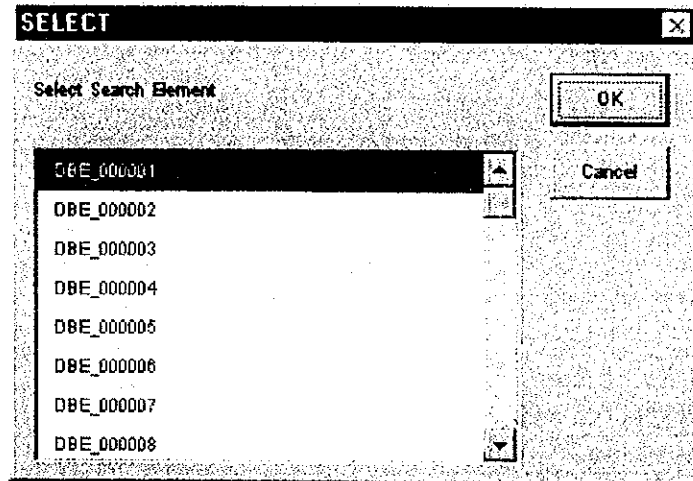


Fig. 9. Select Inventory Code dialog box.

■ Classify

Select Classify from the SELECT dialog box and click OK. Arc View zooms out so you can see all the selected features.

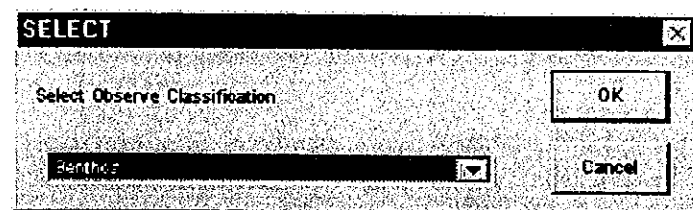


Fig. 10. Select Observe Classification.

Appendix 26 (cont.). Manual for GIS / Database Operation.

■ Scientific name

Select Scientific name from the SELECT dialog box and click OK. Arc View zooms out so you can see all the selected features (Fig.11).

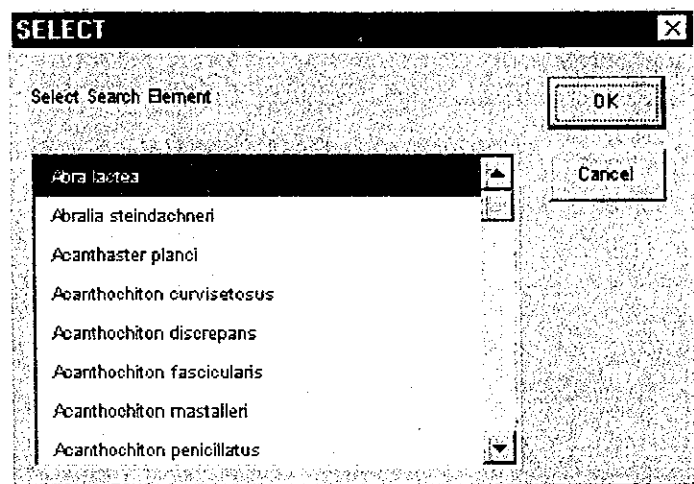


Fig. 11. Select Search Item dialog box.

■ Date

Input Date in a SELECT dialog box and click OK. Input Start Date and End Date using key board and click OK (Fig. 12). Arc View zooms out so you can see all the selected features.

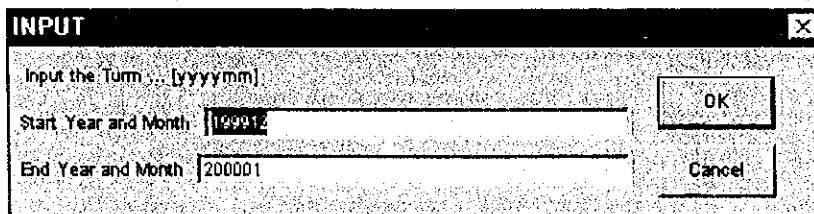


Fig. 12. Input Date dialog box.

## Appendix 26 (cont.), Manual for GIS / Database Operation.

### ■ Location

Select Location in a dialog box and click OK. Using key board input lower left and upper right address in decimal degrees and click OK. Arc View zooms out so you can see all the selected features (Fig.13).

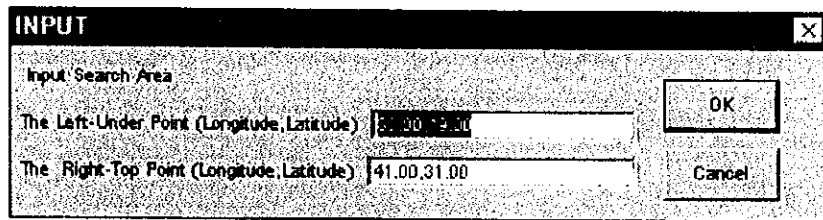


Fig. 13. Input Search Area dialog box.

If no data was selected message dialog box appears (Fig.14).

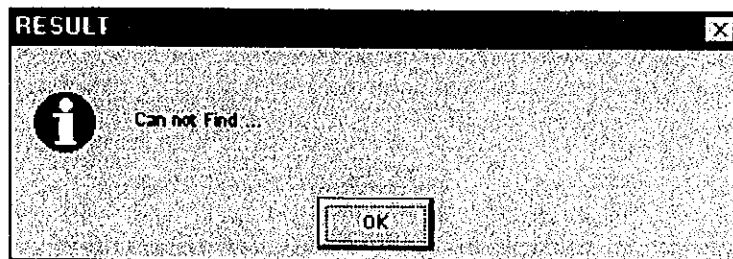


Fig. 14. Message dialog box.



Appendix 26 (cont.). Manual for GIS / Database Operation.

3.4 Area analyse

- (1) Click Area Analyze button to open SELECT dialog box (Fig.15).
- (2) Select Theme from dialog box. More then one items can be selected.

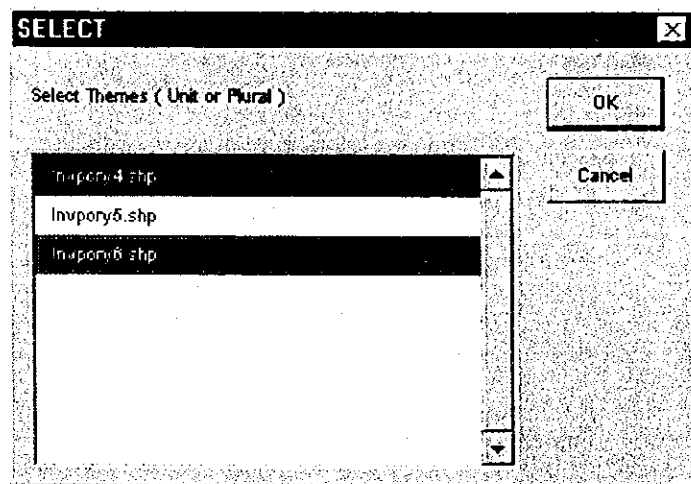


Fig. 15. Select Theme dialog box.

- (3) Select "And" or "OR" for calculate. Click OK to get the result (Fig.16).

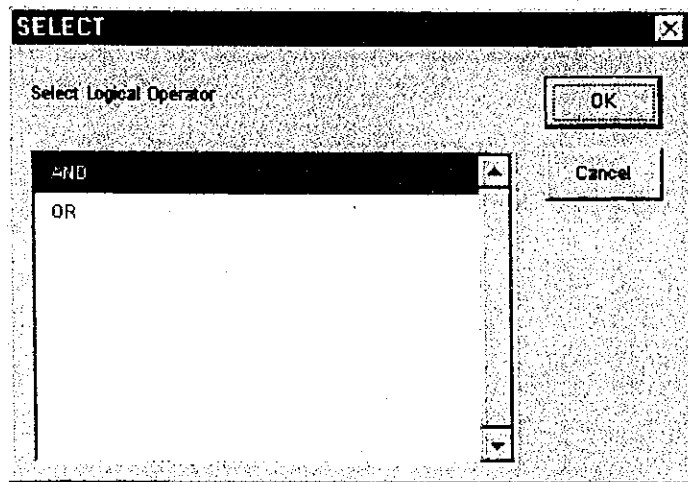
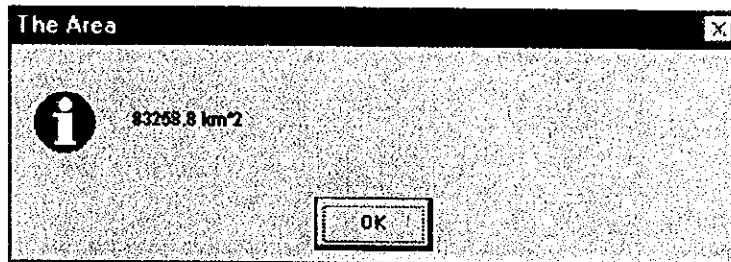


Fig. 16. Select operation dialog box.

**Appendix 26 (cont.). Manual for GIS / Database Operation.**

- (4) "The Area" dialog box gives you the result (Fig.17).
- (5) Arc View show you selected area in blue colour.



**Fig.17. Result of calculation.**

## Appendix 26 (cont.). Manual for GIS / Database Operation.

### 3.5 GPS data

GPS data can be seen in View window.

(1) Click GPS button to open GPS data file dialog box (Fig.18). Select GPS file to convert and click OK.

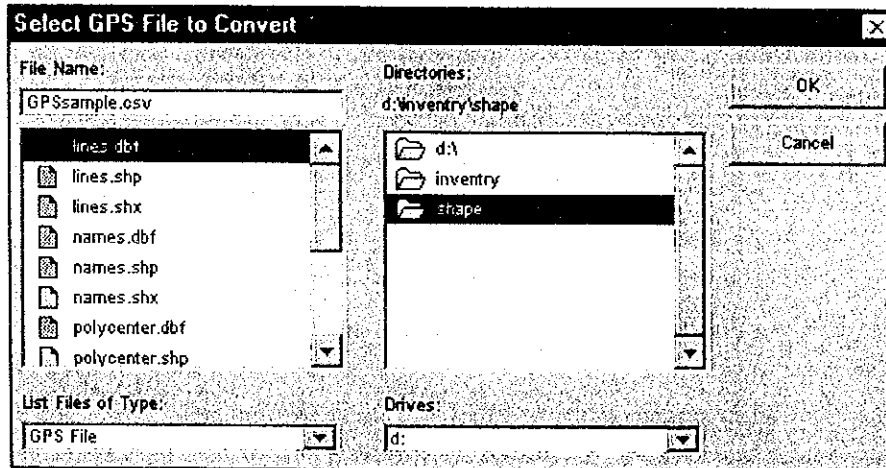


Fig. 18. Select file name dialog box.

(2) Create new GPS point shape file and line shape file using key board (Fig.19).

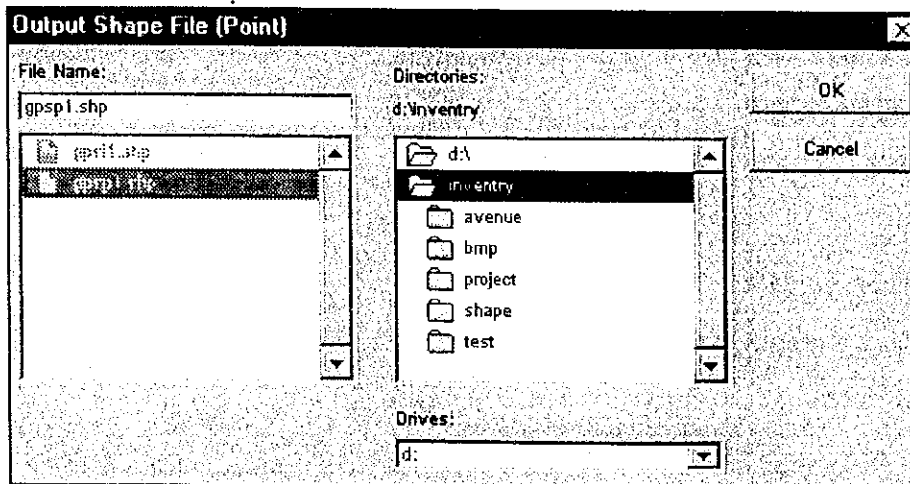


Fig. 19. Input new file name dialog box.

## Appendix 26 (cont.). Manual for GIS / Database Operation.

(3) Input interval for plotting GPS data. Click OK and Arc View show you the line data in View.



Fig. 20. Input Interval dialog box.

### 3.5.1 Make GPS data file

GPS data must be in text format including items listed below (Table 1).

Table 1. File Format.

Item	Format
Date	yyyymmdd
Day	Sunday (=No.1) through Saturday (=No.7)
Time	hhmmss
Longitude	degree, minute, second
Latitude	degree, minute, second
Height	5 character (not necessary)
Direction	3 character (not necessary)
Line No.	3 character (not necessary)

Each character must be small character.

## Appendix 26 (cont.). Manual for GIS / Database Operation.

### 3.6 Print Out

(1) To print out view image, click "Make Layout" button and open the dialog box (Fig.21).

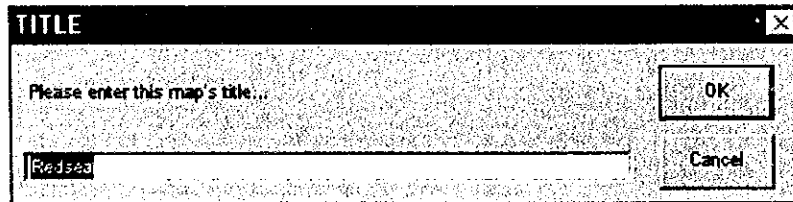


Fig. 21. Input Title dialog box.

(2) Input title and click OK. If you have a printer connected to your computer and it's turn on, layout will be printed (Fig.22).

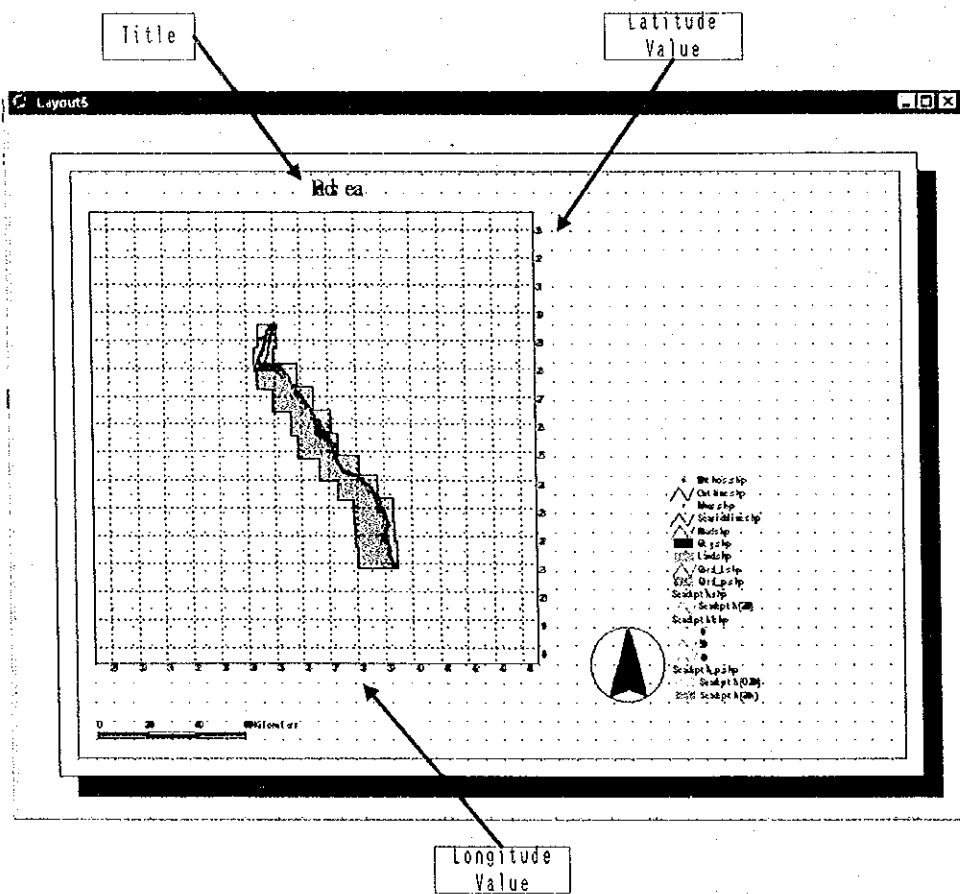


Fig. 22. Layout.

Appendix 26 (cont.). Manual for GIS / Database Operation.

To print out the image , just click Print Out button (Fig. 23).

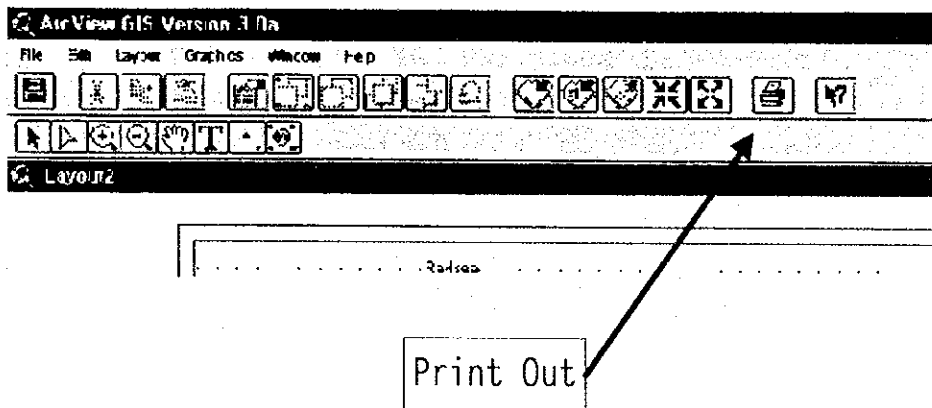


Fig. 23. Print out button.

Appendix 26 (cont.). Manual for GIS / Database Operation.

3.7 Zoom Mesh

Zoom mesh is a tool to zoom particular mesh. Make Mesh active and click ZoomMesh button and click particular mesh you are interested (Fig.24).

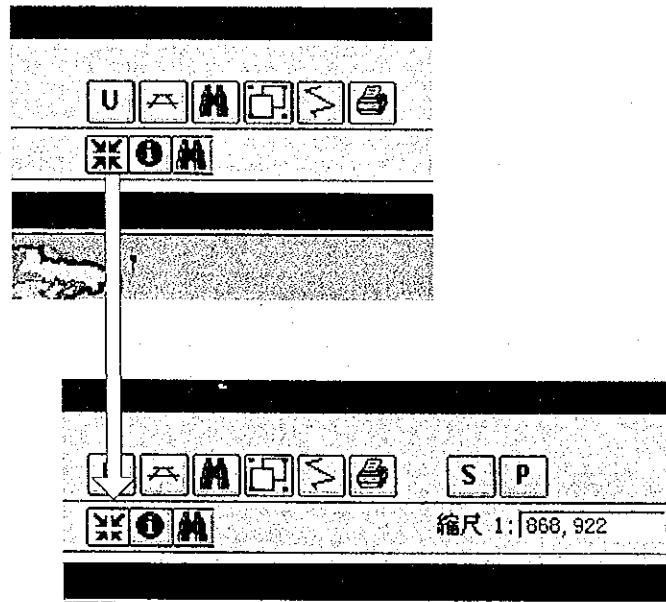


Fig. 24. Zoom Mesh button.

Appendix 26 (cont.). Manual for GIS / Database Operation.

4.8 Inventory information

(1) Click inventory button, and select inventory in the view, and photo and list of Inventory will be visualised (Fig.28).

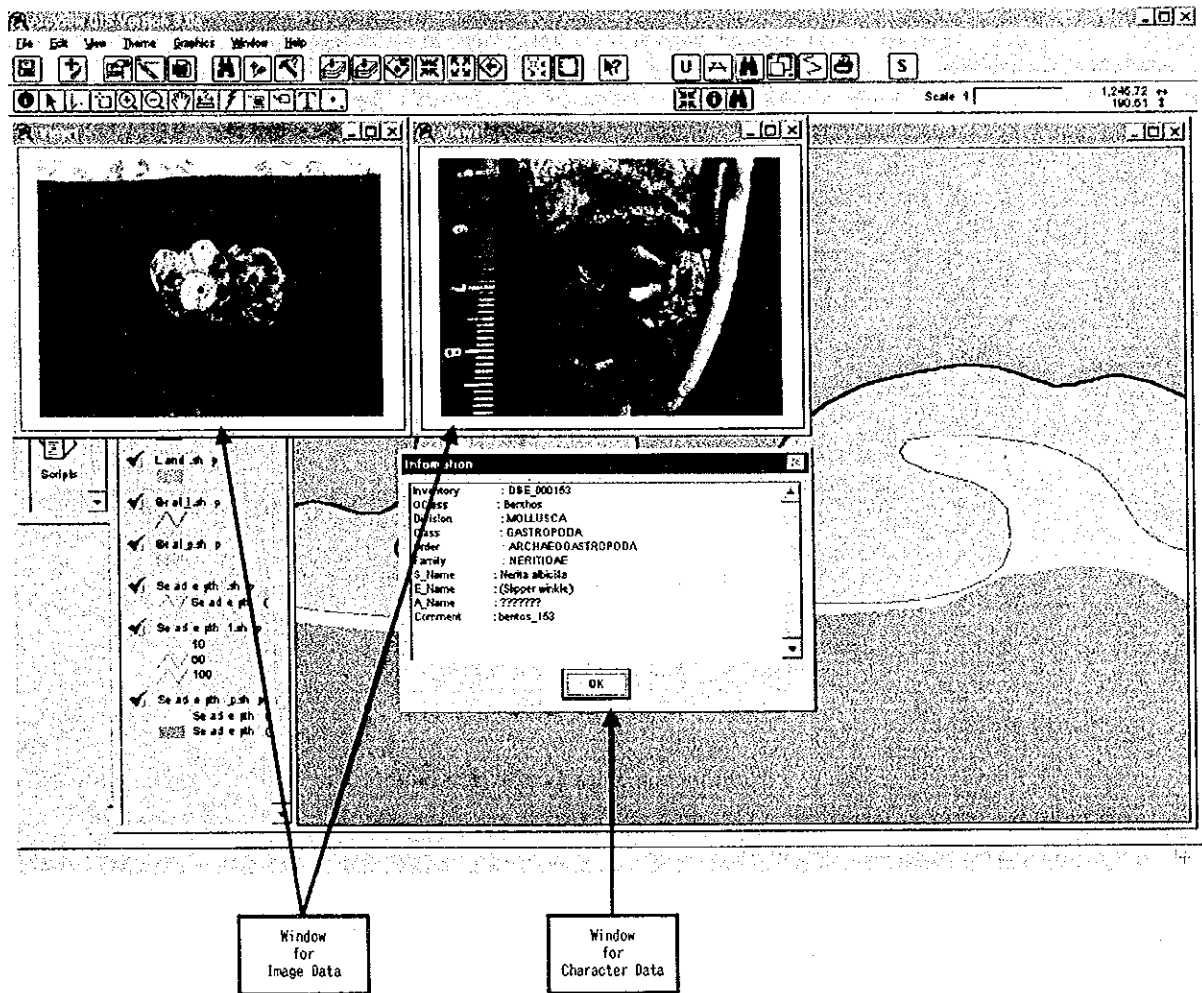
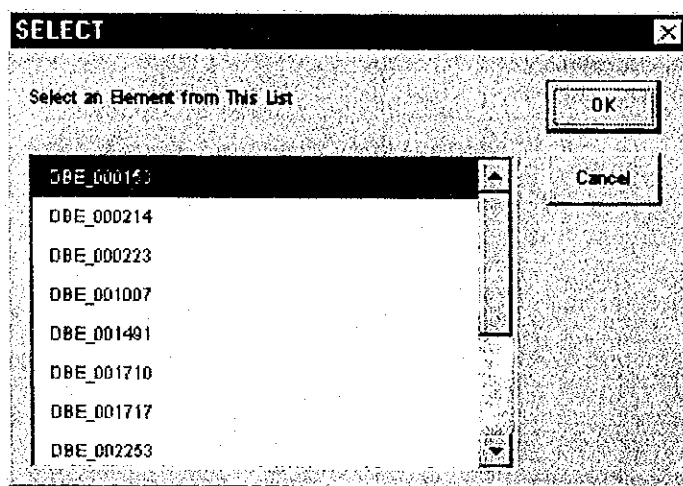


Fig. 25. Inventory information.



**Appendix 26 (cont.). Manual for GIS / Database Operation.**

(2) Click OK to close list and photo windows. If more than one inventory is included, select from the list (Fig.26).



**Fig. 26.** Inventory Select dialog box.

**4.9 Search using mouse**

You can select the area using mouse and Click search button. Arc View zooms out so you can see all the selected features.







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