Everglades Phosphorus Gradient Model (EPGM)

Excel version

Operating Instructions
DRAFT

Prepared for

South Florida Water Management District

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Introduction

The purpose of this document is to illustrate the use of the Everglades Phosphorus Gradient Model (EPGM) developed by Mr. William W. Walker Jr.and Robert H. Kadlec in 1996. The original application was developed in Lotus 123 and converted into an Excel version in 2004.

Step 1: Launching the EPGM Model

To start the EPGM model open the Excel file "EPGM_09_01_2004_comments.xls" located on \\ha1-fs2\ka_db\dcvp\devel\apps\epgm and click on the "Enable Macro" button. The file can be moved.

Step 2: Using the Phosphorus Gradient Model Worksheets

The EPGM Excel model contains the following worksheets that are used to select a case, run the model and navigate between the worksheets.

Menu

From the menu different excel worksheets can be accessed that allows for input, output, and documentation about model contents. Below is the navigation through the top menu and their description:

a. "Read Me First" button - Activates "Notes" worksheet.
b. "Documentation on EPGM web site" - Opens a web browser with the documentation for EPGM model.
c. "Select Case" list - This list contains all input cases. There are 12 cases already defined in the model. The model provides the ability to add a new case.
d. "Load Case" button - Re-runs the model for the case selected in the "Select Case" list and makes the selected case current case.
e. "Select Output Sheet" list - This list contains all the worksheets in the workbook.
f. "View Sheet" button - Activates the worksheet selected in the "Select Output Sheet" list.
g. "Run" button - re-runs the model.

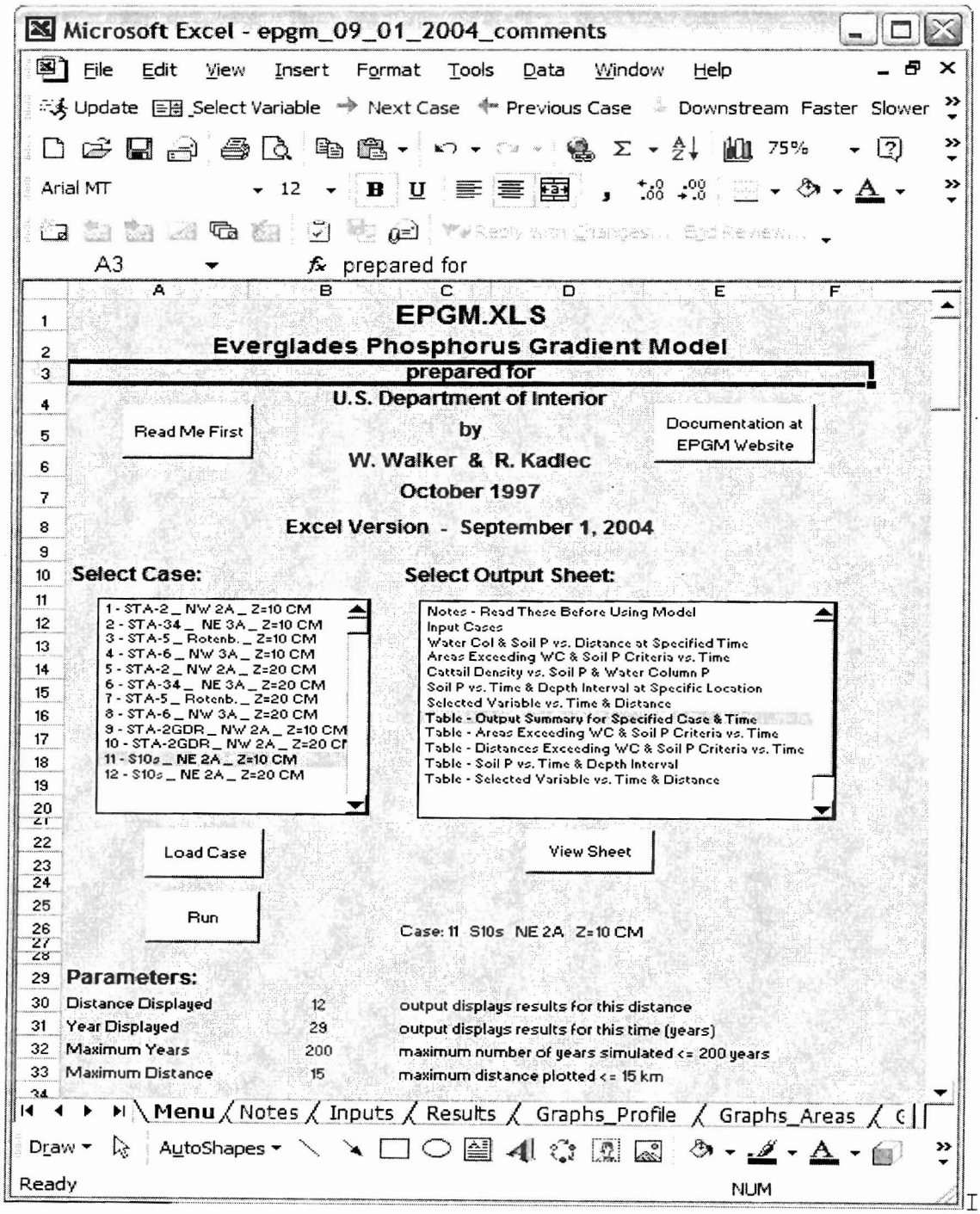
Parameters needed as input to run the model calculations:

1. Distance Displayed - Enter the distance in kilometers for which the output will display results.
2. Year displayed -Enter the number of years for which the output will display results.
3. Maximum Years - Enter the maximum number of simulated years. It should be equal to or less than 200.
4. Maximum Distance - Enter the maximum distance (in km) to be plotted. It should be equal to or less than 15 km.

Toolbar and button descriptions:

1. "**Update**" button Re-runs the model;
2. "**Select variable**" button - Shows a list with all variables.
3. "**Next case**" button - Makes the next case current;
4. "**Previous case**" button - Makes the previous case current.
5. "**Next Year**" button - Moves the output time forward by 1 year.
6. "**Last Year**" button - Moves the output time backward by 1 year.
7. "**Upstream**" button- decreases the output distance by 0.1 km.
8. "**Downstream**" button- increases the output distance by 0.1 km.
9. "**Faster**" button - Increases the "Time Increment" for animation with 1.
10. "**Slower**" button decreases the "Time Increment" for animation with 1.

Figure 1.1 Illustrates cases associated to a particular STA and output criteria can be select from the initial screen:



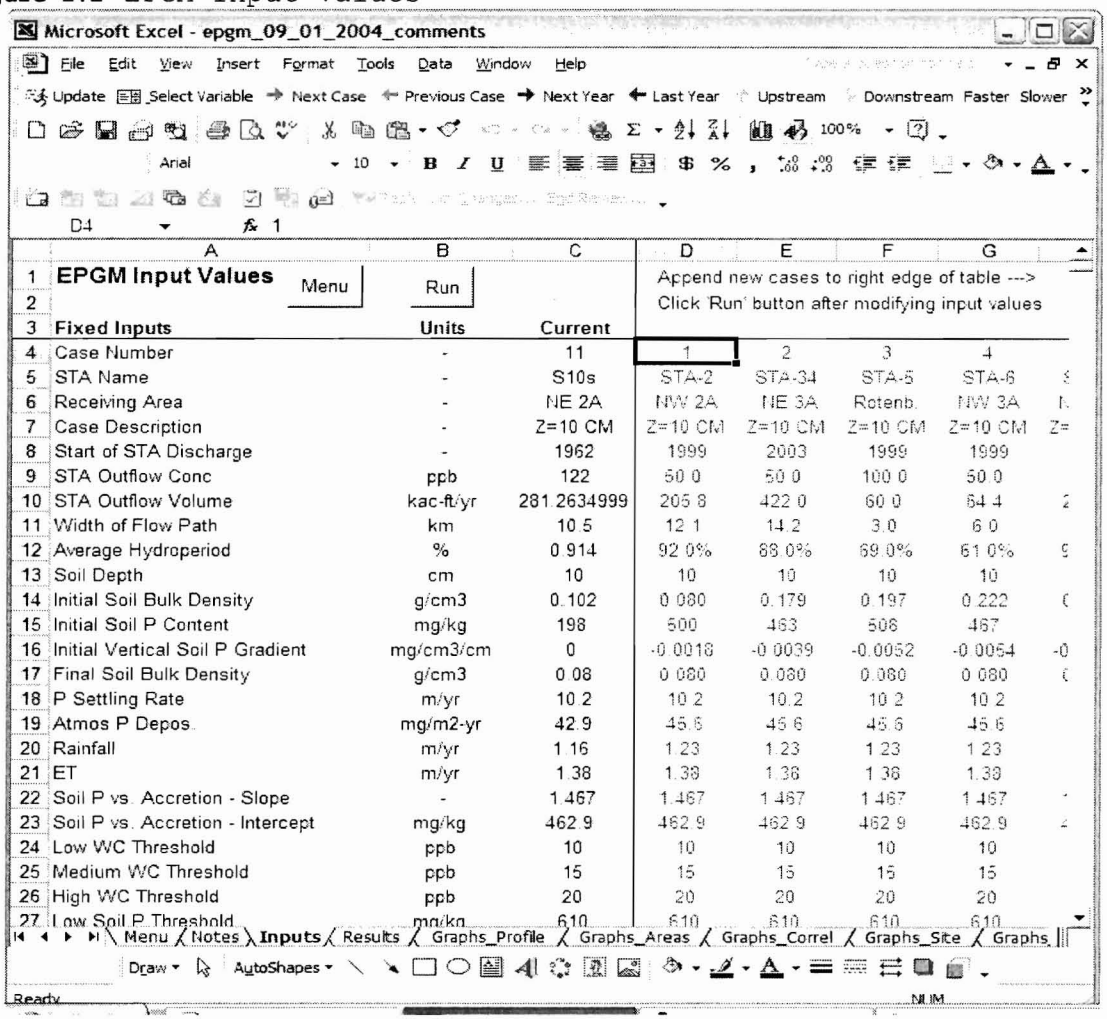
Using the EGPM model to add a new case

1. From the menu select "Input" worksheet;
2. Go to the first empty column to the right of the table. Fill out all the column cells with the information specified above.
3. Go to "Menu" worksheet;
4. Select the case in the "Select case" list;
5. Change the following parameters if desired:
    a. Distance displayed;
    b. Year displayed;
    c. Maximum years;
    d. Maximum distance.
6. Click on "Run" button.

Inputs Worksheet

The Inputs worksheet contains the input information for each case that is set up of the STA to obtain results for various studies.

Figure 1.2 EPGM Input Values



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File Edit View Insert Format Tools Data Window Help

Update | Select Variable | Next Case | Previous Case | Next Year | Last Year | Upstream | Downstream | Faster | Slower

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D4 1

	A	B	C	D	E	F	G
1	**EPGM Input Values** Menu	Run		Append new cases to right edge of table --->			
2				Click 'Run' button after modifying input values			
3	**Fixed Inputs**	**Units**	**Current**				
4	Case Number	-	11	1	2	3	4
5	STA Name	-	S10s	STA-2	STA-34	STA-5	STA-6
6	Receiving Area	-	NE 2A	NW 2A	NE 3A	Rotenb.	NW 3A
7	Case Description	-	Z=10 CM	Z=10 CM	Z=10 CM	Z=10 CM	Z=10 CM
8	Start of STA Discharge	-	1962	1999	2003	1999	1999
9	STA Outflow Conc	ppb	122	50 0	50 0	100 0	50 0
10	STA Outflow Volume	kac-ft/yr	281 2634999	205 8	422 0	60 0	64 4
11	Width of Flow Path	km	10 5	12 1	14 2	3 0	6 0
12	Average Hydroperiod	%	0 914	92 0%	88 0%	69 0%	61 0%
13	Soil Depth	cm	10	10	10	10	10
14	Initial Soil Bulk Density	g/cm3	0 102	0 080	0 179	0 197	0 222
15	Initial Soil P Content	mg/kg	198	500	463	508	467
16	Initial Vertical Soil P Gradient	mg/cm3/cm	0	-0 0018	-0 0039	-0 0052	-0 0054
17	Final Soil Bulk Density	g/cm3	0 08	0 080	0 080	0 080	0 080
18	P Settling Rate	m/yr	10 2	10 2	10 2	10 2	10 2
19	Atmos P Depos.	mg/m2-yr	42 9	45 6	45 6	45 6	45 6
20	Rainfall	m/yr	1 16	1 23	1 23	1 23	1 23
21	ET	m/yr	1 38	1 38	1 38	1 38	1 38
22	Soil P vs. Accretion - Slope	-	1 467	1 467	1 467	1 467	1 467
23	Soil P vs. Accretion - Intercept	mg/kg	462 9	462 9	462 9	462 9	462 9
24	Low WC Threshold	ppb	10	10	10	10	10
25	Medium WC Threshold	ppb	15	15	15	15	15
26	High WC Threshold	ppb	20	20	20	20	20
27	Low Soil P Threshold	mg/kg	610	610	610	610	610

Menu | Notes | Inputs | Results | Graphs_Profile | Graphs_Areas | Graphs_Correl | Graphs_Site | Graphs

Draw AutoShapes

Ready NUM

1. The "Menu" button activates "Menu" worksheet that displays all values needed for input.
2. "Run" button - Re-runs the model.
3. "Case Number" - contains the number of the case. The "EPGM" already has 12 pre-defined cases.
4. "STA Name" - contains the name of the STA (or basin) for which is the case.
5. "Receiving Area"- contains the name of the receiving area.
6. "Case Description".
7. "Start of STA Discharge"- contains the start year of STA discharge.
8. "STA Outflow Conc"- annual flow weighted mean total phosphorus concentration in ppb.
9. "Width of Flow Path" - contains the width of flow path in km.
10. "Average Hydroperiod" - contains the fraction of time the system is wet in percent. This coefficient accounts for drought conditions when no net phosphorus accretion is suppose to occur.
11. "Soil Depth" - contains the soil column depth in cm.
12. "Initial Soil Bulk Density" - contains the initial soil bulk density in g/cm^3. This is derived from soil measurements in relevant portions of WCA 2A, WCA 3A and Rotenberger. Properties are estimated for 0-10 and 0-20 depth intervals.
13. "Initial Soil P Content" - contains the initial soil phosphorus content in mg/kg. This is derived from soil measurements in relevant portions of WCA 2A, WCA 3A and Rotenberger. Properties are estimated for 0-10 and 0-20 depth intervals.
14. "Initial Vertical Soil P Gradient" - contains the vertical P gradient in initial soil in $mg/cm^3/cm$. This is derived from soil measurements in relevant portions of WCA 2A, WCA 3A and Rotenberger. Properties are estimated for 0-10 and 0-20 depth intervals.
15. "Final Soil Bulk Density" - contains the bulk density of new soil in g/cm^3. It is set to 0.08 g/cm^3, based upon measured densities in the NW region of WCA 2A (discharge zone of STA 2) It is assumed that this reflects typical marsh soils generated under hydrologic conditions similar to those expected in the ST A discharge zones. Soils at other STA discharge sites (northern WCA 3A and Rotenberger) have higher initial bulk densities (0.18 to .22 g/cm^3). Higher densities probably reflect frequent dryout and mineralization at these locations under historical conditions. It is assumed that new soils formed in these areas under future conditions (-continuously wet) will have bulk densities similar to those currently found in WCA-2A. If new soils formed in these areas actually have higher bulk densities, soil response times would be longer than those predicted.
16. "P Settling Rate" - contains long-term-average setting rate in m/yr. It is set to 10.2 m/yr.
17. "Atmos P Depos." - contains the atmospheric phosphorus deposition in mg/m^2-yr.
18. "Rainfall" - contains the annual rainfall (m/yr).
19. "ET" - contains the annual evapotranspiration (m/yr).

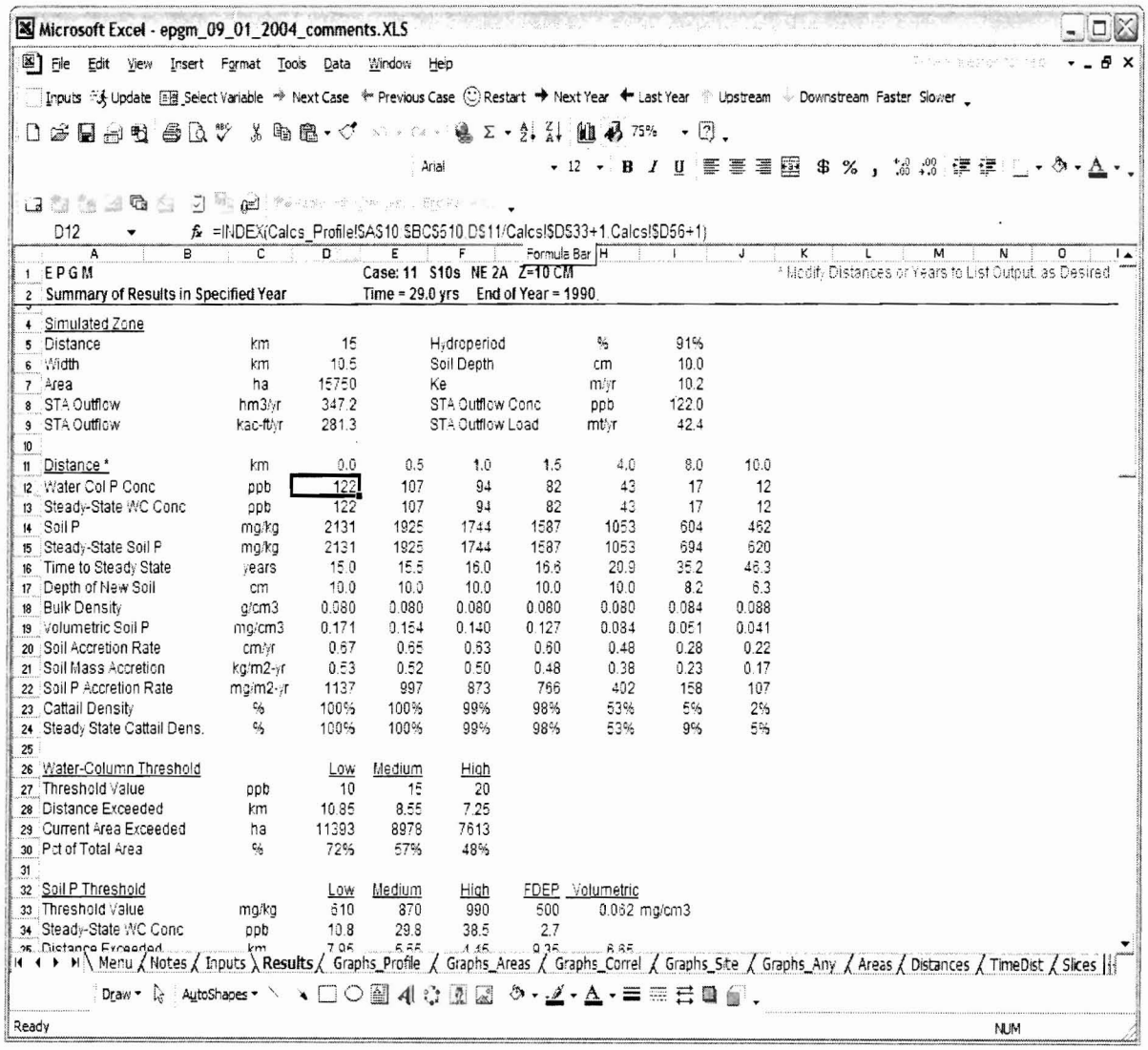
20. "Soil P vs. Accretion - Slope" - Contains Soil phosphorus vs accretion - slope. It is set to 1.467.
21. "Soil P vs. Accretion - Intercept" - Contains Soil phosphorus vs. accretion - slope. It is set to 462.9 mg/kg.
22. "Low WC Threshold" - Contains the low water column threshold. It is set to 10 ppb.
23. "Medium WC Threshold" - Contains the medium water column threshold. It is set to 15 ppb.
24. "High WC Threshold" - Contains the high water column threshold. It is set to 20 ppb.
25. "Low Soil P Threshold" - Contains the low soil phosphorus threshold. It is set to 610 mg/kg. Soil P thresholds for cattail expansion estimated from WCA-2A and WCA-1 data range from 610 to 990 mg/kg for a 10 cm soil depth and from 540 to 720 mg/kg for a 20 cm soil depth. Errors in predicting vegetation types based upon observed soil P levels range from 1 % to 19%. Site classification errors are higher when soil P criteria are expressed on a volumetric basis.
26. "Medium Soil P Threshold" - Contains the medium soil phosphorus threshold. It is set to 870 mg/kg.
27. "High Soil P Threshold" - Contains the high soil phosphorus threshold. It is set to 990 mg/kg.
28. "FDEP Soil P Threshold (Z = 10 cm)" - It is set to 500 mg/kg.
29. "Volumetric Soil P Threshold" - It is set to 0.062 mg/cm^3. Observed soil phosphorus and vegetation patterns in WCA-2A suggest a volumetric threshold criterion of -0.062 mg/cm^3 for a 10-cm soil depth and 0.053 mg/m^3 for a 20-cm depth. Because of high bulk densities (0.18 to 0.23 g/cm^3), soils in the discharge zones of STA's- 34,5, & 6 have initial volumetric P concentrations (.08 - .10 mg/cm 3) that exceed both criteria. Simulations indicate that significant changes in volumetric P content in these areas are not expected to result from discharge of 50 ppb water.
30. "Logistic Spread - Cattail vs. Soil P" - For 10 cm soil depth it is set to 144.1 mg/kg.
31. "Logistic Midpoint - Cattail vs. Soil P" - For 10 cm soil depth it is set to 1034.4 mg/kg.
32. "Total Distance Modeled" - Contains the total distance showed in the output. It is set to 15 km.

Results worksheet

This worksheet contains the results from the model. The values that the user can modify in this worksheet are colored in red. Those values are:

a. Distance
b. Year.

Figure 1.3 Results worksheet



Graphs Profile worksheet

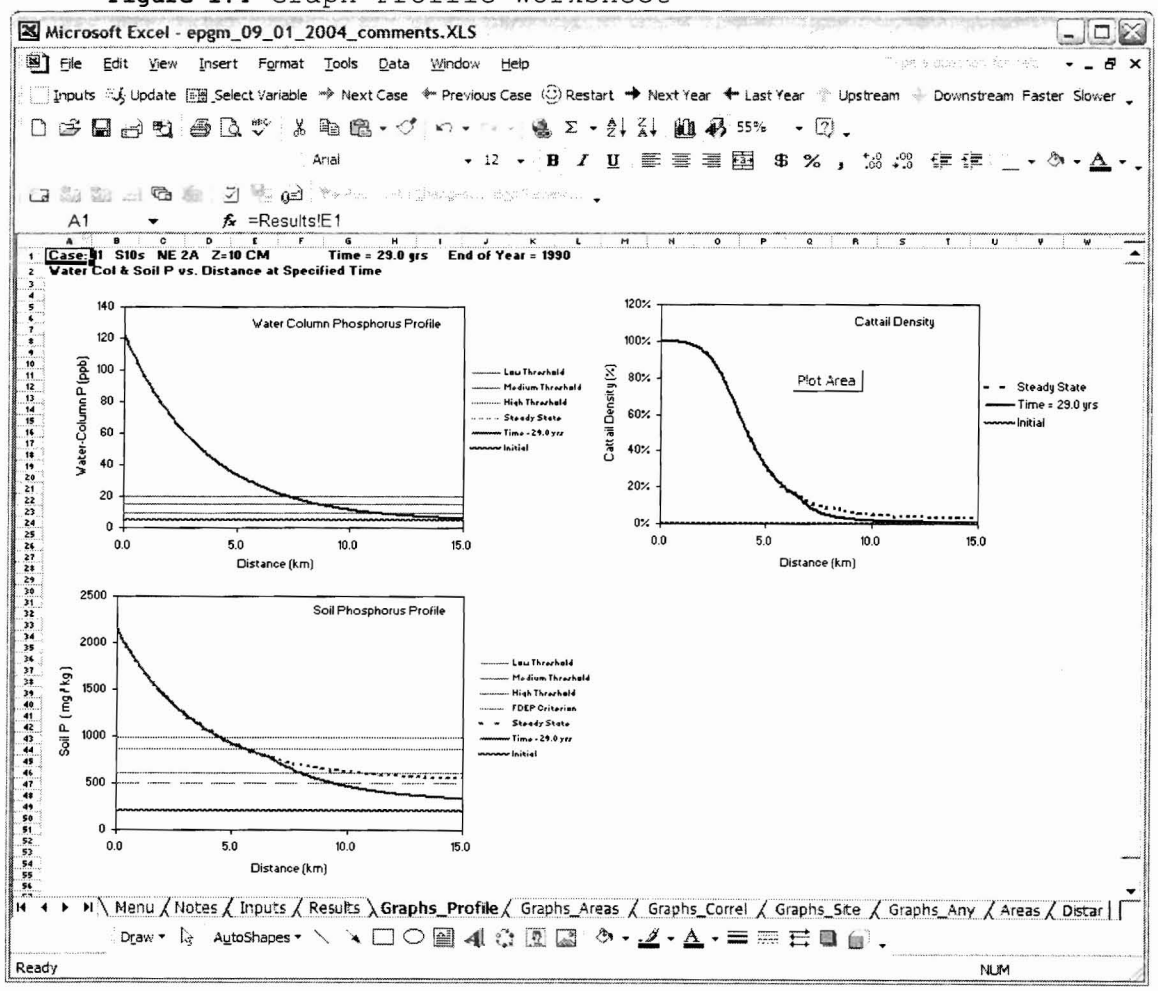
This worksheet contains three graphics: Water Column & Soil Phosphorus vs. Distance at Specified Time. These graphs are the profile against which the model results are lined up.

a. Water Column Phosphorus profile
   i. Low Threshold;
   ii. Medium Threshold;
   ii. High Threshold;
   iv. Steady state;
   v. Time = N of years;
   vi. Initial.

b. Cattail Density;
   1. Steady State
   2. Time = N years
   3. Initial

c. Soil Phosphorus profile.
   i. Low Threshold;
   ii. Medium Threshold;
   ii. High Threshold
   iv. FDEP Criterion;
   v. Steady state;
   vi. Time = N of years;
   vii. Initial.

Figure 1.4 Graph Profile worksheet

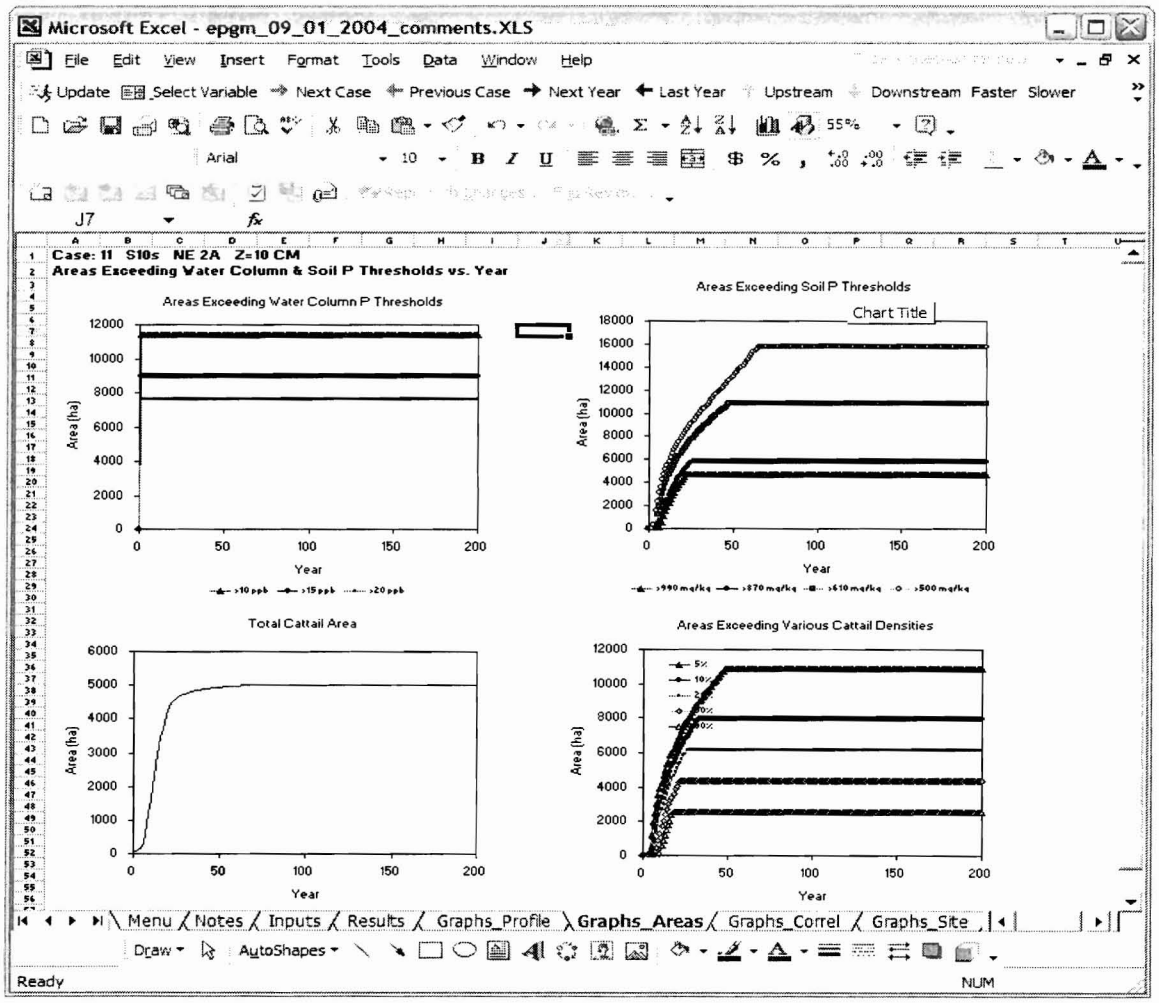


Graphs Area worksheet

The graph areas worksheet contains four graphs. The graphs illustrate each Areas Exceeding Water Column & Soil Phosphorus Thresholds vs. Year Areas exceeding water column phosphorus thresholds. These graphs represent the results for the model.

1. Areas Exceeding Water Column thresholds:
    a. 10 ppb;
    b. 15 ppb;
    c. 20 ppb.
2. Areas exceeding soil phosphorus thresholds:
    a. 990 mg/kg;
    b. 870 mg/kg;
    c. 610 mg/kg;
    d. 500 mg/kg.
3. Total cattail areas
4. Areas exceeding various cattail densities.

Figure 1.5 Graph Results for Areas Exceeding Water Column & Soil P. Thresholds vs. Year.



Graphs_Correl worksheet

This worksheet contains three graphs to display measurements for Cattail Density vs. Soil Phosphorus & Water Column Phosphorus. The measurements are proportioned as followed:

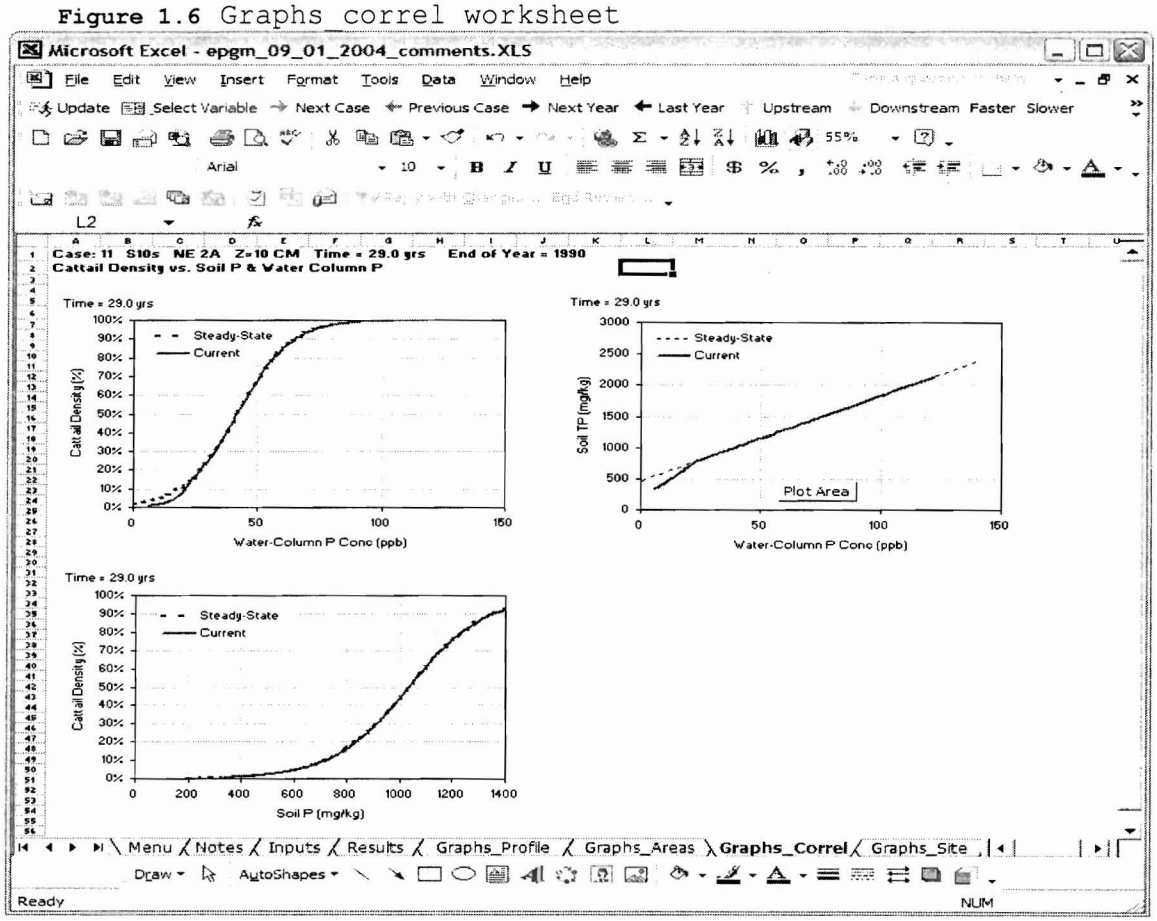
1. Cattail Density (%) vs. Water-Column phosphorus concentration (ppb).
    a. Steady state
    b. Current

    1. Soil Total Phosphorus (mg/kg) vs. Water-Column phosphorus concentration (ppb).

        a. Steady state
        b. Current

3. Cattail Density (%) vs. Soil phosphorus (mg/kg)
    a. Steady state
    b. Current

Figure 1.6 Graphs_correl worksheet

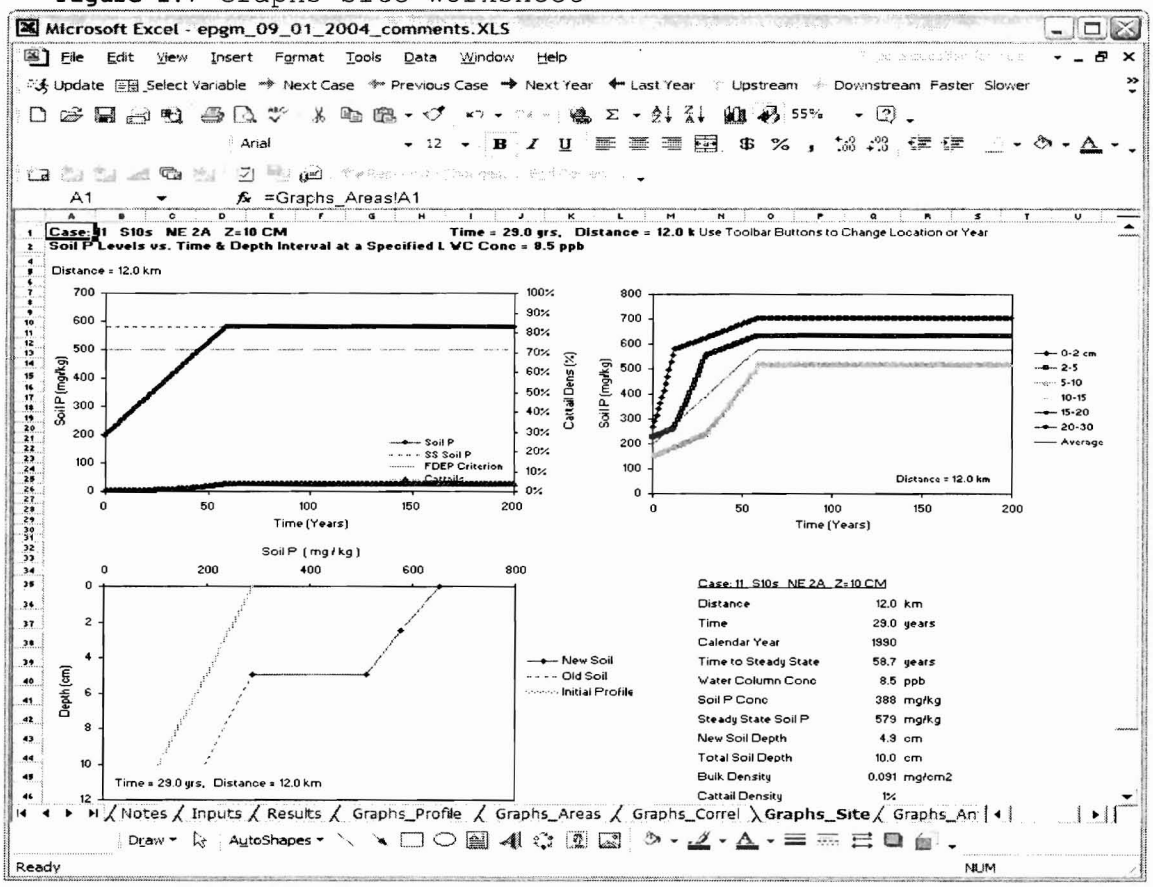


Graphs Site worksheet

The Graph Site worksheet contains three graphs. The graphs are used to measure Soil phosphorus Levels vs. Time & Depth Interval at a Specified Location. The user has the option to change the location or the year using the toolbars.
The following are the conducted measurement results that are illustrated on the graphs:

1. "Next Year" button moves the output time forward by 1 year.
2. "Last Year" button moves the output time backward by 1 year.
3. "Upstream" button decreases the output distance by 0.1 km.
4. "Downstream" button increases the output distance by 0.1 km.
5. Soil phosphorus (mg/kg) by time (years) vs. Cattail Density (%).
6. Soil phosphorus (mg/kg) vs. Time (years).
7. Depth (cm).

Figure 1.7 Graphs Site worksheet

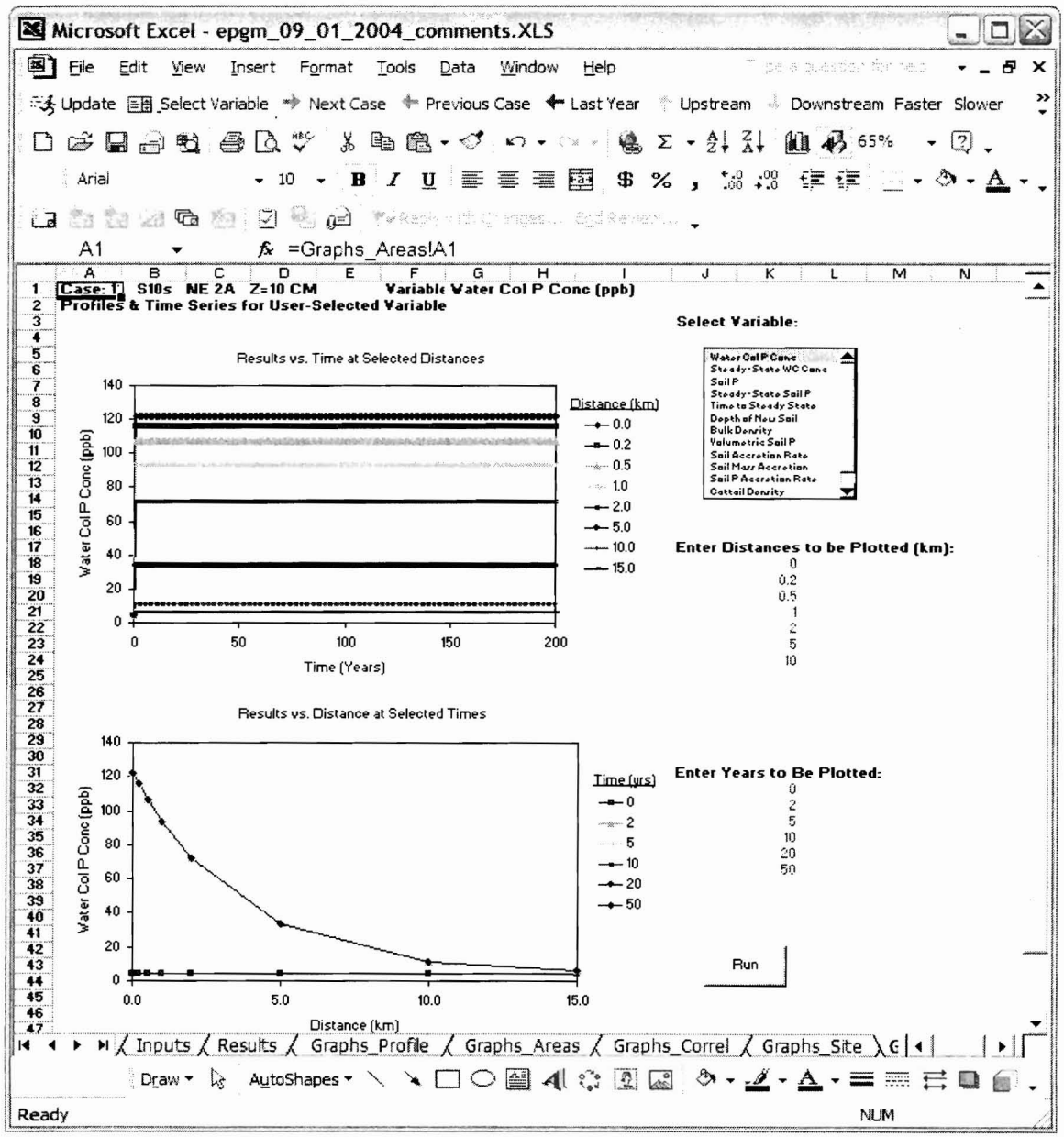


Graphs_Any worksheet

The Graph_Any worksheet contains two graphs that display the results for Profiles & Time Series for User-Selected Variable. The user can change the plotted variable by selected a different variable from the list. The user can also modify the distance and the years to be plotted. The graph results are displayed as followed:

1. **Graph 1** = Variable vs. Time (years);
2. **Graph 2** = Variable vs. Distance (km).

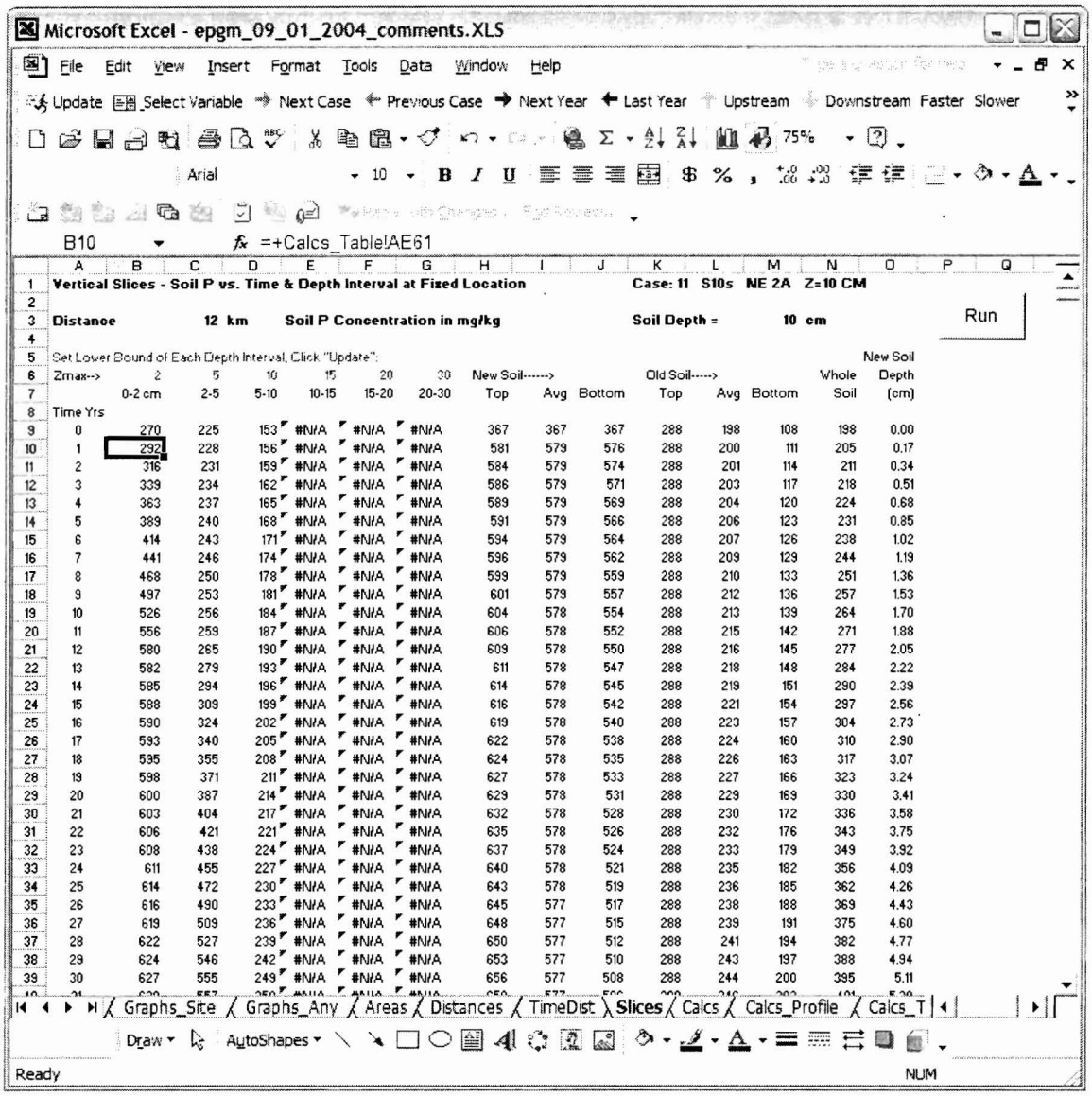
Figure 1.8. Graphs_Any worksheet results



Slices worksheet

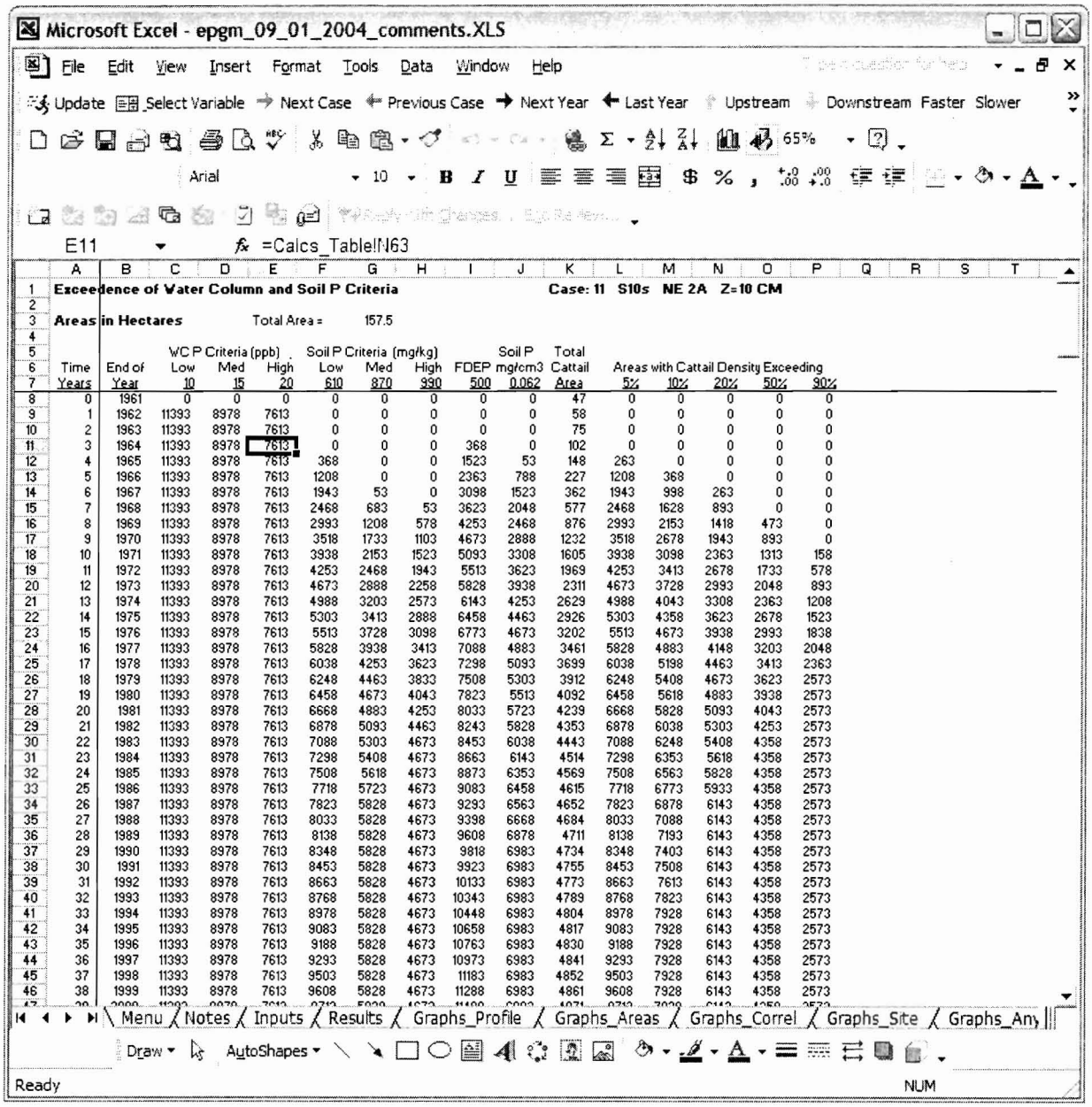
The slices worksheet contains Vertical Slices - Soil Phosphorus vs. Time & Depth Interval at Fixed Location. The user can change the values in red:

Figure 1.9 Slice worksheet results with fields with allows updates in red



Areas worksheet

This worksheet contains table with the Areas Exceedence of Water Column and Soil Phosphorus Criteria in tabular format.



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File Edit View Insert Format Tools Data Window Help

Update Select Variable Next Case Previous Case Next Year Last Year Upstream Downstream Faster Slower

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E11 =Calcs_Table!N63

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	**Exceedence of Water Column and Soil P Criteria**											**Case: 11 S10s NE 2A Z=10 CM**				
2																
3	**Areas in Hectares**			Total Area =	157.5											
4																
5			WC P Criteria (ppb)			Soil P Criteria (mg/kg)				Soil P	Total					
6	Time	End of	Low	Med	High	Low	Med	High	FDEP	mg/cm3	Cattail	Areas with Cattail Density Exceeding				
7	Years	Year	10	15	20	610	870	930	500	0.062	Area	5%	10%	20%	50%	90%
8	0	1961	0	0	0	0	0	0	0	0	47	0	0	0	0	0
9	1	1962	11393	8978	7613	0	0	0	0	0	58	0	0	0	0	0
10	2	1963	11393	8978	7613	0	0	0	0	0	75	0	0	0	0	0
11	3	1964	11393	8978	7613	0	0	0	368	0	102	0	0	0	0	0
12	4	1965	11393	8978	7613	368	0	0	1523	53	148	263	0	0	0	0
13	5	1966	11393	8978	7613	1208	0	0	2363	788	227	1208	368	0	0	0
14	6	1967	11393	8978	7613	1943	53	0	3098	1523	362	1943	998	263	0	0
15	7	1968	11393	8978	7613	2468	683	53	3623	2048	577	2468	1628	893	0	0
16	8	1969	11393	8978	7613	2993	1208	578	4253	2468	876	2993	2153	1418	473	0
17	9	1970	11393	8978	7613	3518	1733	1103	4673	2888	1232	3518	2678	1943	893	0
18	10	1971	11393	8978	7613	3938	2153	1523	5093	3308	1605	3938	3098	2363	1313	158
19	11	1972	11393	8978	7613	4253	2468	1943	5513	3623	1969	4253	3413	2678	1733	578
20	12	1973	11393	8978	7613	4673	2888	2258	5828	3938	2311	4673	3728	2993	2048	893
21	13	1974	11393	8978	7613	4988	3203	2573	6143	4253	2629	4988	4043	3308	2363	1208
22	14	1975	11393	8978	7613	5303	3413	2888	6458	4463	2926	5303	4358	3623	2678	1523
23	15	1976	11393	8978	7613	5513	3728	3098	6773	4673	3202	5513	4673	3938	2993	1838
24	16	1977	11393	8978	7613	5828	3938	3413	7088	4883	3461	5828	4883	4148	3203	2048
25	17	1978	11393	8978	7613	6038	4253	3623	7298	5093	3699	6038	5198	4463	3413	2363
26	18	1979	11393	8978	7613	6248	4463	3833	7508	5303	3912	6248	5408	4673	3623	2573
27	19	1980	11393	8978	7613	6458	4673	4043	7823	5513	4092	6458	5618	4883	3938	2573
28	20	1981	11393	8978	7613	6668	4883	4253	8033	5723	4239	6668	5828	5093	4043	2573
29	21	1982	11393	8978	7613	6878	5093	4463	8243	5828	4353	6878	6038	5303	4253	2573
30	22	1983	11393	8978	7613	7088	5303	4673	8453	6038	4443	7088	6248	5408	4358	2573
31	23	1984	11393	8978	7613	7298	5408	4673	8663	6143	4514	7298	6353	5618	4358	2573
32	24	1985	11393	8978	7613	7508	5618	4673	8873	6353	4569	7508	6563	5828	4358	2573
33	25	1986	11393	8978	7613	7718	5723	4673	9083	6458	4615	7718	6773	5933	4358	2573
34	26	1987	11393	8978	7613	7823	5828	4673	9293	6563	4652	7823	6878	6143	4358	2573
35	27	1988	11393	8978	7613	8033	5828	4673	9398	6668	4684	8033	7088	6143	4358	2573
36	28	1989	11393	8978	7613	8138	5828	4673	9608	6878	4711	8138	7193	6143	4358	2573
37	29	1990	11393	8978	7613	8348	5828	4673	9818	6983	4734	8348	7403	6143	4358	2573
38	30	1991	11393	8978	7613	8453	5828	4673	9923	6983	4755	8453	7508	6143	4358	2573
39	31	1992	11393	8978	7613	8663	5828	4673	10133	6983	4773	8663	7613	6143	4358	2573
40	32	1993	11393	8978	7613	8768	5828	4673	10343	6983	4789	8768	7823	6143	4358	2573
41	33	1994	11393	8978	7613	8978	5828	4673	10448	6983	4804	8978	7928	6143	4358	2573
42	34	1995	11393	8978	7613	9083	5828	4673	10658	6983	4817	9083	7928	6143	4358	2573
43	35	1996	11393	8978	7613	9188	5828	4673	10763	6983	4830	9188	7928	6143	4358	2573
44	36	1997	11393	8978	7613	9293	5828	4673	10973	6983	4841	9293	7928	6143	4358	2573
45	37	1998	11393	8978	7613	9503	5828	4673	11183	6983	4852	9503	7928	6143	4358	2573
46	38	1999	11393	8978	7613	9608	5828	4673	11288	6983	4861	9608	7928	6143	4358	2573

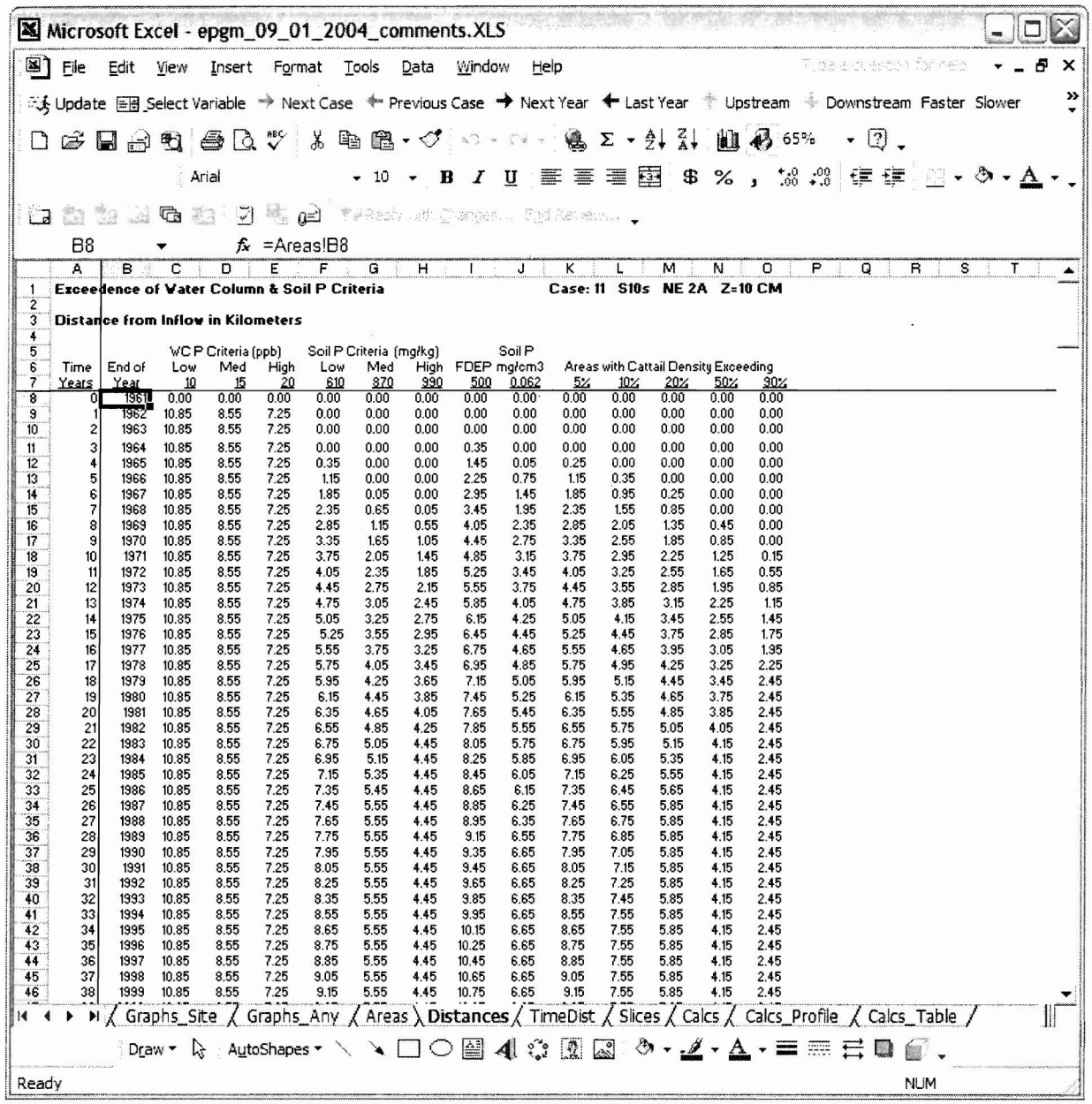
Menu Notes Inputs Results Graphs_Profile Graphs_Areas Graphs_Correl Graphs_Site Graphs_Any

Draw AutoShapes

Ready NUM

Distances worksheet

This worksheet contains the table with Distances Exceedence of Water Column & Soil Phosphorus Criteria in tabular format.



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File Edit View Insert Format Tools Data Window Help

Update Select Variable Next Case Previous Case Next Year Last Year Upstream Downstream Faster Slower

Arial 10 B I U 65%

B8 =Areas!B8

Exceedence of Water Column & Soil P Criteria **Case: 11 S10s NE 2A Z=10 CM**

Distance from Inflow in Kilometers

			WC P Criteria (ppb)			Soil P Criteria (mg/kg)				Soil P					
Time	End of	Low	Med	High	Low	Med	High	FDEP	mg/cm3	Areas with Cattail Density Exceeding				
Years	Year	10	15	20	610	870	990	500	0.062	5%	10%	20%	50%	90%
0	1961	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	1962	10.85	8.55	7.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1963	10.85	8.55	7.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	1964	10.85	8.55	7.25	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00
4	1965	10.85	8.55	7.25	0.35	0.00	0.00	1.45	0.05	0.25	0.00	0.00	0.00	0.00
5	1966	10.85	8.55	7.25	1.15	0.00	0.00	2.25	0.75	1.15	0.35	0.00	0.00	0.00
6	1967	10.85	8.55	7.25	1.85	0.05	0.00	2.95	1.45	1.85	0.95	0.25	0.00	0.00
7	1968	10.85	8.55	7.25	2.35	0.65	0.05	3.45	1.95	2.35	1.55	0.85	0.00	0.00
8	1969	10.85	8.55	7.25	2.85	1.15	0.55	4.05	2.35	2.85	2.05	1.35	0.45	0.00
9	1970	10.85	8.55	7.25	3.35	1.65	1.05	4.45	2.75	3.35	2.55	1.85	0.85	0.00
10	1971	10.85	8.55	7.25	3.75	2.05	1.45	4.85	3.15	3.75	2.95	2.25	1.25	0.15
11	1972	10.85	8.55	7.25	4.05	2.35	1.85	5.25	3.45	4.05	3.25	2.55	1.65	0.55
12	1973	10.85	8.55	7.25	4.45	2.75	2.15	5.55	3.75	4.45	3.55	2.85	1.95	0.85
13	1974	10.85	8.55	7.25	4.75	3.05	2.45	5.85	4.05	4.75	3.85	3.15	2.25	1.15
14	1975	10.85	8.55	7.25	5.05	3.25	2.75	6.15	4.25	5.05	4.15	3.45	2.55	1.45
15	1976	10.85	8.55	7.25	5.25	3.55	2.95	6.45	4.45	5.25	4.45	3.75	2.85	1.75
16	1977	10.85	8.55	7.25	5.55	3.75	3.25	6.75	4.65	5.55	4.65	3.95	3.05	1.95
17	1978	10.85	8.55	7.25	5.75	4.05	3.45	6.95	4.85	5.75	4.95	4.25	3.25	2.25
18	1979	10.85	8.55	7.25	5.95	4.25	3.65	7.15	5.05	5.95	5.15	4.45	3.45	2.45
19	1980	10.85	8.55	7.25	6.15	4.45	3.85	7.45	5.25	6.15	5.35	4.65	3.75	2.45
20	1981	10.85	8.55	7.25	6.35	4.65	4.05	7.65	5.45	6.35	5.55	4.85	3.85	2.45
21	1982	10.85	8.55	7.25	6.55	4.85	4.25	7.85	5.55	6.55	5.75	5.05	4.05	2.45
22	1983	10.85	8.55	7.25	6.75	5.05	4.45	8.05	5.75	6.75	5.95	5.15	4.15	2.45
23	1984	10.85	8.55	7.25	6.95	5.15	4.45	8.25	5.85	6.95	6.05	5.35	4.15	2.45
24	1985	10.85	8.55	7.25	7.15	5.35	4.45	8.45	6.05	7.15	6.25	5.55	4.15	2.45
25	1986	10.85	8.55	7.25	7.35	5.45	4.45	8.65	6.15	7.35	6.45	5.65	4.15	2.45
26	1987	10.85	8.55	7.25	7.45	5.55	4.45	8.85	6.25	7.45	6.55	5.85	4.15	2.45
27	1988	10.85	8.55	7.25	7.65	5.55	4.45	8.95	6.35	7.65	6.75	5.85	4.15	2.45
28	1989	10.85	8.55	7.25	7.75	5.55	4.45	9.15	6.55	7.75	6.85	5.85	4.15	2.45
29	1990	10.85	8.55	7.25	7.95	5.55	4.45	9.35	6.65	7.95	7.05	5.85	4.15	2.45
30	1991	10.85	8.55	7.25	8.05	5.55	4.45	9.45	6.65	8.05	7.15	5.85	4.15	2.45
31	1992	10.85	8.55	7.25	8.25	5.55	4.45	9.65	6.65	8.25	7.25	5.85	4.15	2.45
32	1993	10.85	8.55	7.25	8.35	5.55	4.45	9.85	6.65	8.35	7.45	5.85	4.15	2.45
33	1994	10.85	8.55	7.25	8.55	5.55	4.45	9.95	6.65	8.55	7.55	5.85	4.15	2.45
34	1995	10.85	8.55	7.25	8.65	5.55	4.45	10.15	6.65	8.65	7.55	5.85	4.15	2.45
35	1996	10.85	8.55	7.25	8.75	5.55	4.45	10.25	6.65	8.75	7.55	5.85	4.15	2.45
36	1997	10.85	8.55	7.25	8.85	5.55	4.45	10.45	6.65	8.85	7.55	5.85	4.15	2.45
37	1998	10.85	8.55	7.25	9.05	5.55	4.45	10.65	6.65	9.05	7.55	5.85	4.15	2.45
38	1999	10.85	8.55	7.25	9.15	5.55	4.45	10.75	6.65	9.15	7.55	5.85	4.15	2.45

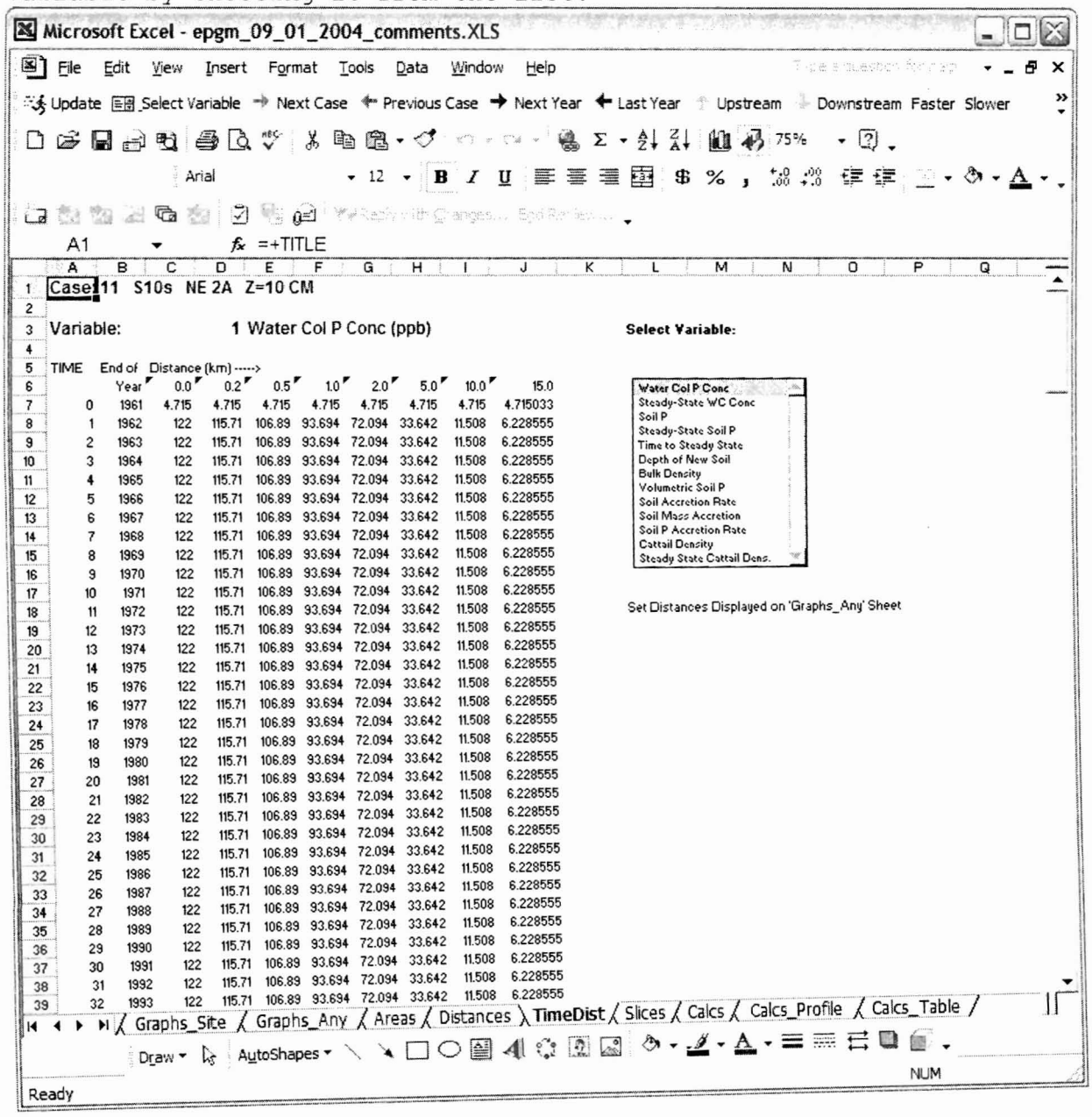
Graphs_Site | Graphs_Any | Areas | Distances | TimeDist | Slices | Calcs | Calcs_Profile | Calcs_Table

Draw AutoShapes

Ready NUM

TimeDist worksheet

This worksheet contains data which Set Distances Displayed on 'Graphs_Any' Sheet in tabular format. The user can change the variable by choosing it from the list.



TIME	End of Year	Distance (km) -----> 0.0	0.2	0.5	1.0	2.0	5.0	10.0	15.0
0	1961	4.715	4.715	4.715	4.715	4.715	4.715	4.715	4.715033
1	1962	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
2	1963	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
3	1964	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
4	1965	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
5	1966	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
6	1967	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
7	1968	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
8	1969	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
9	1970	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
10	1971	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
11	1972	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
12	1973	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
13	1974	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
14	1975	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
15	1976	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
16	1977	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
17	1978	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
18	1979	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
19	1980	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
20	1981	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
21	1982	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
22	1983	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
23	1984	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
24	1985	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
25	1986	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
26	1987	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
27	1988	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
28	1989	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
29	1990	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
30	1991	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
31	1992	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555
32	1993	122	115.71	106.89	93.694	72.094	33.642	11.508	6.228555

EPGM Website

Additional information about the model can be found on Mr. Walker website at: http://www.wwwalker.net/epgm/index.htm.

On the main page the:

1. " Documentation at EPGM Website" button opens a web browser with the http://www.wwwalker.net/epgm/index.htm web site. This web site contains information on EPGM model.
2. "DMSTA Website" button. Opens a web browser with the http://wwwalker.net/dmsta/ web site. This web site contains information on Dynamic Model for Stormwater Treatment Areas.
3. From the above mentioned site there is a link using the "STA Design Model" button to http://www.wwwalker.net/pdf/stadesign.pdf web site. This site contains information on Design Basis for Everglades Stormwater Treatment Areas.