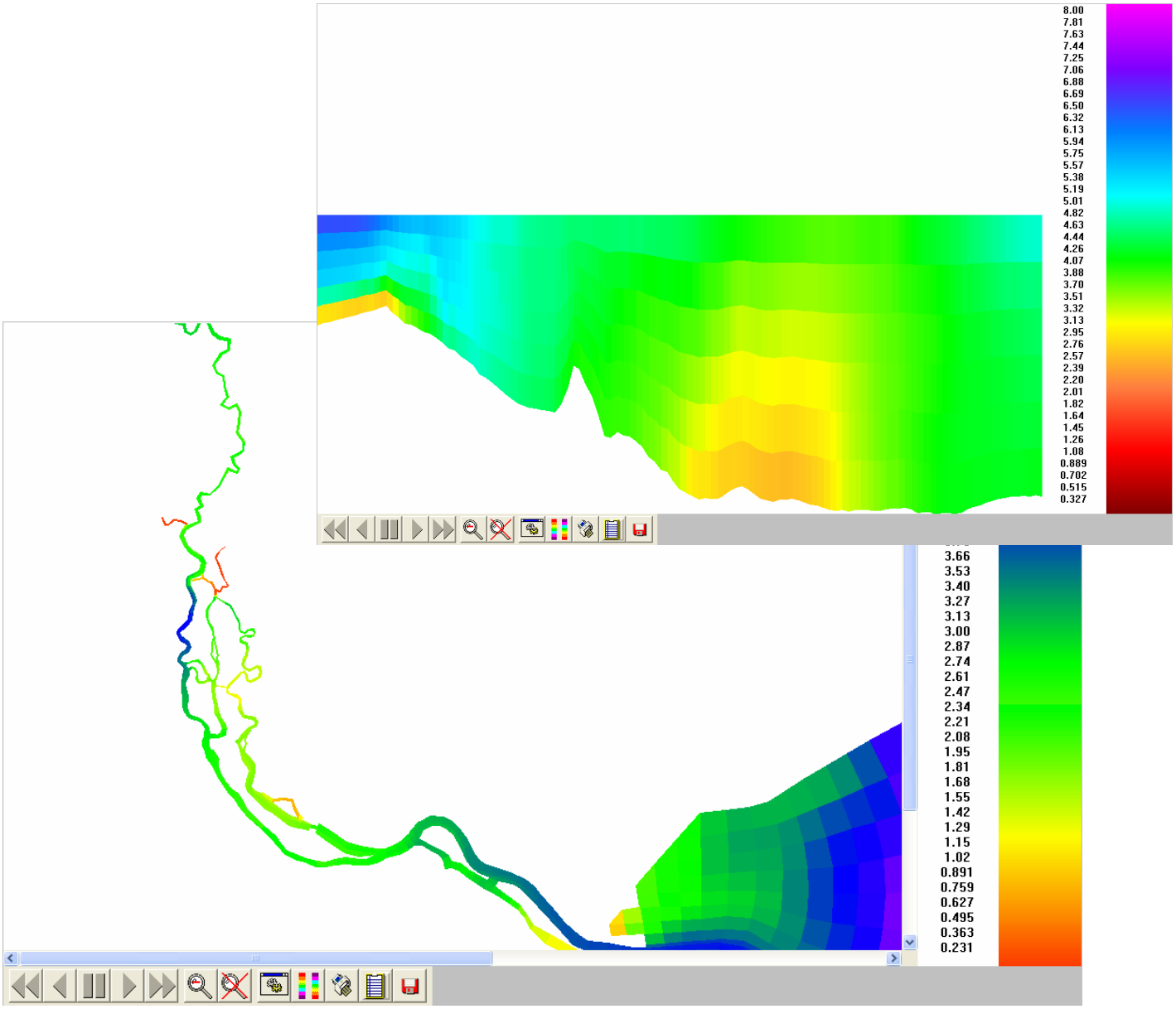
Water Quality Impacts of the Savannah Harbor Expansion Project



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Contract No.: DACA65-99-D-0065-CV0101

February 12, 2007

Executive Summary

This report summarizes the results of evaluating the water quality impacts for the Savannah Harbor Expansion (SHE) project specifically of the harbor deepening, point sources, and Savannah River flow effects. The water quality impacts focus on dissolved oxygen and salinity regimes of the Savannah Harbor.

The Savannah Harbor hydrodynamic and water quality models were developed and finalized in a Tetra Tech report dated January 30, 2006. The models were designed based on EFDC and WASP codes. A post-processor specific to the needs of the SHE was developed by Tetra Tech to analyze the model results of various deepening scenarios and mitigation measures. This is a stand-alone program that can read EFDC and WASP output files (BMD files) and generate required output in specific formats in accordance with requirements of the USACE Savannah District and the agencies involved in the Environmental Impact Statement (EIS) Tier II review.

The hydrodynamic model runs were performed by the USACE Savannah District with the calibrated and confirmed EFDC model developed by Tetra Tech. The WASP water quality simulations were performed by Tetra Tech.

In accordance with the Scope of Work the hydrodynamic and water quality scenarios assume four major evaluations:

- Basic Evaluation (BE) – 1999 (drought year) flow, hydrological and meteorological conditions, and 2004 harbor point sources' BOD loads
- Sensitivity Analysis #1 (SA1) – 1997 (average year) flow, hydrological and meteorological conditions, and 2004 harbor point sources' BOD loads
- Sensitivity Analysis #2 (SA2) – 1999 (drought year) flow, hydrological and meteorological conditions, and 1999 harbor point sources' BOD loads
- Sensitivity Analysis #3 (SA3) – 1999 (drought year) flow, hydrological and meteorological conditions, and permitted harbor point sources' BOD loads

Scenarios of existing bathymetry and 6-, 4-, 3-, and 2-foot deepening were simulated for aforementioned conditions of Basic Evaluation and Sensitivity Analysis #1. Scenarios of existing bathymetry were simulated for Sensitivity Analyses #2 and #3. The 5-foot depth simulation was removed by the USACE Savannah District.

In accordance with the requirements of the Water Quality Review Group, the simulation periods were chosen from May 1 to October 30 of 1999 and 1997.

The total number of analyzed scenarios is 12. The model results are presented in the following Appendixes:

- Appendix A – Basic Evaluation, existing bathymetry (BE-E)
- Appendix A.1 – Basic Evaluation, 6 ft deepening bathymetry (BE-6)
- Appendix A.2 – Basic Evaluation, 4 ft deepening bathymetry (BE-4)
- Appendix A.3 – Basic Evaluation, 3 ft deepening bathymetry (BE-3)
- Appendix A.4 – Basic Evaluation, 2 ft deepening bathymetry (BE-2)
- Appendix B – Sensitivity analysis #1, existing bathymetry (SA1-E)
- Appendix B.1 – Sensitivity analysis #1, 6 ft deepening bathymetry (SA1-6)
- Appendix B.2 – Sensitivity analysis #1, 4 ft deepening bathymetry (SA1-4)

- Appendix B.3 – Sensitivity analysis #1, 3 ft deepening bathymetry (SA1-3)
- Appendix B.4 – Sensitivity analysis #1, 2 ft deepening bathymetry (SA1-2)
- Appendix C – Sensitivity analysis #2, existing bathymetry (SA2-E)
- Appendix D – Sensitivity analysis #3, existing bathymetry (SA3-E)

Table 1 CBODu Point Sources Loads in Savannah Harbor

Facility Name	Location Cell(I,j)	Loads (lbs/day)		
		2004	1999	Permitted
Hardeville	14,148	13.0	25	505.55
Fort James	14,171	5873.0	3810.46	54249.46
Weyerhayser	13,95	6797.0	809.86	30150
Garden City	13,77	32.0	122	2700.7
Whilshire	13,74	0.0	737.31	2814.79
Travis Field	13,74	27.0	129	576.35
President Street	13,54	1489.0	4398.99	16246.15
IP	15,70	143448.0	86669.75	269328
Englehard	13,52	0	0.38	0

To analyze the results of the current simulations the postprocessor was updated in accordance with the Memorandum for Record of the Meeting of Water Quality Interagency Coordination Team (June 5, 2006). The MOVEM (standard postprocessor of WASP) was used for graphical visualization of the outputs of Tetra Tech's Savannah Model post-processor.

The Savannah Model postprocessor outputs information for the harbor's following spatial objects:

- Critical Cell – the cell with lowest D.O. concentrations during specified simulation period
- Critical Segment – an assemblage of cross section cells located at the critical cell's j-coordinate
- Zone – an assemblage of cells that is limited by specified horizontal and vertical boundaries

The postprocessor's outputs were used for comparative evaluation of water quality regime in different areas of the harbor and for different simulation scenarios by:

- Comparing critical cells' D.O. concentrations for project scenarios and existing conditions with Georgia and South Carolina existing and proposed standards for D.O.
- Comparing zones' volume-weighted D.O. concentrations for existing and project scenarios, and D.O. standards.
- Comparing the percentage of water volume with D.O. concentrations that violate the D.O. standards for each zone during the selected simulation periods.
- Comparing the percentage of water volumes with specified salinity and D.O. %iles for major parts and stations of the estuary.
- Comparing the percentage of water volumes in Upper Harbor in increments of 1^{o} C of water temperature and 0.1 mg D.O.

- Analyzing values and their changes in longitudinal profiles of D.O. distributions along critical cells of Front, Back, Little Back, and Middle Rivers.
- Analyzing values and their changes in minimum, 5^{th}, 50^{th}, and 95^{th} percentiles D.O. and salinity distributions in bottom and surface areas of the estuary.
- Analyzing dynamics of 1-, 7-, and 30-day averaged D.O. and salinity and their changes in longitudinal - vertical plane of Front River.

Figure 1 shows 26 spatial zones that delineate the major estuary's simulated areas. The zones cover the estuary areas that are or can be affected by low D.O. levels. There are 11 zones for Front River (FR), 6 zones for Middle River (MR), 3 zones for Back River (BR), 3 zones for Little Back River (LBR), 2 zones for South Channel (SH), and 1 zone for Savannah River (SR). The grid coordinates (I, J) of each zone's boundaries are presented in Table 3-1.

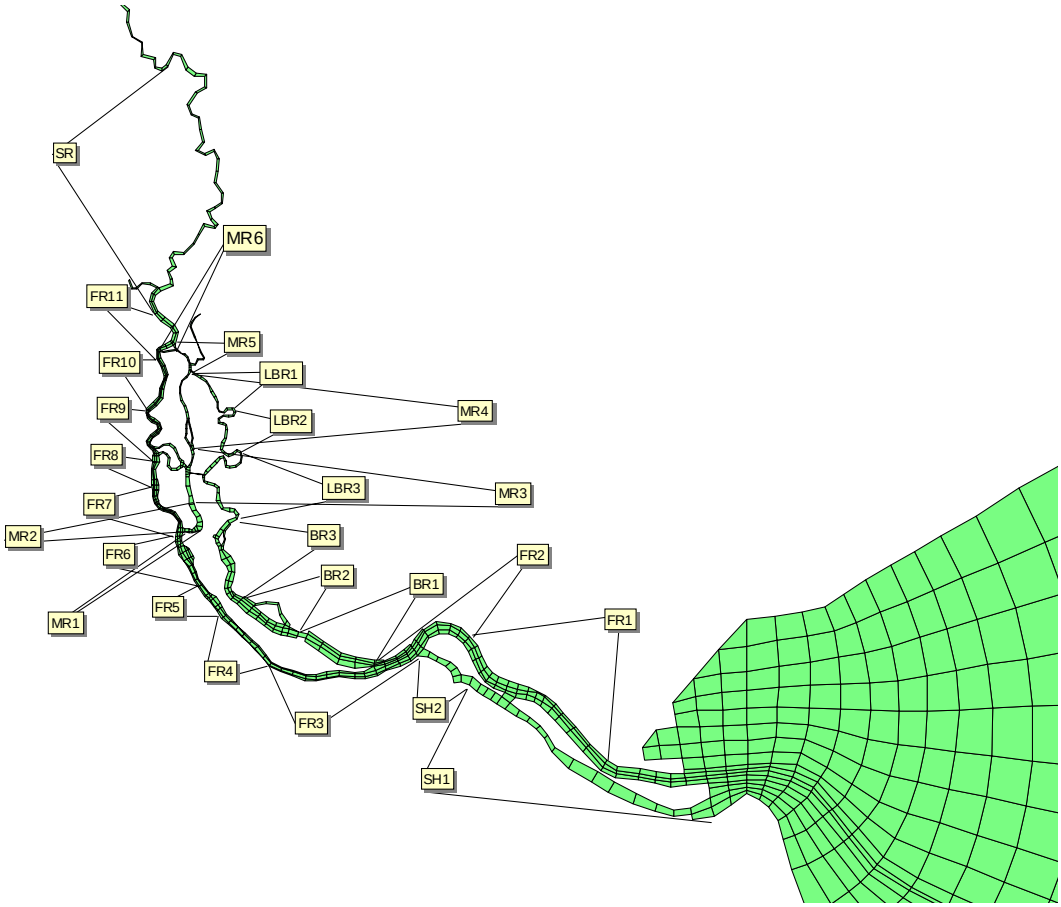


Figure 2-3 Zones' Delineation of Savannah Estuary Computational Grid

The current report is accompanied by the postprocessor's originated outputs: CSV, TXT and BMD files. These files as well as WASP MOVEM postprocessor and GIS horizontal shape files for working with BMD files are included in the attached DVD. Due to the large size of tables with water volumes in D.O. increments and water volumes corresponding to 1-, 7-, and 30-day D.O. averages, the tables were presented in electronic format and placed into folders of the postprocessor output.

Comparing corresponding tables and figures of Appendixes A, C, and D the reviewer can evaluate the effect of the harbor's point sources loads regulation on the dissolved oxygen regime of the estuary. Comparing the tables and figures of Appendixes A, and B the reviewer evaluates the effect of the drought year river flow on the dissolved oxygen regime. Comparing information of Appendixes A, A1, A2, A3, and A4, as well as Appendixes B, B1, B2, B3, and B4, the reviewer estimates effect of different scenarios of the harbor's deepening on the oxygen regime.

Table 2 Grid Coordinates and Volumes of Delineating Zones

Zone #	Zone Name	Grid Coordinates				Volume km3*1000	Relative Volume (%)
		I beg	J beg	I end	J end		
1	FR1	13	26	6	17	56.385	23.45
2	FR2	13	41	6	17	38.867	16.16
3	FR3	13	53	6	17	15.827	6.58
4	FR4	13	60	6	17	10.97	4.56
5	FR5	13	67	6	17	7.413	3.08
6	FR6	13	73	6	17	14.128	5.88
7	FR7	13	81	6	17	6.629	2.76
8	FR8	13	94	6	17	2.455	1.02
9	FR9	13	98	6	15	5.621	2.34
10	FR10	13	112	6	15	4.39	1.83
11	FR11	13	121	6	14	3.422	1.42
12	MR1	17	82	6	21	0.714	0.3
13	MR2	21	83	6	21	0.965	0.4
14	MR3	26	94	6	26	1.232	0.51
15	MR4	26	105	6	26	0.848	0.35
16	MR5	15	123	6	26	0.246	0.1
17	MR6	20	118	6	20	0.03	0.01
18	LBR1	27	123	6	38	0.347	0.14
19	LBR2	39	107	6	39	0.806	0.34
20	LBR3	30	86	6	30	2.765	1.15
21	BR1	30	59	6	34	15.089	6.28
22	BR2	30	64	6	34	4.994	2.08
23	BR3	30	71	6	32	5.572	2.32
24	SCh1	9	20	6	11	24.377	10.14
25	SCh2	7	45	6	12	4.761	1.98
26	SR	13	128	6	15	11.606	4.83

Some short conclusions from the analysis of the report's results are the following:

1. Effect of the harbor's point sources loads:

a. 2004 and 1999 loads scenarios comparisons:

- The zones most affected by the harbor's point sources' impact are FR2-FR9, and BR1-BR3. The scenario of 2004 point sources loads serves as a benchmark for comparisons with other loads scenarios.
- Table C.2 shows that 1999 loads provide 6-8 % (0.16 – 0.2 mg/l) improvement for the 1st %ile of D.O.; 2-5% (0.1-0.2 mg/l) improvement for the 50th %ile of D.O.; and 1-3% (0.02-0.15 mg/l) improvement for the 95th %ile of D.O. for critical cells of zones FR2-FR9. The D.O. deterioration is observed only for zone FR8 50 – 99 %iles. 1999 loads provide 8-11 % (0.14 – 0.16 mg/l) improvement for the 1st %ile of D.O.; 4-12% (0.14-0.32 mg/l) improvement for the 50th %ile of D.O.; and 2-9% (0.11-0.35 mg/l) improvement for the 95th %ile of D.O. for critical cells of zones BR1-BR3.
- These tendencies persist for D.O. values averaged over the volumes of zones (Table C.4) also. But deterioration of the D.O. regime for zone FR8 is not observed. Table C.5 indicates an increase in percentage of volumes with violations of existing and proposed D.O. standards for the 2004 loads scenario.
- Figures C.21 – C.23 show insignificant differences in D.O. distributions along the vertical-longitudinal plane of Upper Harbor for scenarios A and C.

b. 2004 and permitted loads scenarios comparisons:

- Table D.2 shows that 2004 loads provide 12-25 % (0.4 – 0.8 mg/l) improvement for the 1st %ile of D.O.; 6-14% (0.2-0.6 mg/l) improvement for the 50th %ile of D.O.; and 2-9% (0.1-0.6 mg/l) improvement for the 95th %ile of D.O. for critical cells of zones FR2-FR9. It shows that 2004 loads provide 21-32 % (0.41 – 0.43 mg/l) improvement for the 1st %ile of D.O.; 12-14% (0.37-0.38 mg/l) improvement for the 50th %ile of D.O.; and 5-6% (0.24-0.25 mg/l) improvement for the 95th %ile of D.O. for critical cells of zones BR1-BR3.
- These tendencies persist for D.O. values averaged over the zones' volumes (Table D.4) also. Table D.5 indicates an increase in percentage of volume with violations of existing and proposed D.O. standards for the permitted loads scenario.
- Figures D.21 – C.23 show significant differences in D.O. distributions along vertical plane of Upper Harbor for scenarios A and D

2. Effect of 1999 (drought) and 1997 (average) years hydrological and meteorological conditions :

- Table B.2 shows that the increasing of river flow strongly effects the D.O. concentrations in critical cells particularly in zones of Back, Little Back and Middle Rivers, as well as Savannah River. 1997 flow provide 10-50% increasing of the 1st D.O. %ile, 4-14% increasing of the 50th D.O. %ile, and 10-26% increasing of the 95th %ile for zones of the estuary.
- Table B.4 indicates that increases in D.O. concentrations averaged over volume of zones are up to 29 % for the 1st %ile, up to 10% for the 50th %ile, and up to 27% for the 95th %ile.
- The D.O. and salinity distributions along vertical plane of Upper Harbor for scenarios of 1997 and 1999 flows differ significantly.

3. Effect of the harbor deepening:

- Tables 2 in Appendixes A1, A2, A3, A4, and B1, B2, B3, B4 indicate the D.O. regime deterioration under the impact of the ship channel deepening mostly for critical cells of Front River zones F7, F8, and F9. For the drought year 1999 the D.O. decreases are up to 16.3% (1st and 50th %iles, zone FR7) and 18.2% (99th %ile, zone FR7) for 6 ft deepening;

and between 5.1% (1st %ile, zone FR7) and 1% (99th %ile, zone FR7) for 2 ft deepening. For the average year 1997 the D.O. decrease are 22.8% (1st %ile, zone FR9), 11.5% (50th %ile, zone FR9), and 5% (99th %ile, zone FR4) for 6 ft deepening; and between 8.3% (1st %ile, FR9), 6.6% (50th %ile, BR2), and 9.0% (99th %ile, BR2) for 2 ft deepening.

- Tables 4 in Appendixes A1, A2, A3, A4, and B1, B2, B3, B4 indicate the D.O. regime deterioration under the impact of the ship channel deepening for D.O. values averaged over volume of zones. For the drought year 1999 the D.O. decrease are up to 11.1% (1st %ile, FR9), 8.2% (50th %ile, zone FR8), and 4.9% (99th %ile, zone FR7) for 6 ft deepening; and between 4.7% (1st %ile, zone FR7) and 1.7% (99th %ile, zone FR6) for 2 ft deepening. For the average year 1997 the D.O. decrease are 9.5% (1st %ile, zone FR9), 9.3% (50th %ile, zone FR7), and 10.5% (99th %ile, zone FR4) for 6 ft deepening; and 4.0% (1st %ile, FR9), 3.2% (50th %ile, FR7), and 4.2% (99th %ile, FR3) for 2 ft deepening.
- Tables 5 in Appendixes A1, A2, A3, A4, and B1, B2, B3, B4 show that the deepening insignificantly (1-2%) increases the percentage of volume of the harbor's waters with violations of the existing D.O. standards.
- Figures 1 show the deteriorations of lowest D.O. values along critical cells of major parts of the estuary increase proportionally to projected deepening of the ship channel.
- Figures 2, 3, 6 – 8, 12-14 in Appendixes A1, A2, A3, A4, and B1, B2, B3, B4 visualize upstream shifts of lower D.O. zones in bottom and surface layers of the estuary with increasing of the harbor deepening.
- Figures 4, 5, 9 – 11, 15-17 in Appendixes A1, A2, A3, A4, and B1, B2, B3, B4 visualize an increase in salinity intrusions in bottom and surface layers of the estuary with increasing of the harbor deepening.
- Figures 18 - 23 demonstrate snapshots of animations of 1-, 7-, and 30-day averaged D.O. and salinity dynamics in vertical-longitudinal plane along the ship channel. Higher channel deepening provides increasing of salinity and D.O. stratifications particularly for zones FR7, FR8, and FR9

Appendix A

BASIC EVALUATION: EXISTING BATHYMETRY, 2004 POINT SOURCES LOADS, 1999 HYDROLOGICAL AND METEOROLOGICAL CONDITIONS

May 1 – October 30, 1999 Simulation Period

Water Quality Review Group

1. Table A.1. Dissolved oxygen percentiles distribution in Critical cells

Zone	D.O. Percentile (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.43	3.61	3.72	3.95	4.29	4.72	5	5.2	5.57
FR2	2.74	2.99	3.11	3.39	3.74	4.16	4.52	4.67	4.97
FR3	2.45	2.69	2.81	3.05	3.5	3.91	4.26	4.41	4.71
FR4	2.51	2.74	2.85	3.1	3.52	3.91	4.25	4.43	4.71
FR5	2.5	2.69	2.78	3.1	3.5	3.87	4.23	4.41	4.62
FR6	2.54	2.74	2.81	3.15	3.51	3.89	4.3	4.48	4.69
FR7	3.13	3.41	3.59	3.95	4.42	4.87	5.21	5.45	6.03
FR8	3.2	3.52	3.69	4.11	4.69	5.11	5.42	5.61	5.9
FR9	3.39	3.64	3.84	4.23	4.74	5.2	5.46	5.61	5.88
FR10	2.29	3.13	3.38	3.92	4.59	5.24	5.65	5.82	6.03
FR11	2.17	2.78	3.15	3.63	4.22	4.85	5.4	5.62	5.94
MR1	2.58	2.99	3.18	3.55	3.93	4.25	4.58	4.75	4.98
MR2	2.2	2.56	2.91	3.37	3.82	4.21	4.53	4.74	5
MR3	2.08	2.45	2.76	3.28	3.74	4.17	4.5	4.73	4.97
MR4	2.05	2.44	2.63	3.05	3.48	3.83	4.18	4.36	4.68
MR5	0.45	0.99	1.39	2.21	3.63	5.12	5.57	5.73	5.97
MR6	1.05	1.66	2.11	3.03	4.42	5.3	5.71	5.89	6.17
LBR1	2.67	3.29	3.5	3.96	4.31	4.6	4.92	5.1	5.43
LBR2	2.1	2.33	2.51	2.98	3.33	3.64	3.94	4.13	4.43
LBR3	1.34	1.75	2.04	2.56	3.13	3.63	3.98	4.18	4.56
BR1	2	2.23	2.41	2.78	3.21	3.63	4.01	4.22	4.48
BR2	1.37	1.61	1.83	2.2	2.78	3.19	3.57	3.78	4.15
BR3	1.69	2.03	2.22	2.56	3.06	3.47	3.79	4.05	4.39
SCH1	1.29	1.65	1.92	2.49	3.31	4.1	4.66	4.98	5.32
SCH2	3.08	3.31	3.45	3.69	4.04	4.44	4.77	4.96	5.25
SR	2.24	2.52	2.96	3.6	3.86	4.2	4.5	4.64	4.91

2. Table A.2. Dissolved oxygen percentiles distribution in Zones of Savannah Estuary

Zone Name	D.O. Concentration Percentiles (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.80	3.96	4.04	4.25	4.60	5.01	5.28	5.47	5.81
FR2	3.23	3.44	3.55	3.77	4.10	4.52	4.82	4.97	5.30
FR3	2.74	2.95	3.05	3.31	3.68	4.08	4.42	4.59	4.88
FR4	2.50	2.73	2.81	3.07	3.49	3.87	4.24	4.40	4.67
FR5	2.55	2.75	2.83	3.09	3.51	3.88	4.27	4.41	4.63
FR6	2.67	2.87	2.96	3.27	3.64	4.00	4.38	4.56	4.74
FR7	3.02	3.26	3.45	3.84	4.31	4.82	5.13	5.31	5.62
FR8	3.32	3.62	3.80	4.21	4.67	5.08	5.35	5.52	5.77
FR9	3.92	4.23	4.44	4.82	5.20	5.50	5.76	5.90	6.14
FR10	4.01	4.50	4.71	5.00	5.29	5.56	5.81	5.93	6.16
FR11	2.63	3.18	3.56	3.96	4.30	4.63	4.94	5.12	5.36
MR1	2.79	3.05	3.21	3.56	3.93	4.24	4.57	4.75	4.94
MR2	2.36	2.79	3.05	3.46	3.87	4.21	4.53	4.74	4.95
MR3	2.09	2.35	2.67	3.13	3.58	4.03	4.37	4.59	4.92
MR4	2.73	2.93	3.16	3.56	3.90	4.21	4.51	4.68	4.86
MR5	1.07	1.46	1.87	2.73	4.13	5.08	5.50	5.66	5.92
MR6	1.10	1.68	2.13	3.10	4.46	5.28	5.66	5.84	6.11
LBR1	2.86	3.03	3.17	3.63	3.91	4.16	4.47	4.60	4.76
LBR2	2.03	2.26	2.49	2.92	3.29	3.60	3.89	4.09	4.29
LBR3	1.76	1.90	2.00	2.52	3.05	3.33	3.66	3.81	4.16
BR1	2.41	2.55	2.66	2.95	3.36	3.77	4.15	4.34	4.60
BR2	1.95	2.17	2.30	2.61	3.07	3.50	3.88	4.08	4.34
BR3	1.92	2.10	2.24	2.58	3.06	3.43	3.81	4.03	4.30
SCh1	2.61	2.88	3.01	3.27	3.64	4.11	4.44	4.58	4.84
SCh2	3.34	3.48	3.58	3.79	4.10	4.52	4.83	5.00	5.29
SR	2.62	2.79	3.29	3.88	4.12	4.44	4.71	4.85	5.11

3. Table A.3. Percentage of water volumes with salinity in %iles within the period of May 1 – October 30, 1999

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	19.6	5.2	4.4	4.8	4.4	4.3	4.5	3.8	88
10	23.6	9.1	8.8	9.1	8.9	8.7	9.1	8.4	88
25	35.8	20.7	22.4	22.3	22.8	22.1	26.1	21.6	88
50	57	43.1	46.6	46.5	47.1	46.1	47.1	43	88
75	79.7	69.8	72.8	72.8	73.1	72.8	74.2	69.7	88
90	91.1	87.5	89	89	89.2	89.2	89.3	87.5	89.3
95	95.6	93.6	94.4	94.5	94.6	94.6	94.1	93.7	95.3
Total Volume 100*km3:	31414.5	659.1	4809.2	22.6	39.2	136.3	10	9.5	43.6

4. Table A.4. Percentage of water volumes with D.O. in %iles within the period of May 1 – October 30, 1999

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	5.2	4.8	4.9	5.7	5.3	4.8	5.4	5.4	5.8
10	10.4	9.6	9.8	11.1	10.5	9.6	10.3	10.5	10.9
25	26.2	24.3	24.7	27.5	25.9	24.4	25.5	25.4	26.5
50	52.1	49	49.8	53.5	51.2	49.2	50.7	50.6	51.4
75	77.4	74.2	75.1	77.8	76	74.4	75.7	75.8	75.7
90	90.7	89.6	90.1	91.3	90.5	89.8	90.2	90.3	90.4
95	95.4	94.8	95	95.7	95.3	94.9	95.1	95.3	95.2
Total Volume 100*km3:	31414.5	659.1	4809.2	22.6	39.2	136.3	10	9.5	43.6

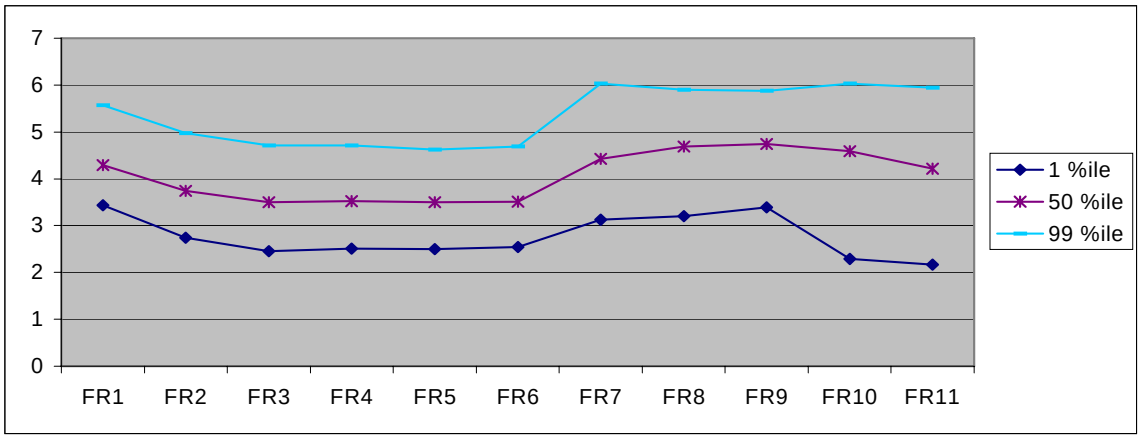
5. Table A.5. Water volumes in Upper Harbor in increments of 1^{o} C of water temperature within the period of May 1 – October 30, 1999

Temperature C^{o}	Total Volume %
19	0.01
20	0.7
21	3.71
22	8.89
23	14.26
24	22.76
25	33.67
26	48.48
27	59.67
28	68.63
29	77.56
30	85.3
31	89.56
32	96.42
33	99.99
34	100

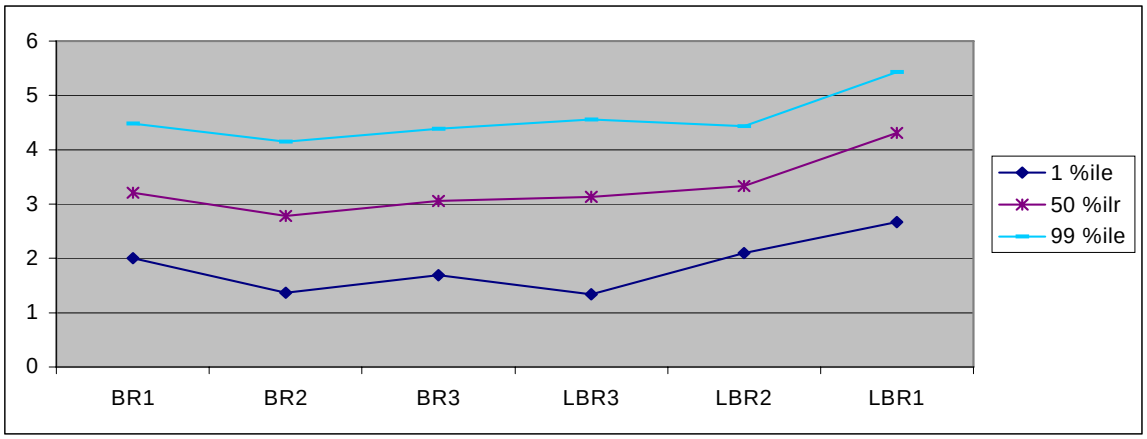
6. Table A.6. Water volumes in Upper Harbor in increments of 0.1 mg/l of D.O. within the period of May 1 – October 30, 1999
   (See file: Postprocessor Output\99-B1E\99-B1E_DO Increment Volume)

7. Table A.7. Percentage of water volumes corresponding to 1-, 7-, and 30-days averages of D.O. depth-averaged concentrations in Upper Harbor within the period of May 1 – October 30, 1999
   (See file: Postprocessor Output\99-B1E\99-B1E_volume DO in averages)

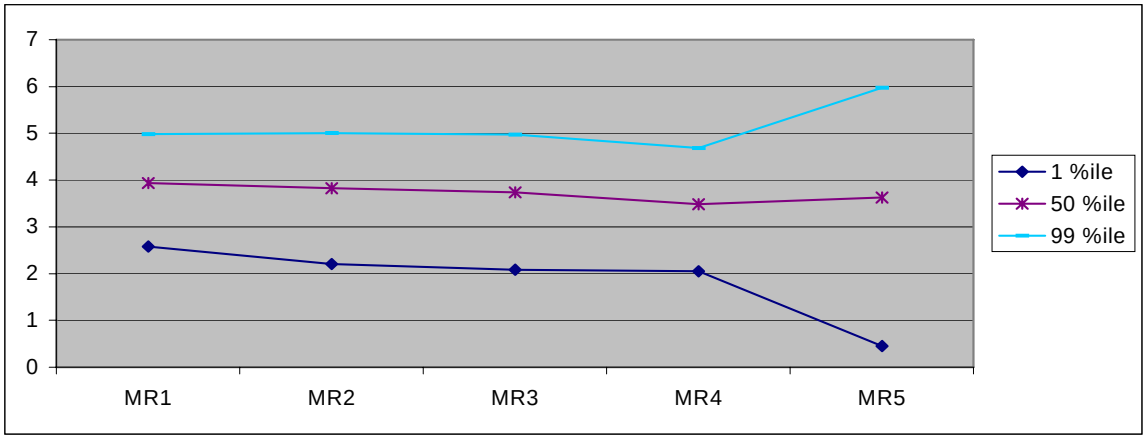
Front River



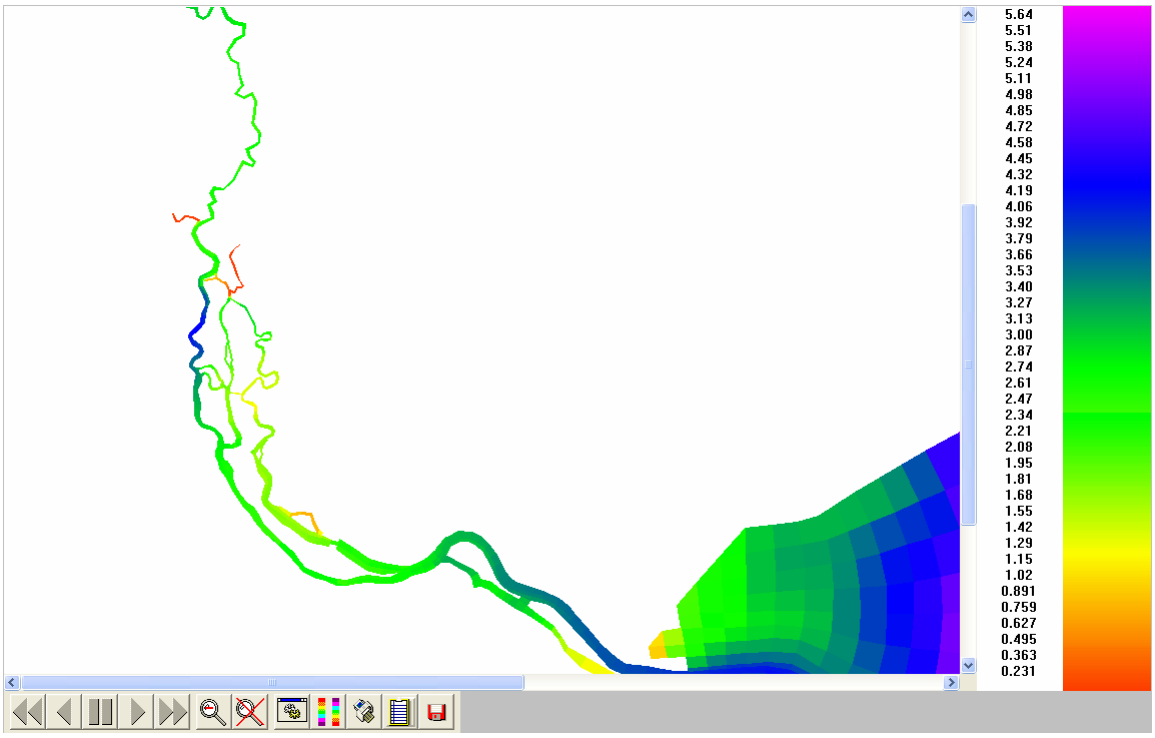
Back and Little Back Rivers



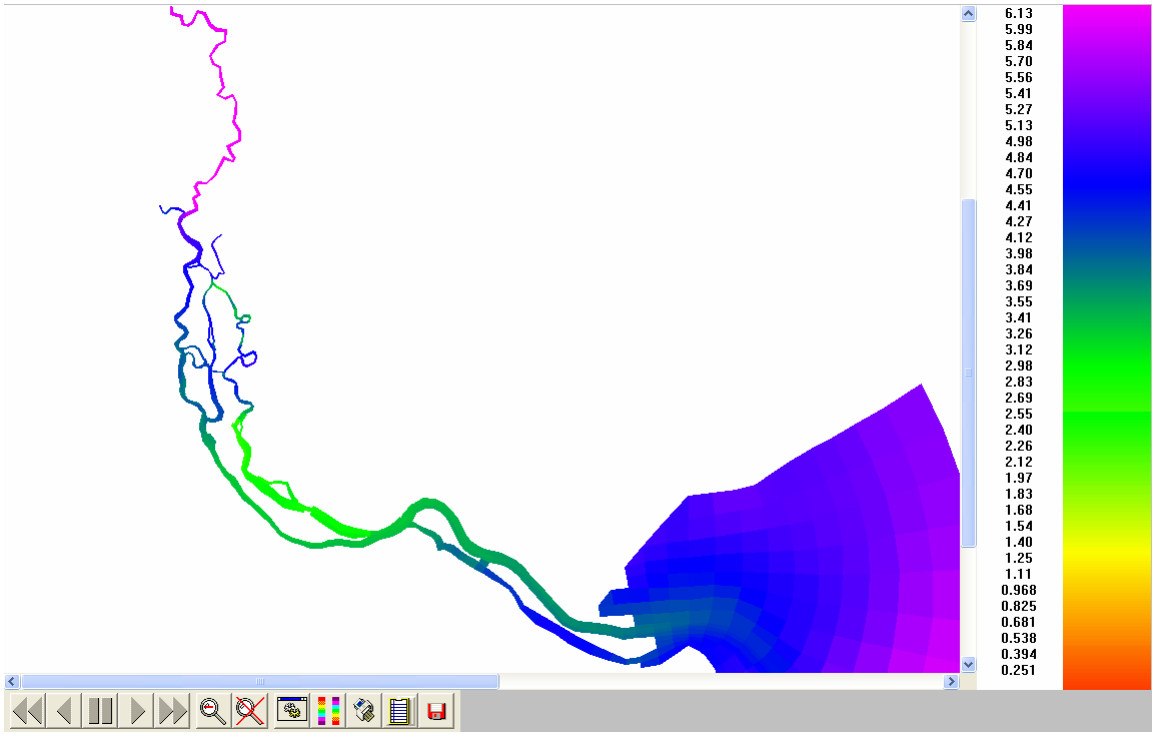
Middle River



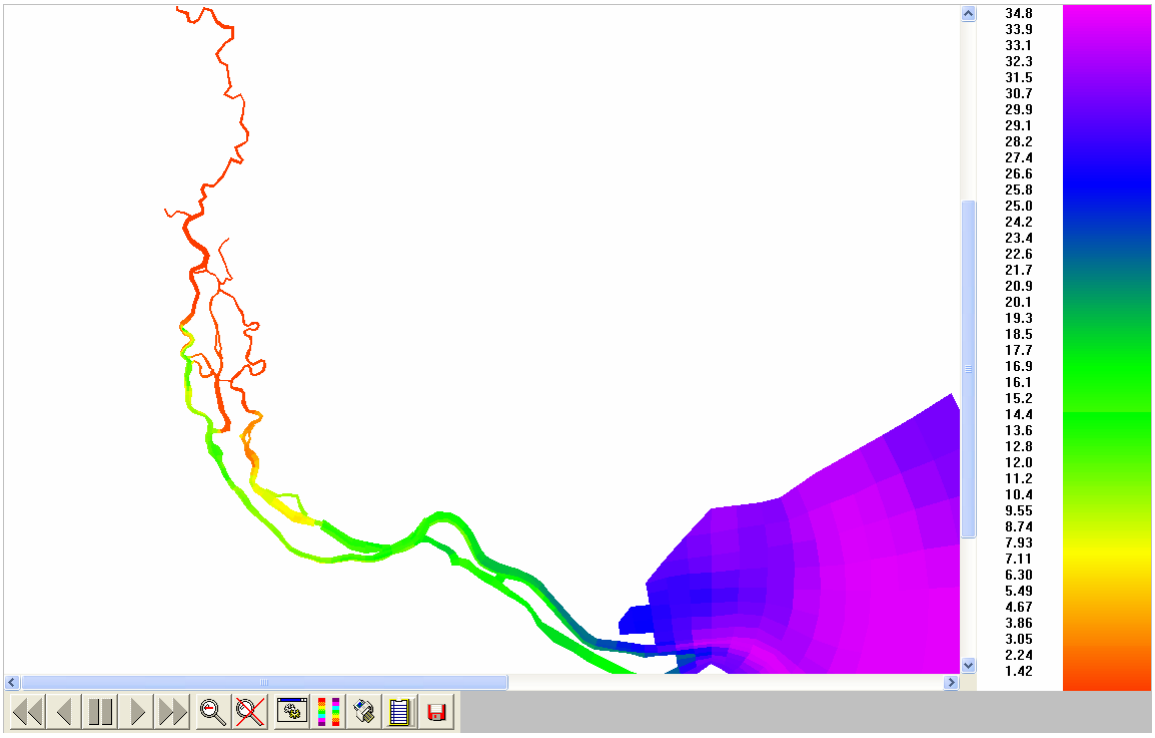
8. Figure A.1. Longitudinal profile of Dissolved Oxygen (mg/l) distribution along Critical cells of Savannah Estuary: Existing bathymetry



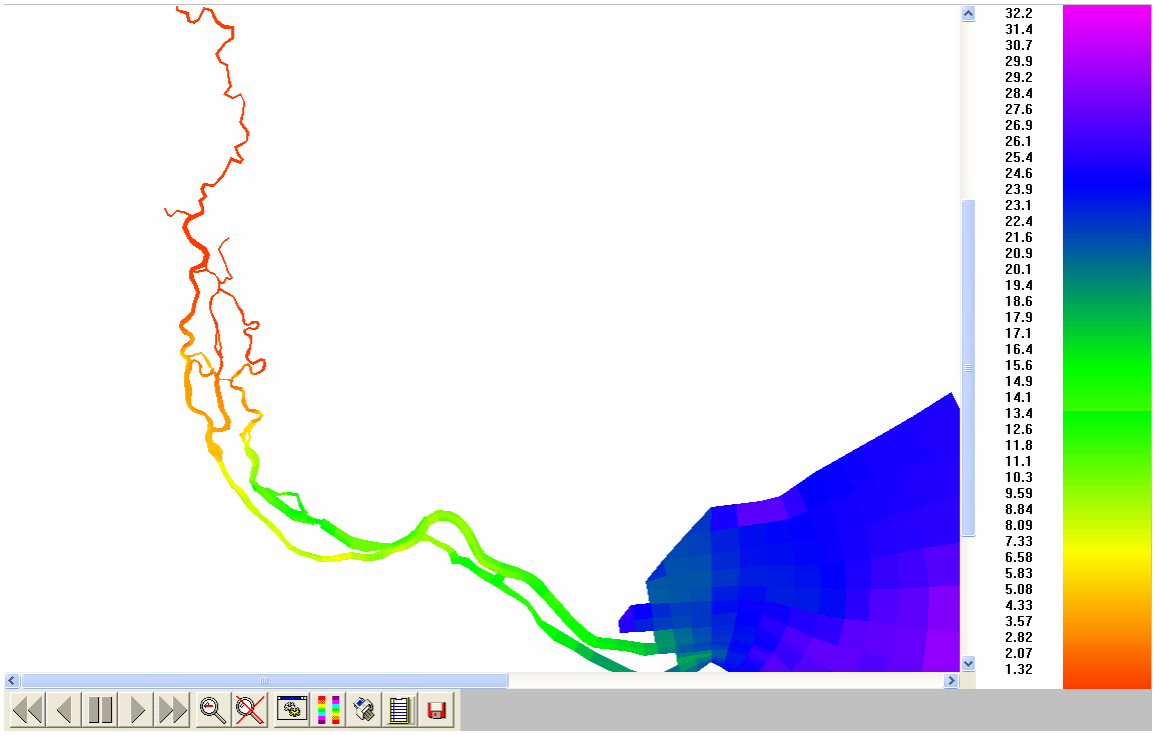
9. Figure A.2. Minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1999: Existing bathymetry



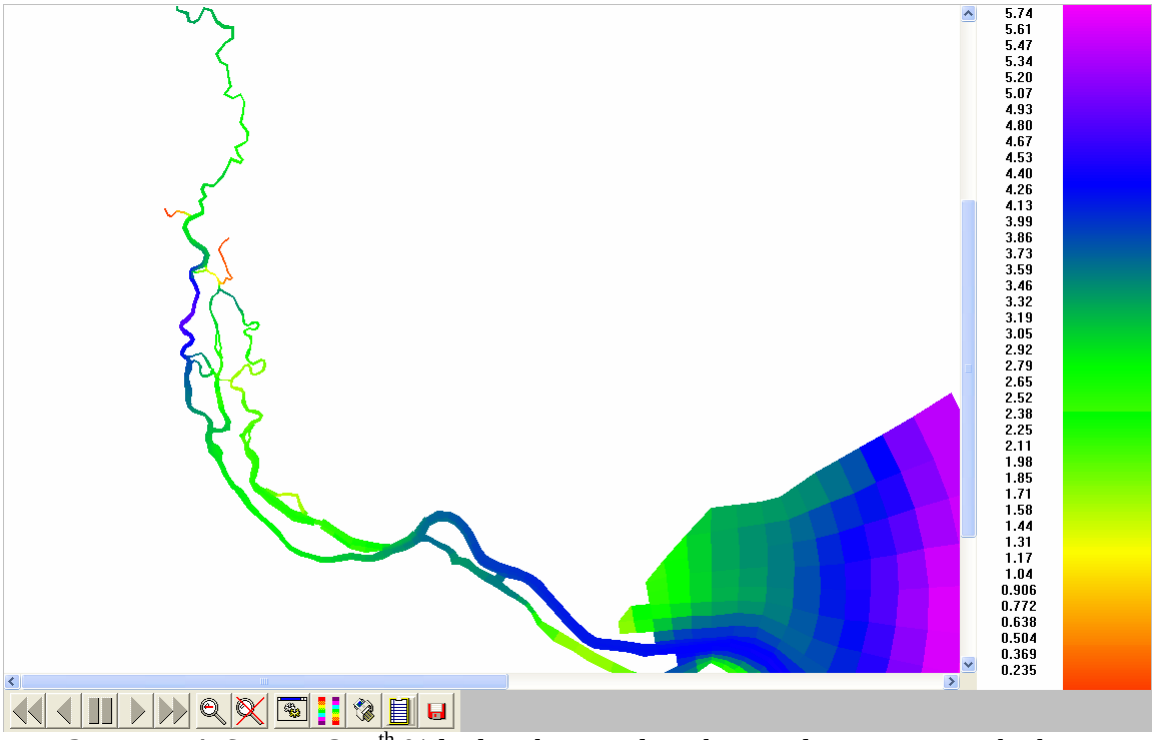
10. Figure A.3. Minimum D.O. distribution along surface layer within the analyzed period of May 1 - October 30, 1999: Existing bathymetry



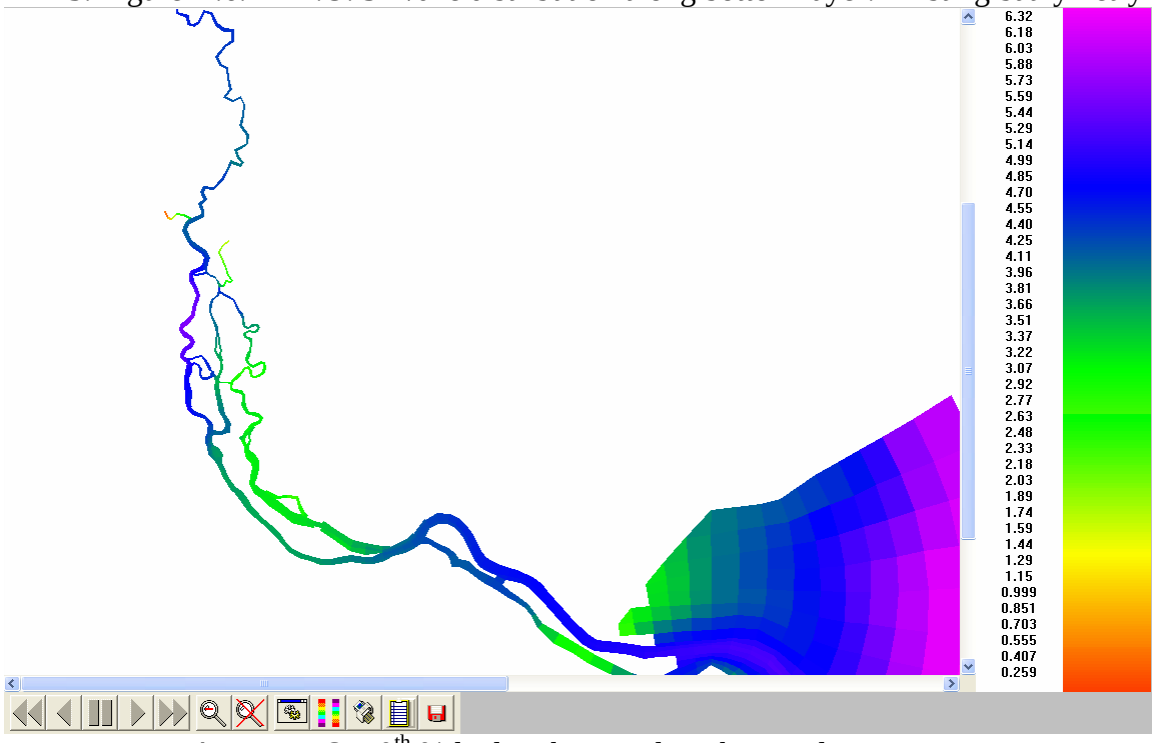
11. Figure A.4. Salinity corresponded to Minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1999: Existing bathymetry



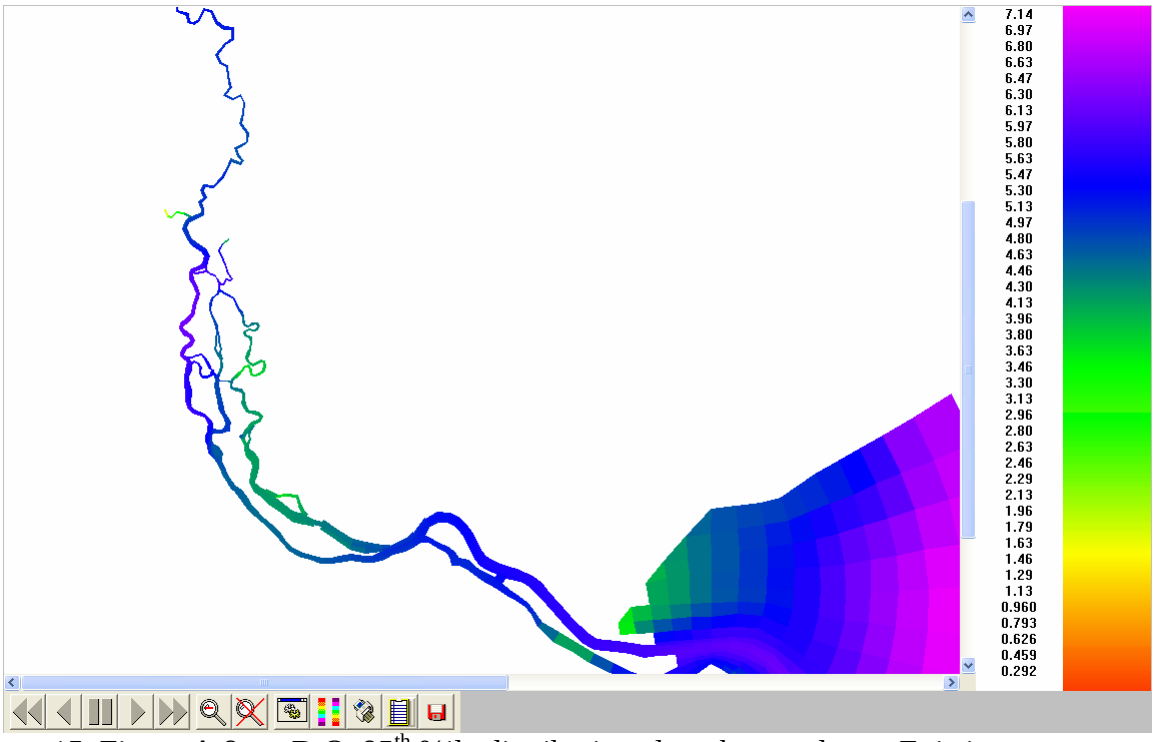
12. Figure A.5. Salinity corresponded to Minimum D.O. distribution along Surface layer within the analyzed period of May 1 - October 30, 1999: Existing bathymetry



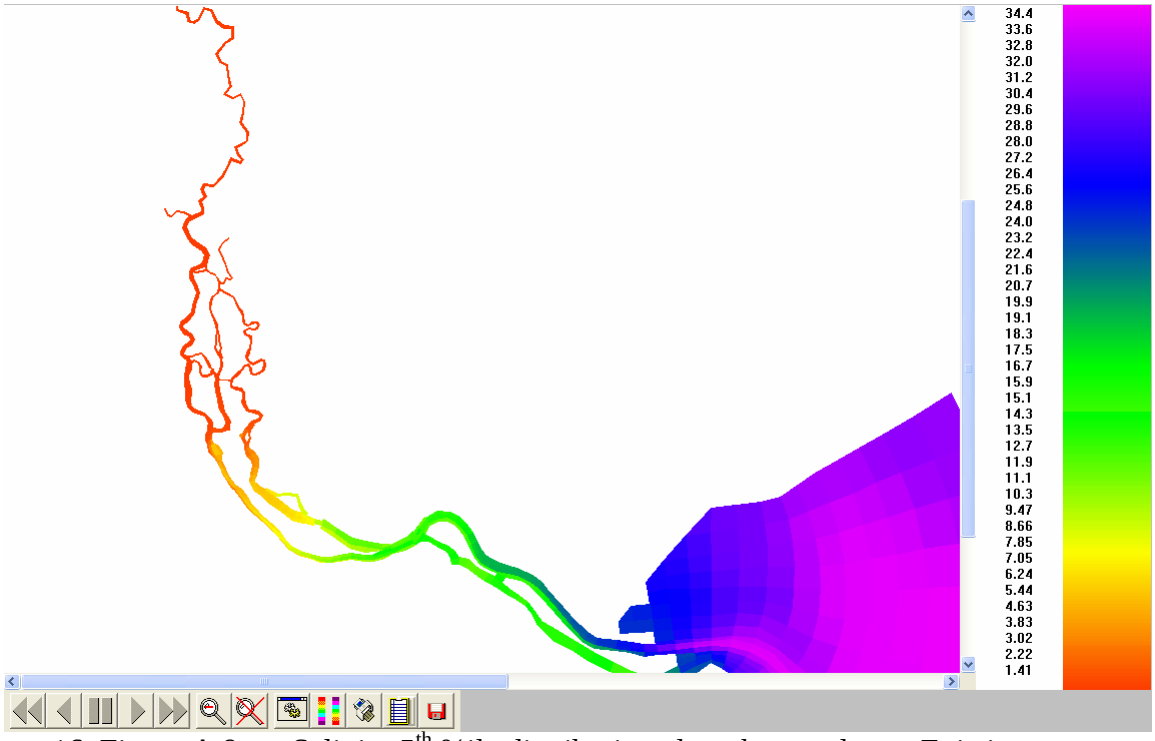
13. Figure A.6. D.O. 5th %ile distribution along bottom layer: Existing bathymetry



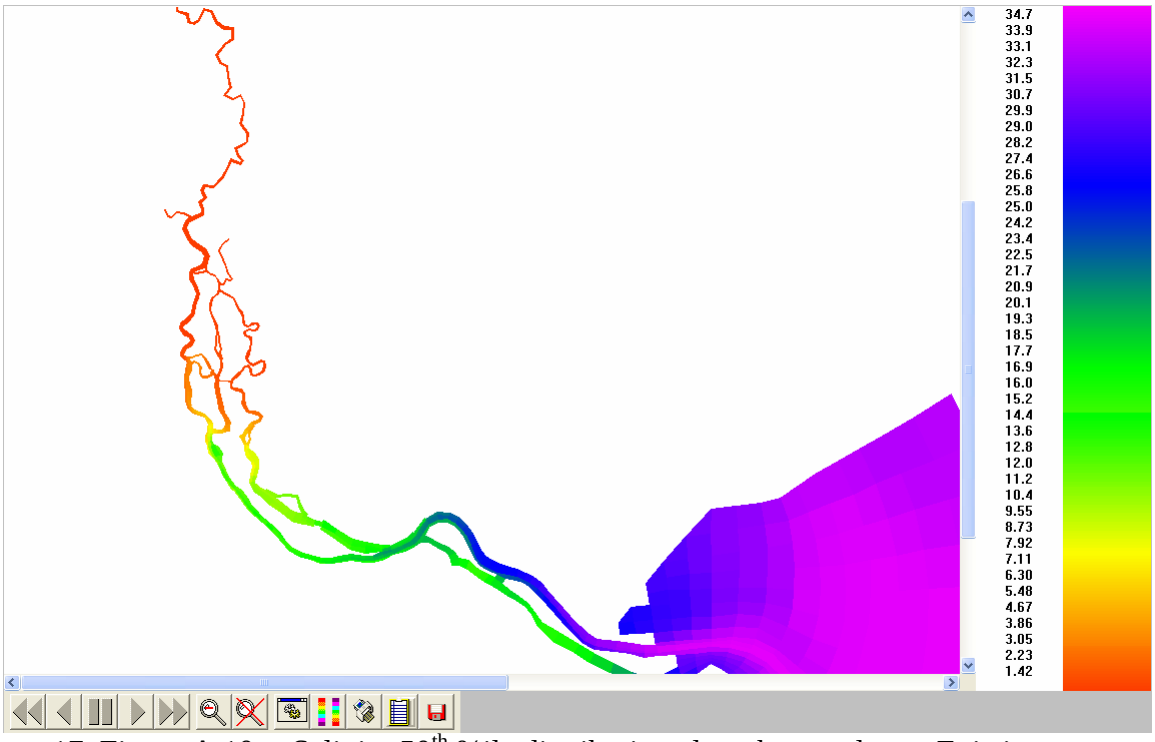
14. Figure A.7. D.O. 50th %ile distribution along bottom layer: Existing bathymetry



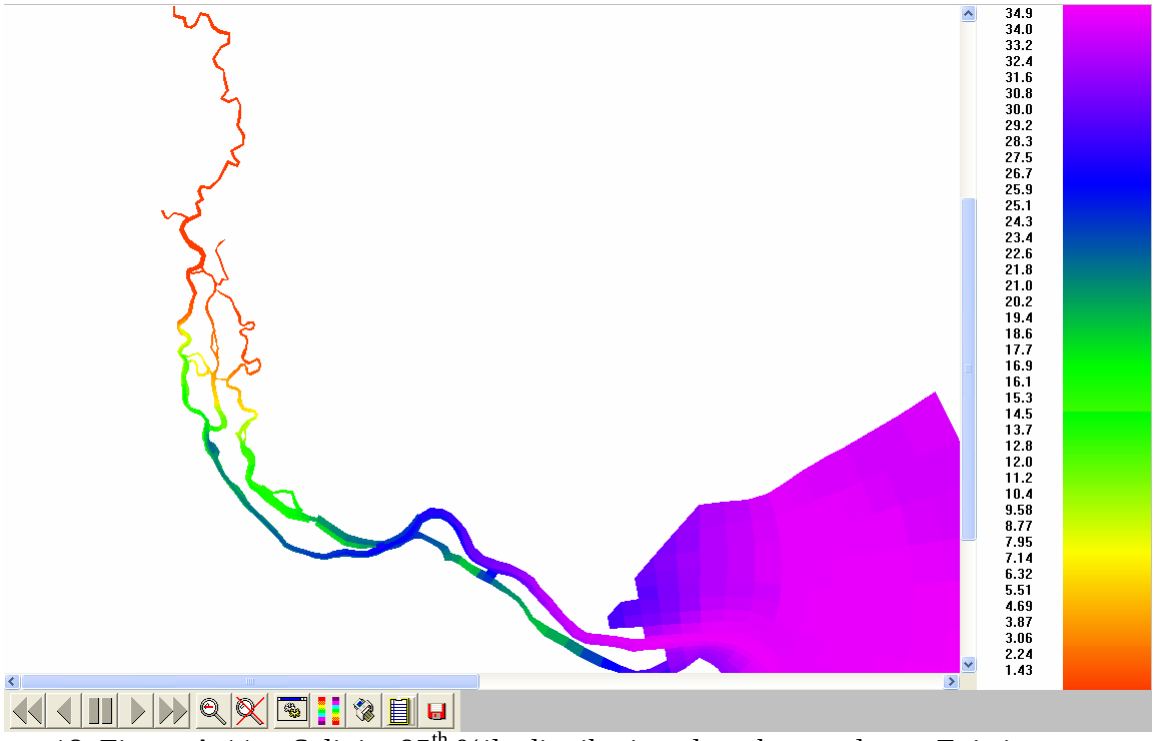
15. Figure A.8. D.O. 95th %ile distribution along bottom layer: Existing bathymetry



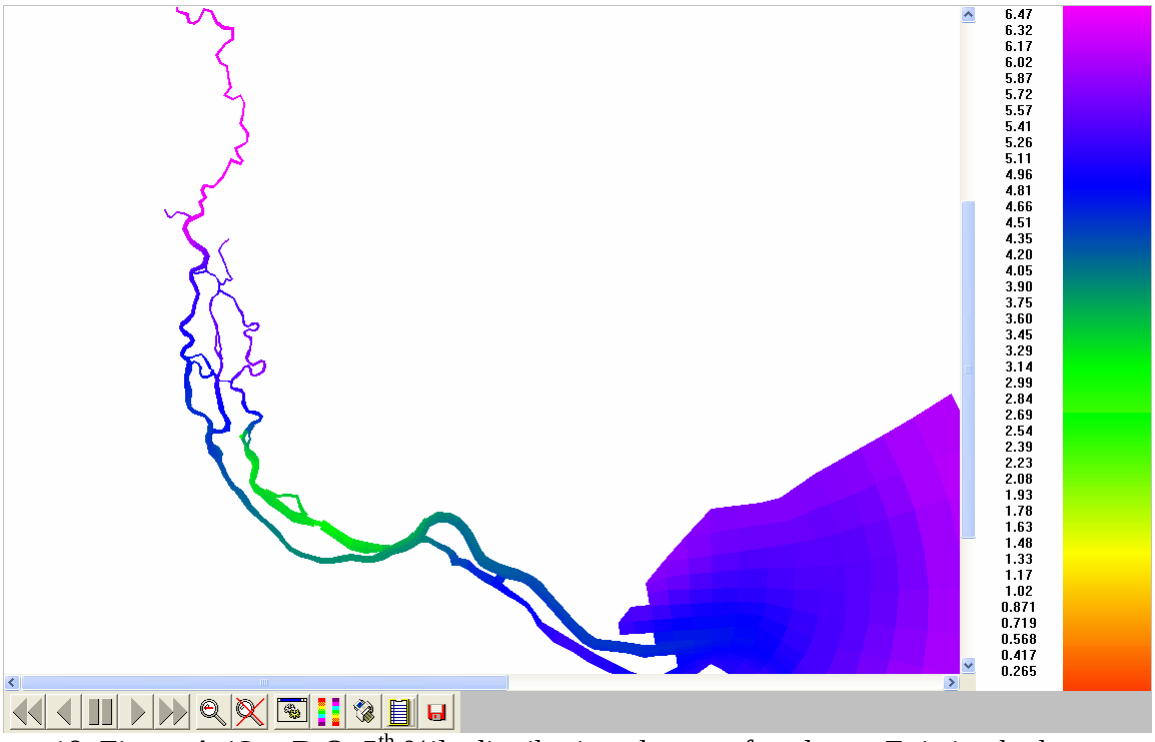
16. Figure A.9. Salinity 5th %ile distribution along bottom layer: Existing bathymetry



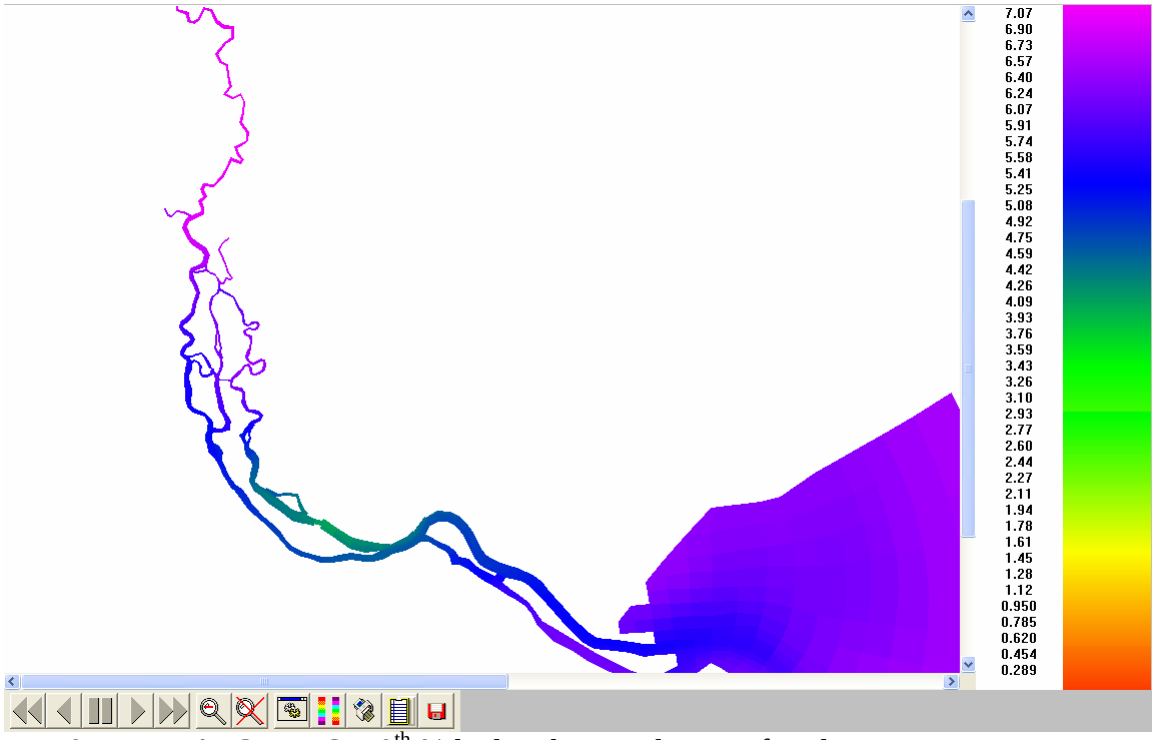
17. Figure A.10. Salinity 50th %ile distribution along bottom layer: Existing bathymetry



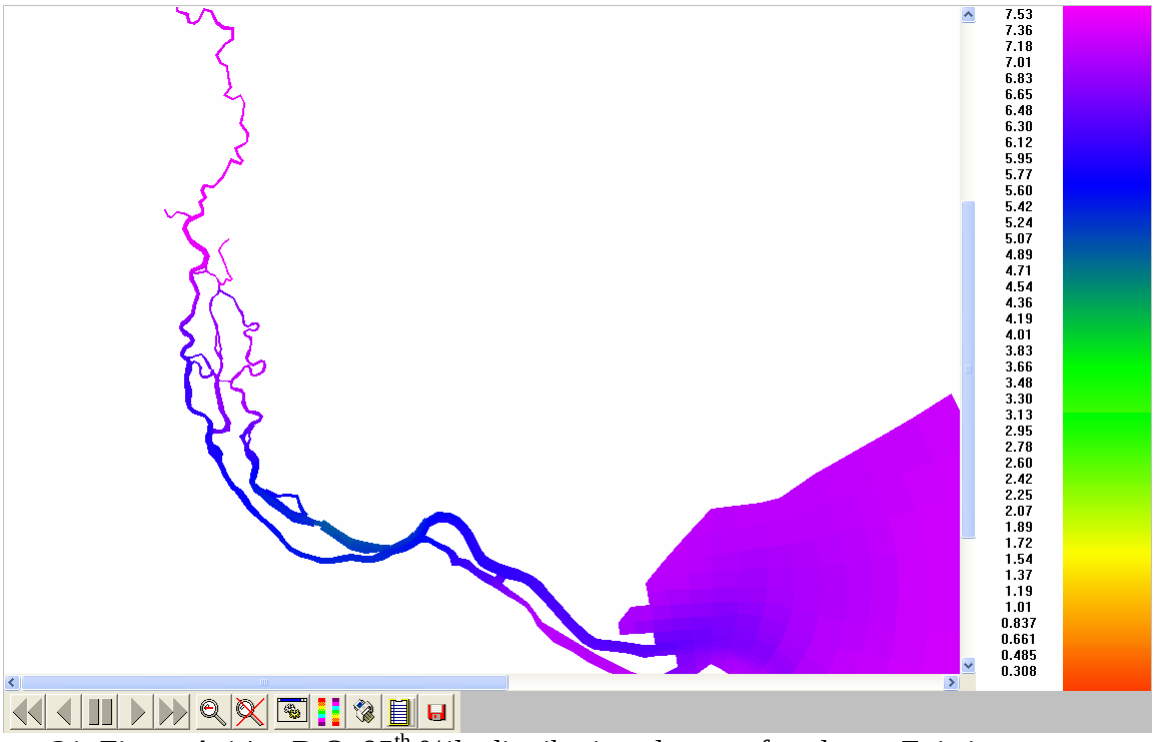
18. Figure A.11. Salinity 95th %ile distribution along bottom layer: Existing bathymetry



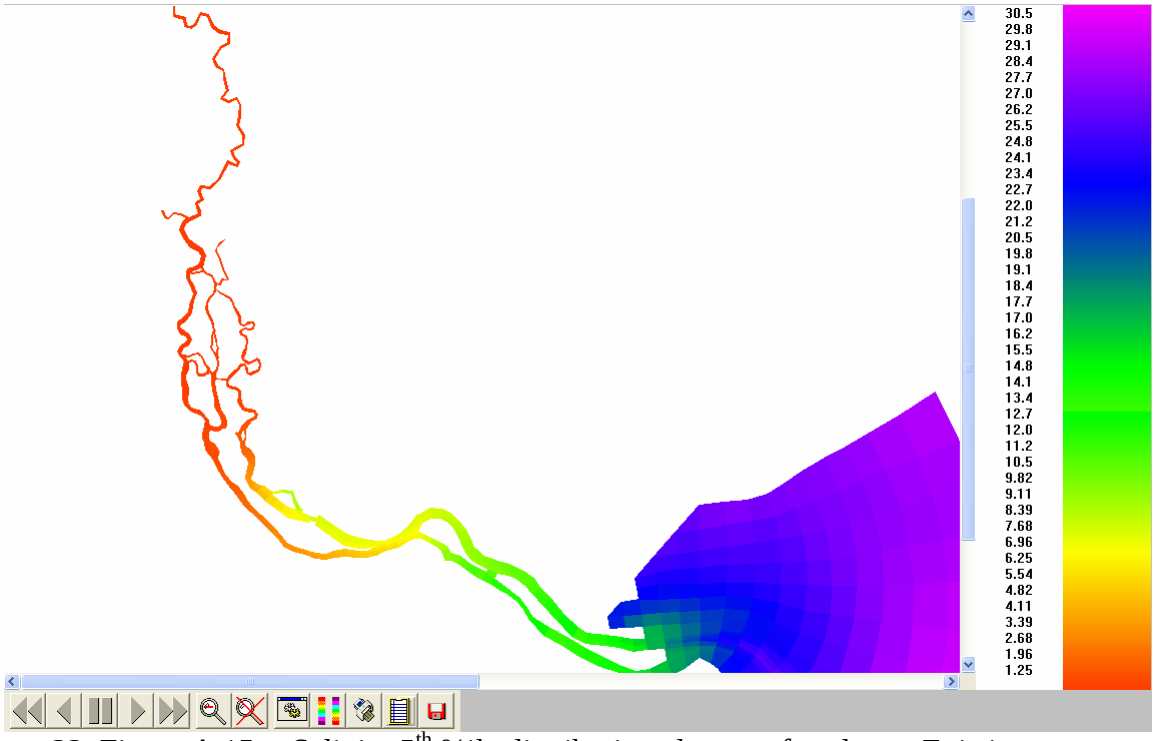
19. Figure A.12. D.O. 5th %ile distribution along surface layer: Existing bathymetry



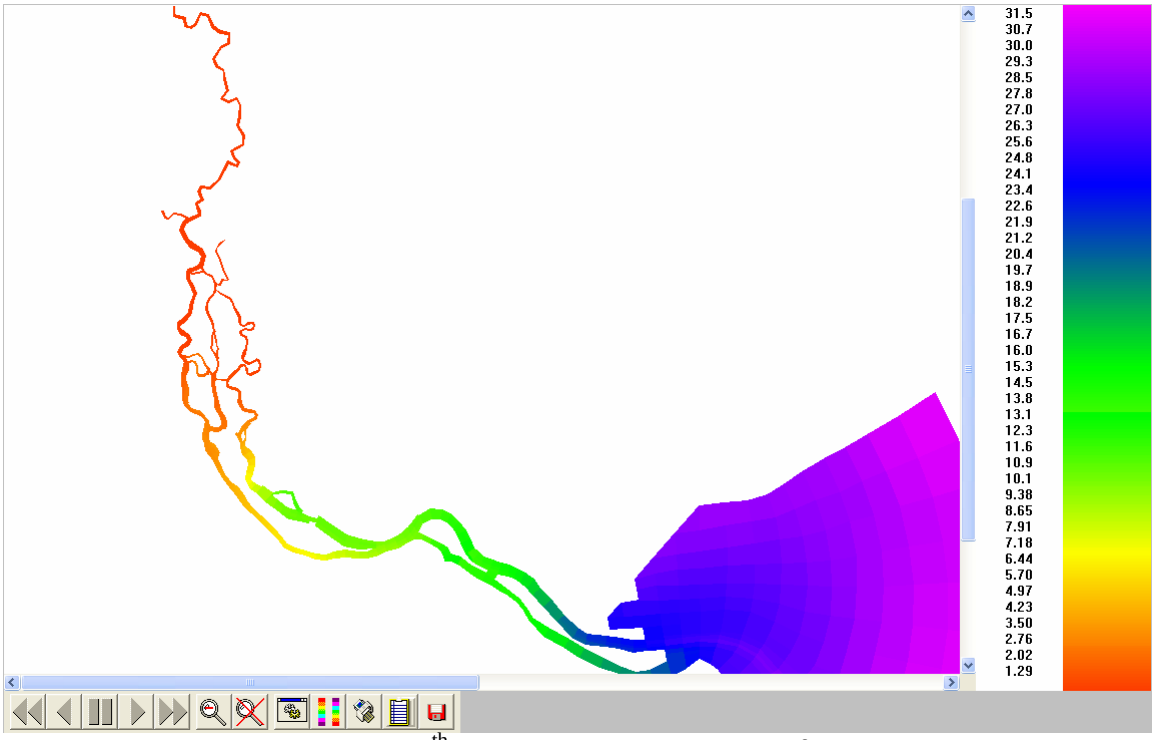
20. Figure A.13. D.O. 50th %ile distribution along surface layer: Existing bathymetry



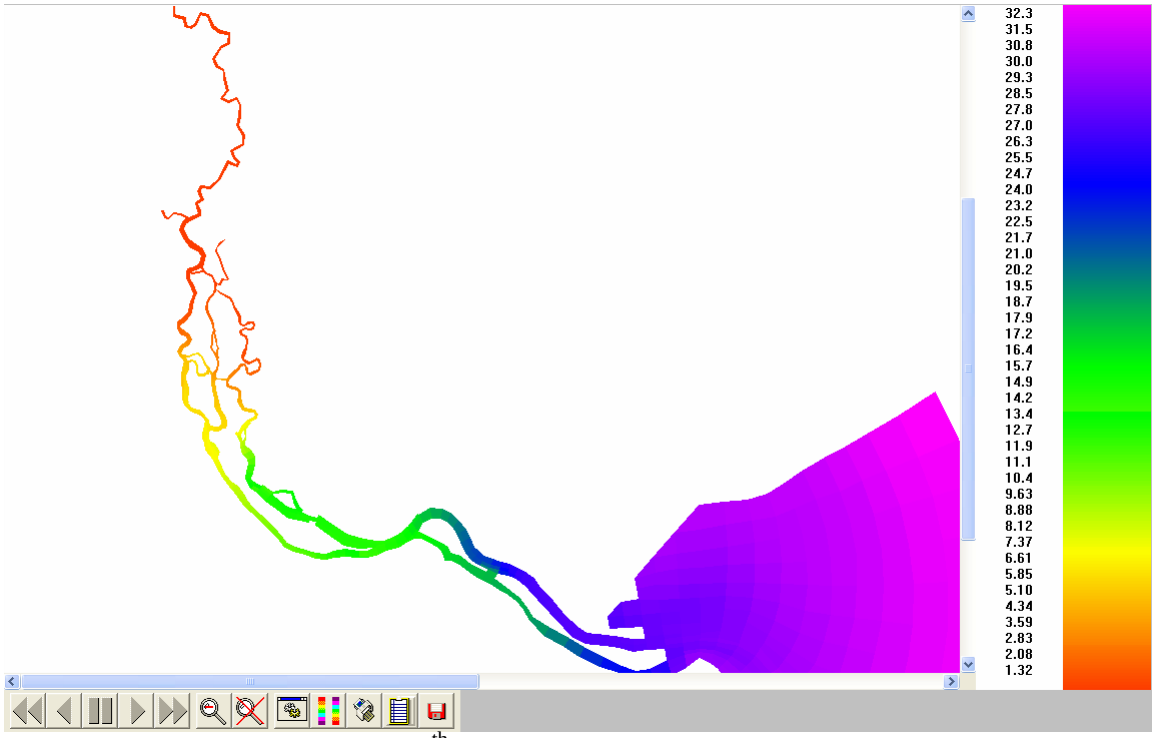
21. Figure A.14. D.O. 95th %ile distribution along surface layer: Existing bathymetry



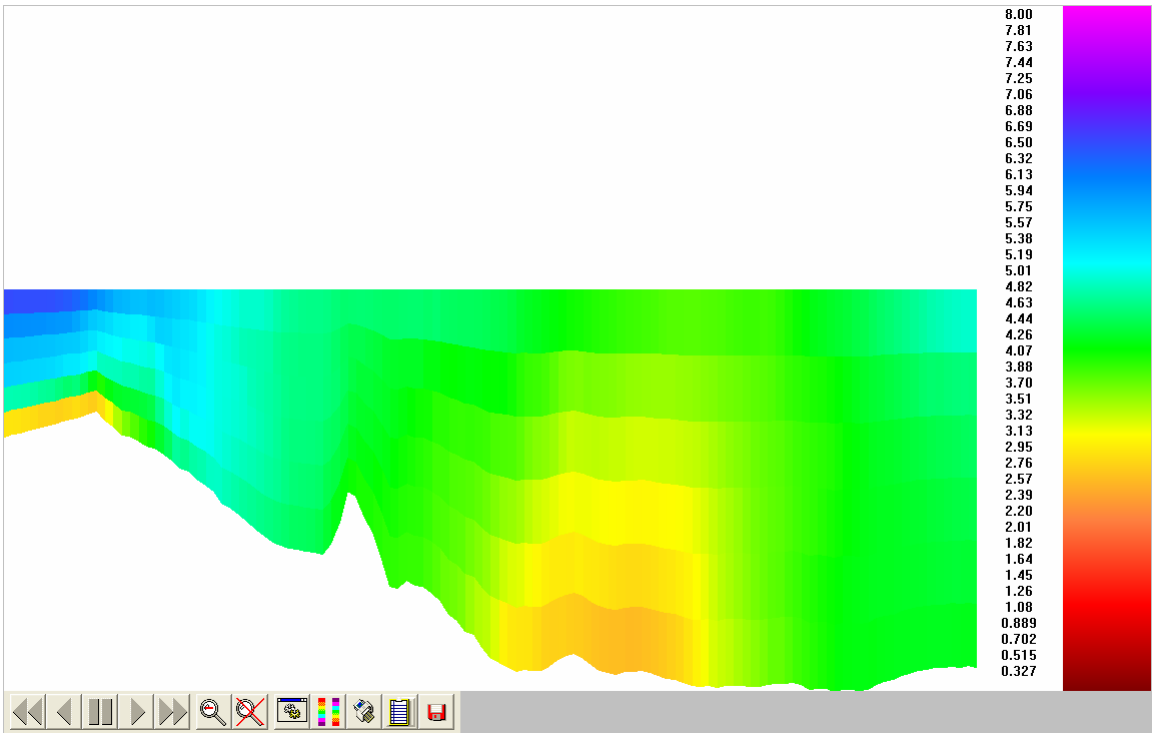
22. Figure A.15. Salinity 5th %ile distribution along surface layer: Existing bathymetry



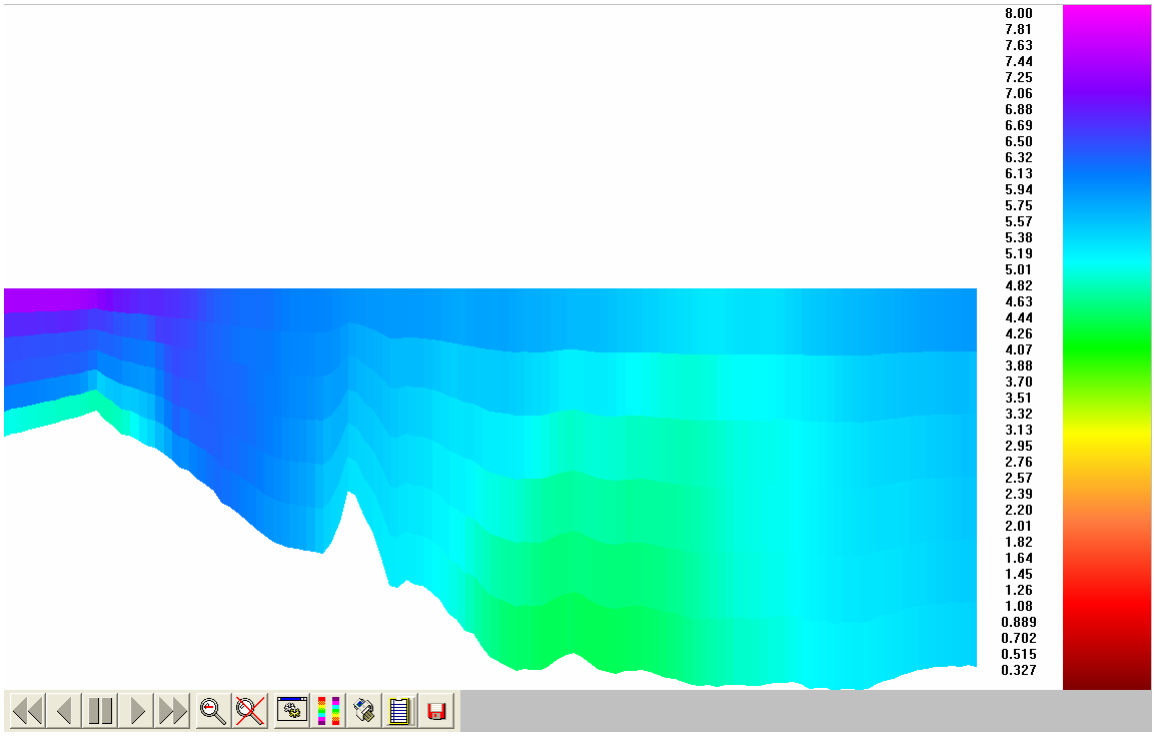
23. Figure A.16. Salinity 50th %ile distribution along surface layer: Existing bathymetry



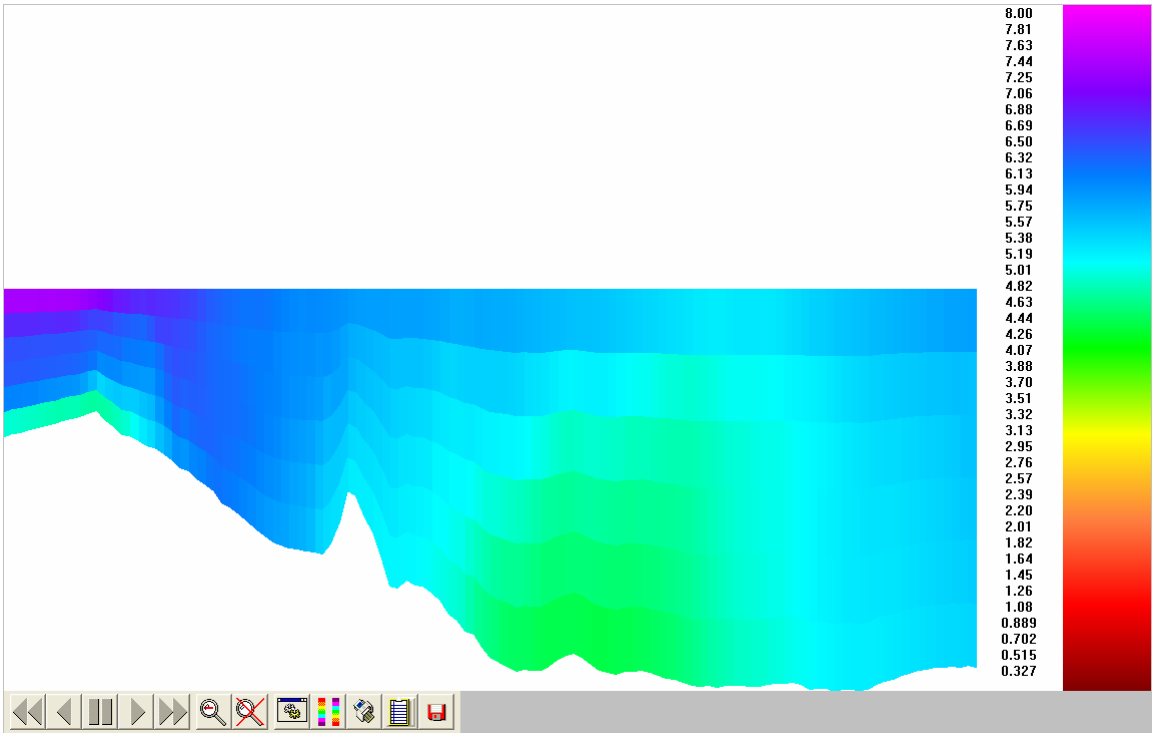
24. Figure A.17. Salinity 95th %ile distribution along surface layer: Existing bathymetry



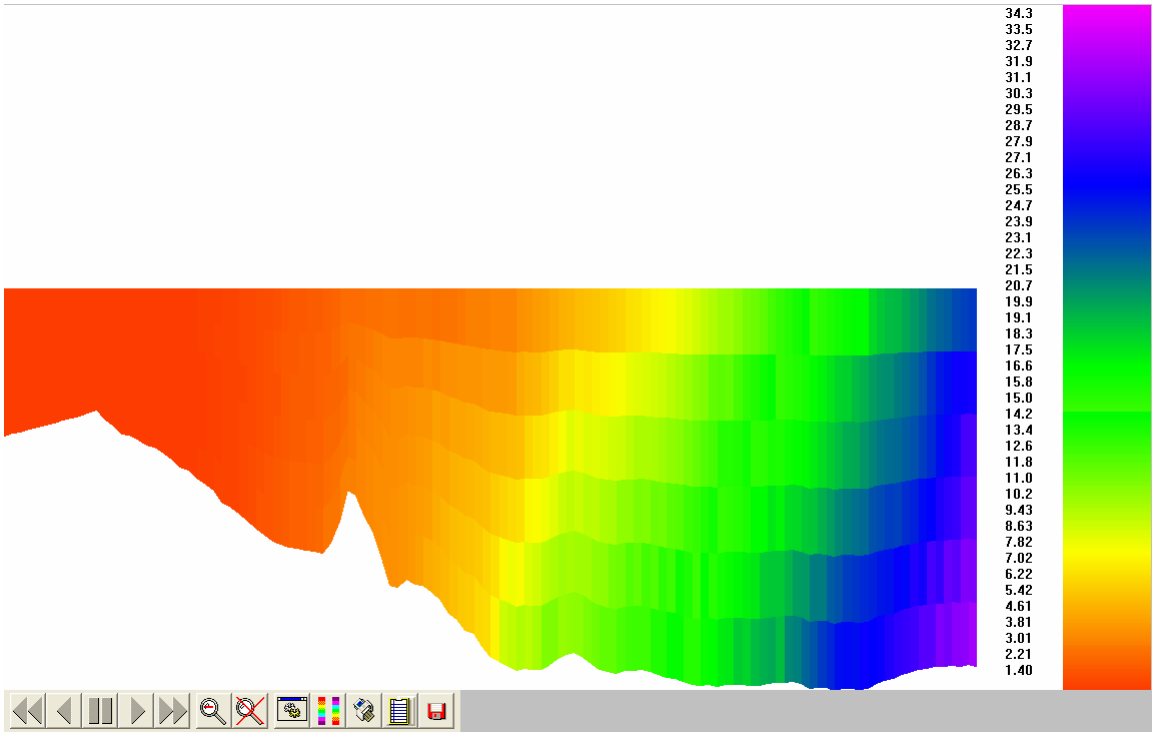
25. Figure A.18. Snapshot of 1-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Existing bathymetry



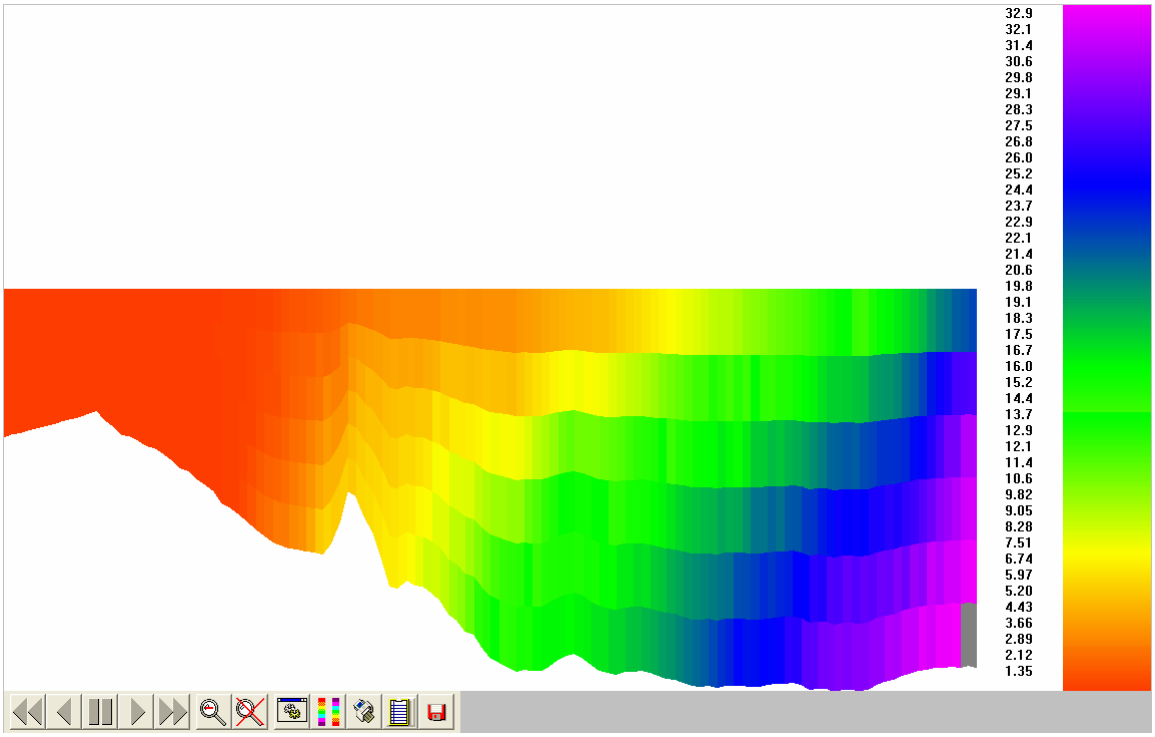
26. Figure A.19.0. Snapshot of 7-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Existing bathymetry



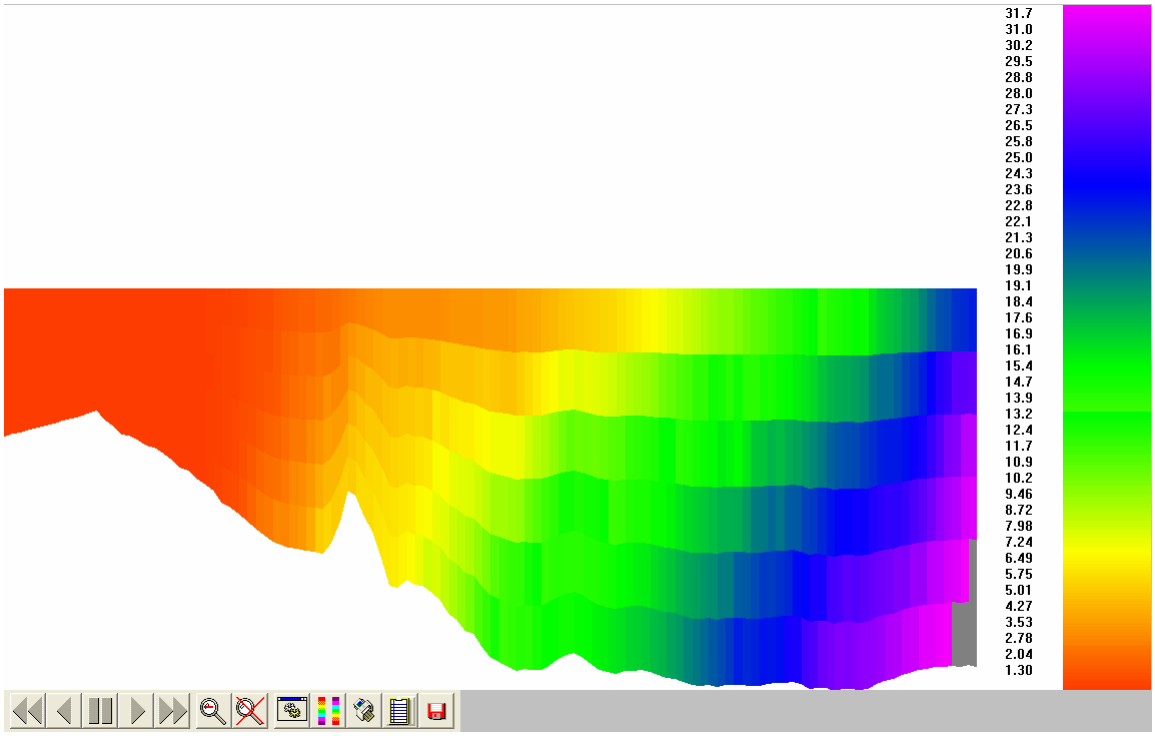
27. Figure A.20. Snapshot of 30-days averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Existing bathymetry



28. Figure A.21. Snapshot of 1-day averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Existing bathymetry



29. Figure A.22. Snapshot of 7-day averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Existing bathymetry



30. Figure A.23. Snapshot of 30-days averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Existing bathymetry

Appendix A1

BASIC EVALUATION: 6 ft DEEPENING BATHYMETRY, 2004 POINT SOURCES LOADS, 1999 HYDROLOGICAL AND METEOROLOGICAL CONDITIONS

May 1 – October 30, 1999 Simulation Period

Water Quality Review Group

1. Table A1.1. Dissolved oxygen percentiles distribution in Critical cells

Zone	D.O. Percentile (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.42	3.62	3.72	3.93	4.28	4.72	4.99	5.2	5.53
FR2	2.82	3.12	3.23	3.46	3.81	4.23	4.56	4.72	5
FR3	2.42	2.7	2.82	3.04	3.47	3.89	4.22	4.37	4.7
FR4	2.42	2.68	2.81	3.03	3.47	3.89	4.21	4.38	4.69
FR5	2.44	2.65	2.81	3.11	3.47	3.88	4.2	4.39	4.66
FR6	2.46	2.66	2.81	3.14	3.49	3.88	4.23	4.39	4.68
FR7	2.62	2.84	3.06	3.39	3.7	4.11	4.44	4.64	4.93
FR8	2.87	3.14	3.41	3.79	4.27	4.8	5.19	5.39	5.72
FR9	3.05	3.29	3.49	3.86	4.3	4.83	5.24	5.42	5.72
FR10	2.33	3.12	3.38	3.91	4.61	5.23	5.63	5.81	6.05
FR11	2.16	2.78	3.18	3.64	4.23	4.87	5.4	5.62	5.96
MR1	2.55	2.83	3.03	3.41	3.73	4.06	4.4	4.58	4.8
MR2	2.16	2.54	2.82	3.24	3.66	4.01	4.33	4.55	4.78
MR3	2.05	2.42	2.72	3.17	3.6	3.97	4.31	4.54	4.76
MR4	2.07	2.41	2.6	3.04	3.45	3.79	4.13	4.31	4.62
MR5	0.44	1	1.42	2.26	3.7	5.13	5.57	5.72	5.98
MR6	1.09	1.73	2.17	3.09	4.43	5.33	5.71	5.9	6.19
LBR1	2.51	3.32	3.54	4.01	4.34	4.63	4.94	5.09	5.38
LBR2	2.5	2.68	2.82	3.28	3.57	3.83	4.14	4.3	4.47
LBR3	1.56	2.15	2.36	2.8	3.32	3.75	4.08	4.31	4.66
BR1	2	2.24	2.43	2.8	3.23	3.66	4.04	4.24	4.51
BR2	1.4	1.75	2.03	2.47	2.96	3.39	3.8	4.05	4.35
BR3	1.71	2.05	2.26	2.59	3.08	3.47	3.81	4.05	4.39
SCH1	1.39	1.69	1.94	2.51	3.26	3.98	4.57	4.89	5.2
SCH2	3.05	3.26	3.41	3.65	3.99	4.41	4.75	4.93	5.25
SR	2.25	2.54	2.97	3.6	3.86	4.2	4.5	4.65	4.91

2. Table A1.2. Delta of Dissolved Oxygen percentiles distribution in Critical cells: Deepening scenario minus Existing bathymetry scenario

Zone	Delta D.O. Percentile																	
	1%		5%		10%		25%		50%		75%		90%		95%		99	
	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%
FR1	-0.01	-0.3	0.01	0.3	0	0.0	-0.02	-0.5	-0.01	-0.2	0	0.0	-0.01	-0.2	0	0.0	-0.04	-0.7
FR2	0.08	2.9	0.13	4.3	0.12	3.9	0.07	2.1	0.07	1.9	0.07	1.7	0.04	0.9	0.05	1.1	0.03	0.6
FR3	-0.03	-1.2	0.01	0.4	0.01	0.4	-0.01	-0.3	-0.03	-0.9	-0.02	-0.5	-0.04	-0.9	-0.04	-0.9	-0.01	-0.2
FR4	-0.09	-3.6	-0.06	-2.2	-0.04	-1.4	-0.07	-2.3	-0.05	-1.4	-0.02	-0.5	-0.04	-0.9	-0.05	-1.1	-0.02	-0.4
FR5	-0.06	-2.4	-0.04	-1.5	0.03	1.1	0.01	0.3	-0.03	-0.9	0.01	0.3	-0.03	-0.7	-0.02	-0.5	0.04	0.9
FR6	-0.08	-3.1	-0.08	-2.9	0	0.0	-0.01	-0.3	-0.02	-0.6	-0.01	-0.3	-0.07	-1.6	-0.09	-2.0	-0.01	-0.2
FR7	-0.51	-16.3	-0.57	-16.7	-0.53	-14.8	-0.56	-14.2	-0.72	-16.3	-0.76	-15.6	-0.77	-14.8	-0.81	-14.9	-1.1	-18.2
FR8	-0.33	-10.3	-0.38	-10.8	-0.28	-7.6	-0.32	-7.8	-0.42	-9.0	-0.31	-6.1	-0.23	-4.2	-0.22	-3.9	-0.18	-3.1
FR9	-0.34	-10.0	-0.35	-9.6	-0.35	-9.1	-0.37	-8.7	-0.44	-9.3	-0.37	-7.1	-0.22	-4.0	-0.19	-3.4	-0.16	-2.7
FR10	0.04	1.7	-0.01	-0.3	0	0.0	-0.01	-0.3	0.02	0.4	-0.01	-0.2	-0.02	-0.4	-0.01	-0.2	0.02	0.3
FR11	-0.01	-0.5	0	0.0	0.03	1.0	0.01	0.3	0.01	0.2	0.02	0.4	0	0.0	0	0.0	0.02	0.3
MR1	-0.03	-1.2	-0.16	-5.4	-0.15	-4.7	-0.14	-3.9	-0.2	-5.1	-0.19	-4.5	-0.18	-3.9	-0.17	-3.6	-0.18	-3.6
MR2	-0.04	-1.8	-0.02	-0.8	-0.09	-3.1	-0.13	-3.9	-0.16	-4.2	-0.2	-4.8	-0.2	-4.4	-0.19	-4.0	-0.22	-4.4
MR3	-0.03	-1.4	-0.03	-1.2	-0.04	-1.4	-0.11	-3.4	-0.14	-3.7	-0.2	-4.8	-0.19	-4.2	-0.19	-4.0	-0.21	-4.2
MR4	0.02	1.0	-0.03	-1.2	-0.03	-1.1	-0.01	-0.3	-0.03	-0.9	-0.04	-1.0	-0.05	-1.2	-0.05	-1.1	-0.06	-1.3
MR5	-0.01	-2.2	0.01	1.0	0.03	2.2	0.05	2.3	0.07	1.9	0.01	0.2	0	0.0	-0.01	-0.2	0.01	0.2
MR6	0.04	3.8	0.07	4.2	0.06	2.8	0.06	2.0	0.01	0.2	0.03	0.6	0	0.0	0.01	0.2	0.02	0.3
LBR1	-0.16	-6.0	0.03	0.9	0.04	1.1	0.05	1.3	0.03	0.7	0.03	0.7	0.02	0.4	-0.01	-0.2	-0.05	-0.9
LBR2	0.4	19.0	0.35	15.0	0.31	12.4	0.3	10.1	0.24	7.2	0.19	5.2	0.2	5.1	0.17	4.1	0.04	0.9
LBR3	0.22	16.4	0.4	22.9	0.32	15.7	0.24	9.4	0.19	6.1	0.12	3.3	0.1	2.5	0.13	3.1	0.1	2.2
BR1	0	0.0	0.01	0.4	0.02	0.8	0.02	0.7	0.02	0.6	0.03	0.8	0.03	0.7	0.02	0.5	0.03	0.7
BR2	0.03	2.2	0.14	8.7	0.2	10.9	0.27	12.3	0.18	6.5	0.2	6.3	0.23	6.4	0.27	7.1	0.2	4.8
BR3	0.02	1.2	0.02	1.0	0.04	1.8	0.03	1.2	0.02	0.7	0	0.0	0.02	0.5	0	0.0	0	0.0
SCH1	0.1	7.8	0.04	2.4	0.02	1.0	0.02	0.8	-0.05	-1.5	-0.12	-2.9	-0.09	-1.9	-0.09	-1.8	-0.12	-2.3
SCH2	-0.03	-1.0	-0.05	-1.5	-0.04	-1.2	-0.04	-1.1	-0.05	-1.2	-0.03	-0.7	-0.02	-0.4	-0.03	-0.6	0	0.0
SR	0.01	0.4	0.02	0.8	0.01	0.3	0	0.0	0	0.0	0	0.0	0	0.0	0.01	0.2	0	0.0

3. Table A1.3. Dissolved oxygen percentiles distribution in Zones of Savannah Estuary

Zone Name	D.O. Concentration Percentiles (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.82	3.96	4.04	4.25	4.62	5.03	5.29	5.48	5.76
FR2	3.24	3.48	3.58	3.79	4.14	4.56	4.86	4.99	5.31
FR3	2.79	3.05	3.15	3.37	3.73	4.16	4.48	4.64	4.93
FR4	2.47	2.74	2.90	3.14	3.52	3.94	4.27	4.47	4.73
FR5	2.44	2.67	2.82	3.09	3.47	3.88	4.20	4.40	4.67
FR6	2.54	2.74	2.84	3.13	3.51	3.88	4.23	4.37	4.65
FR7	2.75	2.99	3.22	3.57	3.97	4.42	4.80	4.98	5.34
FR8	2.96	3.25	3.49	3.86	4.29	4.77	5.09	5.27	5.59
FR9	3.49	3.83	4.03	4.40	4.86	5.30	5.59	5.75	5.99
FR10	4.00	4.46	4.66	4.93	5.22	5.48	5.73	5.86	6.09
FR11	2.63	3.19	3.56	3.96	4.30	4.63	4.94	5.13	5.39
MR1	2.65	2.88	3.05	3.44	3.73	4.06	4.40	4.58	4.79
MR2	2.31	2.71	2.92	3.33	3.69	4.02	4.35	4.54	4.76
MR3	2.08	2.33	2.64	3.08	3.50	3.91	4.23	4.47	4.77
MR4	2.73	2.94	3.17	3.58	3.91	4.20	4.50	4.66	4.87
MR5	1.08	1.51	1.91	2.76	4.15	5.09	5.51	5.67	5.94
MR6	1.11	1.75	2.19	3.15	4.48	5.30	5.66	5.85	6.10
LBR1	2.89	3.06	3.21	3.66	3.93	4.17	4.48	4.62	4.76
LBR2	2.04	2.26	2.50	2.92	3.30	3.60	3.89	4.09	4.30
LBR3	1.93	2.07	2.17	2.63	3.11	3.42	3.76	3.89	4.25
BR1	2.42	2.54	2.65	2.96	3.37	3.78	4.17	4.35	4.59
BR2	1.95	2.18	2.31	2.64	3.09	3.51	3.89	4.08	4.34
BR3	1.97	2.14	2.26	2.63	3.06	3.43	3.82	4.03	4.28
SCh1	2.67	2.89	3.01	3.27	3.65	4.13	4.43	4.57	4.86
SCh2	3.33	3.48	3.57	3.77	4.10	4.50	4.82	4.99	5.29
SR	2.62	2.80	3.29	3.89	4.12	4.44	4.71	4.85	5.11

4. Table A1.4. Delta of Dissolved Oxygen percentiles distribution in Zones of Savannah Estuary: Deepening scenario minus Existing bathymetry scenario

Zone	Project - Baseline Difference (mg/l)									Project - Baseline Relative Difference (%)								
Name	1%	5%	10%	25%	50%	75%	90%	95%	99%	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	0.02	0.01	0.00	0.00	0.02	0.03	0.01	0.01	-0.04	0.4	0.2	0.0	0.0	0.4	0.5	0.3	0.2	-0.8
FR2	0.01	0.04	0.03	0.02	0.04	0.04	0.04	0.02	0.01	0.3	1.1	0.9	0.6	0.9	0.9	0.8	0.5	0.2
FR3	0.05	0.10	0.10	0.06	0.05	0.08	0.06	0.05	0.04	1.8	3.4	3.4	1.8	1.5	2.0	1.3	1.0	0.9
FR4	-0.02	0.01	0.09	0.08	0.02	0.07	0.03	0.07	0.06	-1.0	0.5	3.3	2.5	0.7	1.8	0.7	1.6	1.4
FR5	-0.10	-0.08	-0.01	0.00	-0.04	0.00	-0.07	-0.01	0.04	-4.1	-2.9	-0.5	0.0	-1.1	0.1	-1.6	-0.3	0.9
FR6	-0.14	-0.14	-0.12	-0.14	-0.14	-0.12	-0.15	-0.19	-0.09	-5.2	-4.7	-4.1	-4.4	-3.7	-3.1	-3.4	-4.1	-1.9
FR7	-0.27	-0.27	-0.24	-0.26	-0.34	-0.40	-0.33	-0.33	-0.28	-9.0	-8.4	-6.8	-6.9	-7.9	-8.3	-6.4	-6.3	-4.9
FR8	-0.36	-0.37	-0.32	-0.34	-0.39	-0.31	-0.26	-0.25	-0.19	-11.0	-10.1	-8.3	-8.2	-8.2	-6.2	-4.8	-4.5	-3.2
FR9	-0.44	-0.41	-0.41	-0.41	-0.34	-0.19	-0.17	-0.15	-0.15	-11.1	-9.6	-9.2	-8.6	-6.5	-3.5	-2.9	-2.6	-2.4
FR10	-0.01	-0.04	-0.05	-0.07	-0.07	-0.08	-0.08	-0.07	-0.07	-0.1	-0.9	-1.0	-1.4	-1.3	-1.3	-1.3	-1.1	-1.2
FR11	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	-0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.4
MR1	-0.14	-0.16	-0.17	-0.13	-0.20	-0.18	-0.17	-0.16	-0.15	-5.0	-5.4	-5.1	-3.5	-5.1	-4.2	-3.8	-3.4	-3.0
MR2	-0.04	-0.07	-0.14	-0.13	-0.18	-0.19	-0.18	-0.20	-0.19	-1.9	-2.7	-4.4	-3.8	-4.7	-4.4	-3.9	-4.3	-3.8
MR3	-0.01	-0.02	-0.02	-0.05	-0.08	-0.12	-0.14	-0.12	-0.15	-0.5	-1.1	-0.9	-1.7	-2.2	-3.0	-3.2	-2.6	-2.9
MR4	-0.01	0.00	0.01	0.02	0.01	0.00	-0.01	-0.02	0.02	-0.2	0.2	0.3	0.6	0.2	-0.1	-0.3	-0.4	0.3
MR5	0.01	0.05	0.04	0.04	0.02	0.01	0.01	0.01	0.02	1.3	3.1	2.2	1.4	0.5	0.2	0.2	0.2	0.4
MR6	0.01	0.07	0.06	0.05	0.02	0.02	0.00	0.01	-0.01	0.6	3.9	2.9	1.6	0.4	0.4	0.1	0.1	-0.1
LBR1	0.03	0.03	0.04	0.02	0.01	0.02	0.01	0.02	0.01	0.9	1.0	1.1	0.7	0.3	0.4	0.3	0.3	0.2
LBR2	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.2	-0.1	0.3	0.1	0.2	0.0	-0.1	0.0	0.1
LBR3	0.17	0.17	0.17	0.11	0.07	0.09	0.10	0.07	0.09	9.8	8.9	8.2	4.2	2.1	2.9	2.8	1.9	2.2
BR1	0.01	0.00	0.00	0.01	0.01	0.01	0.02	0.01	0.00	0.4	-0.1	-0.2	0.4	0.4	0.3	0.4	0.1	-0.1
BR2	0.00	0.01	0.01	0.03	0.02	0.01	0.01	0.01	0.00	-0.1	0.4	0.3	1.3	0.6	0.3	0.2	0.2	0.0
BR3	0.05	0.03	0.02	0.05	0.00	0.00	0.01	0.00	-0.02	2.6	1.5	1.0	1.9	-0.1	0.0	0.3	0.0	-0.4
SCh1	0.06	0.01	0.00	0.00	0.01	0.02	-0.01	-0.02	0.02	2.3	0.5	0.2	0.0	0.2	0.5	-0.2	-0.3	0.4
SCh2	-0.01	0.01	0.00	-0.02	0.00	-0.02	-0.01	-0.01	0.00	-0.3	0.2	0.0	-0.4	0.0	-0.4	-0.2	-0.1	0.0
SR	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0

5. Table A1.5. Percentage of the volume of waters with violation of Dissolved Oxygen standards for Zones of Savannah Estuary within the period of May 1 – October 30, 1999: Deepening (Project) and Existing bathymetry (Baseline)

Zones	D.O. STANDARDS														
	1-Day Average			7-Day Average			30-Day Average			GA MINIMUM D.O.			SC MINIMUM D.O.		
	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B
FR1	0	0	0	0	0	0	0	0	0	0	0	0	7	6	-1
FR2	0	0	0	0	0	0	3	3	0	0	0	0	31	30	-1
FR3	0	0	0	2	1	-1	19	18	-1	3	2	-1	N/A	N/A	N/A
FR4	0	0	0	5	4	-1	22	23	1	6	5	-1	N/A	N/A	N/A
FR5	0	0	0	4	5	1	19	22	3	5	6	1	N/A	N/A	N/A
FR6	0	0	0	2	5	3	12	20	8	4	6	2	N/A	N/A	N/A
FR7	0	0	0	0	0	0	1	4	3	0	2	2	N/A	N/A	N/A
FR8	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR9	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR10	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR11	0	0	0	0	0	0	2	2	0	1	1	0	6	6	0
MR1	0	0	0	0	2	2	5	9	4	1	2	1	N/A	N/A	N/A
MR2	0	0	0	1	3	2	6	11	5	1	2	1	N/A	N/A	N/A
MR3	0	0	0	3	3	0	10	12	2	3	4	1	N/A	N/A	N/A
MR4	0	0	0	1	1	0	5	5	0	2	2	0	N/A	N/A	N/A
MR5	0	0	0	1	1	0	5	5	0	5	5	0	11	11	0
MR6	0	0	0	0	0	0	3	2	-1	3	3	0	9	8	-1
LBR1	0	0	0	1	1	0	6	6	0	1	1	0	18	18	0
LBR2	1	1	0	6	6	0	18	18	0	7	7	0	34	35	1
LBR3	3	2	-1	13	13	0	30	32	2	14	14	0	47	50	3
BR1	0	0	0	10	10	0	39	40	1	12	12	0	67	68	1
BR2	2	2	0	19	20	1	49	50	1	20	20	0	75	76	1
BR3	3	3	0	21	21	0	48	49	1	22	22	0	70	72	2
SCh1	1	1	0	4	3	-1	8	8	0	5	4	-1	N/A	N/A	N/A
SCh2	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
SR	0	0	0	1	1	0	3	3	0	1	1	0	6	6	0

26. Table A1.6. Percentage of water volumes with salinity in %iles within the period of May 1 – October 30, 1999

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	18.1	4.3	4.3	4.4	4.4	4.3	4.4	4	82.9
10	22.1	7.8	8.7	8.9	9	8.7	9.8	8.5	82.9
25	34.7	19.4	22.2	22.5	22.9	22.1	23.4	19.5	82.9
50	56.4	41.4	46.5	46.8	47.5	46.1	46.7	42.1	82.9
75	77.8	68.8	72.7	73	73.4	72.8	72.6	69	82.9
90	90.9	87.1	88.9	89.2	89.3	89.2	88.5	87.3	89.9
95	95.3	93.4	94.4	94.6	94.6	94.6	94	93.6	96.4
Total Volume 100*km3:	33199.7	657.9	4805.5	27.3	39.2	136.3	9.9	9.5	43.6

27. Table A1.7. Percentage of water volumes with D.O. in %iles within the period of May 1 – October 30, 1999

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	5.2	5.1	4.9	5.6	5.2	4.7	5.5	5.6	5.8
10	10.4	10	9.8	11	10.3	9.5	10.4	11.1	10.9
25	26.1	25.2	24.7	27.2	25.7	24.2	25.5	25.9	26.4
50	52	50.2	49.8	53.1	50.8	49.1	51.3	51.5	51.4
75	76.3	75	75.1	77.5	75.4	74.3	75.7	76.3	75.8
90	90.6	90	90.1	91.1	90.3	89.7	90.3	90.5	90.4
95	95.2	95	95	95.6	95.2	94.8	95.2	95.4	95.1
Total Volume 100*km3:	33199.7	657.9	4805.5	27.3	39.2	136.3	9.9	9.5	43.6

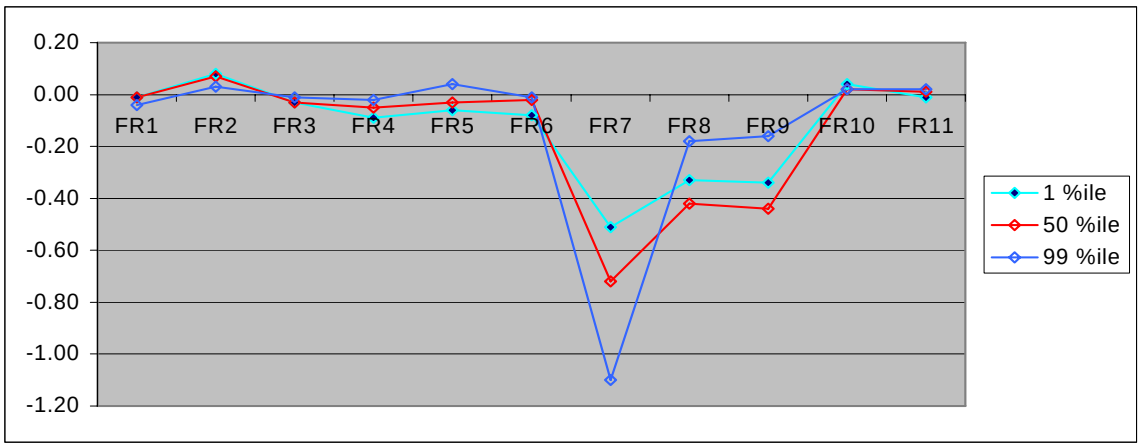
28. Table A1.8. Water volumes in Upper Harbor in increments of 1^{o} C of water temperature within the period of May 1 – October 30, 1999

Temperature C^{o}	Total Volume %
19	0.01
20	0.83
21	4.1
22	9.29
23	15.05
24	23.57
25	35.42
26	49.25
27	60.1
28	69.06
29	75.54
30	85.25
31	89.74
32	96.51
33	99.99
34	100

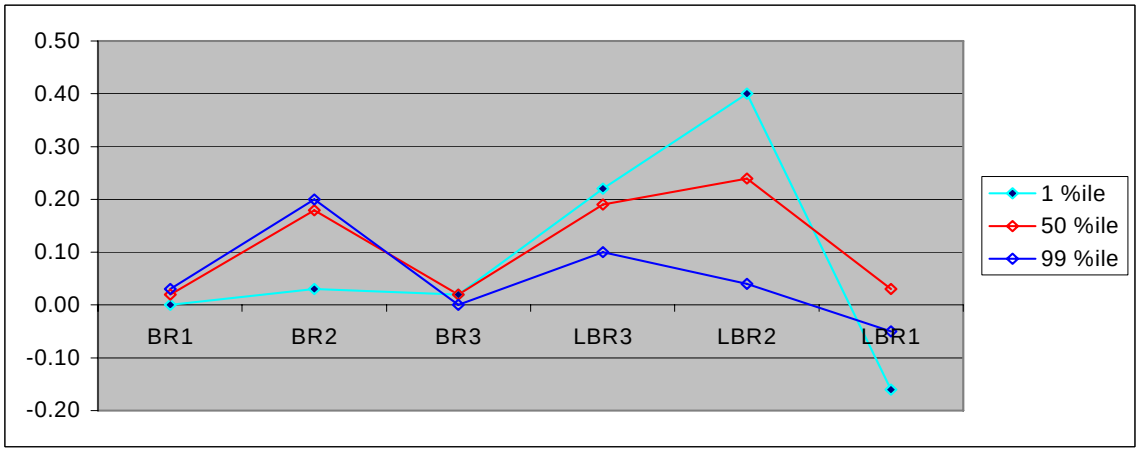
29. Table A1.9. Water volumes in Upper Harbor in increments of 0.1 mg/l of D.O. within the period of May 1 – October 30, 1999
(See file: Postprocessor Output\99-B16\99-B16_DO Increment Volume)

30. Table A1.10. Percentage of water volumes corresponding to 1-, 7-, and 30-days averages of D.O. depth-averaged concentrations in Upper Harbor within the period of May 1 – October 30, 1999
(See file: Postprocessor Output\99-B16\99-B16_volume DO in averages)

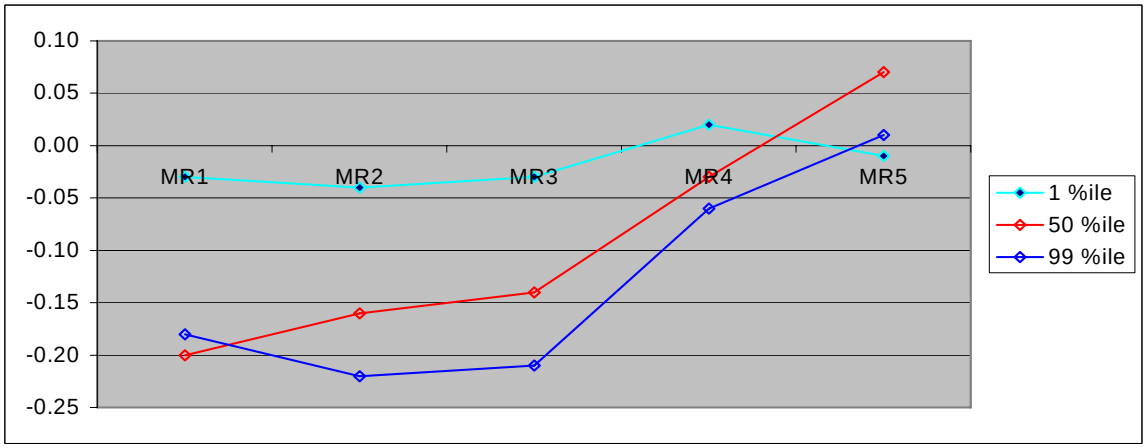
Front River



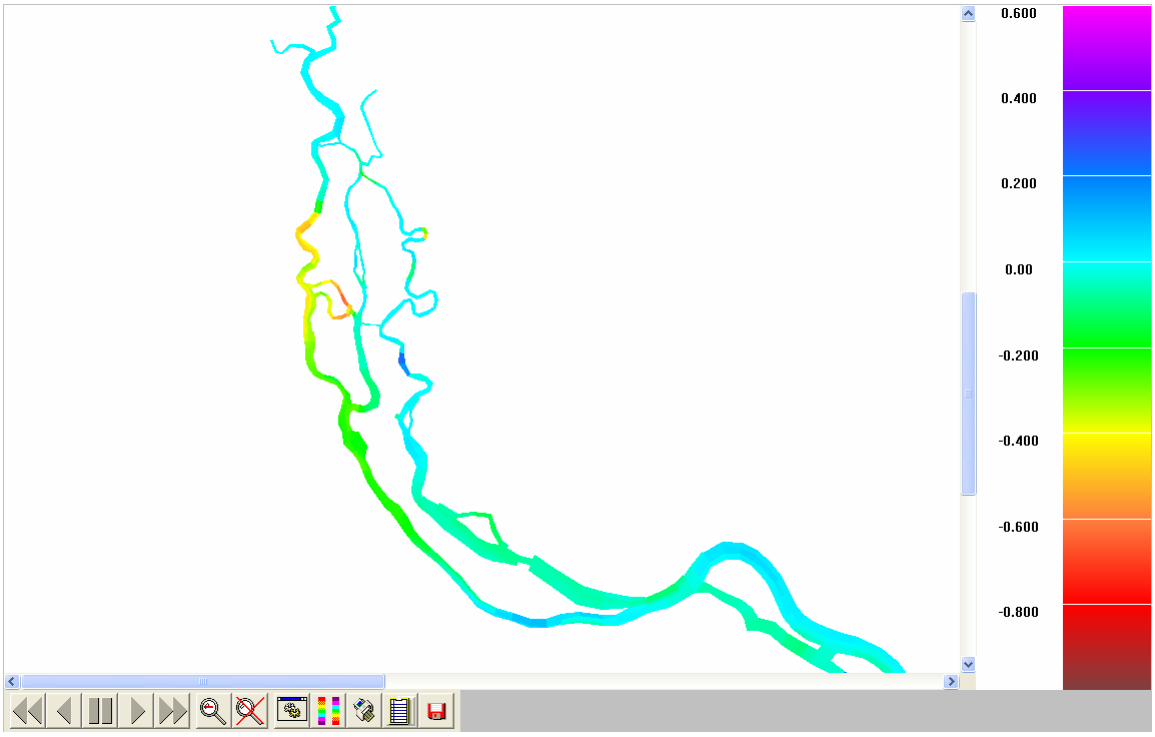
Back and Little Back Rivers



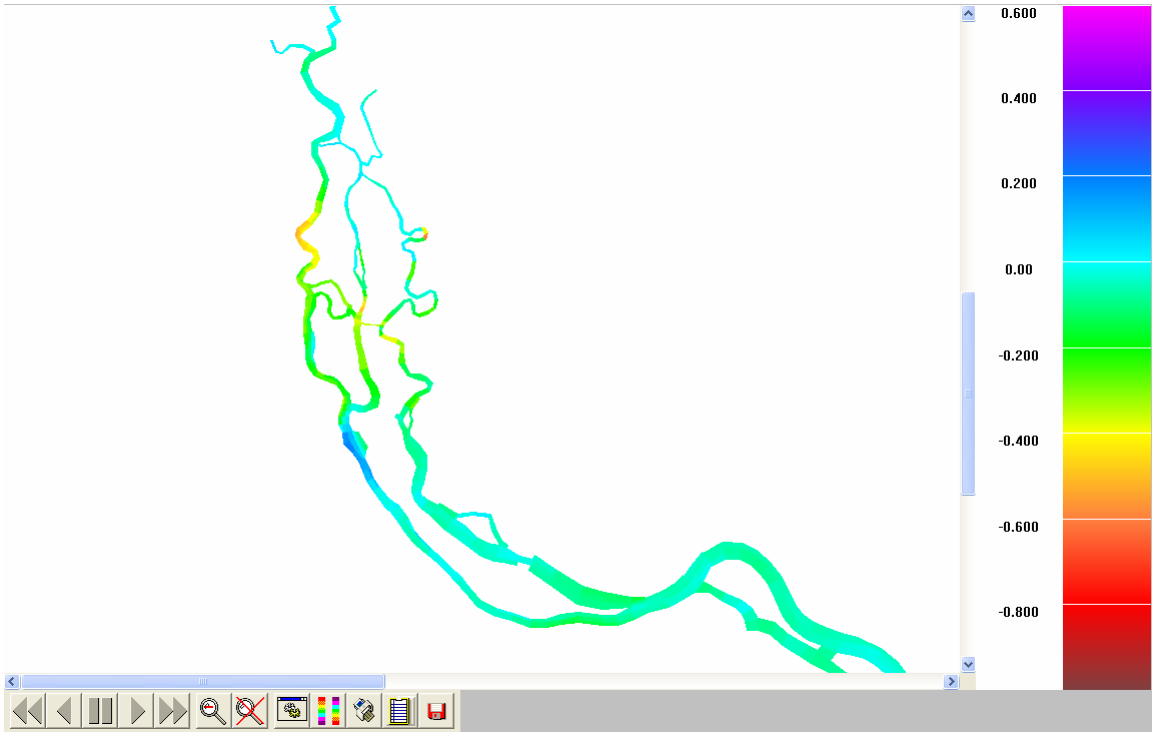
Middle River



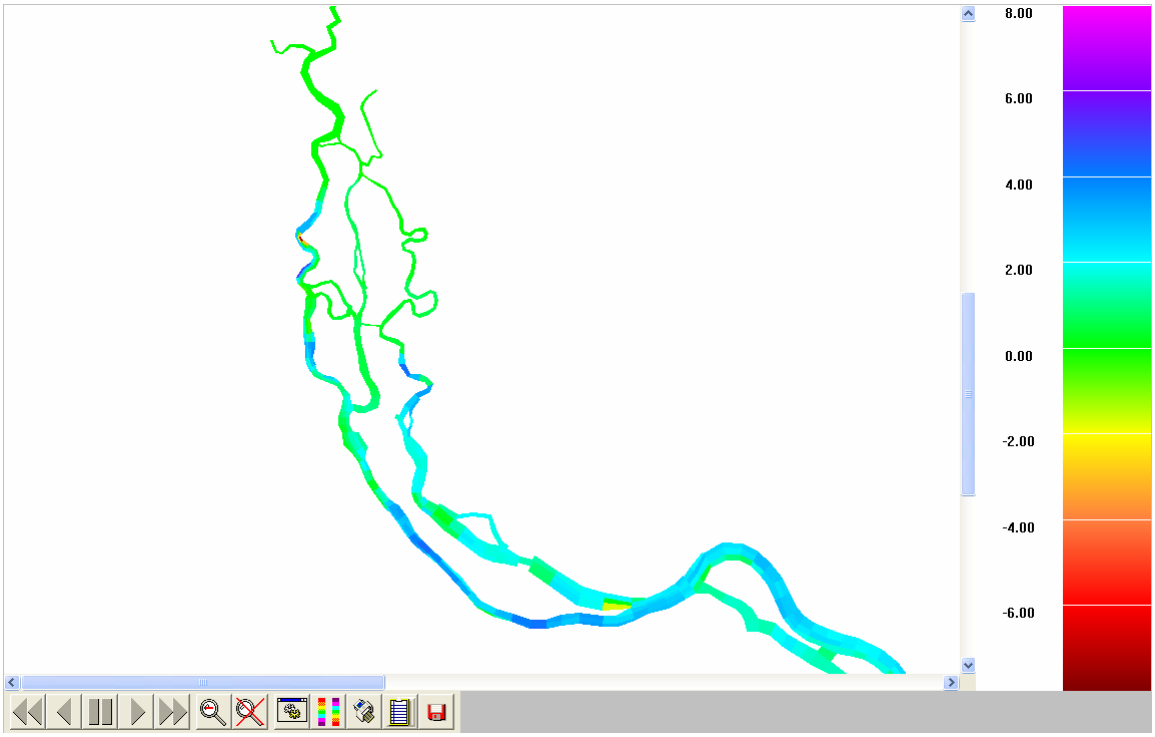
31. Figure A1.1. Changes in longitudinal profile of Dissolved Oxygen (mg/l) distribution along Critical cells of Savannah Estuary: 6 ft deepening



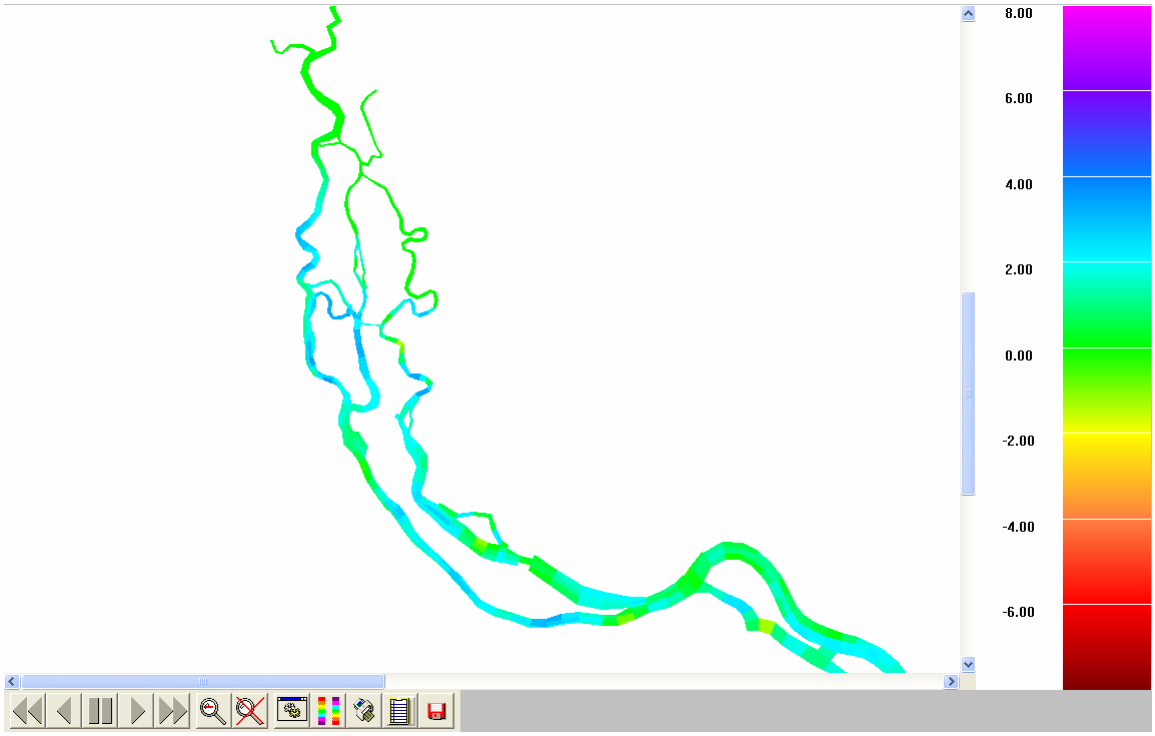
32. Figure A1.2. Changes in minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1999: 6 ft deepening



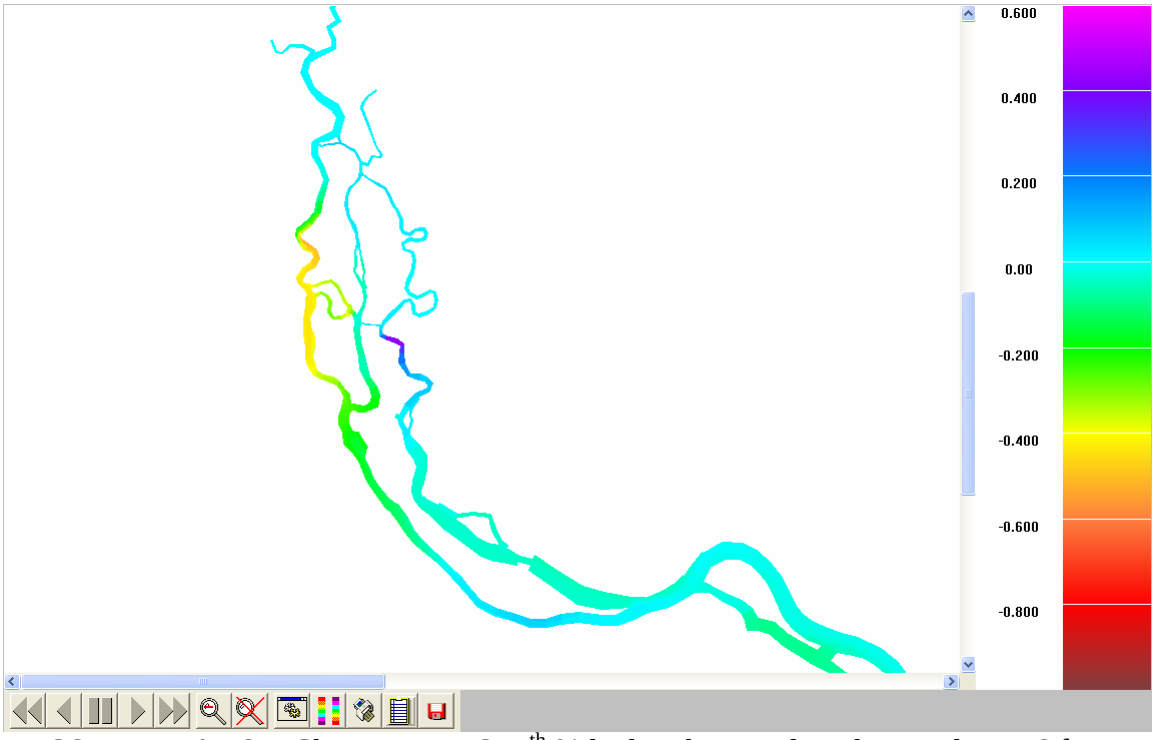
33. Figure A1.3. Changes in minimum D.O. distribution along surface layer within the analyzed period of May 1 - October 30, 1999: 6 ft deepening



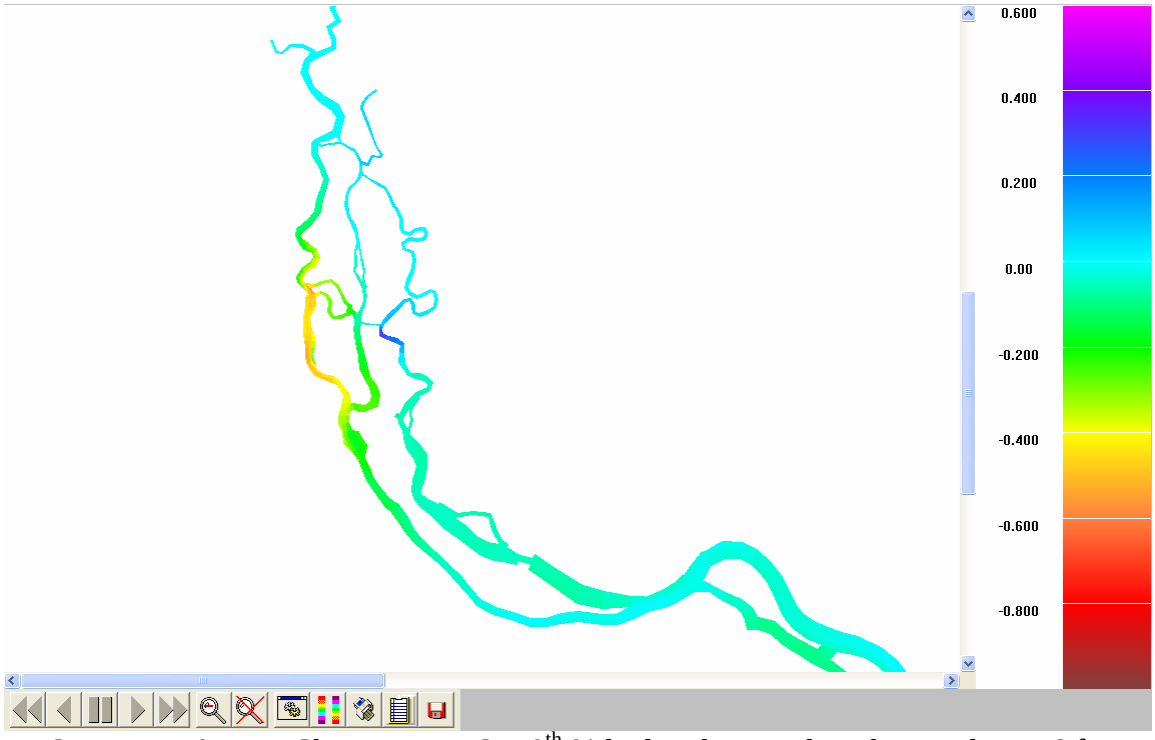
34. Figure A1.4. Changes in Salinity corresponded to Minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1999: 6 ft deepening



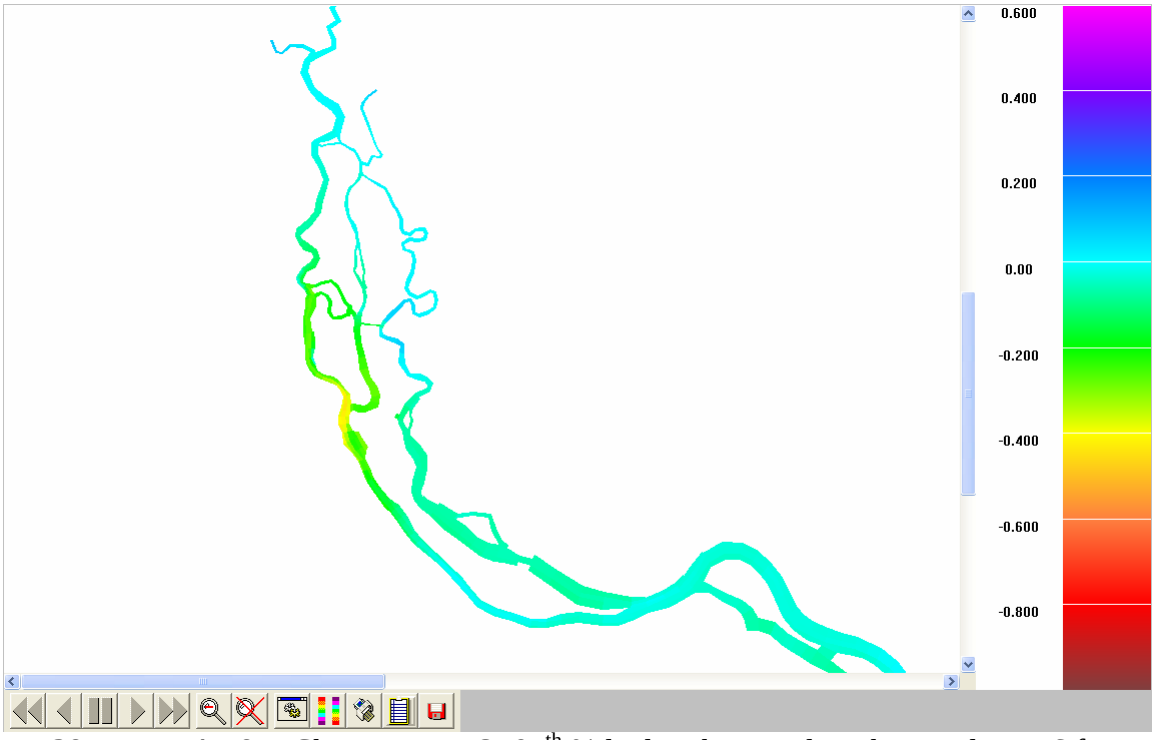
35. Figure A1.5. Changes in Salinity corresponded to Minimum D.O. distribution along Surface layer within the analyzed period of May 1 - October 30, 1999: 6 ft deepening



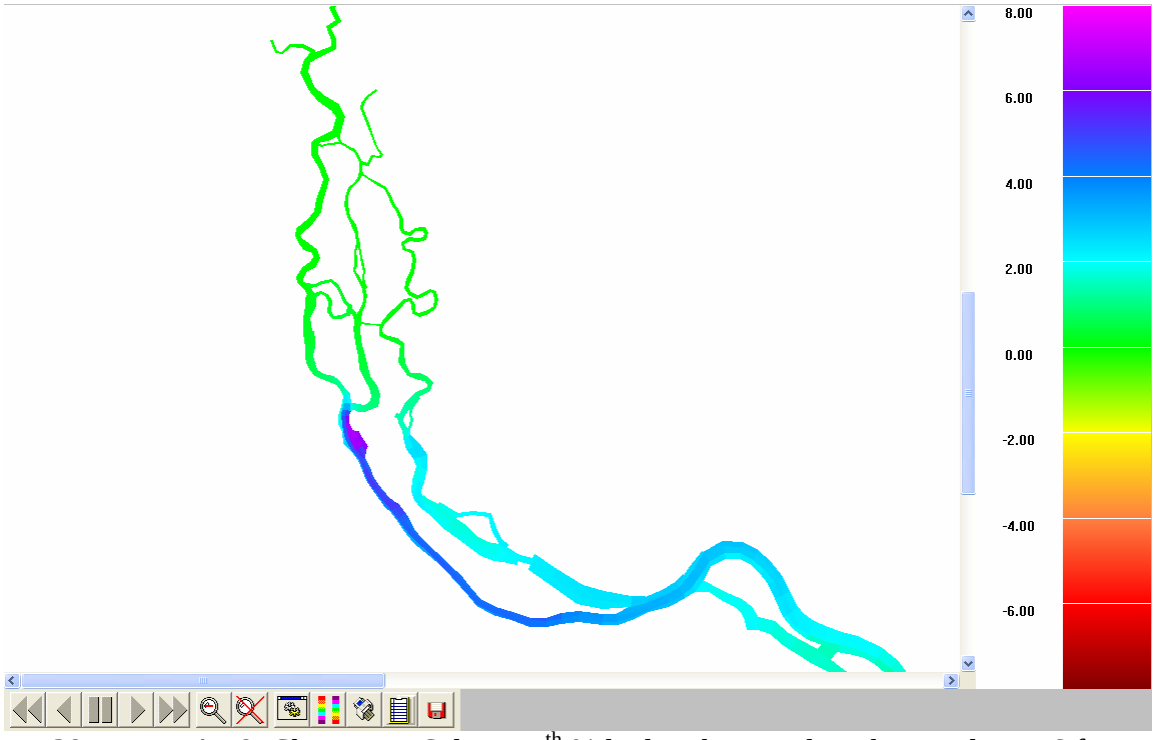
36. Figure A1.6. Changes in D.O. 5th %ile distribution along bottom layer: 6 ft deepening



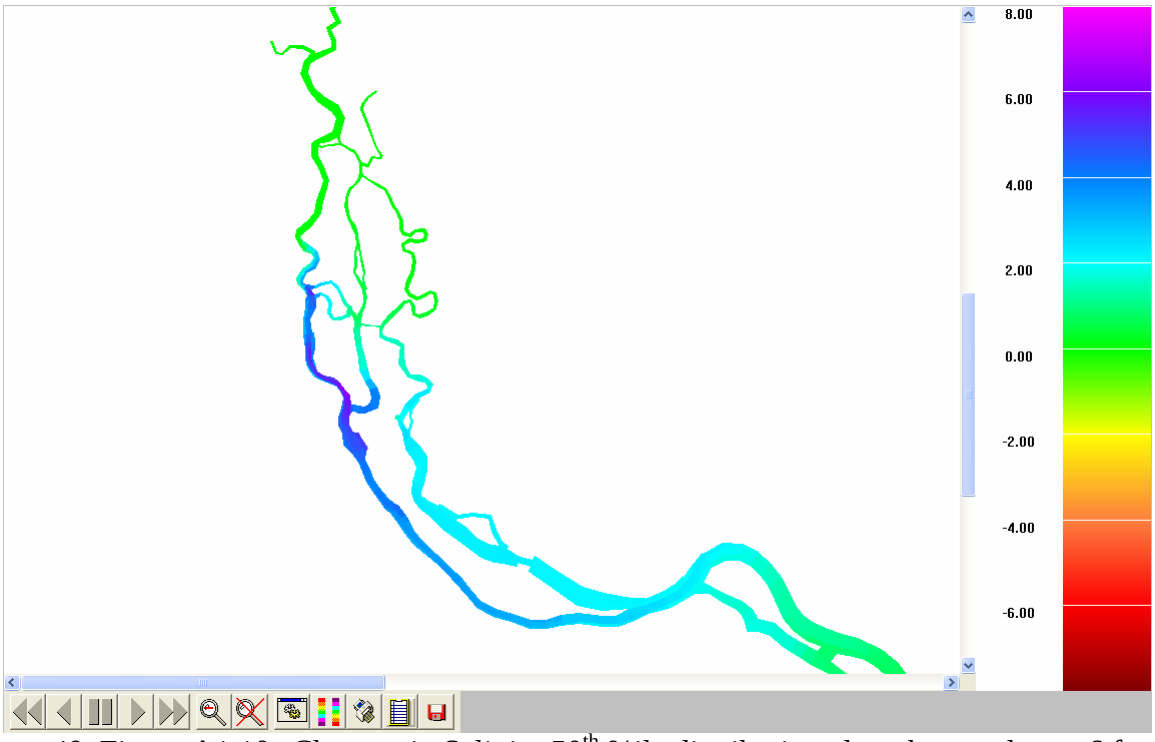
37. Figure A1.7. Changes in D.O. 50th %ile distribution along bottom layer: 6 ft deepening



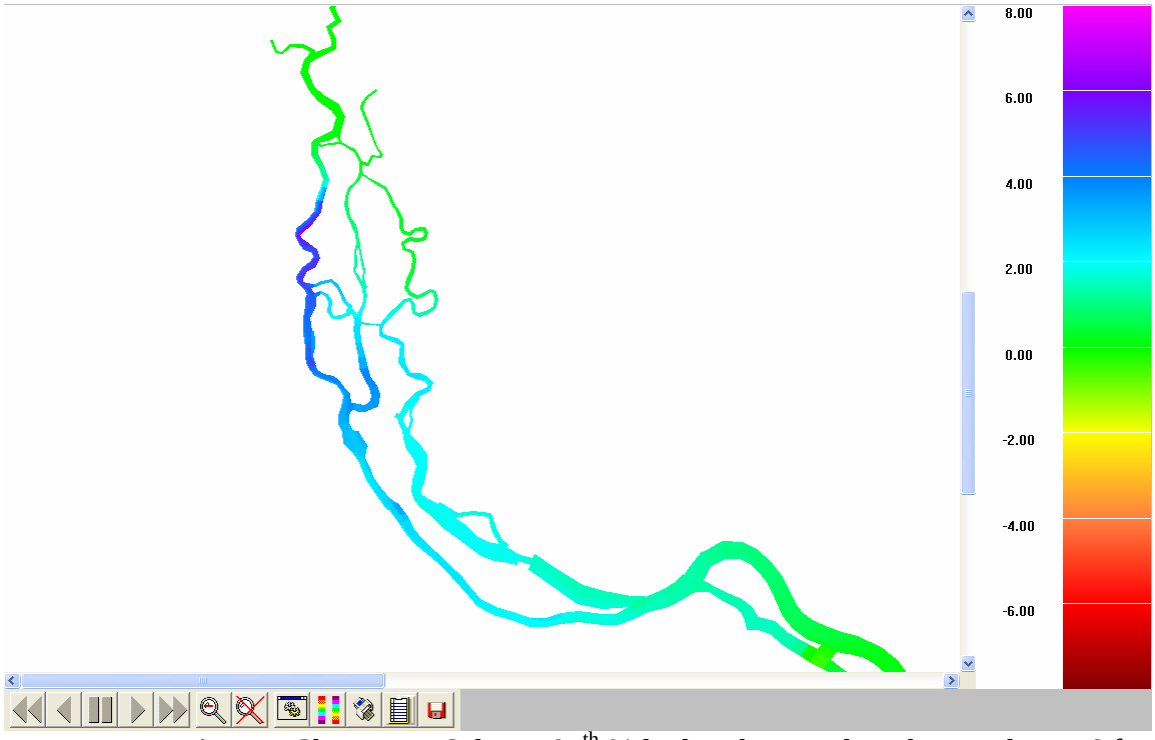
38. Figure A1.8. Changes in D.O. 95th %ile distribution along bottom layer: 6 ft deepening



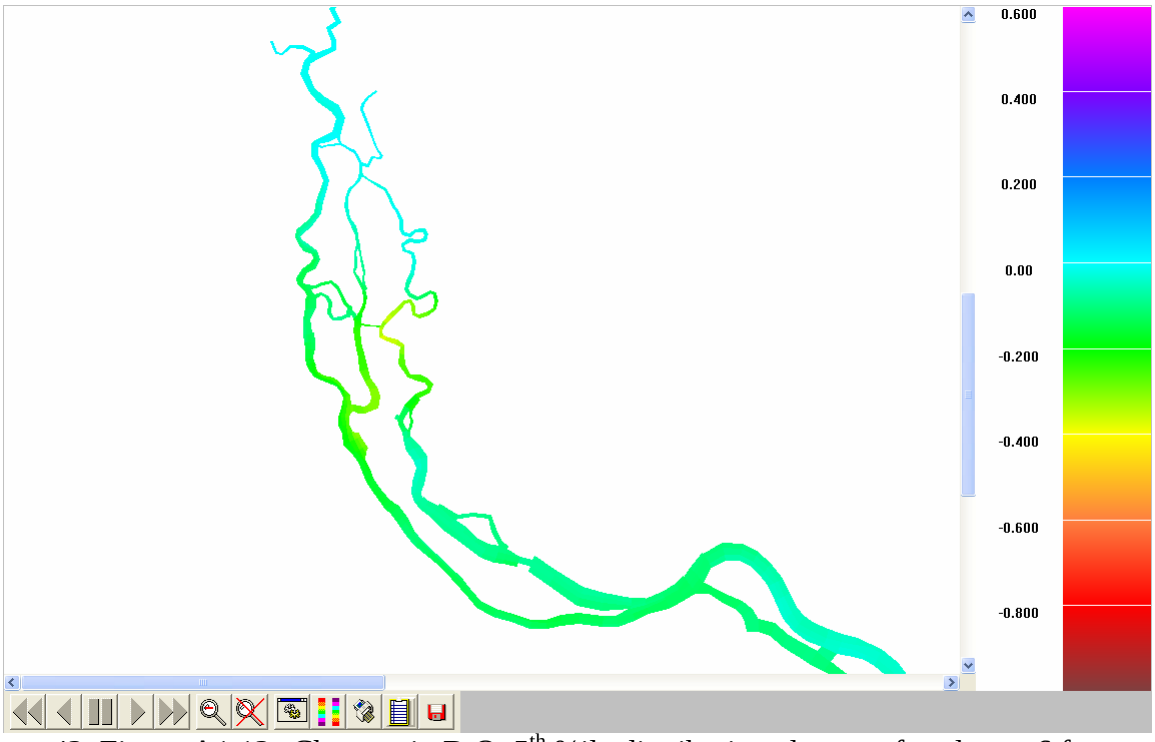
39. Figure A1.9. Changes in Salinity 5th %ile distribution along bottom layer: 6 ft deepening



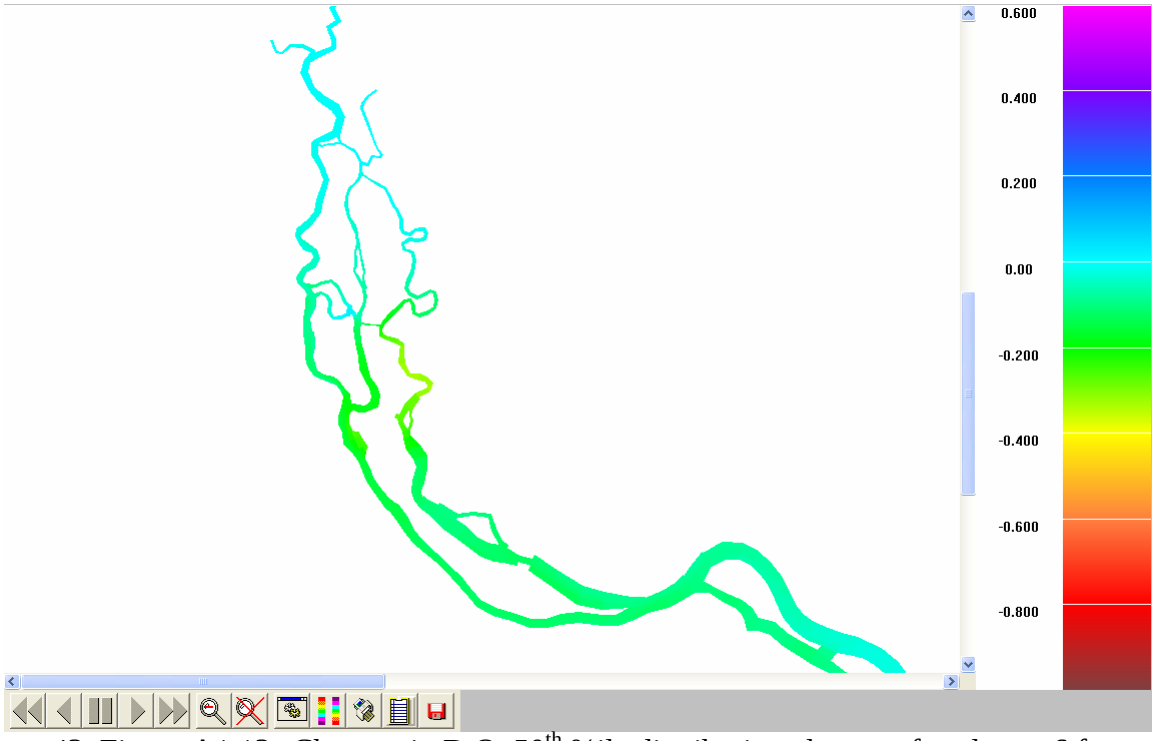
40. Figure A1.10. Changes in Salinity 50th %ile distribution along bottom layer: 6 ft deepening



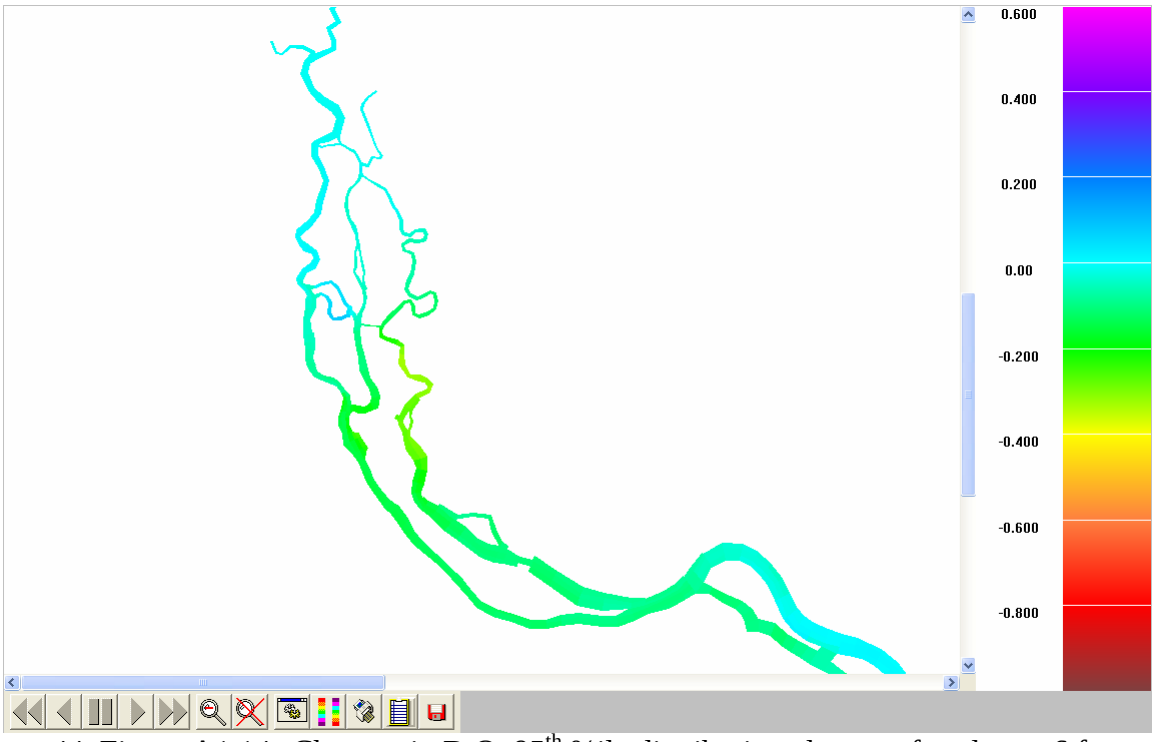
41. Figure A1.11. Changes in Salinity 95th %ile distribution along bottom layer: 6 ft deepening



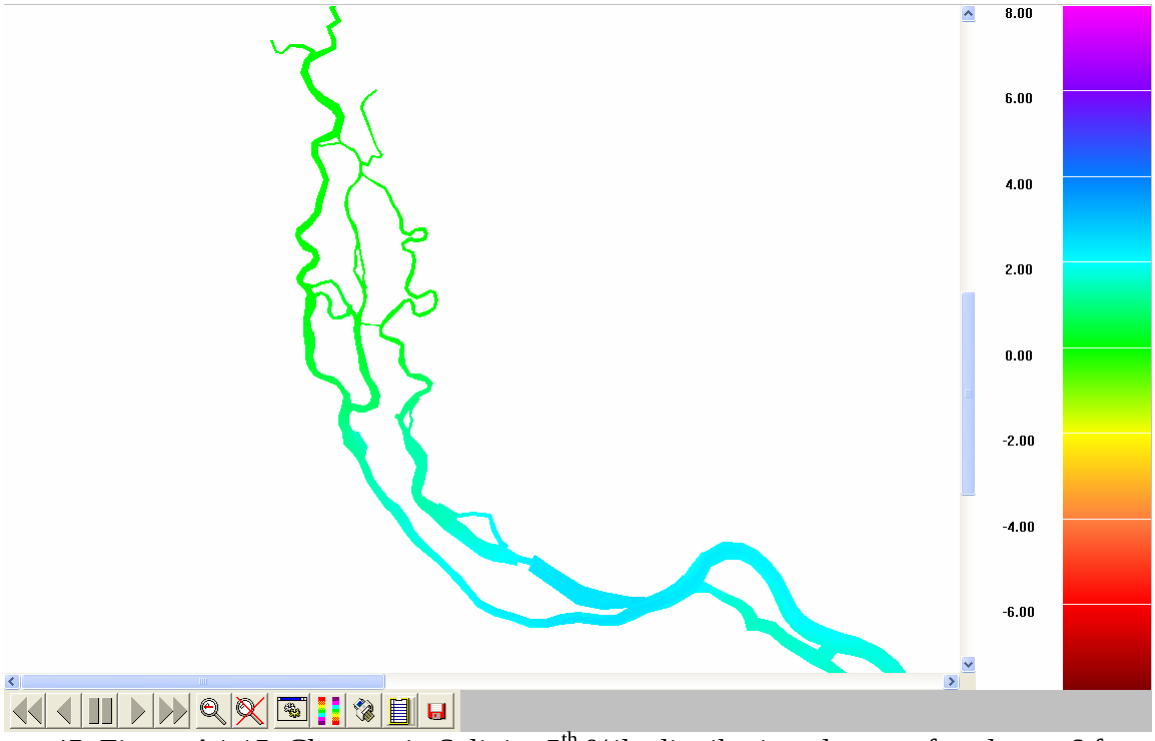
42. Figure A1.12. Changes in D.O. 5th %ile distribution along surface layer: 6 ft deepening



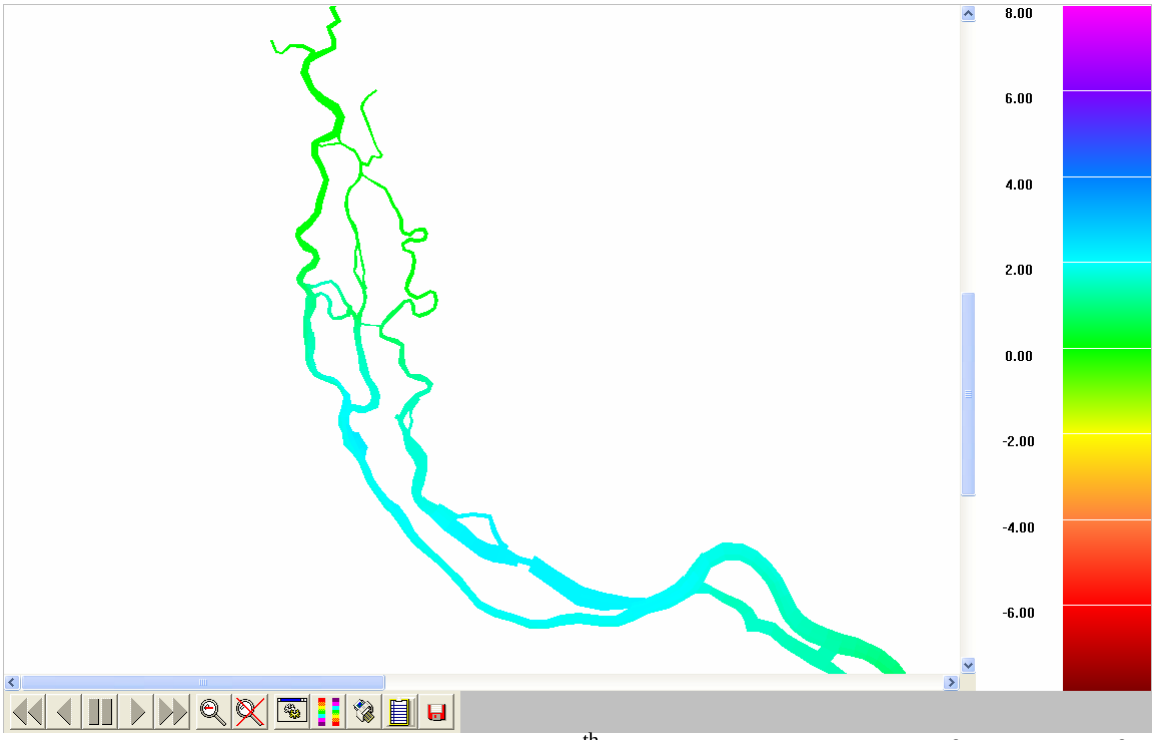
43. Figure A1.13. Changes in D.O. 50th %ile distribution along surface layer: 6 ft deepening



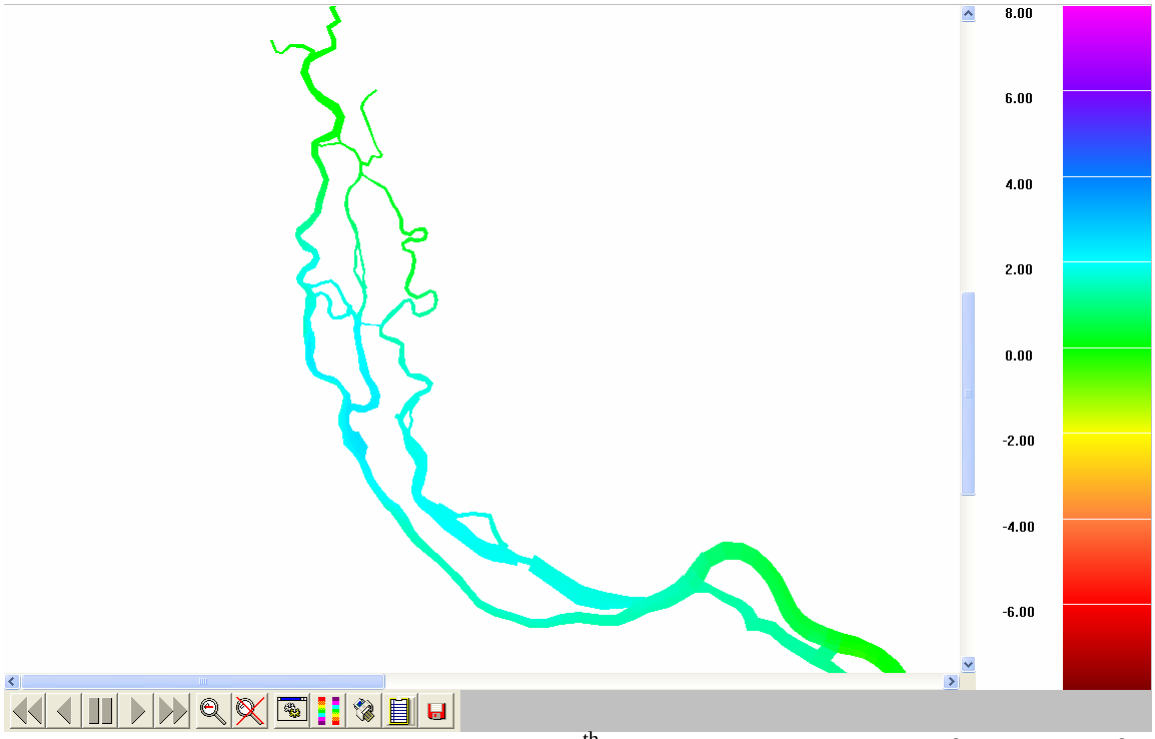
44. Figure A1.14. Changes in D.O. 95th %ile distribution along surface layer: 6 ft deepening



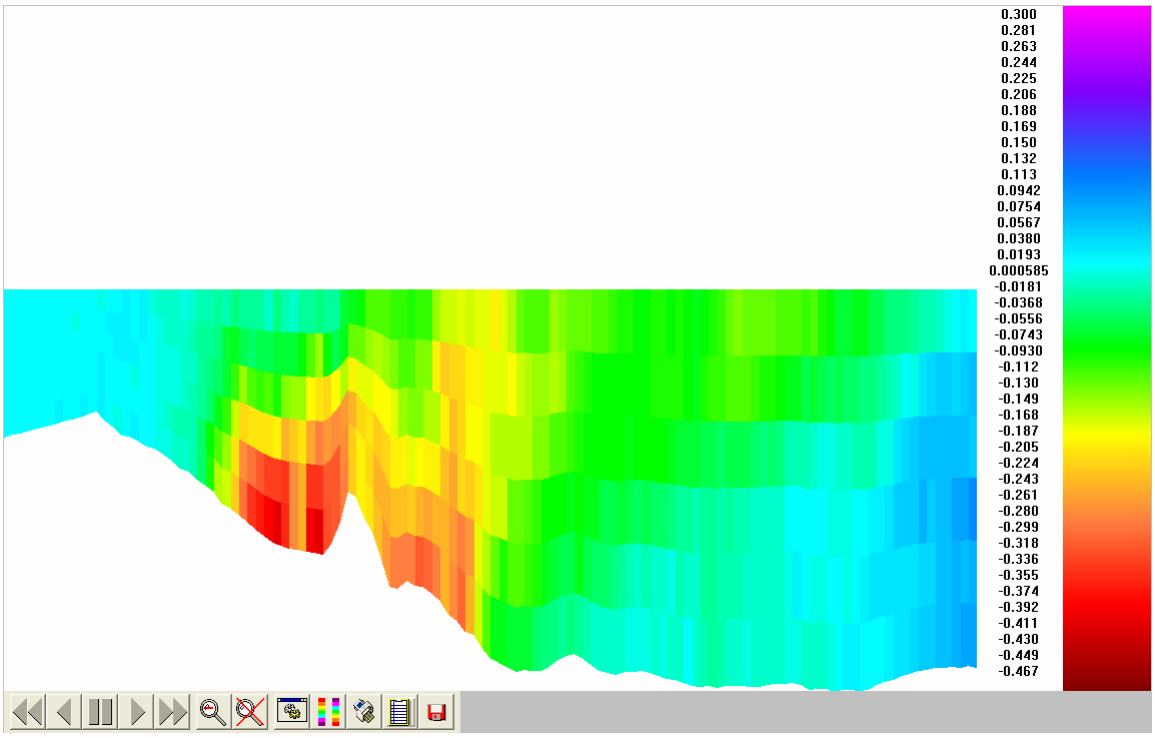
45. Figure A1.15. Changes in Salinity 5th %ile distribution along surface layer: 6 ft deepening



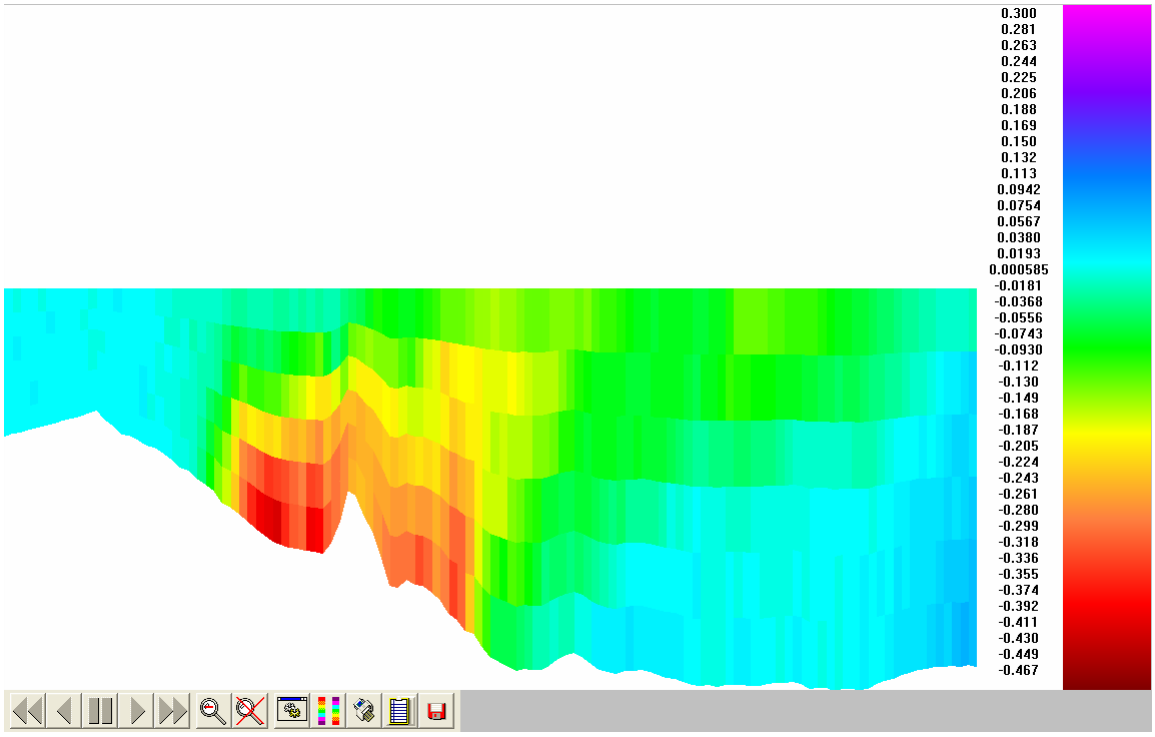
46. Figure A1.16. Changes in Salinity 50th %ile distribution along surface layer: 6 ft deepening



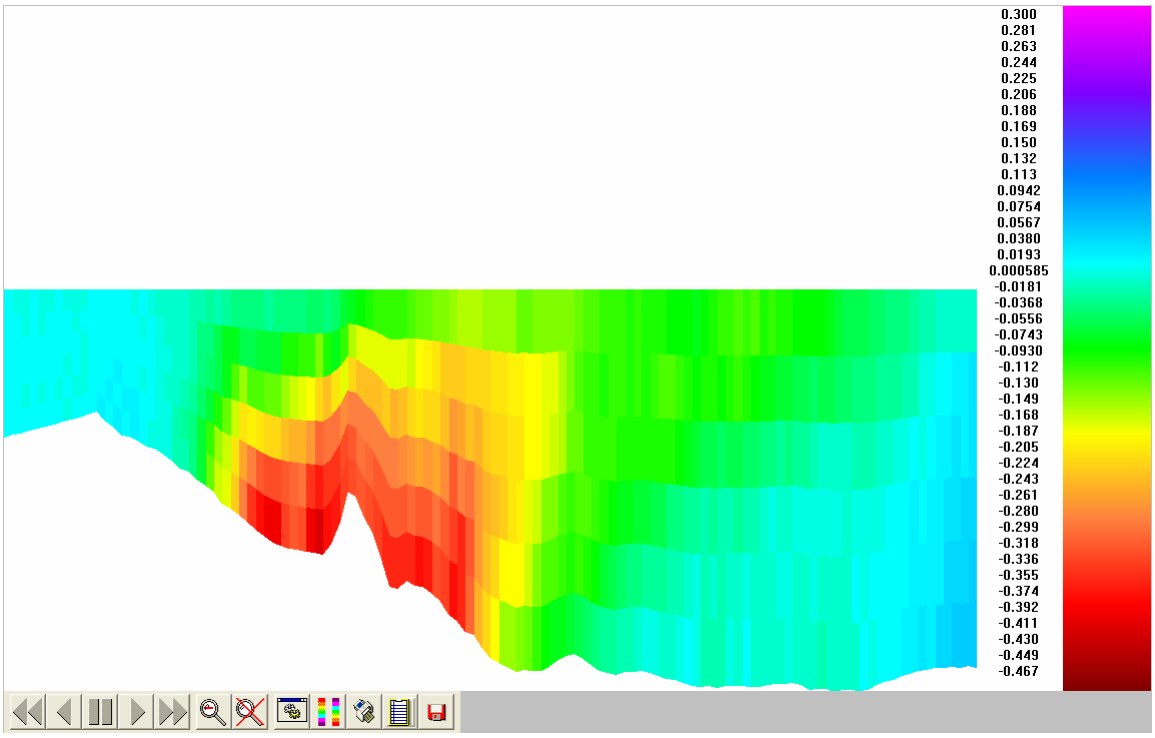
47. Figure A1.17. Changes in Salinity 95th %ile distribution along surface layer: 6 ft deepening



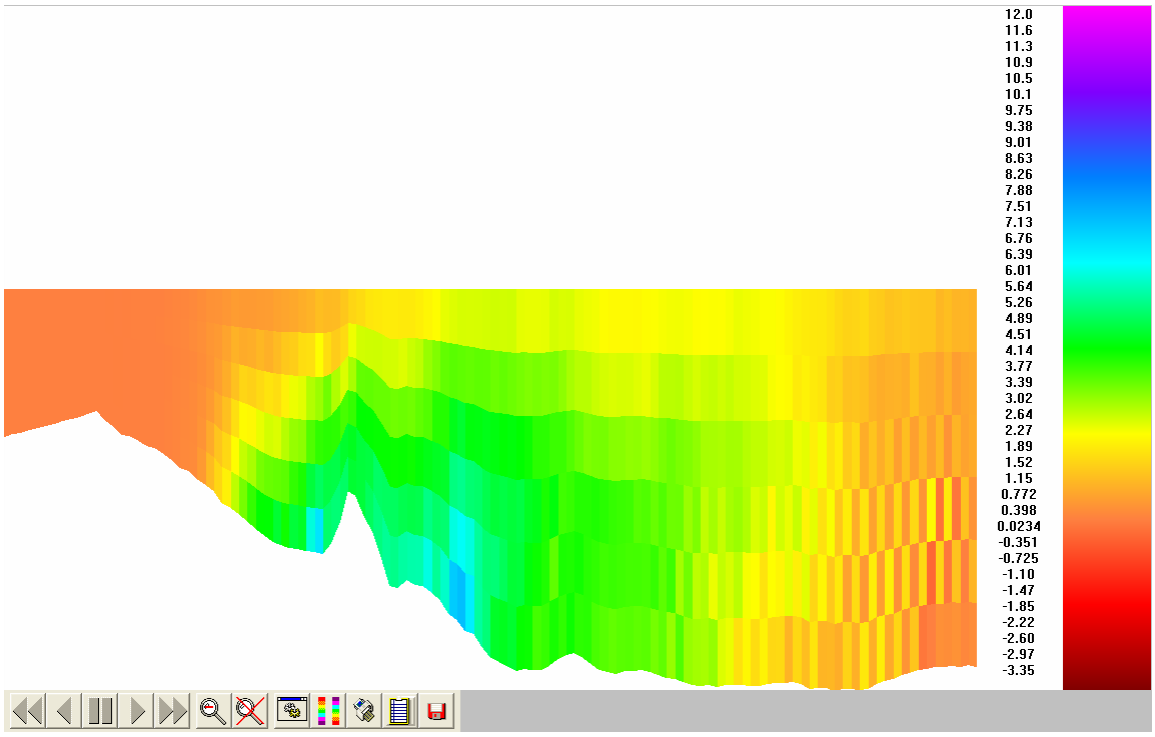
48. Figure A1.18. Snapshot of changes in 1-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 6 ft deepening



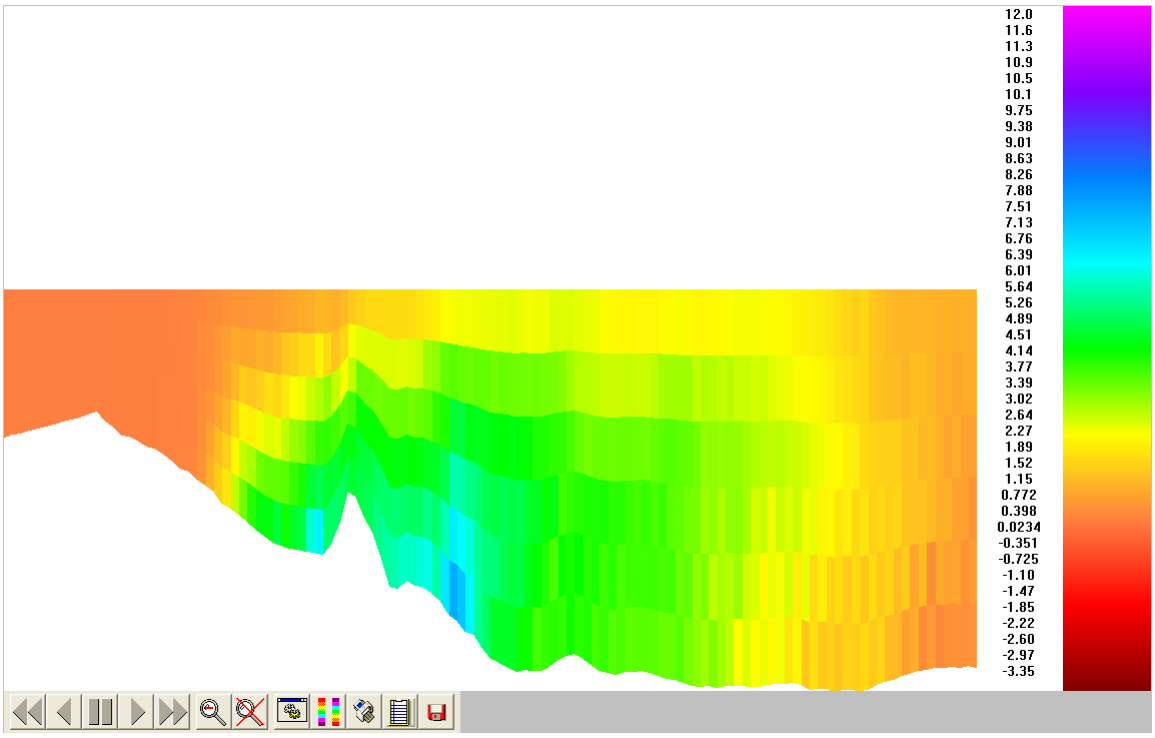
49. Figure A1.19. Snapshot of changes in 7-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 6 ft deepening



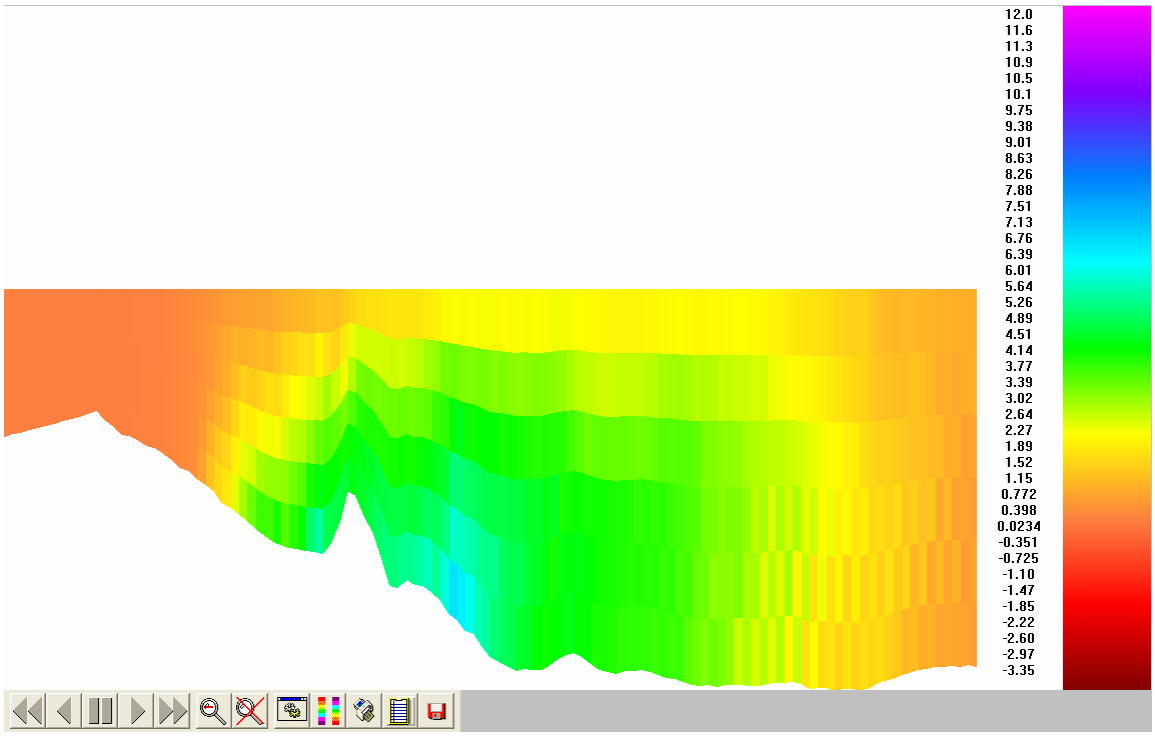
50. Figure A1.20. Snapshot of changes in 30-days averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 6 ft deepening



51. Figure A1.21. Snapshot of changes in 1-day averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 6 ft deepening



52. Figure A1.22. Snapshot of changes in 7-days averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 6 ft deepening



53. Figure A1.23. Snapshot of changes in 30-days averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 6 ft deepening

Appendix A2

BASIC EVALUATION: 4 ft DEEPENING BATHYMETRY, 2004 POINT SOURCES LOADS, 1999 HYDROLOGICAL AND METEOROLOGICAL CONDITIONS

May 1 – October 30, 1999 Simulation Period

Water Quality Review Group

1. Table A2.1. Dissolved oxygen percentiles distribution in Critical cells

Zone	D.O. Percentile (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.44	3.62	3.72	3.92	4.27	4.71	4.97	5.18	5.55
FR2	2.76	3.01	3.13	3.38	3.75	4.17	4.52	4.68	4.97
FR3	2.47	2.71	2.82	3.05	3.48	3.91	4.24	4.38	4.71
FR4	2.42	2.68	2.79	3.02	3.45	3.87	4.2	4.35	4.68
FR5	2.45	2.67	2.8	3.09	3.47	3.86	4.2	4.36	4.64
FR6	2.47	2.7	2.84	3.16	3.49	3.91	4.28	4.46	4.74
FR7	2.68	2.89	3.08	3.43	3.77	4.19	4.5	4.69	5.02
FR8	2.95	3.24	3.46	3.87	4.4	4.89	5.27	5.45	5.79
FR9	3.12	3.39	3.55	3.93	4.39	4.9	5.27	5.43	5.73
FR10	2.33	3.13	3.38	3.92	4.6	5.24	5.63	5.81	6.05
FR11	2.18	2.78	3.17	3.64	4.23	4.86	5.4	5.62	5.95
MR1	2.57	2.87	3.07	3.43	3.77	4.1	4.44	4.61	4.85
MR2	2.18	2.56	2.85	3.28	3.7	4.06	4.38	4.6	4.85
MR3	2.06	2.43	2.73	3.2	3.64	4.02	4.36	4.59	4.82
MR4	2.06	2.43	2.61	3.05	3.45	3.8	4.13	4.32	4.61
MR5	0.43	1	1.4	2.25	3.7	5.13	5.58	5.73	5.98
MR6	1.07	1.71	2.15	3.07	4.43	5.33	5.71	5.9	6.18
LBR1	2.58	3.31	3.53	3.99	4.33	4.63	4.93	5.1	5.38
LBR2	2.5	2.68	2.82	3.29	3.57	3.83	4.14	4.29	4.48
LBR3	1.4	1.94	2.18	2.7	3.28	3.76	4.17	4.38	4.73
BR1	2.01	2.24	2.43	2.79	3.22	3.65	4.03	4.24	4.49
BR2	1.4	1.75	2.03	2.46	2.96	3.38	3.78	4.04	4.35
BR3	1.72	2.05	2.24	2.58	3.07	3.47	3.81	4.04	4.39
SCH1	1.39	1.68	1.93	2.51	3.26	4.01	4.59	4.9	5.23
SCH2	3.06	3.28	3.43	3.66	4	4.42	4.76	4.94	5.25
SR	2.25	2.53	2.96	3.6	3.86	4.2	4.5	4.65	4.91

2. Table A2.2. Delta of Dissolved Oxygen percentiles distribution in Critical cells: Deepening scenario minus Existing bathymetry scenario

Zone	Delta D.O. Percentile																	
	1%		5%		10%		25%		50%		75%		90%		95%		99	
	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%
FR1	0.01	0.3	0.01	0.3	0	0.0	-0.03	-0.8	-0.02	-0.5	-0.01	-0.2	-0.03	-0.6	-0.02	-0.4	-0.02	-0.4
FR2	0.02	0.7	0.02	0.7	0.02	0.6	-0.01	-0.3	0.01	0.3	0.01	0.2	0	0.0	0.01	0.2	0	0.0
FR3	0.02	0.8	0.02	0.7	0.01	0.4	0	0.0	-0.02	-0.6	0	0.0	-0.02	-0.5	-0.03	-0.7	0	0.0
FR4	-0.09	-3.6	-0.06	-2.2	-0.06	-2.1	-0.08	-2.6	-0.07	-2.0	-0.04	-1.0	-0.05	-1.2	-0.08	-1.8	-0.03	-0.6
FR5	-0.05	-2.0	-0.02	-0.7	0.02	0.7	-0.01	-0.3	-0.03	-0.9	-0.01	-0.3	-0.03	-0.7	-0.05	-1.1	0.02	0.4
FR6	-0.07	-2.8	-0.04	-1.5	0.03	1.1	0.01	0.3	-0.02	-0.6	0.02	0.5	-0.02	-0.5	-0.02	-0.4	0.05	1.1
FR7	-0.45	-14.4	-0.52	-15.2	-0.51	-14.2	-0.52	-13.2	-0.65	-14.7	-0.68	-14.0	-0.71	-13.6	-0.76	-13.9	-1.01	-16.7
FR8	-0.25	-7.8	-0.28	-8.0	-0.23	-6.2	-0.24	-5.8	-0.29	-6.2	-0.22	-4.3	-0.15	-2.8	-0.16	-2.9	-0.11	-1.9
FR9	-0.27	-8.0	-0.25	-6.9	-0.29	-7.6	-0.3	-7.1	-0.35	-7.4	-0.3	-5.8	-0.19	-3.5	-0.18	-3.2	-0.15	-2.6
FR10	0.04	1.7	0	0.0	0	0.0	0	0.0	0.01	0.2	0	0.0	-0.02	-0.4	-0.01	-0.2	0.02	0.3
FR11	0.01	0.5	0	0.0	0.02	0.6	0.01	0.3	0.01	0.2	0.01	0.2	0	0.0	0	0.0	0.01	0.2
MR1	-0.01	-0.4	-0.12	-4.0	-0.11	-3.5	-0.12	-3.4	-0.16	-4.1	-0.15	-3.5	-0.14	-3.1	-0.14	-2.9	-0.13	-2.6
MR2	-0.02	-0.9	0	0.0	-0.06	-2.1	-0.09	-2.7	-0.12	-3.1	-0.15	-3.6	-0.15	-3.3	-0.14	-3.0	-0.15	-3.0
MR3	-0.02	-1.0	-0.02	-0.8	-0.03	-1.1	-0.08	-2.4	-0.1	-2.7	-0.15	-3.6	-0.14	-3.1	-0.14	-3.0	-0.15	-3.0
MR4	0.01	0.5	-0.01	-0.4	-0.02	-0.8	0	0.0	-0.03	-0.9	-0.03	-0.8	-0.05	-1.2	-0.04	-0.9	-0.07	-1.5
MR5	-0.02	-4.4	0.01	1.0	0.01	0.7	0.04	1.8	0.07	1.9	0.01	0.2	0.01	0.2	0	0.0	0.01	0.2
MR6	0.02	1.9	0.05	3.0	0.04	1.9	0.04	1.3	0.01	0.2	0.03	0.6	0	0.0	0.01	0.2	0.01	0.2
LBR1	-0.09	-3.4	0.02	0.6	0.03	0.9	0.03	0.8	0.02	0.5	0.03	0.7	0.01	0.2	0	0.0	-0.05	-0.9
LBR2	0.4	19.0	0.35	15.0	0.31	12.4	0.31	10.4	0.24	7.2	0.19	5.2	0.2	5.1	0.16	3.9	0.05	1.1
LBR3	0.06	4.5	0.19	10.9	0.14	6.9	0.14	5.5	0.15	4.8	0.13	3.6	0.19	4.8	0.2	4.8	0.17	3.7
BR1	0.01	0.5	0.01	0.4	0.02	0.8	0.01	0.4	0.01	0.3	0.02	0.6	0.02	0.5	0.02	0.5	0.01	0.2
BR2	0.03	2.2	0.14	8.7	0.2	10.9	0.26	11.8	0.18	6.5	0.19	6.0	0.21	5.9	0.26	6.9	0.2	4.8
BR3	0.03	1.8	0.02	1.0	0.02	0.9	0.02	0.8	0.01	0.3	0	0.0	0.02	0.5	-0.01	-0.2	0	0.0
SCH1	0.1	7.8	0.03	1.8	0.01	0.5	0.02	0.8	-0.05	-1.5	-0.09	-2.2	-0.07	-1.5	-0.08	-1.6	-0.09	-1.7
SCH2	-0.02	-0.6	-0.03	-0.9	-0.02	-0.6	-0.03	-0.8	-0.04	-1.0	-0.02	-0.5	-0.01	-0.2	-0.02	-0.4	0	0.0
SR	0.01	0.4	0.01	0.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.01	0.2	0	0.0

3. Table A2.3. Dissolved oxygen percentiles distribution in Zones of Savannah Estuary

Zone Name	D.O. Concentration Percentiles (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.83	3.97	4.04	4.24	4.60	5.01	5.27	5.45	5.76
FR2	3.23	3.47	3.57	3.78	4.12	4.54	4.83	4.97	5.29
FR3	2.78	3.01	3.12	3.34	3.70	4.12	4.46	4.61	4.90
FR4	2.47	2.72	2.87	3.11	3.49	3.91	4.23	4.42	4.70
FR5	2.47	2.69	2.81	3.07	3.46	3.85	4.20	4.36	4.64
FR6	2.57	2.77	2.87	3.14	3.52	3.89	4.25	4.40	4.64
FR7	2.81	3.05	3.26	3.62	4.04	4.52	4.91	5.09	5.45
FR8	3.08	3.34	3.55	3.95	4.39	4.86	5.17	5.35	5.65
FR9	3.62	3.93	4.15	4.53	4.97	5.37	5.65	5.81	6.04
FR10	4.00	4.48	4.68	4.96	5.24	5.51	5.76	5.89	6.12
FR11	2.63	3.19	3.57	3.96	4.30	4.63	4.95	5.13	5.38
MR1	2.70	2.93	3.09	3.46	3.78	4.09	4.43	4.62	4.83
MR2	2.34	2.74	2.96	3.36	3.72	4.06	4.40	4.58	4.81
MR3	2.09	2.33	2.65	3.10	3.52	3.94	4.28	4.50	4.81
MR4	2.73	2.94	3.17	3.58	3.91	4.21	4.50	4.66	4.87
MR5	1.08	1.50	1.91	2.76	4.15	5.09	5.51	5.67	5.94
MR6	1.11	1.73	2.18	3.14	4.47	5.29	5.67	5.85	6.12
LBR1	2.89	3.05	3.20	3.65	3.92	4.17	4.48	4.62	4.77
LBR2	2.05	2.27	2.50	2.92	3.30	3.61	3.89	4.09	4.31
LBR3	1.88	2.01	2.13	2.60	3.09	3.40	3.74	3.88	4.21
BR1	2.42	2.55	2.66	2.96	3.37	3.77	4.16	4.34	4.60
BR2	1.96	2.18	2.31	2.63	3.08	3.50	3.88	4.08	4.34
BR3	1.97	2.13	2.26	2.62	3.06	3.44	3.82	4.04	4.29
SCh1	2.67	2.89	3.01	3.27	3.64	4.11	4.41	4.56	4.83
SCh2	3.33	3.48	3.58	3.78	4.09	4.50	4.81	4.98	5.28
SR	2.62	2.80	3.29	3.89	4.12	4.44	4.71	4.85	5.11

4. Table A2.4. Delta of Dissolved Oxygen percentiles distribution in Zones of Savannah Estuary: Deepening scenario minus Existing bathymetry scenario

Zone	Project - Baseline Difference (mg/l)									Project - Baseline Relative Difference (%)								
Name	1%	5%	10%	25%	50%	75%	90%	95%	99%	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	0.02	0.01	0.00	-0.01	0.00	0.00	-0.01	-0.03	-0.05	0.6	0.3	0.0	-0.2	0.1	0.1	-0.2	-0.5	-0.9
FR2	0.01	0.03	0.02	0.01	0.01	0.02	0.01	0.00	-0.01	0.2	0.8	0.6	0.3	0.3	0.4	0.2	0.1	-0.2
FR3	0.04	0.06	0.07	0.04	0.03	0.05	0.04	0.03	0.02	1.4	2.2	2.4	1.1	0.7	1.1	0.8	0.6	0.4
FR4	-0.03	-0.01	0.06	0.05	-0.01	0.04	-0.01	0.03	0.04	-1.1	-0.3	2.0	1.5	-0.1	0.9	-0.2	0.6	0.8
FR5	-0.08	-0.06	-0.03	-0.02	-0.05	-0.03	-0.07	-0.05	0.01	-3.0	-2.1	-0.9	-0.8	-1.4	-0.7	-1.7	-1.1	0.2
FR6	-0.11	-0.10	-0.08	-0.13	-0.13	-0.12	-0.13	-0.16	-0.10	-4.0	-3.6	-2.8	-3.9	-3.5	-2.9	-3.0	-3.5	-2.1
FR7	-0.22	-0.21	-0.20	-0.22	-0.27	-0.29	-0.22	-0.22	-0.17	-7.1	-6.6	-5.6	-5.7	-6.2	-6.1	-4.3	-4.2	-3.0
FR8	-0.24	-0.27	-0.25	-0.26	-0.28	-0.22	-0.18	-0.17	-0.12	-7.3	-7.5	-6.6	-6.1	-6.0	-4.3	-3.3	-3.1	-2.1
FR9	-0.30	-0.31	-0.29	-0.29	-0.23	-0.13	-0.11	-0.10	-0.10	-7.7	-7.2	-6.5	-5.9	-4.4	-2.4	-1.9	-1.6	-1.6
FR10	-0.01	-0.03	-0.02	-0.04	-0.04	-0.05	-0.04	-0.04	-0.04	-0.2	-0.6	-0.5	-0.8	-0.8	-0.9	-0.7	-0.6	-0.6
FR11	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.3
MR1	-0.09	-0.12	-0.13	-0.10	-0.16	-0.15	-0.14	-0.13	-0.11	-3.4	-3.9	-4.0	-2.8	-4.0	-3.6	-3.0	-2.7	-2.3
MR2	-0.02	-0.04	-0.09	-0.10	-0.14	-0.14	-0.13	-0.16	-0.14	-0.8	-1.6	-3.0	-2.8	-3.7	-3.4	-2.9	-3.3	-2.8
MR3	0.00	-0.02	-0.01	-0.03	-0.06	-0.09	-0.09	-0.09	-0.10	-0.1	-0.9	-0.5	-1.1	-1.8	-2.3	-2.2	-1.9	-2.1
MR4	-0.01	0.01	0.01	0.02	0.01	0.00	-0.01	-0.01	0.01	-0.2	0.3	0.4	0.5	0.3	0.0	-0.3	-0.3	0.2
MR5	0.01	0.04	0.03	0.03	0.01	0.01	0.01	0.01	0.02	1.3	2.9	1.9	1.0	0.4	0.3	0.2	0.2	0.4
MR6	0.00	0.05	0.05	0.04	0.01	0.02	0.01	0.01	0.01	0.4	2.7	2.3	1.3	0.3	0.3	0.1	0.1	0.1
LBR1	0.02	0.02	0.03	0.02	0.01	0.01	0.01	0.02	0.01	0.8	0.8	1.0	0.5	0.2	0.3	0.3	0.4	0.2
LBR2	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.7	0.4	0.5	0.1	0.2	0.3	0.0	0.0	0.3
LBR3	0.12	0.11	0.13	0.08	0.05	0.07	0.07	0.07	0.05	6.7	6.0	6.3	3.1	1.6	2.1	2.0	1.8	1.2
BR1	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.3	0.0	0.0	0.2	0.2	0.0	0.1	0.0	0.0
BR2	0.01	0.01	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.7	0.5	0.3	0.8	0.4	0.1	-0.1	0.1	0.1
BR3	0.05	0.03	0.02	0.04	0.00	0.00	0.01	0.01	-0.01	2.6	1.4	1.0	1.5	0.1	0.1	0.2	0.3	-0.2
SCh1	0.06	0.01	0.00	0.00	0.00	0.00	-0.03	-0.03	-0.01	2.5	0.5	0.0	0.0	-0.1	0.0	-0.6	-0.6	-0.1
SCh2	-0.01	0.00	0.00	-0.01	-0.01	-0.02	-0.02	-0.02	-0.01	-0.2	0.1	0.0	-0.3	-0.2	-0.4	-0.4	-0.4	-0.2
SR	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0

5. Table A2.5. Percentage of the volume of waters with violation of Dissolved Oxygen standards for Zones of Savannah Estuary within the period of May 1 – October 30, 1999: Deepening (Project) and Existing (Baseline) bathymetry

Zones	D.O. STANDARDS														
	1-Day Average			7-Day Average			30-Day Average			GA MINIMUM D.O.			SC MINIMUM D.O.		
	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B
FR1	0	0	0	0	0	0	0	0	0	0	0	0	7	6	-1
FR2	0	0	0	0	0	0	3	3	0	0	0	0	31	30	-1
FR3	0	0	0	2	2	0	19	18	-1	3	3	0	N/A	N/A	N/A
FR4	0	0	0	5	5	0	22	23	1	6	5	-1	N/A	N/A	N/A
FR5	0	0	0	4	6	2	19	22	3	5	6	1	N/A	N/A	N/A
FR6	0	0	0	2	4	2	12	19	7	4	5	1	N/A	N/A	N/A
FR7	0	0	0	0	0	0	1	2	1	0	1	1	N/A	N/A	N/A
FR8	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR9	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR10	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR11	0	0	0	0	0	0	2	2	0	1	1	0	6	6	0
MR1	0	0	0	0	1	1	5	7	2	1	2	1	N/A	N/A	N/A
MR2	0	0	0	1	2	1	6	8	2	1	2	1	N/A	N/A	N/A
MR3	0	0	0	3	3	0	10	11	1	3	4	1	N/A	N/A	N/A
MR4	0	0	0	1	1	0	5	5	0	2	2	0	N/A	N/A	N/A
MR5	0	0	0	1	1	0	5	5	0	5	5	0	11	11	0
MR6	0	0	0	0	0	0	3	3	0	3	3	0	9	8	-1
LBR1	0	0	0	1	1	0	6	6	0	1	1	0	18	18	0
LBR2	1	1	0	6	6	0	18	18	0	7	7	0	34	35	1
LBR3	3	2	-1	13	13	0	30	31	1	14	14	0	47	49	2
BR1	0	0	0	10	10	0	39	40	1	12	12	0	67	68	1
BR2	2	2	0	19	20	1	49	50	1	20	20	0	75	75	0
BR3	3	3	0	21	21	0	48	49	1	22	22	0	70	71	1
SCh1	1	1	0	4	3	-1	8	8	0	5	4	-1	N/A	N/A	N/A
SCh2	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
SR	0	0	0	1	1	0	3	3	0	1	1	0	6	6	0

26. Table A2.6. Percentage of water volumes with salinity in %iles within the period of May 1 – October 30, 1999

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	18.6	4.5	4.4	4.5	4.4	4.3	5.6	3.8	85.2
10	22.6	8.2	8.7	8.9	8.9	8.7	8.9	8.3	85.2
25	35	20	22.2	22.4	22.9	22.1	24.5	19.8	85.2
50	56.6	41.9	46.5	46.6	47.3	46.1	48	42.5	85.2
75	78.2	69.1	72.7	73	73.3	72.9	72.8	69.3	85.2
90	91	87.2	88.9	89.1	89.3	89.2	88.9	87.4	91.7
95	95.2	93.5	94.4	94.6	94.6	94.6	94.2	93.7	95.7
Total Volume 100*km3:	32610	658.2	4806.5	25.7	39.2	136.3	9.9	9.5	43.6

27. Table A2.7. Percentage of water volumes with D.O. in %iles within the period of May 1 – October 30, 1999

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	5.2	5	4.9	5.6	5.2	4.7	5.4	5.5	5.7
10	10.4	9.9	9.8	11.2	10.4	9.5	10.4	11	11
25	26.1	25	24.8	27.3	25.7	24.2	25.5	25.8	26.4
50	52	49.9	49.8	53.3	51	49.1	51.2	51.2	51.3
75	76.3	74.8	75.2	77.5	75.7	74.6	75.6	76.1	75.8
90	90.5	89.9	90.1	91.2	90.3	89.7	90.2	90.4	90.3
95	95	94.9	95	95.7	95.2	94.8	95.2	95.4	95.1
Total Volume 100*km3:	32610	658.2	4806.5	25.7	39.2	136.3	9.9	9.5	43.6

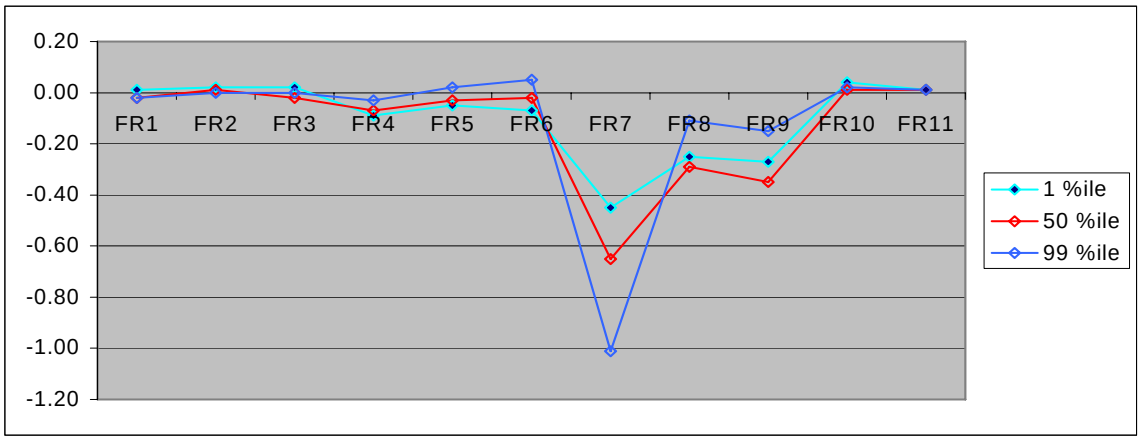
28. Table A2.8. Water volumes in Upper Harbor in increments of 1^{o} C of water temperature within the period of May 1 – October 30, 1999

Temperature C^{o}	Total Volume %
19	0.01
20	0.87
21	4.05
22	9.28
23	14.85
24	23.34
25	35.04
26	48.99
27	60.13
28	69.22
29	76.12
30	85.05
31	89.54
32	96.28
33	99.99
34	100

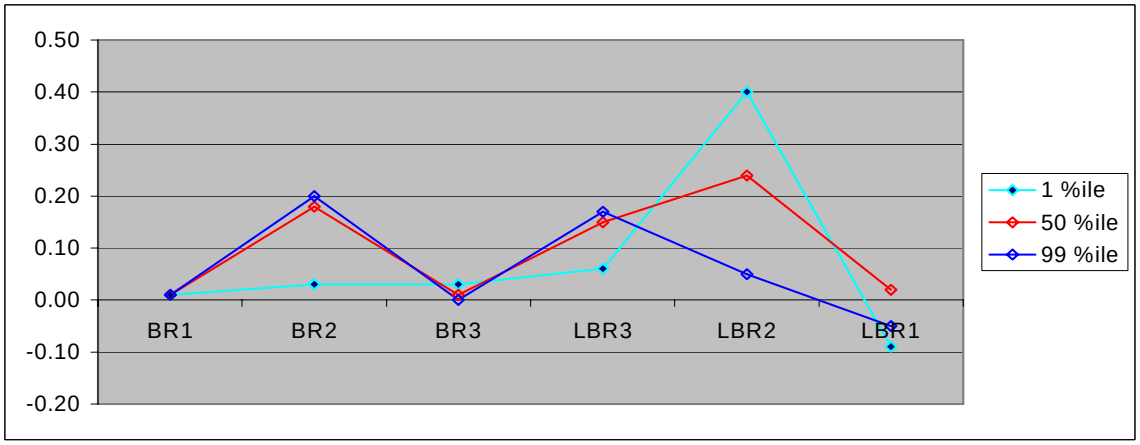
29. Table A2.9. Water volumes in Upper Harbor in increments of 0.1 mg/l of D.O. within the period of May 1 – October 30, 1999
(See file: Postprocessor Output\99-B14\99-B14_DO Increment Volume)

30. Table A2.10. Percentage of water volumes corresponding to 1-, 7-, and 30-days averages of D.O. depth-averaged concentrations in Upper Harbor within the period of May 1 – October 30, 1999
(See file: Postprocessor Output\99-B14\99-B14_volume DO in averages)

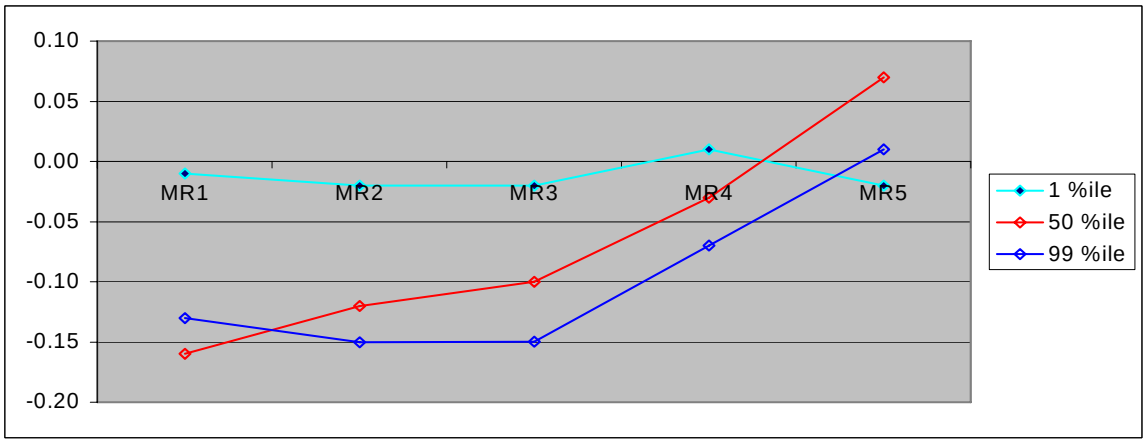
Front River



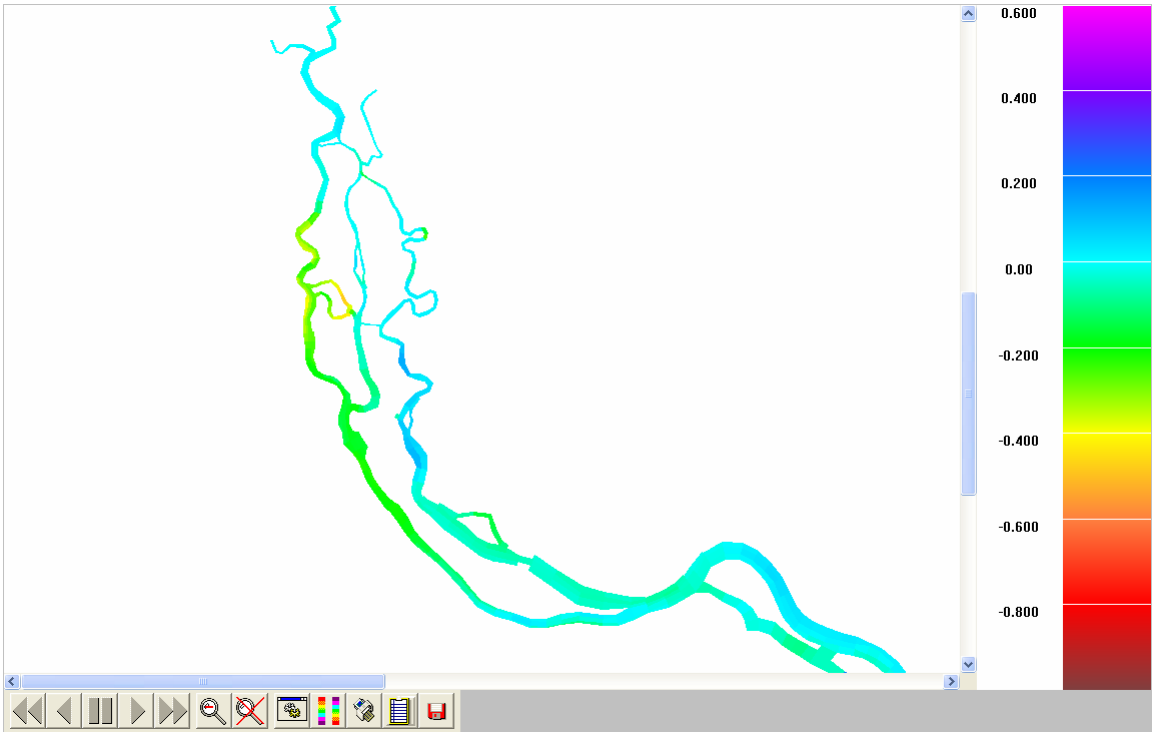
Back and Little Back Rivers



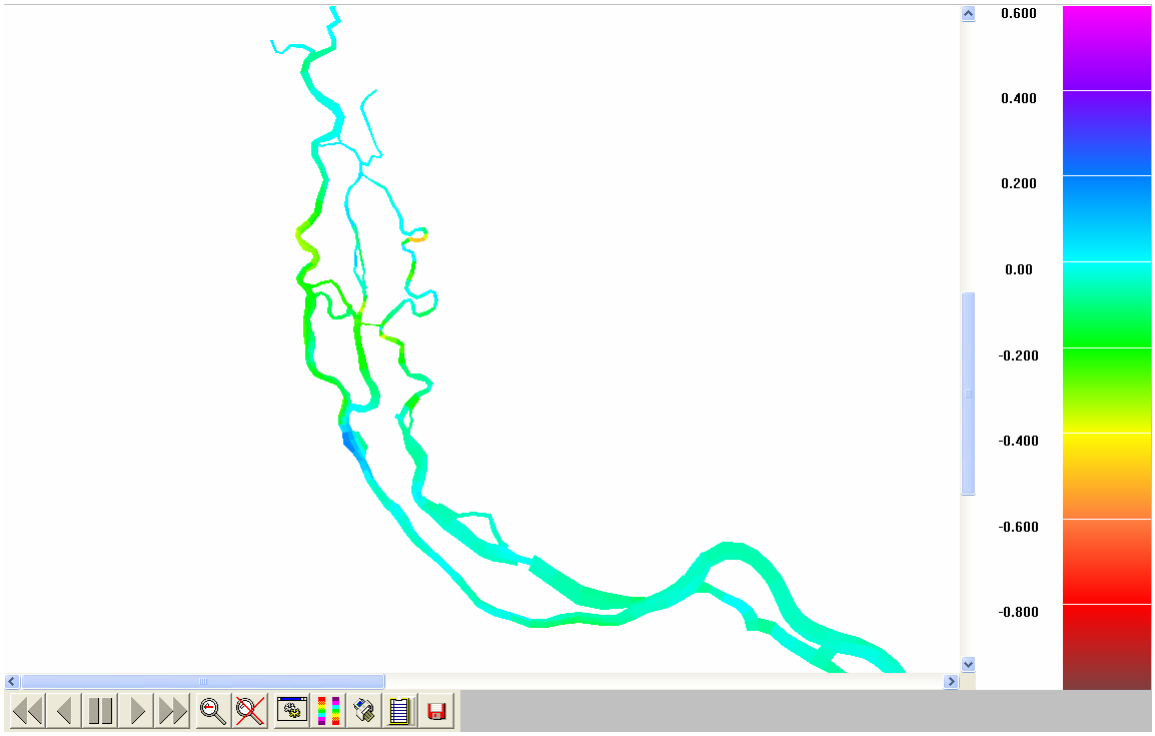
Middle River



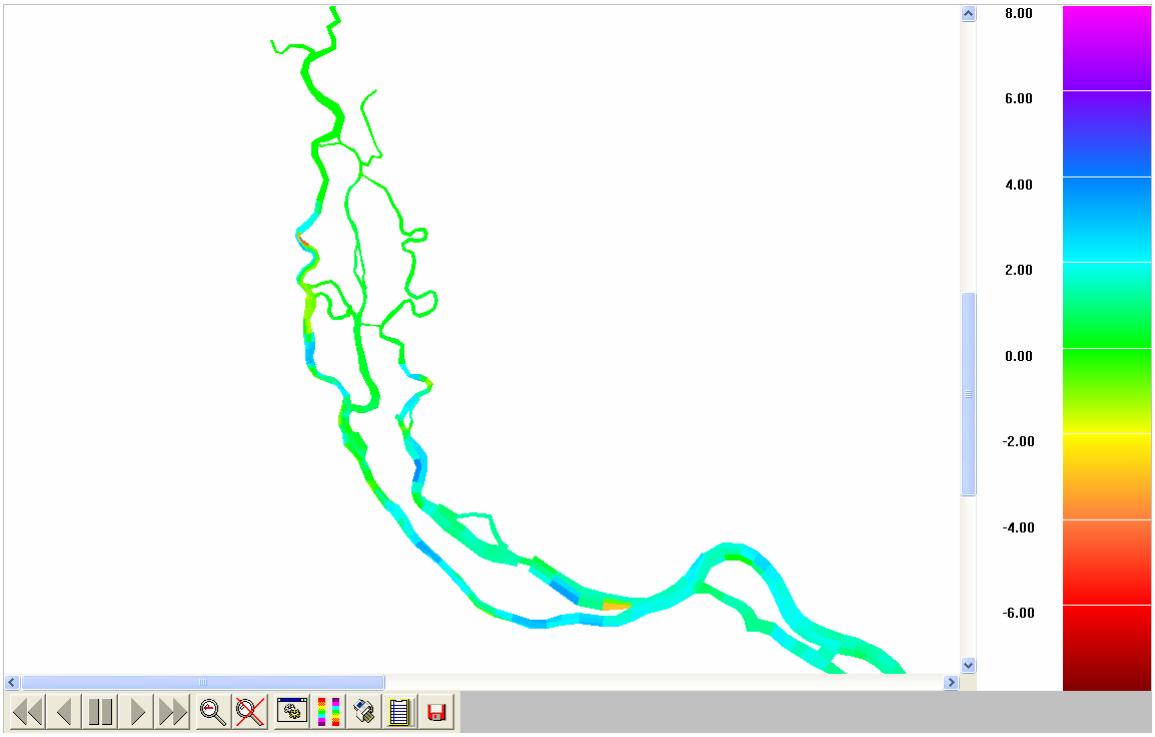
31. Figure A2.1. Changes in longitudinal profile of Dissolved Oxygen (mg/l) distribution along Critical cells of Savannah Estuary: 4 ft deepening



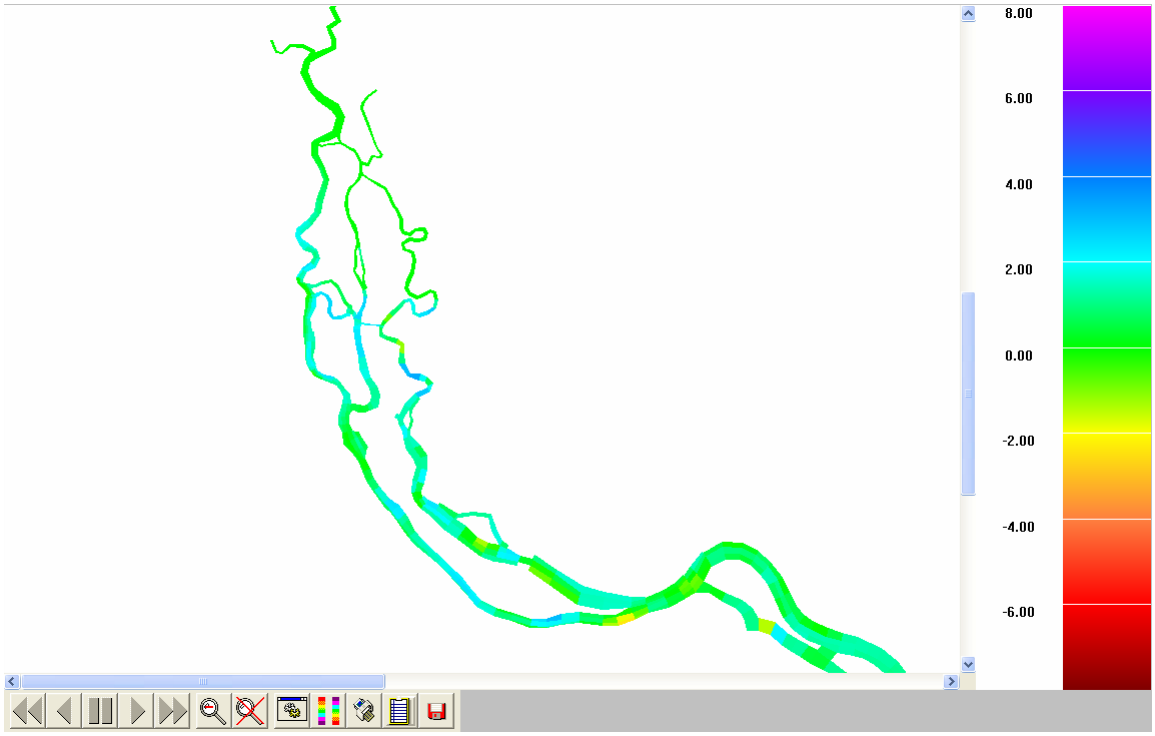
32. Figure A2.2. Changes in minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1999: 4 ft deepening



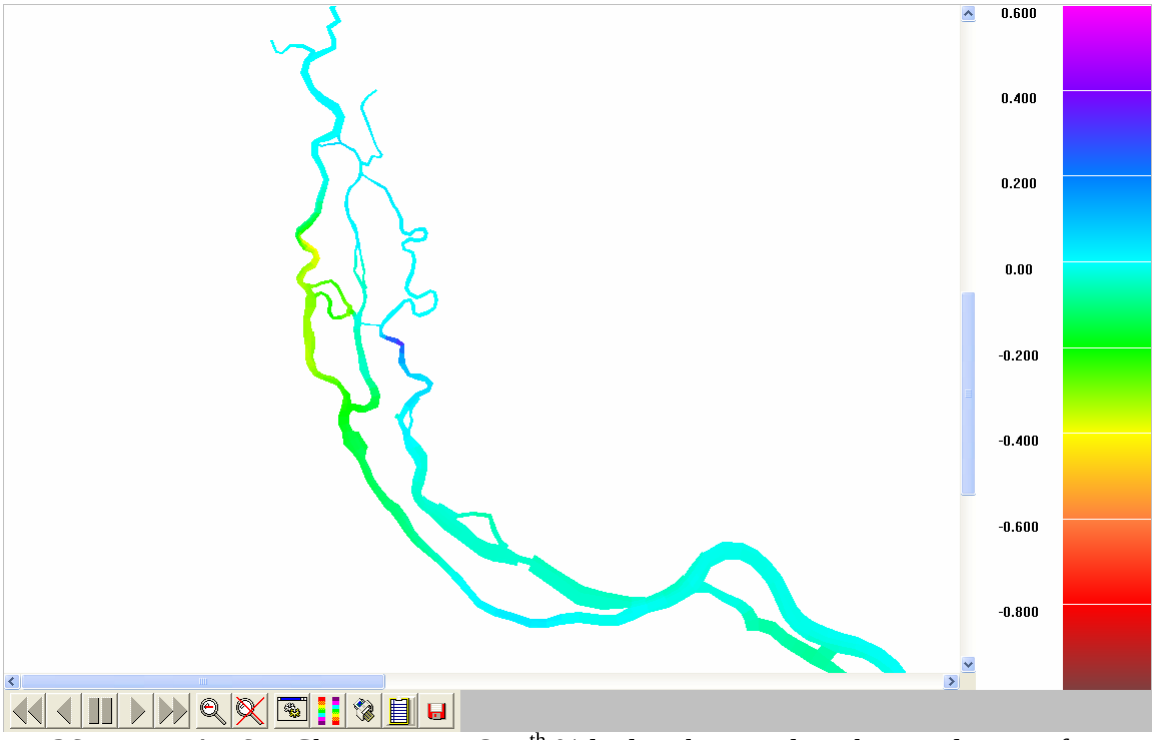
33. Figure A2.3. Changes in minimum D.O. distribution along surface layer within the analyzed period of May 1 - October 30, 1999: 4 ft deepening



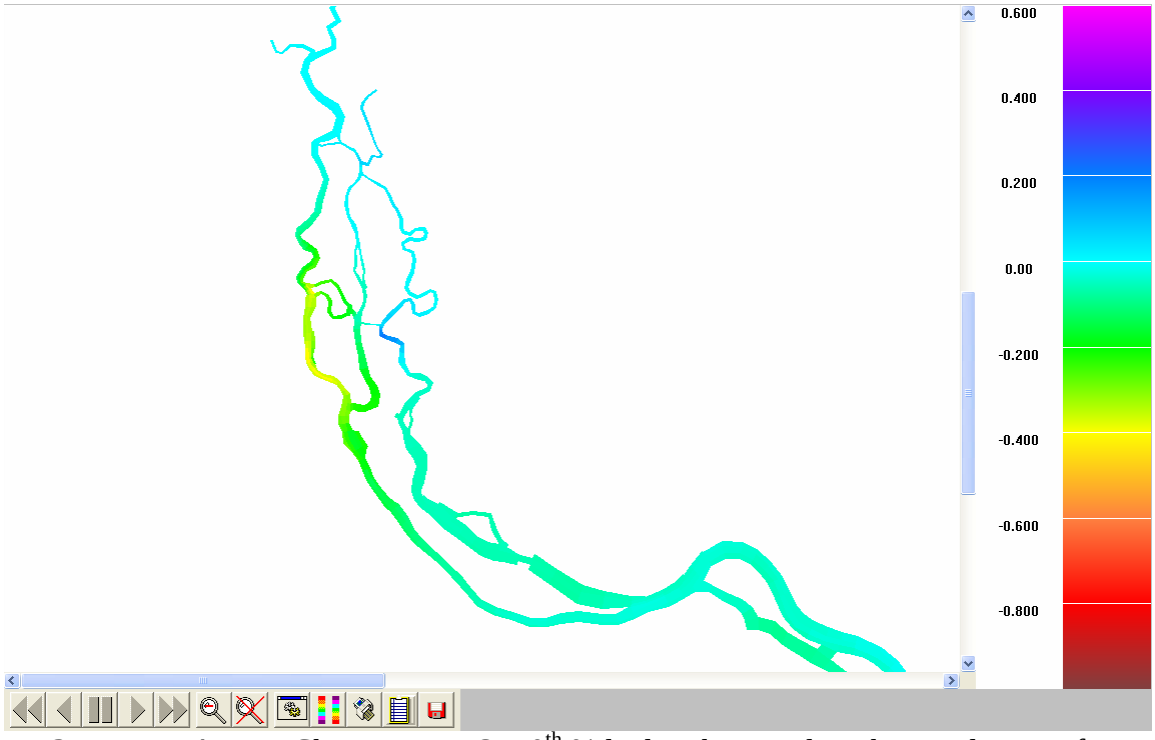
34. Figure A2.4. Changes in Salinity corresponded to Minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1999: 4 ft deepening



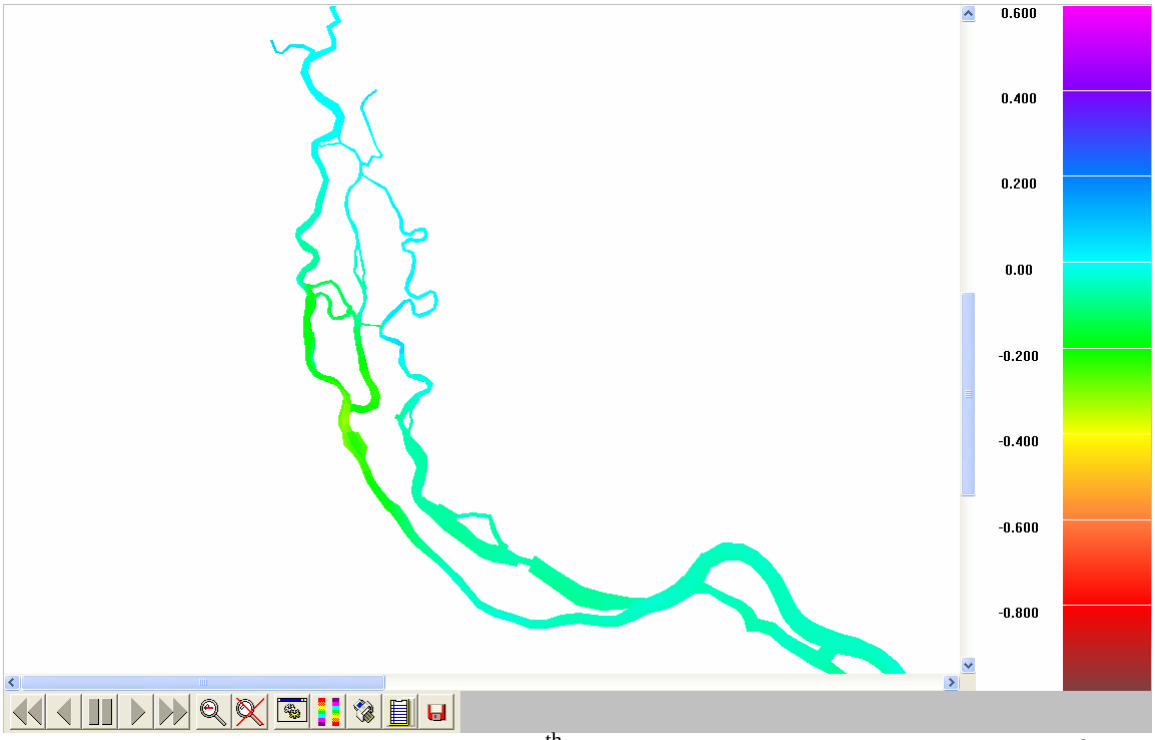
35. Figure A2.5. Changes in Salinity corresponded to Minimum D.O. distribution along Surface layer within the analyzed period of May 1 - October 30, 1999: 4 ft deepening



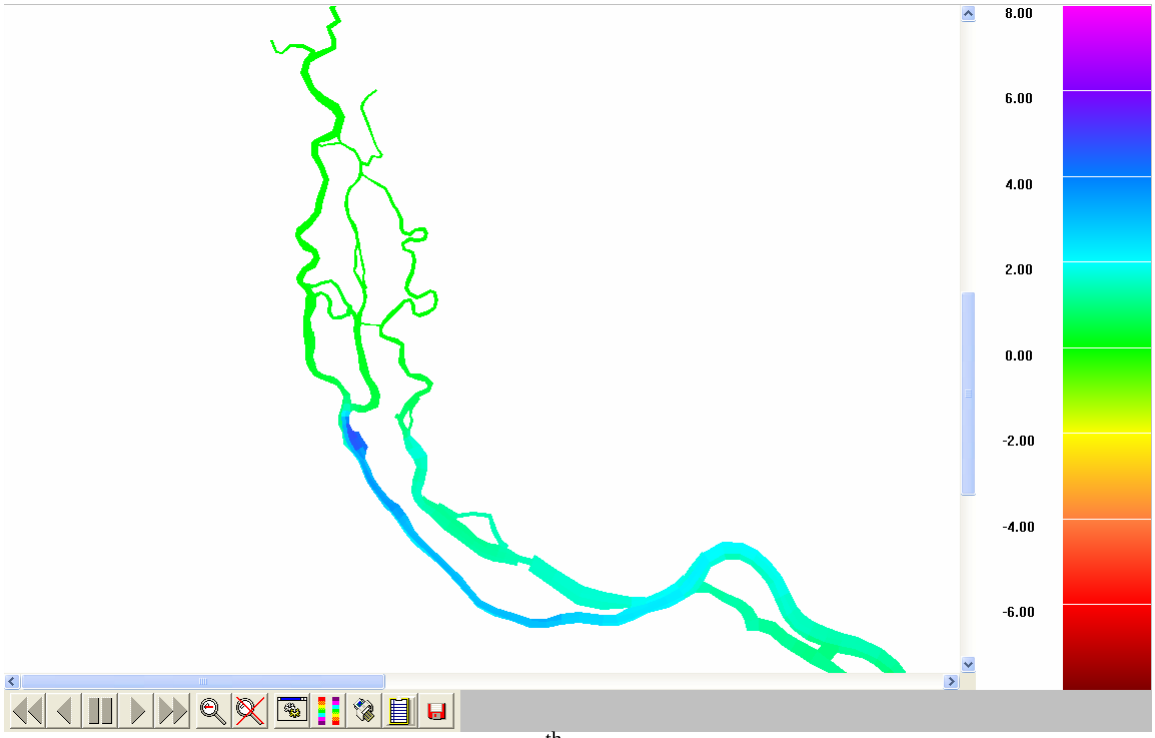
36. Figure A2.6. Changes in D.O. 5th %ile distribution along bottom layer: 4 ft deepening



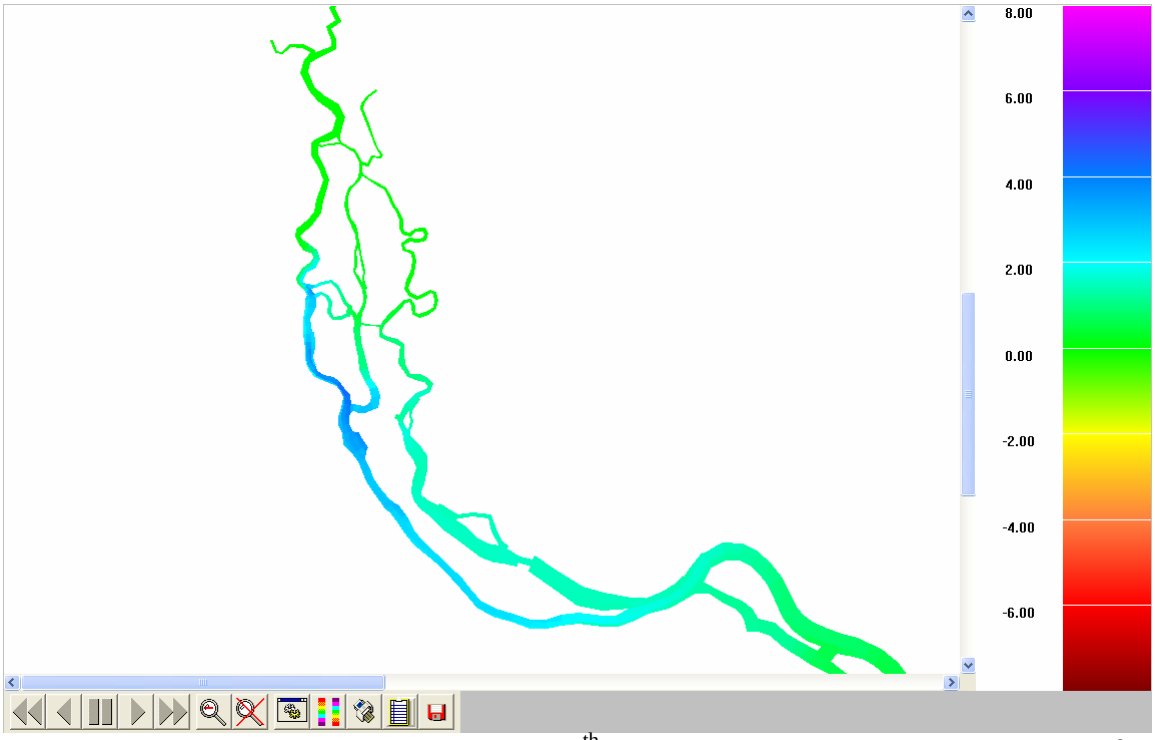
37. Figure A2.7. Changes in D.O. 50th %ile distribution along bottom layer: 4 ft deepening



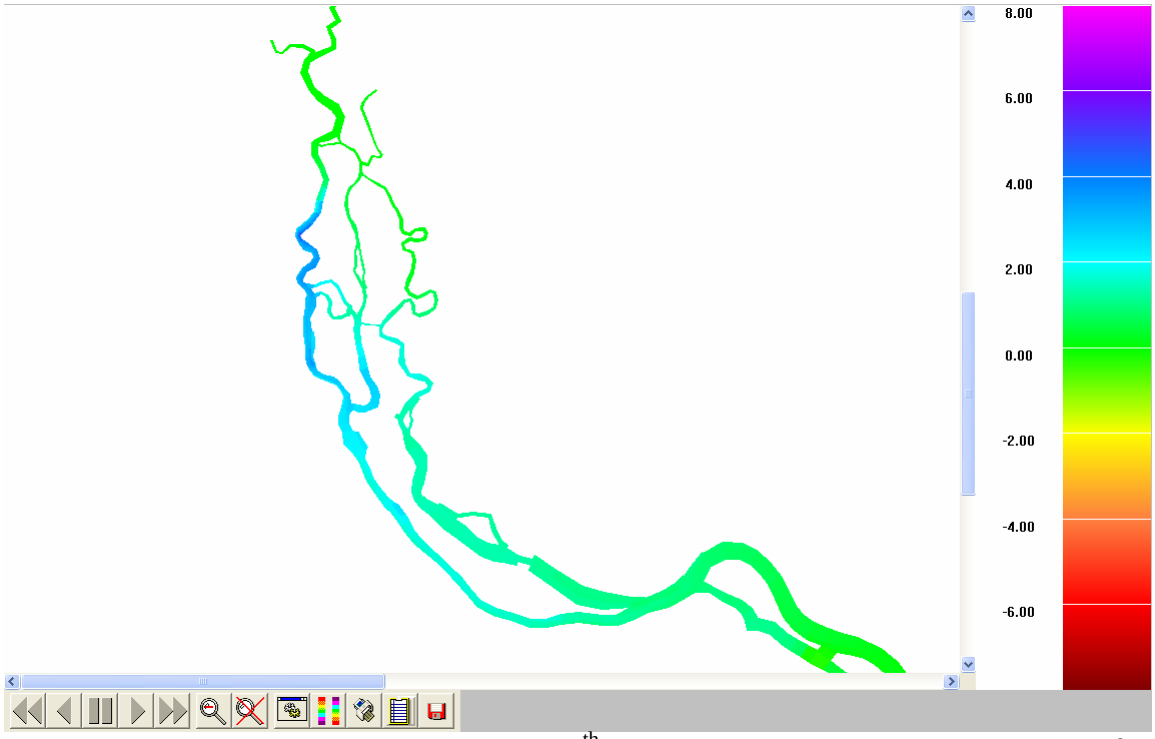
38. Figure A2.8. Changes in D.O. 95th %ile distribution along bottom layer: 4 ft deepening



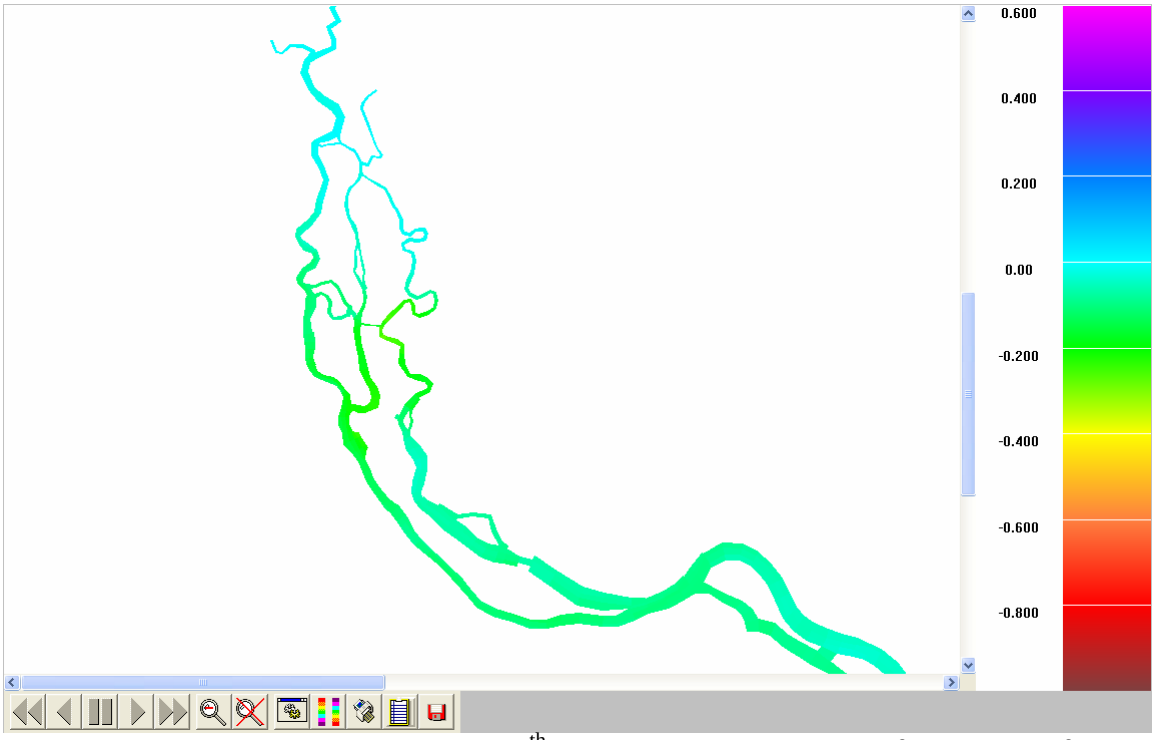
39. Figure A2.9. Changes in Salinity 5th %ile distribution along bottom layer: 4 ft deepening



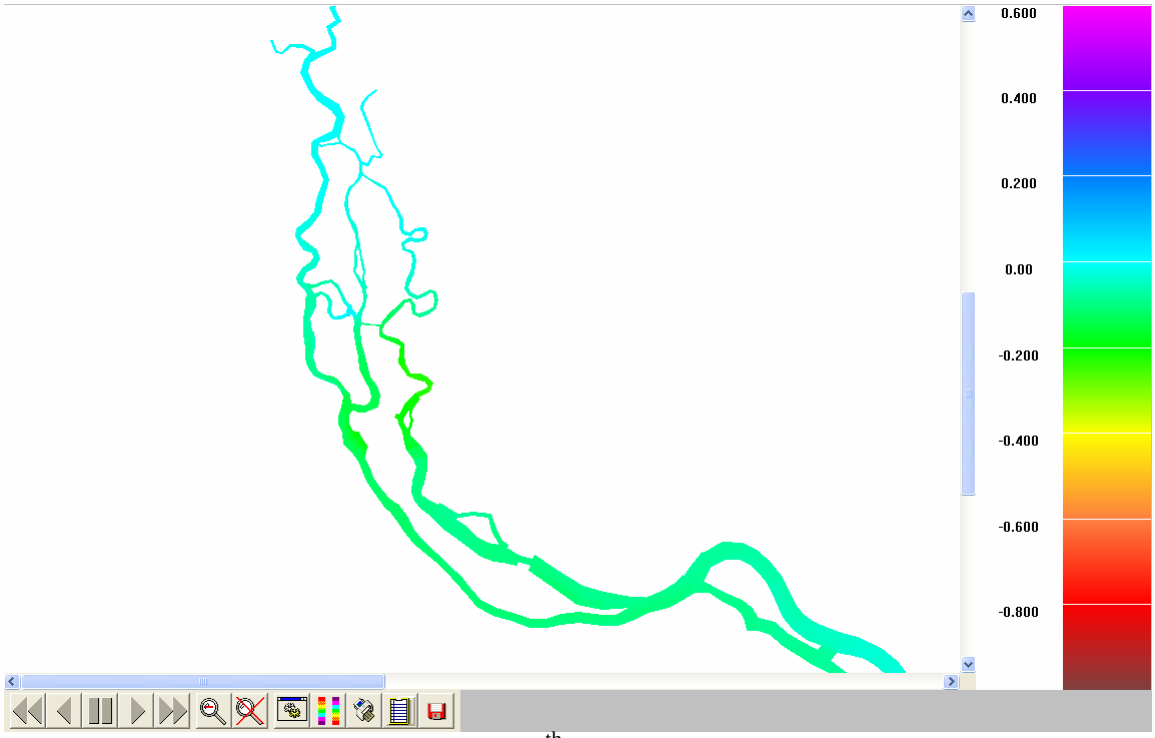
40. Figure A2.10. Changes in Salinity 50th %ile distribution along bottom layer: 4 ft deepening



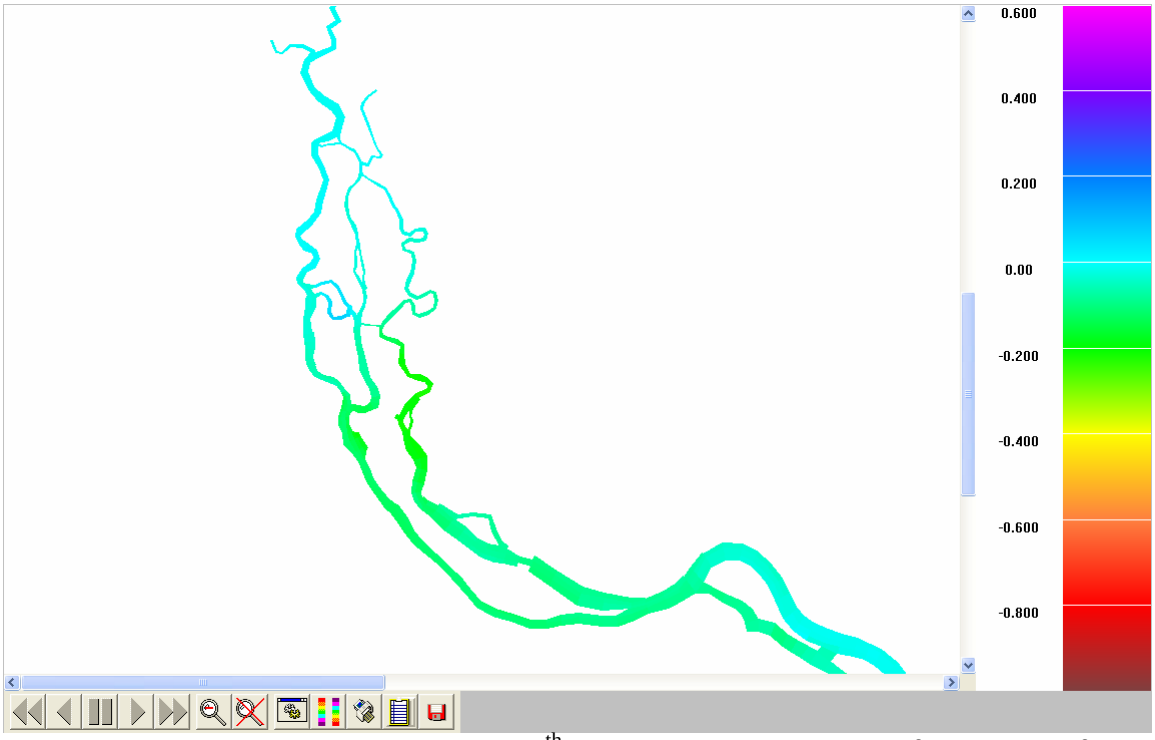
41. Figure A2.11. Changes in Salinity 95th %ile distribution along bottom layer: 4 ft deepening



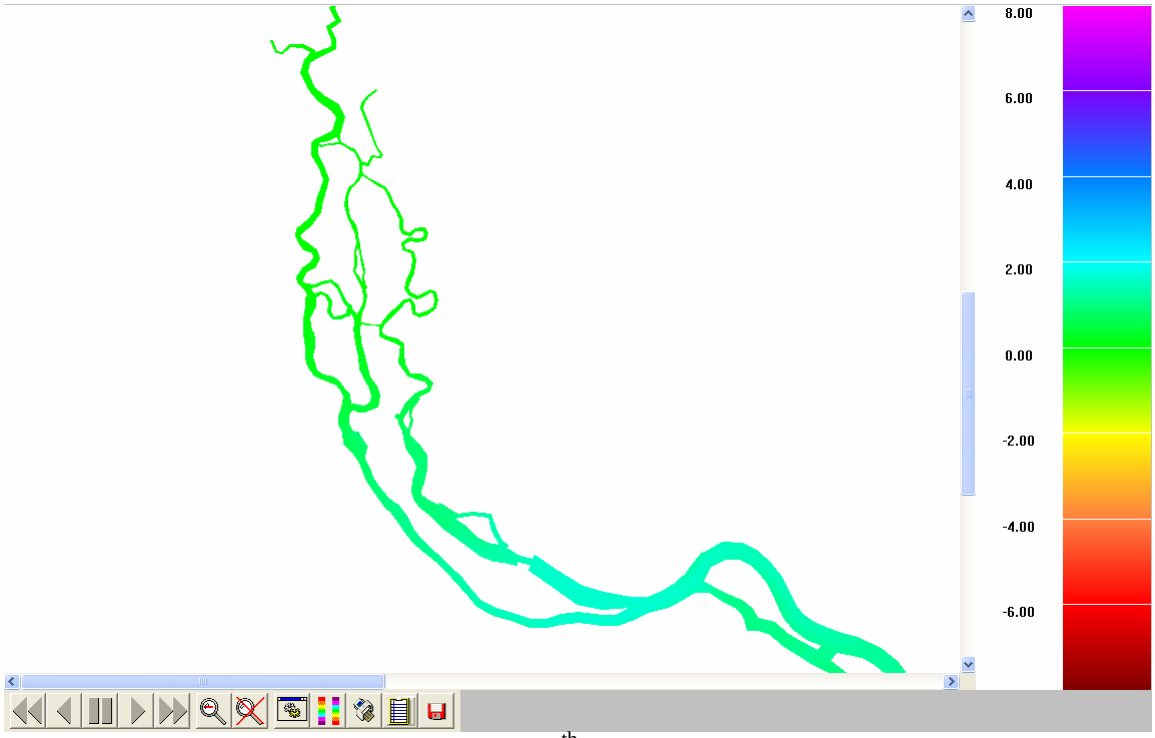
42. Figure A2.12. Changes in D.O. 5th %ile distribution along surface layer: 4 ft deepening



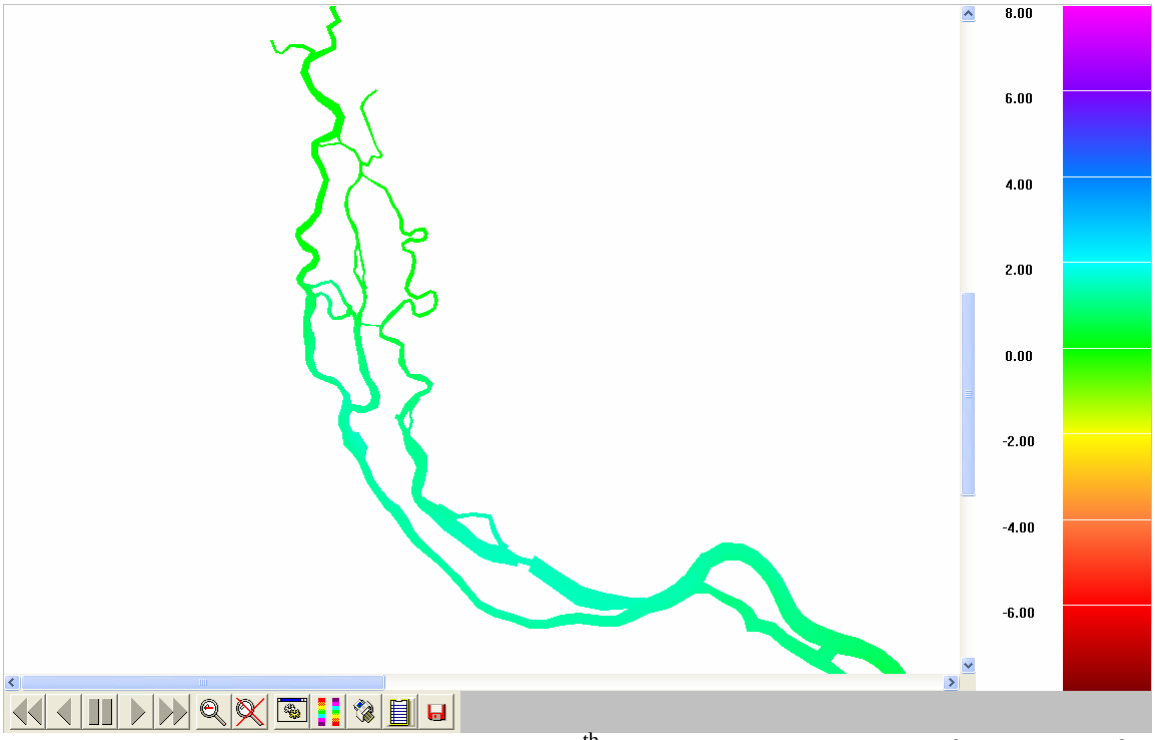
43. Figure A2.13. Changes in D.O. 50th %ile distribution along surface layer: 4 ft deepening



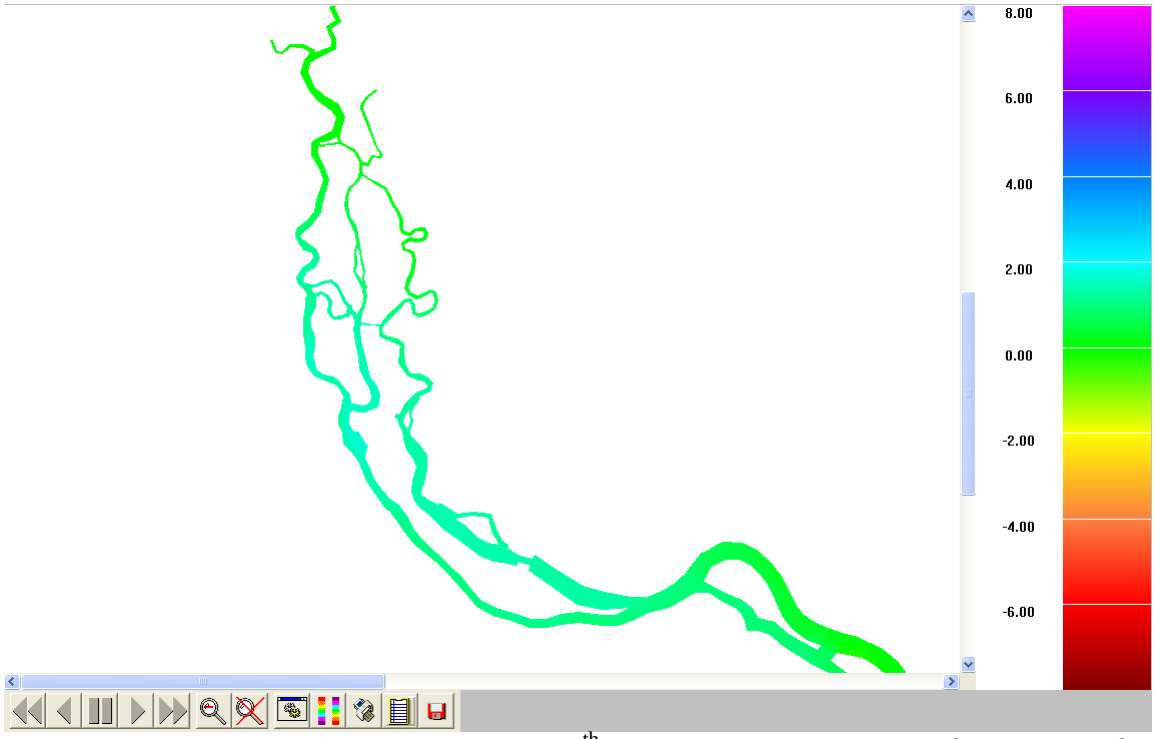
44. Figure A2.14. Changes in D.O. 95th %ile distribution along surface layer: 4 ft deepening



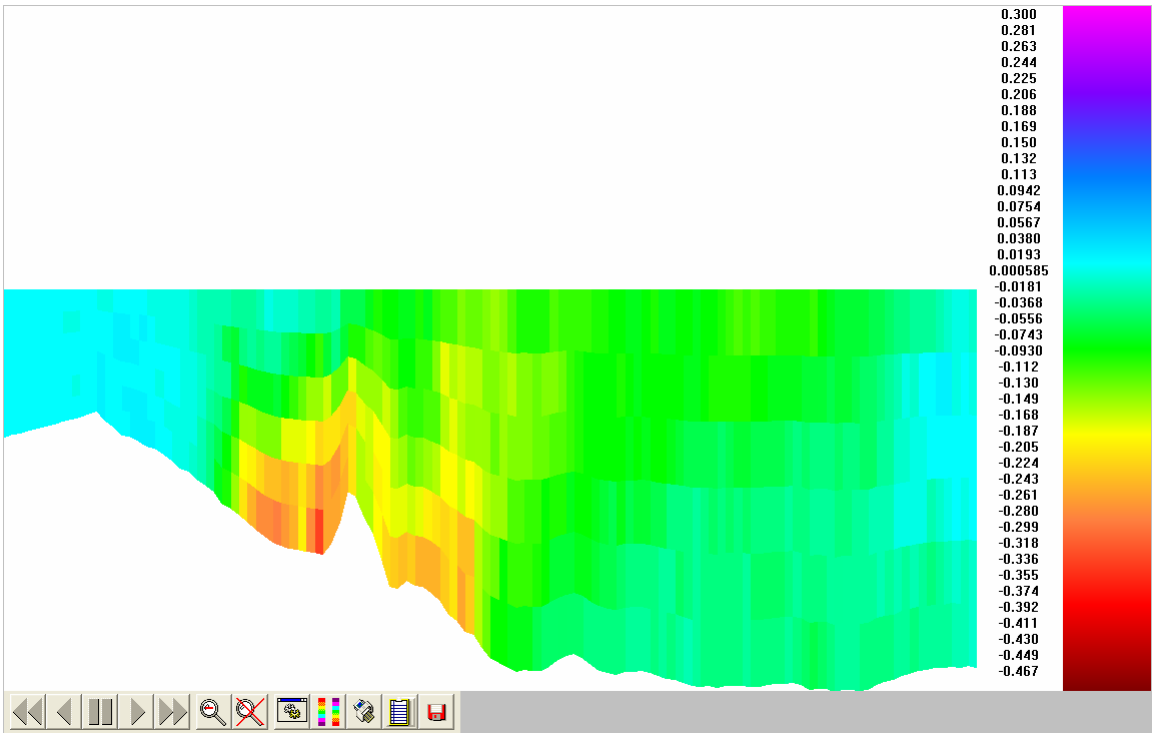
45. Figure A2.15. Changes in Salinity 5th %ile distribution along surface layer: 4 ft deepening



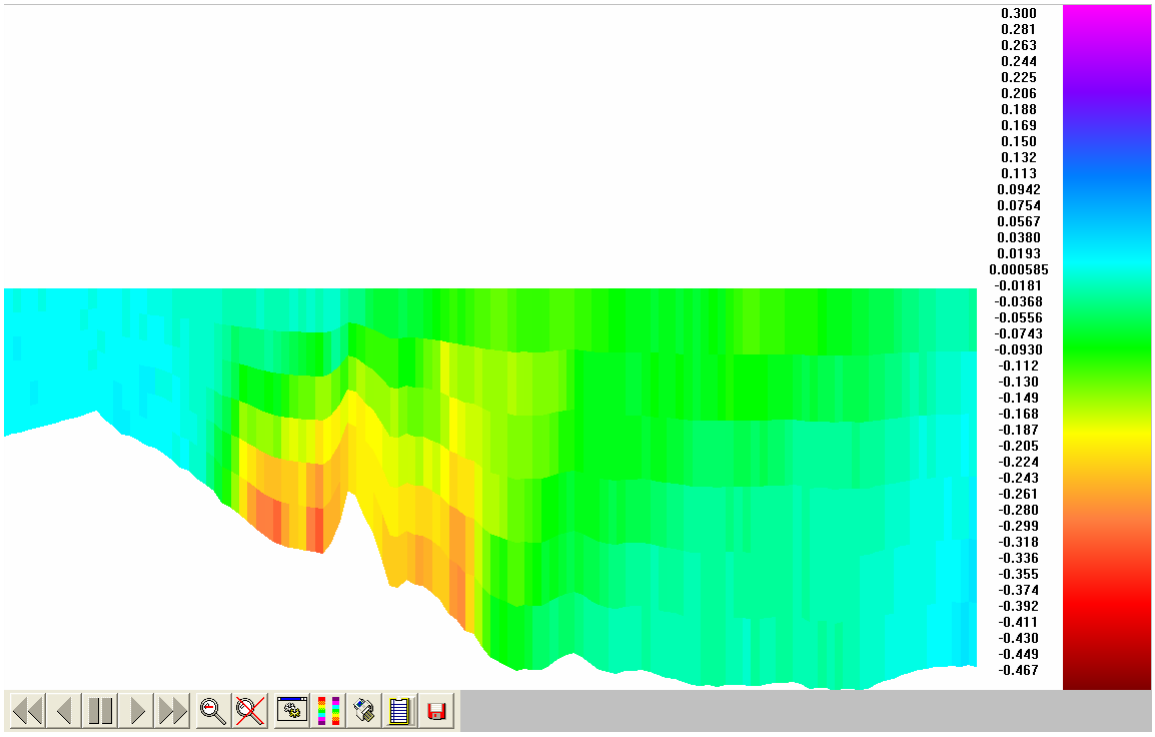
46. Figure A2.16. Changes in Salinity 50th %ile distribution along surface layer: 4 ft deepening



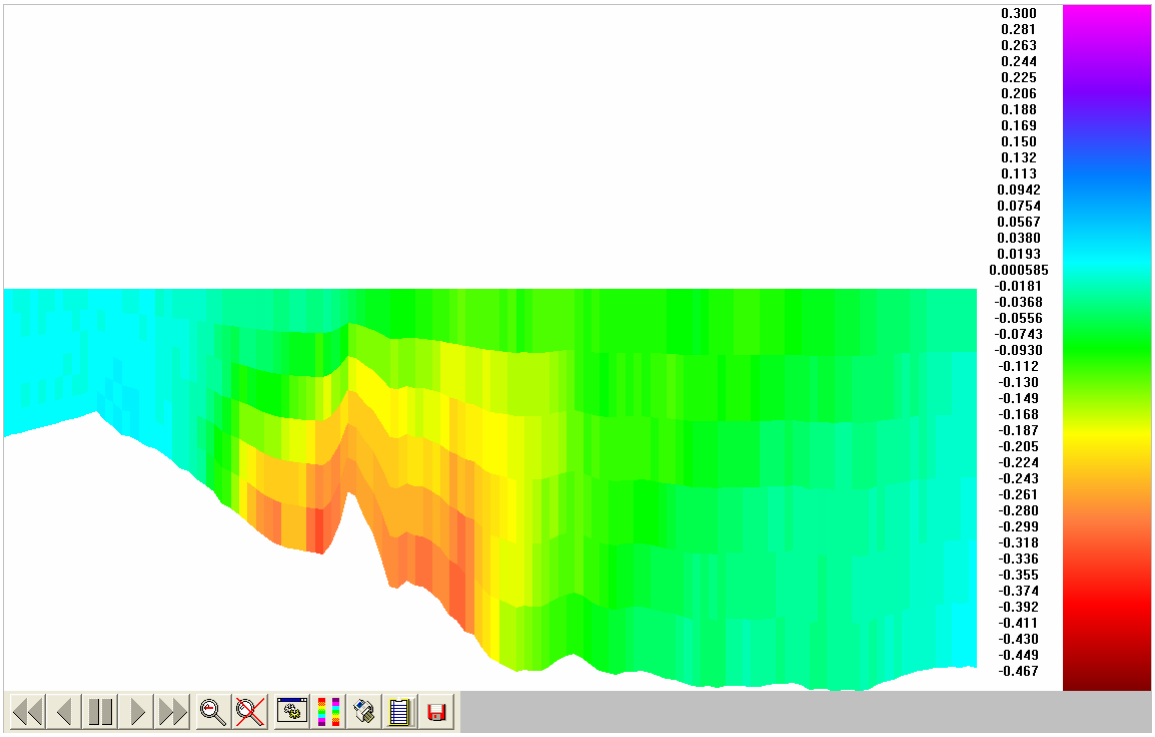
47. Figure A2.17. Changes in Salinity 95th %ile distribution along surface layer: 4 ft deepening



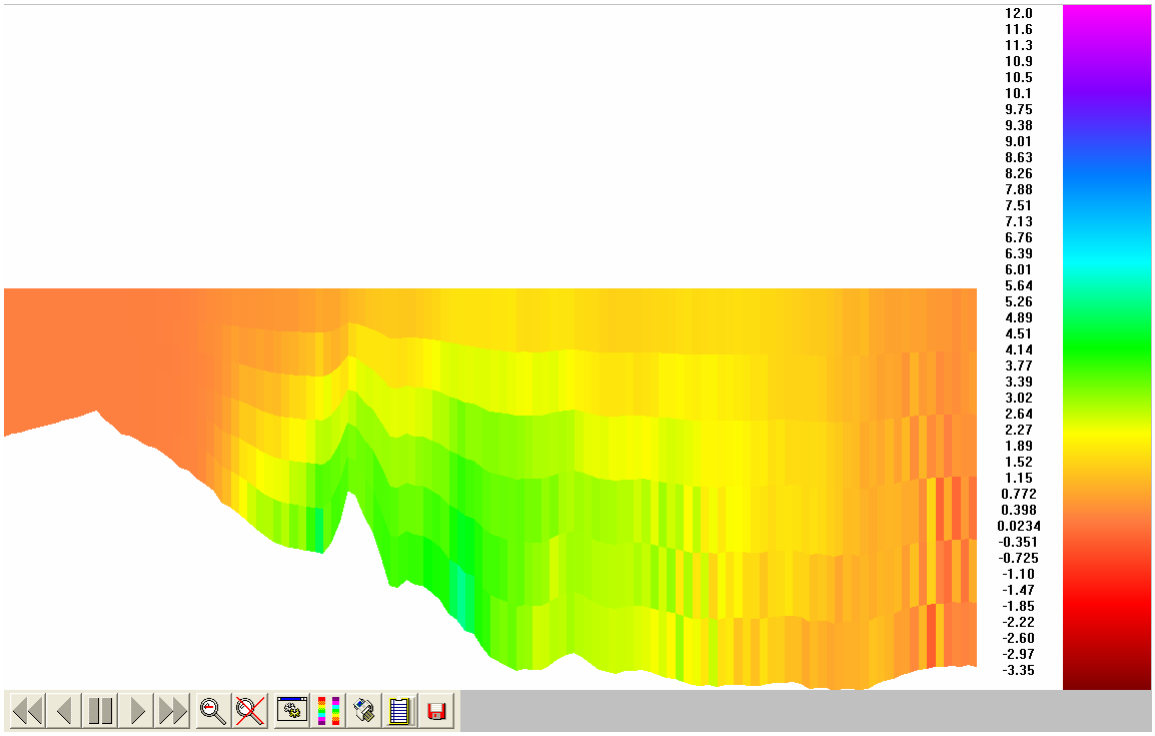
48. Figure A2.18. Snapshot of changes in 1-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 4 ft deepening



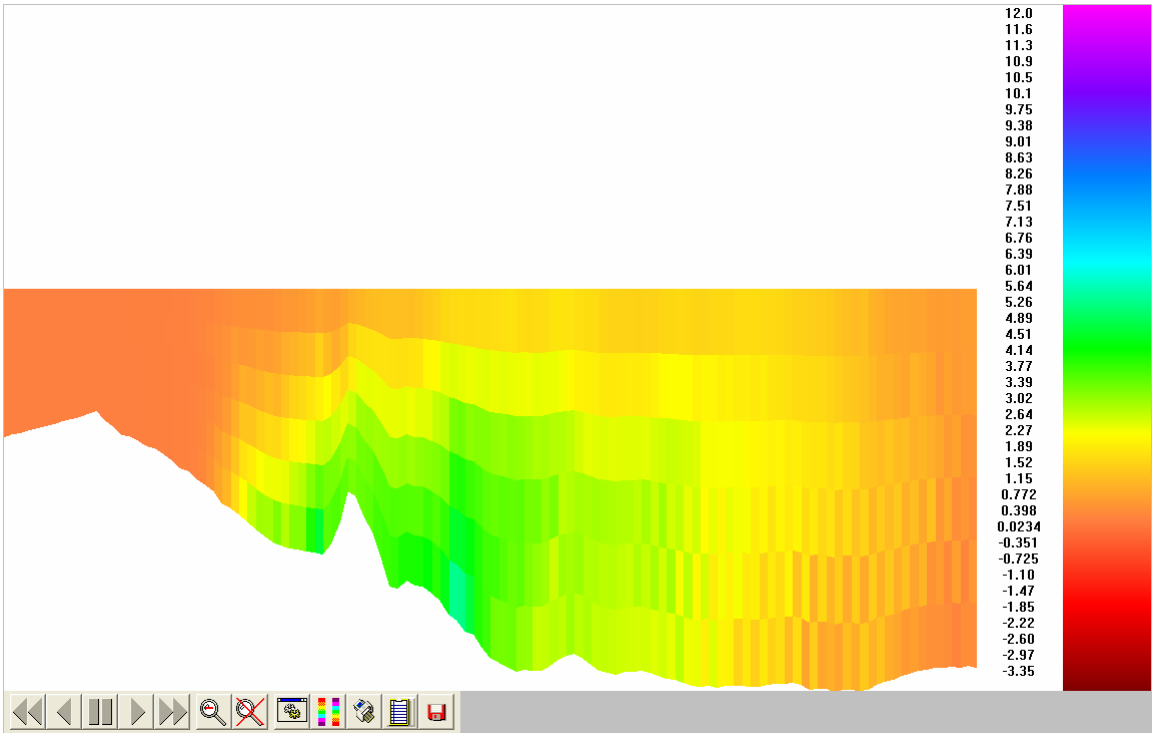
49. Figure A2.19. Snapshot of changes in 7-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 4 ft deepening



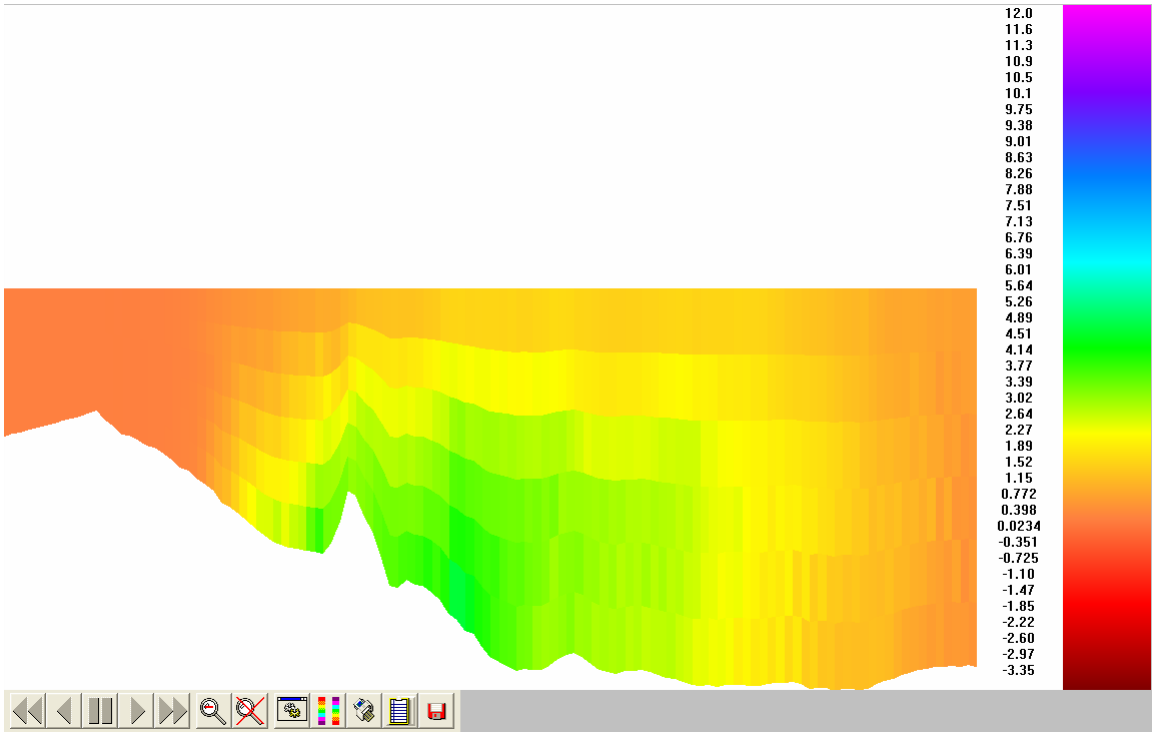
50. Figure A2.20. Snapshot of changes in 30-days averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 4 ft deepening



51. Figure A2.21. Snapshot of changes in 1-day averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 4 ft deepening



52. Figure A2.22. Snapshot of changes in 7-days averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 4 ft deepening



53. Figure A2.23. Snapshot of changes in 30-days averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 4 ft deepening

Appendix A3

BASIC EVALUATION: 3 ft DEEPENING BATHYMETRY, 2004 POINT SOURCES LOADS, 1999 HYDROLOGICAL AND METEOROLOGICAL CONDITIONS

May 1 – October 30, 1999 Simulation Period

Water Quality Review Group

1. Table A3.1. Dissolved oxygen percentiles distribution in Critical cells

Zone	D.O. Percentile (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.45	3.62	3.72	3.93	4.29	4.72	4.98	5.2	5.56
FR2	2.76	3.01	3.12	3.39	3.75	4.17	4.52	4.67	4.97
FR3	2.49	2.74	2.85	3.07	3.5	3.93	4.27	4.42	4.73
FR4	2.43	2.67	2.77	3	3.45	3.87	4.2	4.35	4.67
FR5	2.47	2.68	2.79	3.09	3.48	3.86	4.21	4.38	4.64
FR6	2.47	2.69	2.83	3.18	3.52	3.93	4.31	4.51	4.8
FR7	2.72	2.95	3.18	3.55	3.98	4.5	4.96	5.15	5.48
FR8	3.03	3.32	3.51	3.93	4.46	4.93	5.31	5.49	5.82
FR9	3.18	3.46	3.62	4	4.47	4.98	5.32	5.47	5.78
FR10	2.32	3.13	3.38	3.92	4.6	5.25	5.64	5.81	6.04
FR11	2.16	2.77	3.17	3.64	4.23	4.86	5.41	5.62	5.95
MR1	2.58	2.9	3.09	3.47	3.81	4.13	4.47	4.63	4.88
MR2	2.18	2.55	2.86	3.3	3.73	4.1	4.42	4.62	4.88
MR3	2.07	2.43	2.74	3.22	3.66	4.06	4.39	4.62	4.86
MR4	2.06	2.43	2.61	3.05	3.46	3.81	4.14	4.33	4.64
MR5	0.43	1.01	1.4	2.24	3.67	5.13	5.58	5.73	5.98
MR6	1.07	1.7	2.15	3.07	4.41	5.33	5.71	5.9	6.18
LBR1	2.59	3.31	3.52	3.99	4.33	4.62	4.93	5.09	5.39
LBR2	2.11	2.34	2.51	2.99	3.34	3.64	3.95	4.14	4.45
LBR3	1.4	1.98	2.19	2.69	3.25	3.71	4.04	4.26	4.62
BR1	2.01	2.24	2.42	2.8	3.22	3.65	4.02	4.22	4.49
BR2	1.38	1.65	1.85	2.22	2.81	3.2	3.59	3.79	4.17
BR3	1.71	2.05	2.25	2.58	3.07	3.47	3.8	4.05	4.4
SCH1	1.33	1.67	1.91	2.51	3.3	4.06	4.63	4.93	5.25
SCH2	3.07	3.28	3.44	3.67	4.02	4.43	4.76	4.94	5.26
SR	2.24	2.53	2.96	3.6	3.86	4.2	4.5	4.65	4.91

2. Table A3.2. Delta of Dissolved Oxygen percentiles distribution in Critical cells: Deepening scenario minus Existing bathymetry scenario

Zone	Delta D.O. Percentile																	
	1%		5%		10%		25%		50%		75%		90%		95%		99	
	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%
FR1	0.02	0.6	0.01	0.3	0	0.0	-0.02	-0.5	0	0.0	0	0.0	-0.02	-0.4	0	0.0	-0.01	-0.2
FR2	0.02	0.7	0.02	0.7	0.01	0.3	0	0.0	0.01	0.3	0.01	0.2	0	0.0	0	0.0	0	0.0
FR3	0.04	1.6	0.05	1.9	0.04	1.4	0.02	0.7	0	0.0	0.02	0.5	0.01	0.2	0.01	0.2	0.02	0.4
FR4	-0.08	-3.2	-0.07	-2.6	-0.08	-2.8	-0.1	-3.2	-0.07	-2.0	-0.04	-1.0	-0.05	-1.2	-0.08	-1.8	-0.04	-0.8
FR5	-0.03	-1.2	-0.01	-0.4	0.01	0.4	-0.01	-0.3	-0.02	-0.6	-0.01	-0.3	-0.02	-0.5	-0.03	-0.7	0.02	0.4
FR6	-0.07	-2.8	-0.05	-1.8	0.02	0.7	0.03	1.0	0.01	0.3	0.04	1.0	0.01	0.2	0.03	0.7	0.11	2.3
FR7	-0.41	-13.1	-0.46	-13.5	-0.41	-11.4	-0.4	-10.1	-0.44	-10.0	-0.37	-7.6	-0.25	-4.8	-0.3	-5.5	-0.55	-9.1
FR8	-0.17	-5.3	-0.2	-5.7	-0.18	-4.9	-0.18	-4.4	-0.23	-4.9	-0.18	-3.5	-0.11	-2.0	-0.12	-2.1	-0.08	-1.4
FR9	-0.21	-6.2	-0.18	-4.9	-0.22	-5.7	-0.23	-5.4	-0.27	-5.7	-0.22	-4.2	-0.14	-2.6	-0.14	-2.5	-0.1	-1.7
FR10	0.03	1.3	0	0.0	0	0.0	0	0.0	0.01	0.2	0.01	0.2	-0.01	-0.2	-0.01	-0.2	0.01	0.2
FR11	-0.01	-0.5	-0.01	-0.4	0.02	0.6	0.01	0.3	0.01	0.2	0.01	0.2	0.01	0.2	0	0.0	0.01	0.2
MR1	0	0.0	-0.09	-3.0	-0.09	-2.8	-0.08	-2.3	-0.12	-3.1	-0.12	-2.8	-0.11	-2.4	-0.12	-2.5	-0.1	-2.0
MR2	-0.02	-0.9	-0.01	-0.4	-0.05	-1.7	-0.07	-2.1	-0.09	-2.4	-0.11	-2.6	-0.11	-2.4	-0.12	-2.5	-0.12	-2.4
MR3	-0.01	-0.5	-0.02	-0.8	-0.02	-0.7	-0.06	-1.8	-0.08	-2.1	-0.11	-2.6	-0.11	-2.4	-0.11	-2.3	-0.11	-2.2
MR4	0.01	0.5	-0.01	-0.4	-0.02	-0.8	0	0.0	-0.02	-0.6	-0.02	-0.5	-0.04	-1.0	-0.03	-0.7	-0.04	-0.9
MR5	-0.02	-4.4	0.02	2.0	0.01	0.7	0.03	1.4	0.04	1.1	0.01	0.2	0.01	0.2	0	0.0	0.01	0.2
MR6	0.02	1.9	0.04	2.4	0.04	1.9	0.04	1.3	-0.01	-0.2	0.03	0.6	0	0.0	0.01	0.2	0.01	0.2
LBR1	-0.08	-3.0	0.02	0.6	0.02	0.6	0.03	0.8	0.02	0.5	0.02	0.4	0.01	0.2	-0.01	-0.2	-0.04	-0.7
LBR2	0.01	0.5	0.01	0.4	0	0.0	0.01	0.3	0.01	0.3	0	0.0	0.01	0.3	0.01	0.2	0.02	0.5
LBR3	0.06	4.5	0.23	13.1	0.15	7.4	0.13	5.1	0.12	3.8	0.08	2.2	0.06	1.5	0.08	1.9	0.06	1.3
BR1	0.01	0.5	0.01	0.4	0.01	0.4	0.02	0.7	0.01	0.3	0.02	0.6	0.01	0.2	0	0.0	0.01	0.2
BR2	0.01	0.7	0.04	2.5	0.02	1.1	0.02	0.9	0.03	1.1	0.01	0.3	0.02	0.6	0.01	0.3	0.02	0.5
BR3	0.02	1.2	0.02	1.0	0.03	1.4	0.02	0.8	0.01	0.3	0	0.0	0.01	0.3	0	0.0	0.01	0.2
SCH1	0.04	3.1	0.02	1.2	-0.01	-0.5	0.02	0.8	-0.01	-0.3	-0.04	-1.0	-0.03	-0.6	-0.05	-1.0	-0.07	-1.3
SCH2	-0.01	-0.3	-0.03	-0.9	-0.01	-0.3	-0.02	-0.5	-0.02	-0.5	-0.01	-0.2	-0.01	-0.2	-0.02	-0.4	0.01	0.2
SR	0	0.0	0.01	0.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.01	0.2	0	0.0

3. Table A3.3. Dissolved oxygen percentiles distribution in Zones of Savannah Estuary

Zone Name	D.O. Concentration Percentiles (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.84	3.97	4.05	4.25	4.61	5.02	5.27	5.47	5.78
FR2	3.24	3.46	3.57	3.77	4.12	4.54	4.83	4.98	5.30
FR3	2.77	2.99	3.10	3.33	3.70	4.11	4.45	4.61	4.90
FR4	2.47	2.71	2.84	3.09	3.49	3.89	4.23	4.42	4.69
FR5	2.49	2.70	2.80	3.06	3.47	3.84	4.21	4.36	4.64
FR6	2.59	2.79	2.88	3.16	3.53	3.90	4.27	4.43	4.65
FR7	2.86	3.08	3.30	3.66	4.09	4.59	4.97	5.16	5.50
FR8	3.14	3.43	3.61	4.01	4.47	4.92	5.21	5.39	5.69
FR9	3.70	4.01	4.23	4.61	5.03	5.40	5.68	5.84	6.08
FR10	4.00	4.48	4.69	4.97	5.25	5.52	5.78	5.90	6.14
FR11	2.63	3.19	3.56	3.96	4.30	4.63	4.94	5.13	5.38
MR1	2.72	2.96	3.11	3.49	3.81	4.12	4.46	4.65	4.85
MR2	2.33	2.76	2.98	3.38	3.76	4.10	4.42	4.62	4.84
MR3	2.09	2.33	2.66	3.10	3.54	3.96	4.30	4.52	4.84
MR4	2.73	2.94	3.17	3.57	3.91	4.21	4.50	4.67	4.86
MR5	1.08	1.49	1.90	2.75	4.14	5.09	5.51	5.66	5.93
MR6	1.11	1.72	2.17	3.12	4.47	5.29	5.66	5.85	6.11
LBR1	2.88	3.05	3.20	3.65	3.92	4.17	4.48	4.62	4.76
LBR2	2.04	2.26	2.50	2.92	3.30	3.60	3.89	4.09	4.30
LBR3	1.85	1.99	2.11	2.59	3.09	3.38	3.71	3.86	4.21
BR1	2.43	2.54	2.66	2.96	3.37	3.77	4.15	4.35	4.60
BR2	1.96	2.17	2.31	2.62	3.08	3.50	3.88	4.08	4.34
BR3	1.97	2.14	2.27	2.61	3.07	3.44	3.82	4.04	4.29
SCh1	2.64	2.90	3.00	3.27	3.65	4.12	4.43	4.57	4.85
SCh2	3.34	3.48	3.58	3.78	4.10	4.51	4.81	4.99	5.29
SR	2.62	2.79	3.29	3.89	4.12	4.44	4.71	4.85	5.11

4. Table A3.4. Delta (Deepening minus Existing bathymetry) of Dissolved Oxygen percentiles distribution in Zones of Savannah Estuary: Deepening scenario minus Existing bathymetry scenario

Zone	Project - Baseline Difference (mg/l)									Project - Baseline Relative Difference (%)								
Name	1%	5%	10%	25%	50%	75%	90%	95%	99%	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	0.03	0.01	0.00	0.00	0.01	0.01	-0.01	0.00	-0.03	0.8	0.3	0.0	0.0	0.2	0.2	-0.1	0.0	-0.5
FR2	0.02	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.00	0.6	0.6	0.4	0.1	0.5	0.4	0.2	0.3	0.1
FR3	0.03	0.04	0.05	0.02	0.02	0.04	0.03	0.02	0.02	1.0	1.4	1.6	0.5	0.5	0.9	0.7	0.4	0.4
FR4	-0.03	-0.02	0.03	0.03	-0.01	0.02	-0.01	0.03	0.02	-1.2	-0.6	0.9	0.9	-0.2	0.5	-0.3	0.6	0.5
FR5	-0.06	-0.05	-0.03	-0.04	-0.04	-0.03	-0.06	-0.05	0.00	-2.4	-1.9	-1.1	-1.2	-1.2	-0.8	-1.4	-1.1	0.1
FR6	-0.08	-0.08	-0.07	-0.11	-0.11	-0.11	-0.11	-0.12	-0.09	-3.0	-2.9	-2.5	-3.4	-3.1	-2.7	-2.5	-2.7	-2.0
FR7	-0.16	-0.19	-0.15	-0.18	-0.22	-0.22	-0.16	-0.16	-0.12	-5.3	-5.7	-4.3	-4.6	-5.1	-4.6	-3.1	-3.0	-2.1
FR8	-0.18	-0.19	-0.19	-0.19	-0.21	-0.17	-0.14	-0.13	-0.08	-5.5	-5.2	-5.0	-4.5	-4.4	-3.3	-2.6	-2.4	-1.4
FR9	-0.23	-0.23	-0.21	-0.21	-0.17	-0.09	-0.08	-0.07	-0.06	-5.8	-5.3	-4.8	-4.4	-3.2	-1.7	-1.3	-1.1	-0.9
FR10	0.00	-0.02	-0.01	-0.03	-0.03	-0.03	-0.03	-0.03	-0.02	0.0	-0.4	-0.3	-0.5	-0.6	-0.6	-0.5	-0.5	-0.4
FR11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	-0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.3
MR1	-0.07	-0.09	-0.10	-0.07	-0.12	-0.12	-0.11	-0.10	-0.08	-2.5	-3.0	-3.1	-2.0	-3.2	-2.8	-2.5	-2.1	-1.7
MR2	-0.03	-0.03	-0.07	-0.07	-0.11	-0.11	-0.10	-0.12	-0.11	-1.1	-1.1	-2.4	-2.1	-2.8	-2.6	-2.3	-2.6	-2.2
MR3	0.00	-0.02	-0.01	-0.02	-0.05	-0.06	-0.07	-0.07	-0.08	0.0	-0.8	-0.4	-0.8	-1.3	-1.6	-1.7	-1.5	-1.6
MR4	0.00	0.01	0.01	0.01	0.01	0.00	-0.01	-0.01	0.00	-0.1	0.3	0.3	0.4	0.3	0.1	-0.1	-0.2	0.1
MR5	0.01	0.03	0.03	0.02	0.00	0.01	0.01	0.01	0.02	0.7	2.1	1.7	0.7	0.1	0.2	0.2	0.1	0.3
MR6	0.00	0.04	0.04	0.02	0.01	0.01	0.00	0.01	0.00	0.4	2.3	1.7	0.7	0.2	0.2	0.0	0.1	0.1
LBR1	0.01	0.02	0.03	0.02	0.01	0.01	0.01	0.02	0.00	0.4	0.7	0.8	0.5	0.2	0.3	0.3	0.3	0.0
LBR2	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.1	0.0	0.5	0.1	0.3	0.2	0.1	0.0	0.2
LBR3	0.09	0.09	0.10	0.06	0.04	0.06	0.05	0.04	0.05	5.2	4.5	5.1	2.4	1.3	1.7	1.4	1.2	1.3
BR1	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.5	-0.1	-0.1	0.2	0.3	0.0	0.0	0.0	0.0
BR2	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.5	0.3	0.3	0.5	0.4	0.1	0.0	0.0	0.1
BR3	0.05	0.03	0.03	0.03	0.01	0.01	0.01	0.01	-0.01	2.7	1.7	1.5	1.3	0.3	0.2	0.3	0.3	-0.1
SCh1	0.03	0.02	0.00	0.00	0.01	0.01	-0.01	-0.01	0.02	1.2	0.7	-0.2	0.1	0.1	0.2	-0.2	-0.2	0.4
SCh2	0.00	0.01	0.00	-0.01	0.00	-0.01	-0.02	-0.01	0.00	0.1	0.3	0.0	-0.4	0.0	-0.2	-0.4	-0.1	0.1
SR	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0

5. Table A3.5. Percentage of the volume of waters with violation of Dissolved Oxygen standards for Zones of Savannah Estuary within the period of May 1 – October 30, 1999: Deepening (Project) and Existing (Baseline) bathymetry

Zones	D.O. STANDARDS														
	1-Day Average			7-Day Average			30-Day Average			GA MINIMUM D.O.			SC MINIMUM D.O.		
	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B
FR1	0	0	0	0	0	0	0	0	0	0	0	0	7	6	-1
FR2	0	0	0	0	0	0	3	3	0	0	0	0	31	30	-1
FR3	0	0	0	2	2	0	19	19	0	3	3	0	N/A	N/A	N/A
FR4	0	0	0	5	5	0	22	23	1	6	6	0	N/A	N/A	N/A
FR5	0	0	0	4	5	1	19	22	3	5	6	1	N/A	N/A	N/A
FR6	0	0	0	2	4	2	12	17	5	4	5	1	N/A	N/A	N/A
FR7	0	0	0	0	0	0	1	2	1	0	1	1	N/A	N/A	N/A
FR8	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR9	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR10	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR11	0	0	0	0	0	0	2	2	0	1	1	0	6	6	0
MR1	0	0	0	0	1	1	5	6	1	1	2	1	N/A	N/A	N/A
MR2	0	0	0	1	2	1	6	8	2	1	2	1	N/A	N/A	N/A
MR3	0	0	0	3	3	0	10	11	1	3	4	1	N/A	N/A	N/A
MR4	0	0	0	1	1	0	5	5	0	2	2	0	N/A	N/A	N/A
MR5	0	0	0	1	1	0	5	5	0	5	5	0	11	11	0
MR6	0	0	0	0	0	0	3	3	0	3	3	0	9	9	0
LBR1	0	0	0	1	1	0	6	6	0	1	1	0	18	18	0
LBR2	1	1	0	6	6	0	18	18	0	7	7	0	34	35	1
LBR3	3	2	-1	13	13	0	30	31	1	14	14	0	47	48	1
BR1	0	0	0	10	10	0	39	39	0	12	12	0	67	67	0
BR2	2	2	0	19	19	0	49	49	0	20	20	0	75	75	0
BR3	3	3	0	21	21	0	48	48	0	22	22	0	70	71	1
SCh1	1	1	0	4	3	-1	8	8	0	5	4	-1	N/A	N/A	N/A
SCh2	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
SR	0	0	0	1	1	0	3	3	0	1	1	0	6	6	0

26. Table A3.6. Percentage of water volumes with salinity in %iles within the period of May 1 – October 30, 1999

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	18.9	4.6	4.4	4.5	4.4	4.3	6.2	4.7	86.2
10	22.8	8.4	8.8	8.9	8.9	8.7	10.2	8.1	86.2
25	35.2	19.8	22.3	22.4	22.8	22.1	22.8	20.1	86.2
50	56.8	42.2	46.6	46.6	47.3	46.1	49.1	42.4	86.2
75	78.6	69.3	72.8	72.9	73.2	72.9	72.9	69.4	86.2
90	91.1	87.3	89	89.1	89.3	89.2	88.6	87.5	92.6
95	95.2	93.5	94.4	94.5	94.6	94.6	94.2	93.8	96.5
Total Volume 100*km3:	32284.9	658.5	4807.2	24.9	39.2	136.3	9.9	9.5	43.6

27. Table A3.7. Percentage of water volumes with D.O. in %iles within the period of May 1 – October 30, 1999

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	5.2	5	4.9	5.6	5.2	4.7	5.2	5.5	5.7
10	10.4	9.9	9.8	11.1	10.4	9.5	10.3	10.9	11.1
25	26.1	24.9	24.8	27.4	25.8	24.1	25.5	25.7	26.5
50	52.1	49.7	49.8	53.4	51.1	49.3	50.9	51.4	51.5
75	76.5	74.7	75.2	77.6	75.8	74.5	75.7	76.1	75.8
90	90.6	89.8	90.1	91.2	90.4	89.7	90.3	90.5	90.4
95	95.1	94.9	95	95.7	95.3	94.8	95.2	95.3	95.1
Total Volume 100*km3:	32284.9	658.5	4807.2	24.9	39.2	136.3	9.9	9.5	43.6

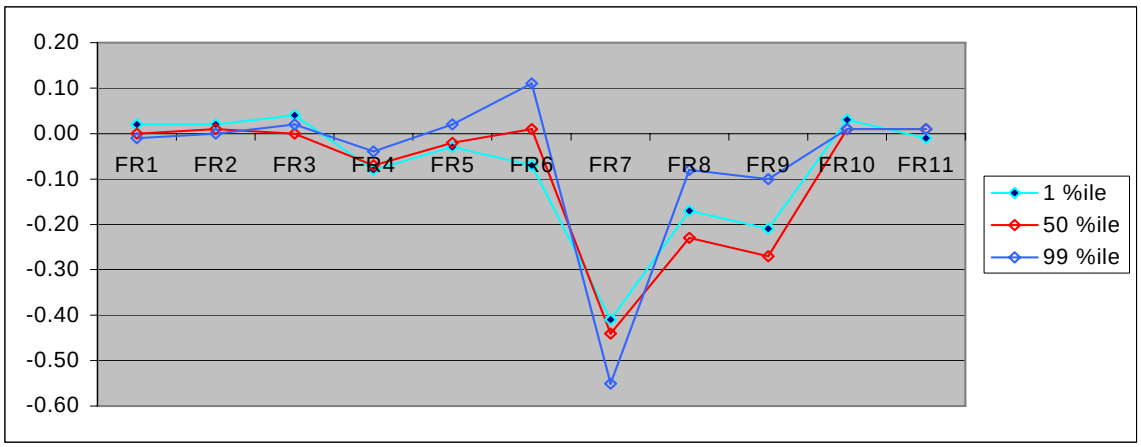
28. Table A3.8. Water volumes in Upper Harbor in increments of 1^{o} C of water temperature within the period of May 1 – October 30, 1999

Temperature C^{o}	Total Volume %
19	0.01
20	0.8
21	3.96
22	9.15
23	14.66
24	23.19
25	34.27
26	48.94
27	60.11
28	68.92
29	76.39
30	85.21
31	89.49
32	96.16
33	99.98
34	100

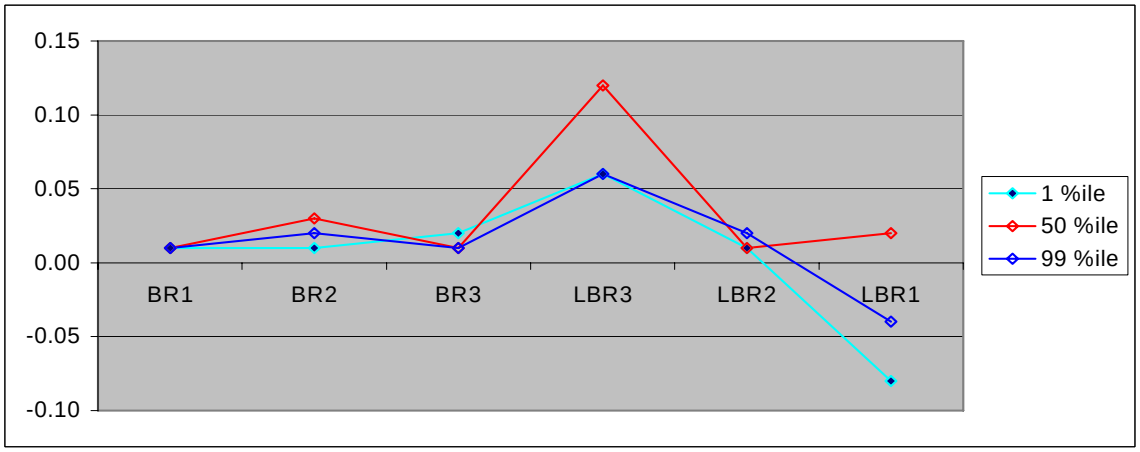
29. Table A3.9. Water volumes in Upper Harbor in increments of 0.1 mg/l of D.O. within the period of May 1 – October 30, 1999
(See file: Postprocessor Output\99-B13\99-B13_DO Increment Volume)

30. Table A3.10. Percentage of water volumes corresponding to 1-, 7-, and 30-days averages of D.O. depth-averaged concentrations in Upper Harbor within the period of May 1 – October 30, 1999
(See file: Postprocessor Output\99-B13\99-B13_volume DO in averages)

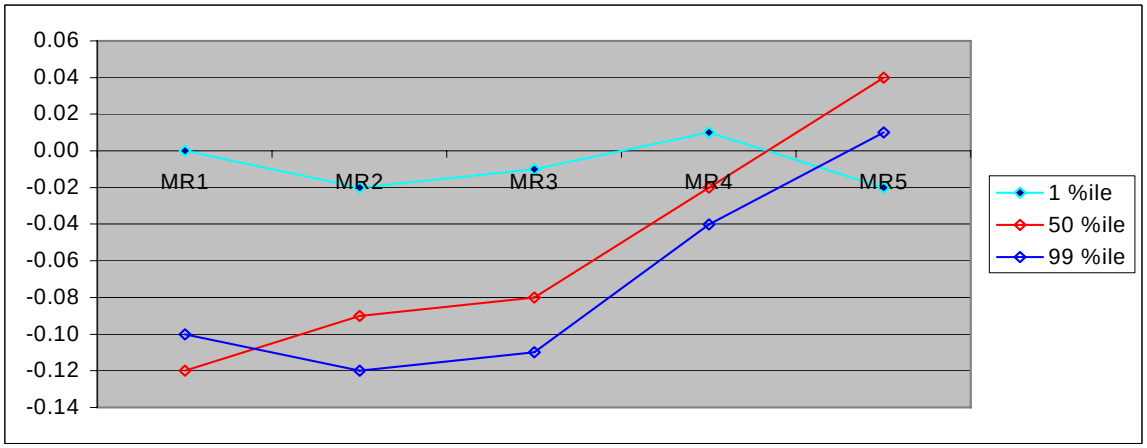
Front River



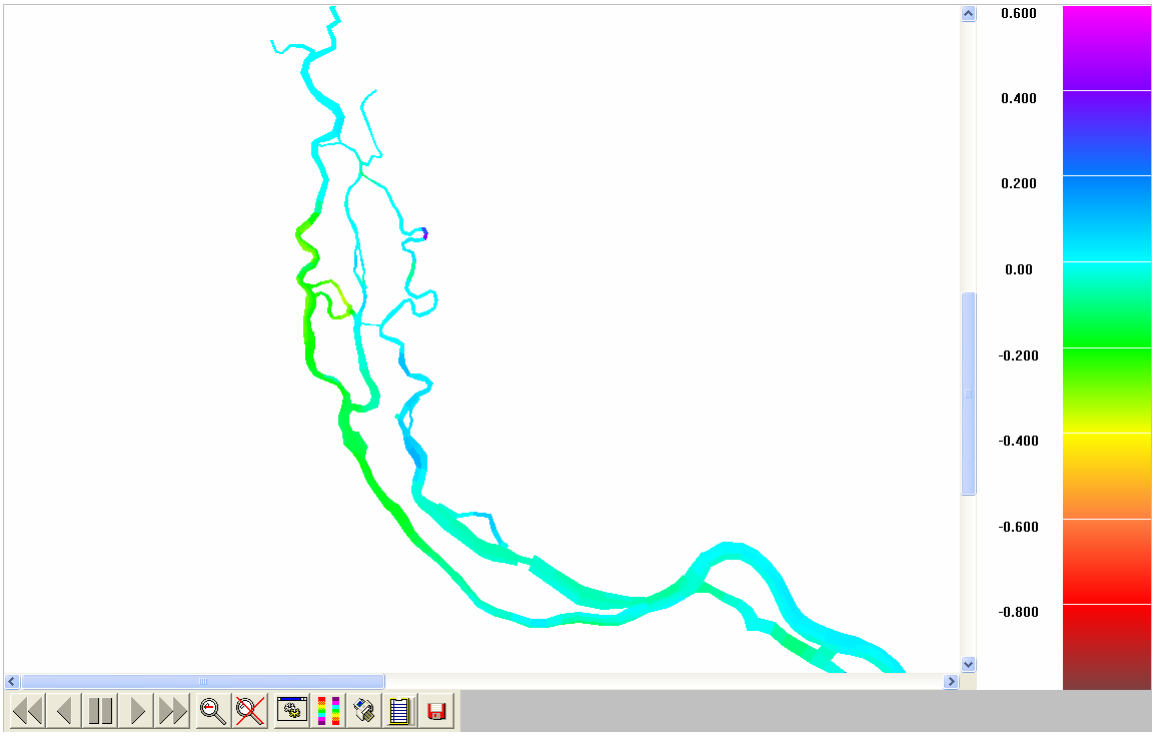
Back and Little Back Rivers



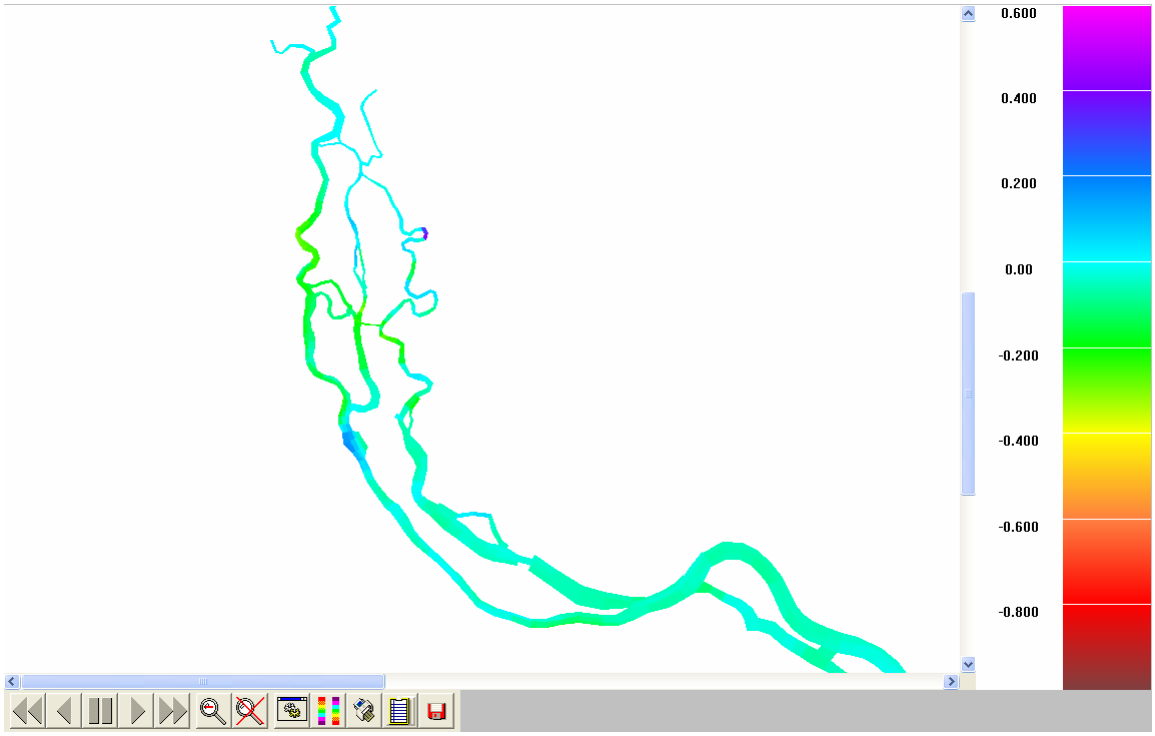
Middle River



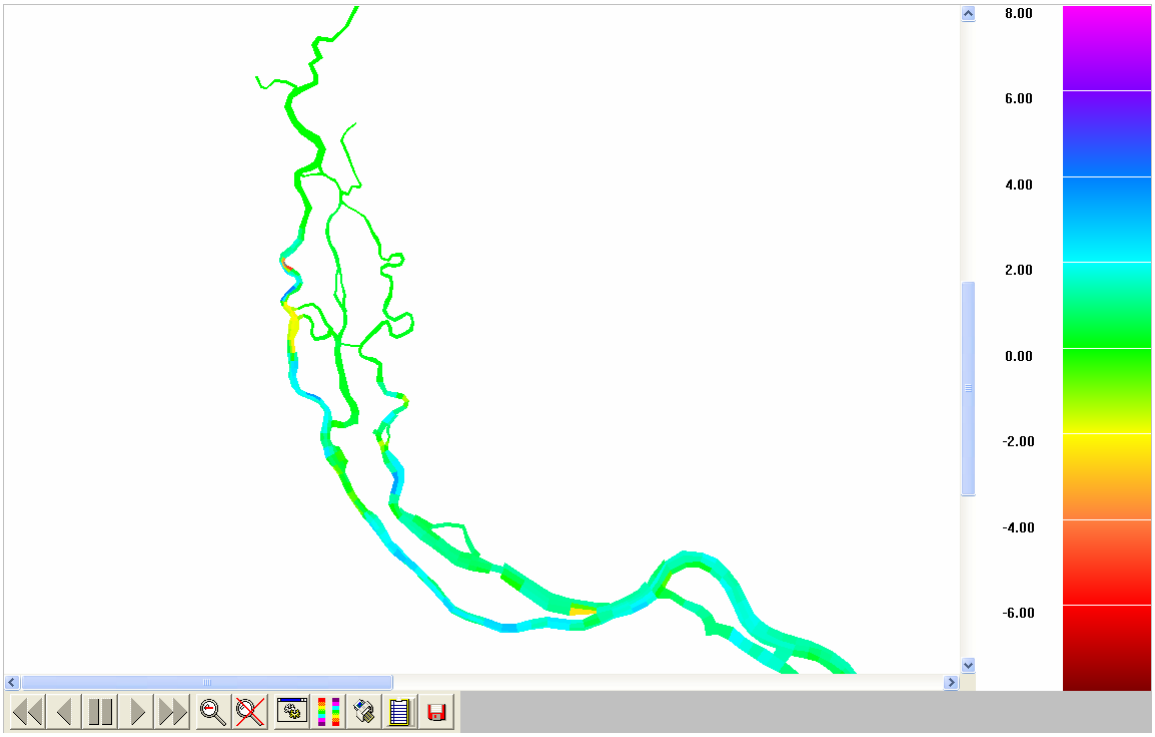
31. Figure A3.1. Changes in longitudinal profile of Dissolved Oxygen (mg/l) distribution along Critical cells of Savannah Estuary: 3 ft deepening



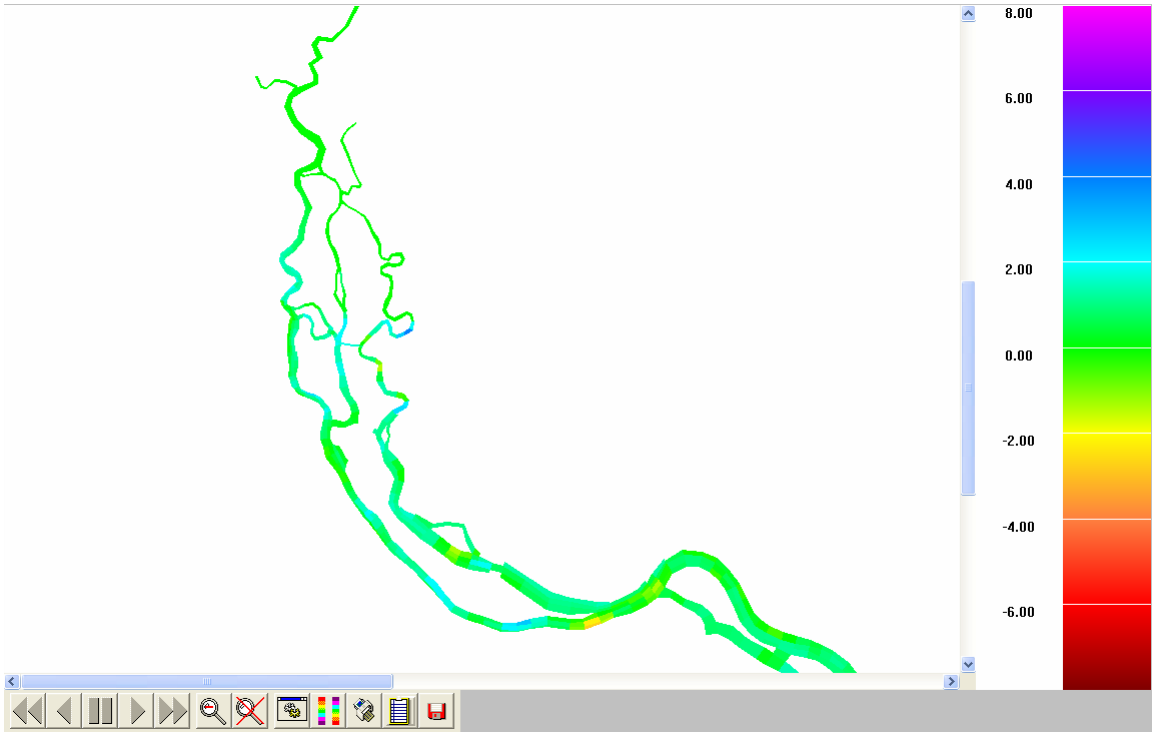
32. Figure A3.2. Changes in minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1999: 3 ft deepening



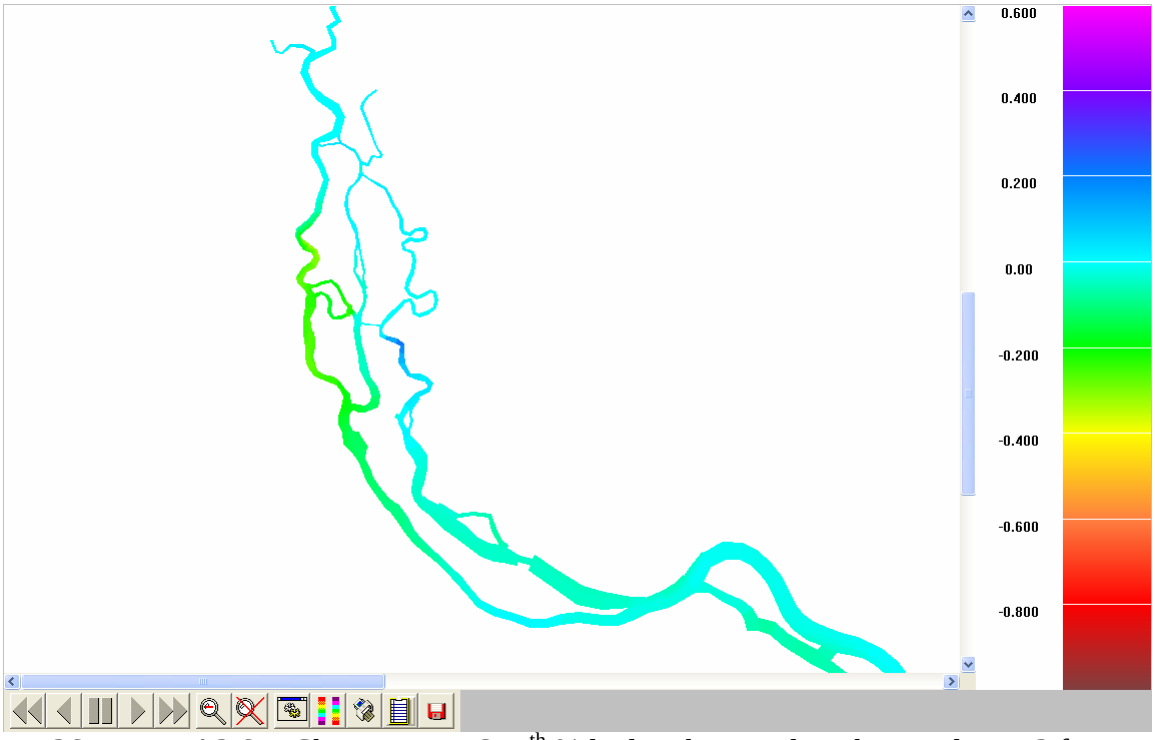
33. Figure A3.3. Changes in minimum D.O. distribution along surface layer within the analyzed period of May 1 - October 30, 1999: 3 ft deepening



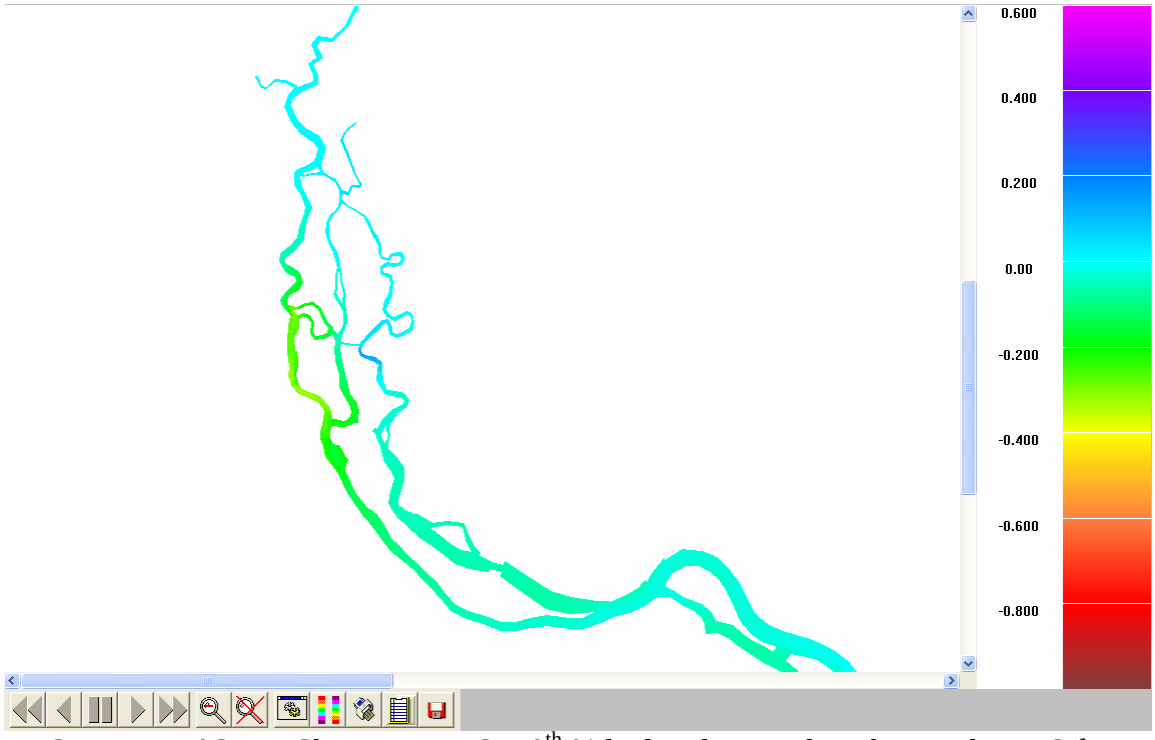
34. Figure A3.4. Changes in Salinity corresponded to Minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1999: 3 ft deepening



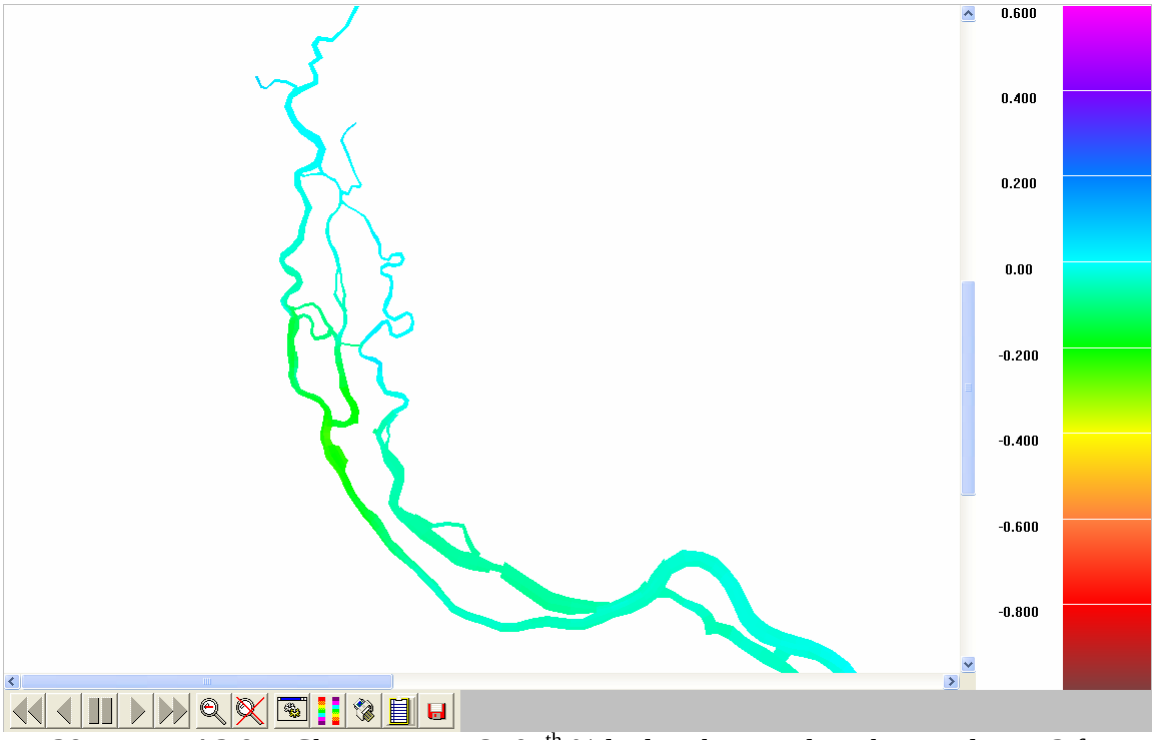
35. Figure A3.5. Changes in Salinity corresponded to Minimum D.O. distribution along Surface layer within the analyzed period of May 1 - October 30, 1999: 3 ft deepening



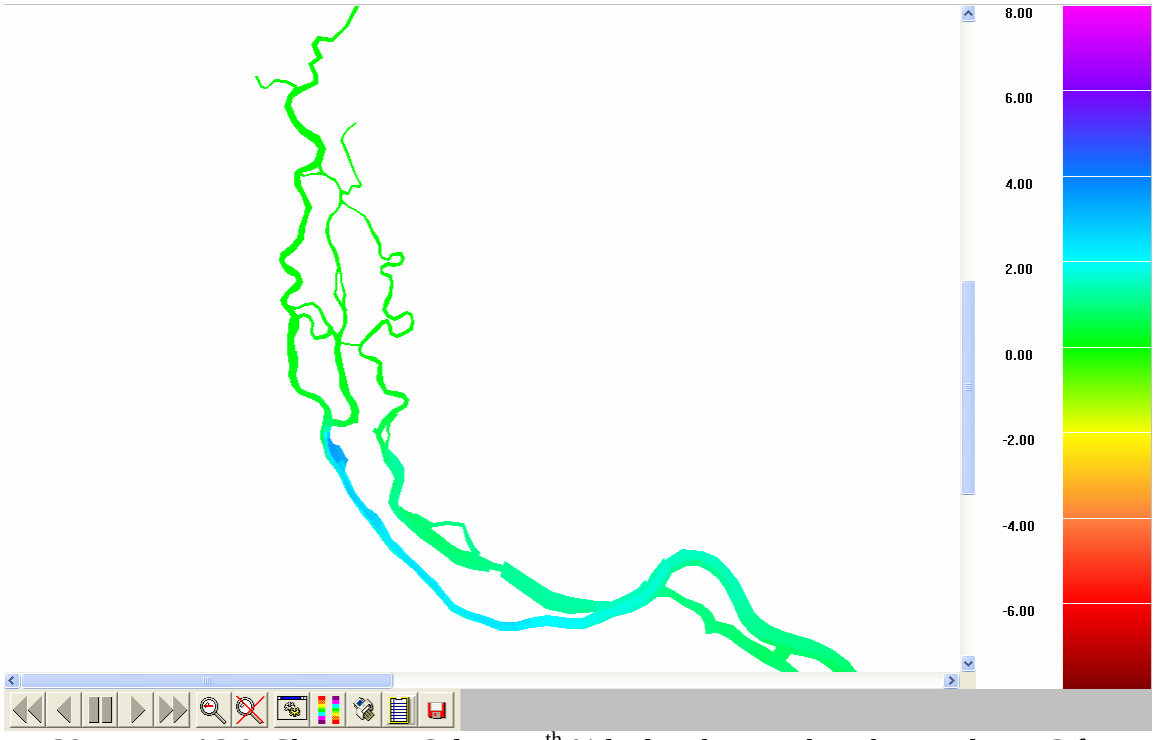
36. Figure A3.6. Changes in D.O. 5th %ile distribution along bottom layer: 3 ft deepening



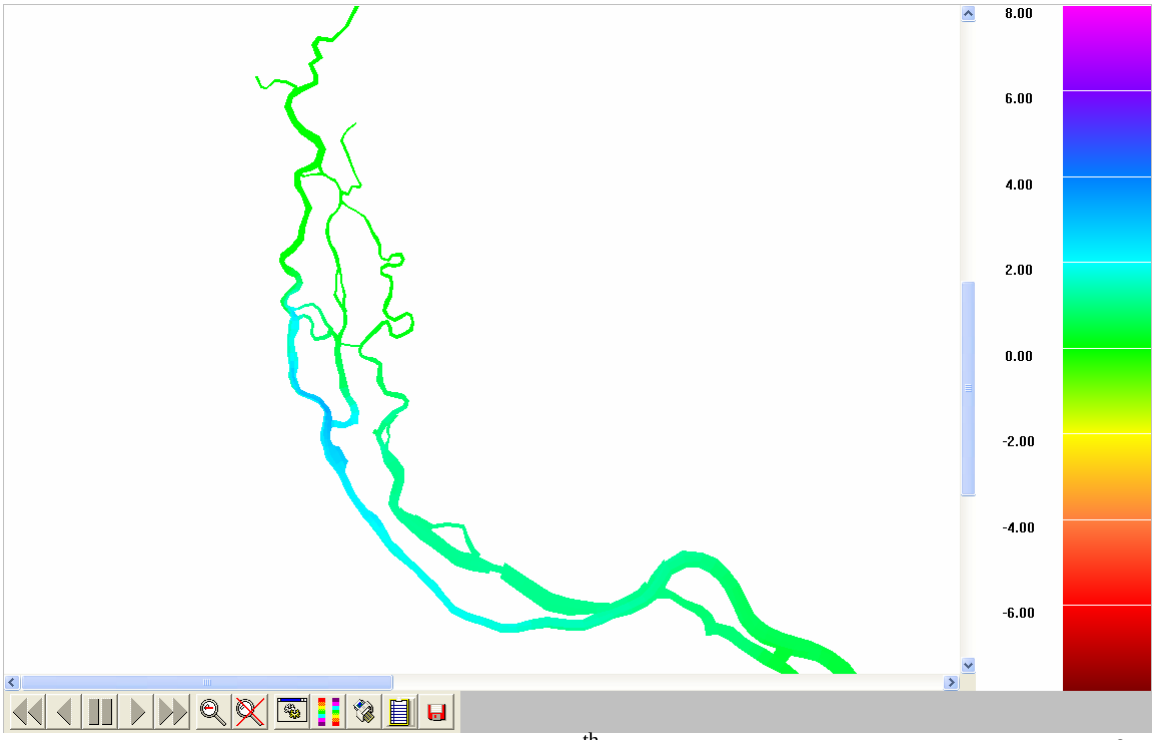
37. Figure A3.7. Changes in D.O. 50th %ile distribution along bottom layer: 3 ft deepening



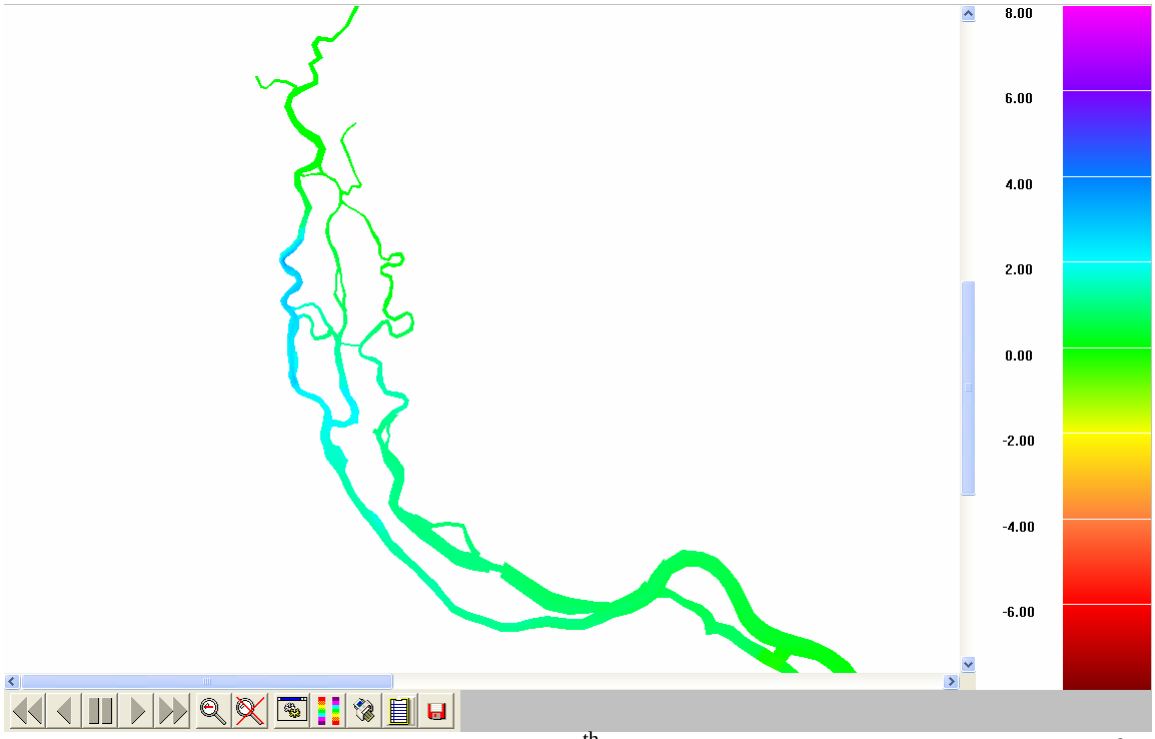
38. Figure A3.8. Changes in D.O. 95th %ile distribution along bottom layer: 3 ft deepening



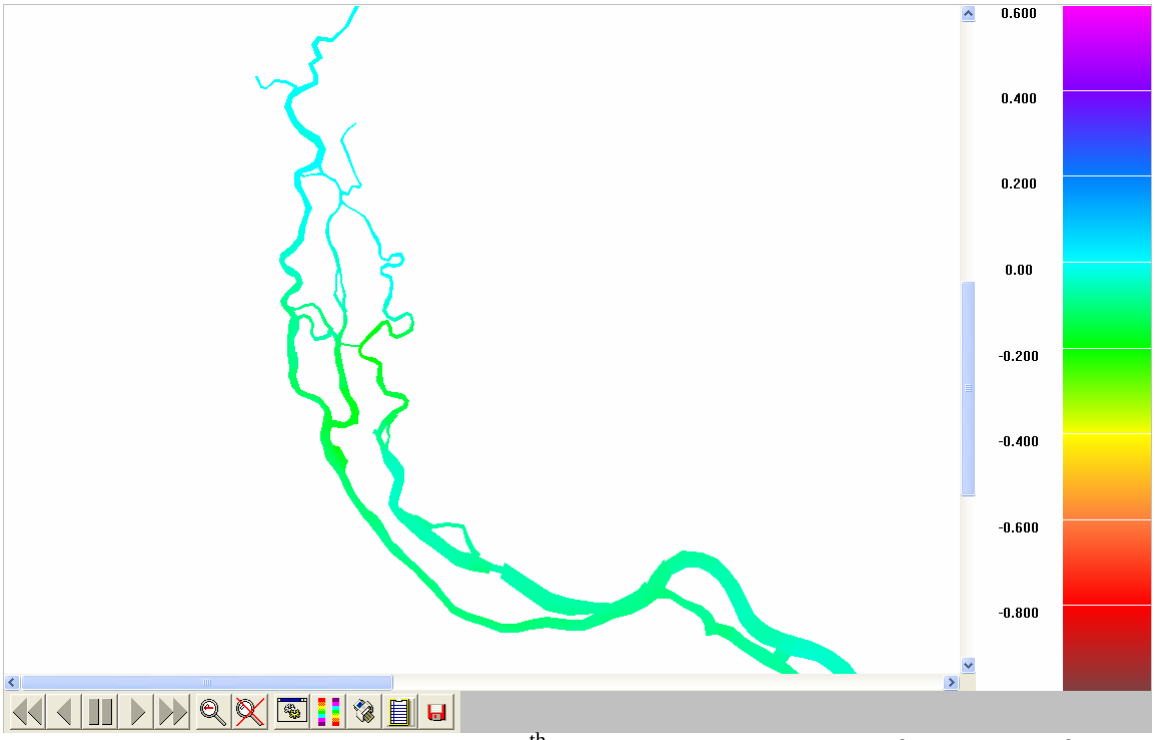
39. Figure A3.9. Changes in Salinity 5th %ile distribution along bottom layer: 3 ft deepening



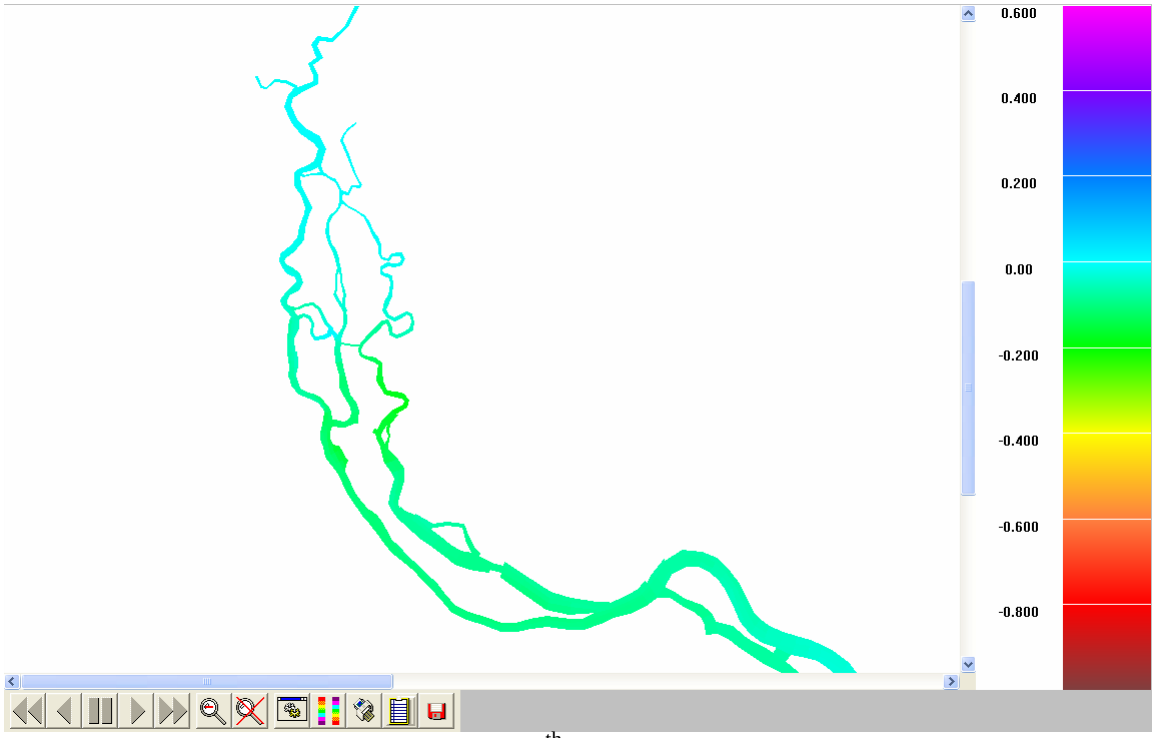
40. Figure A3.10. Changes in Salinity 50th %ile distribution along bottom layer: 3 ft deepening



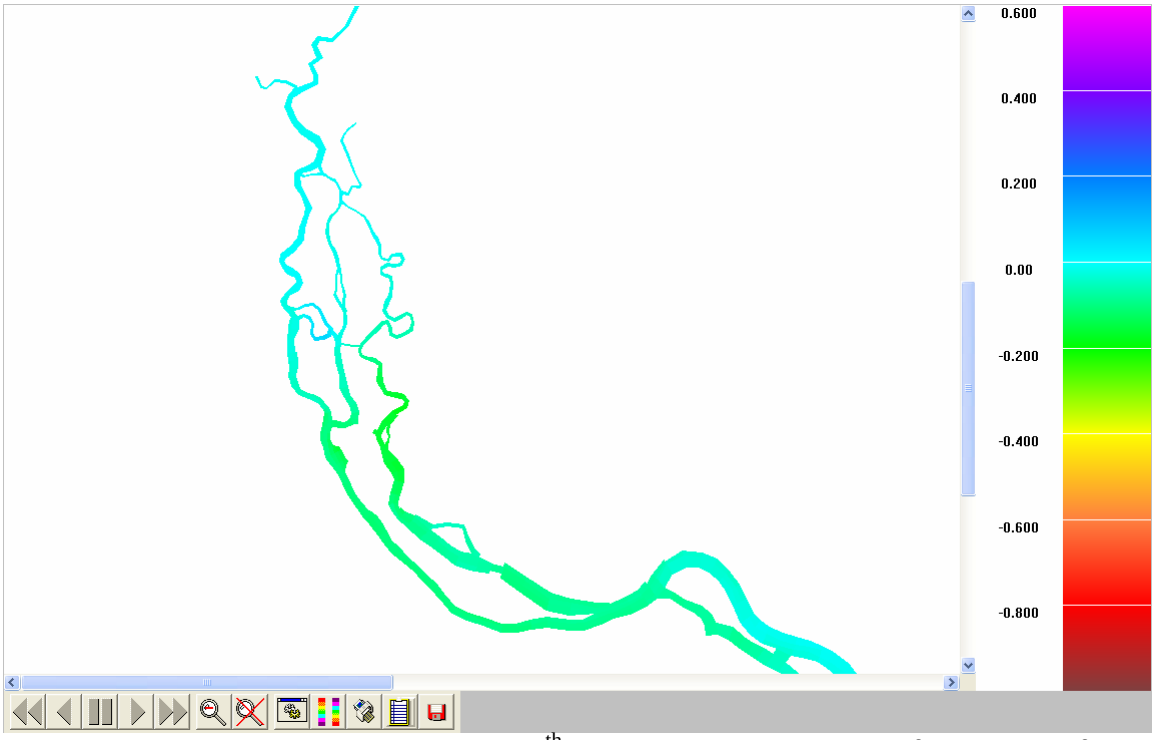
41. Figure A3.11. Changes in Salinity 95th %ile distribution along bottom layer: 3 ft deepening



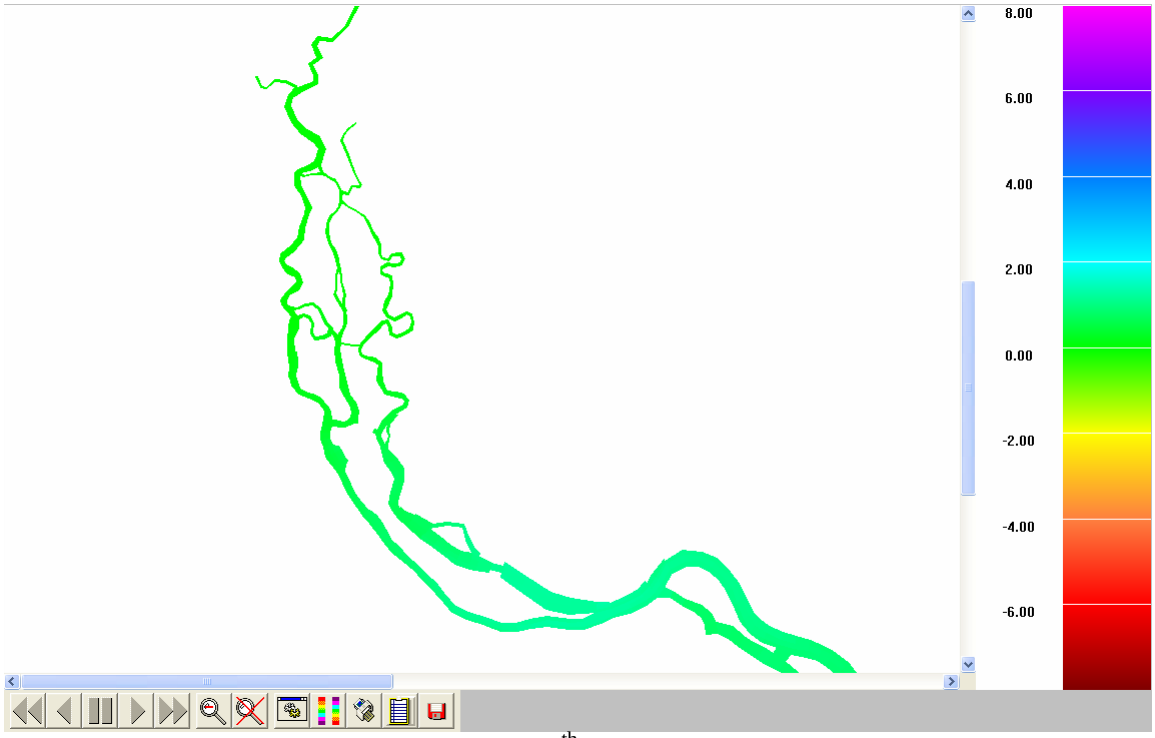
42. Figure A3.12. Changes in D.O. 5th %ile distribution along surface layer: 3 ft deepening



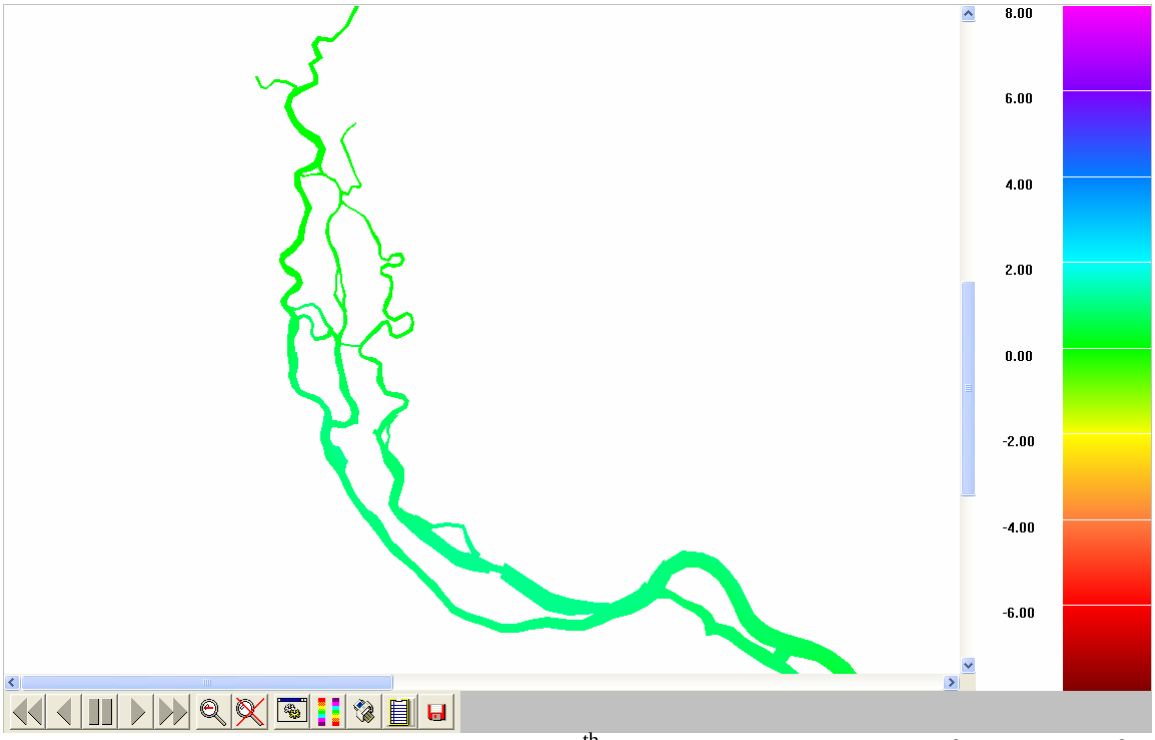
43. Figure A3.13. Changes in D.O. 50th %ile distribution along surface layer: 3 ft deepening



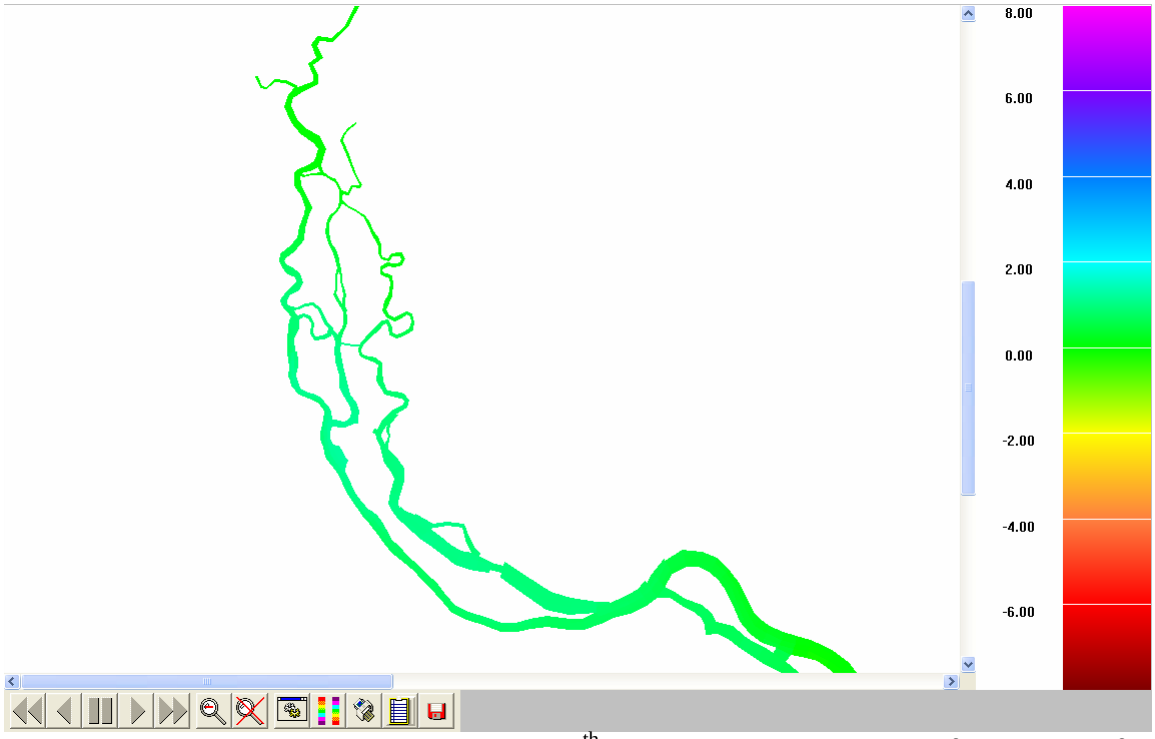
44. Figure A3.14. Changes in D.O. 95th %ile distribution along surface layer: 3 ft deepening



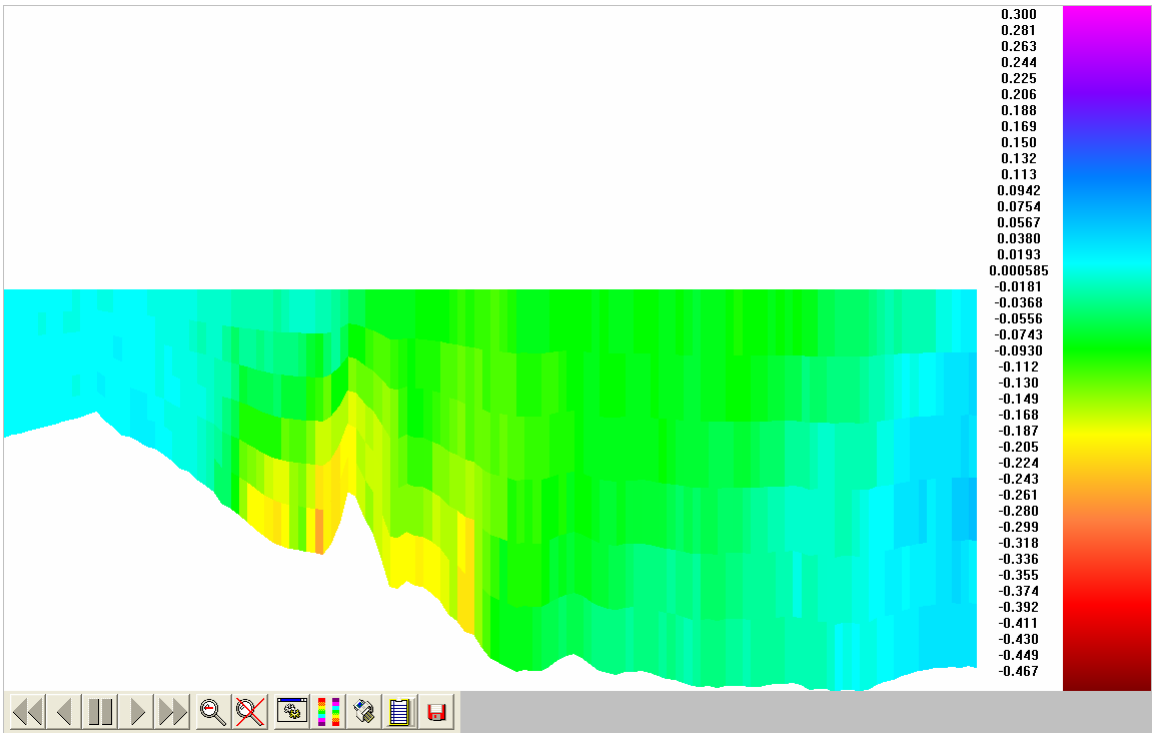
45. Figure A3.15. Changes in Salinity 5th %ile distribution along surface layer: 3 ft deepening



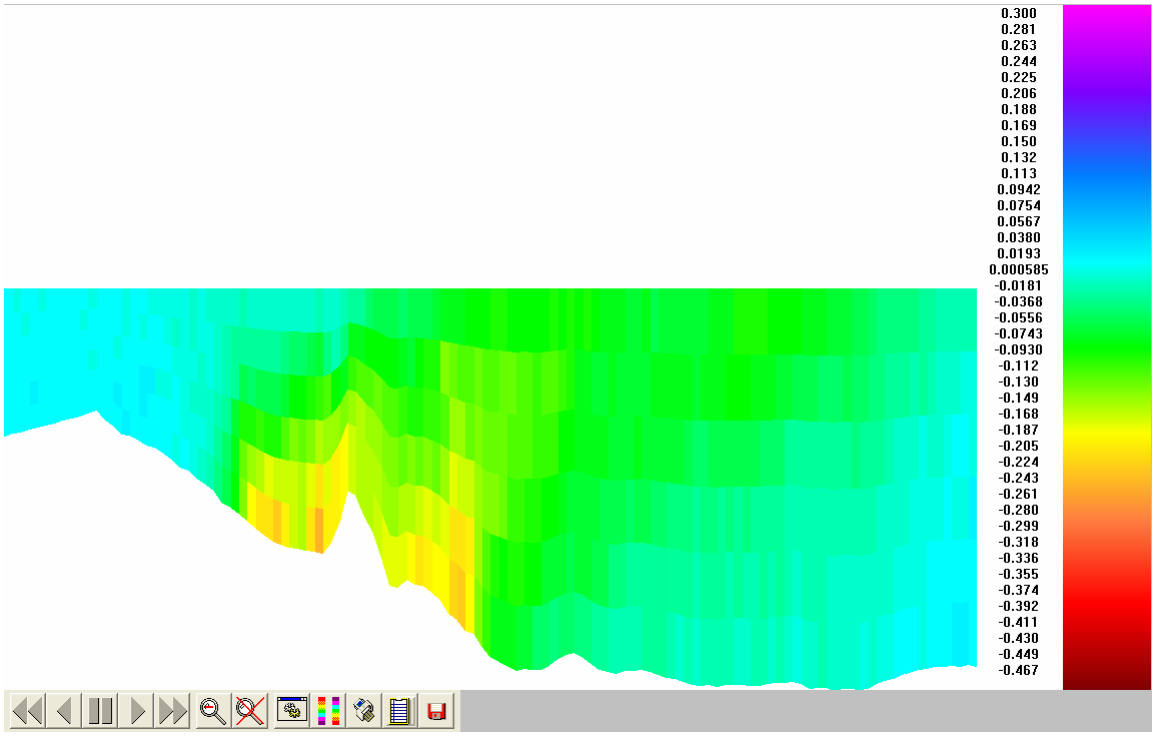
46. Figure A3.16. Changes in Salinity 50th %ile distribution along surface layer: 3 ft deepening



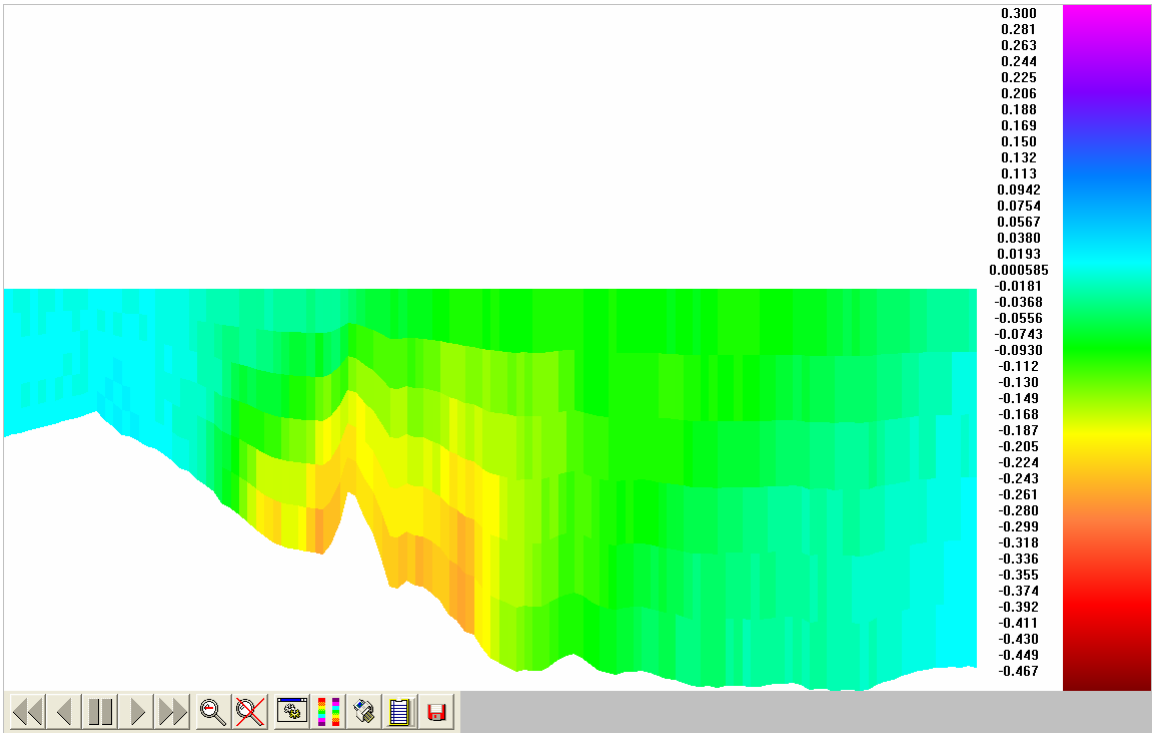
47. Figure A3.17. Changes in Salinity 95th %ile distribution along surface layer: 3 ft deepening



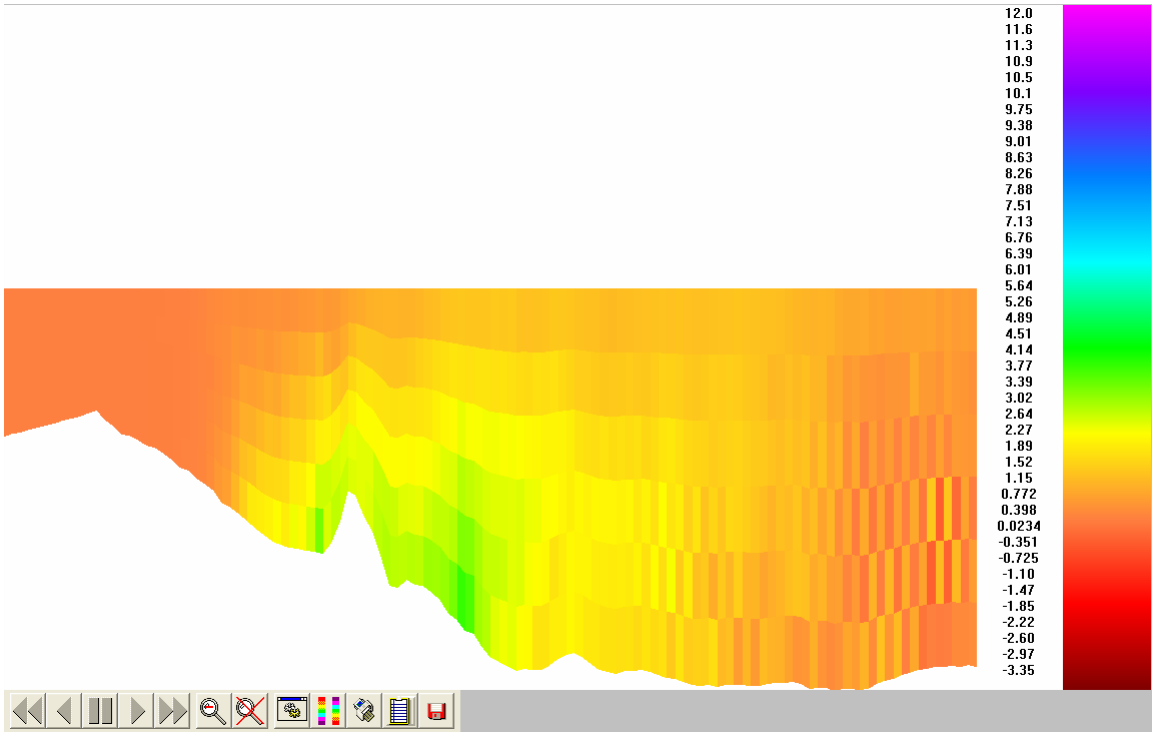
48. Figure A3.18. Snapshot of changes in 1-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 3 ft deepening



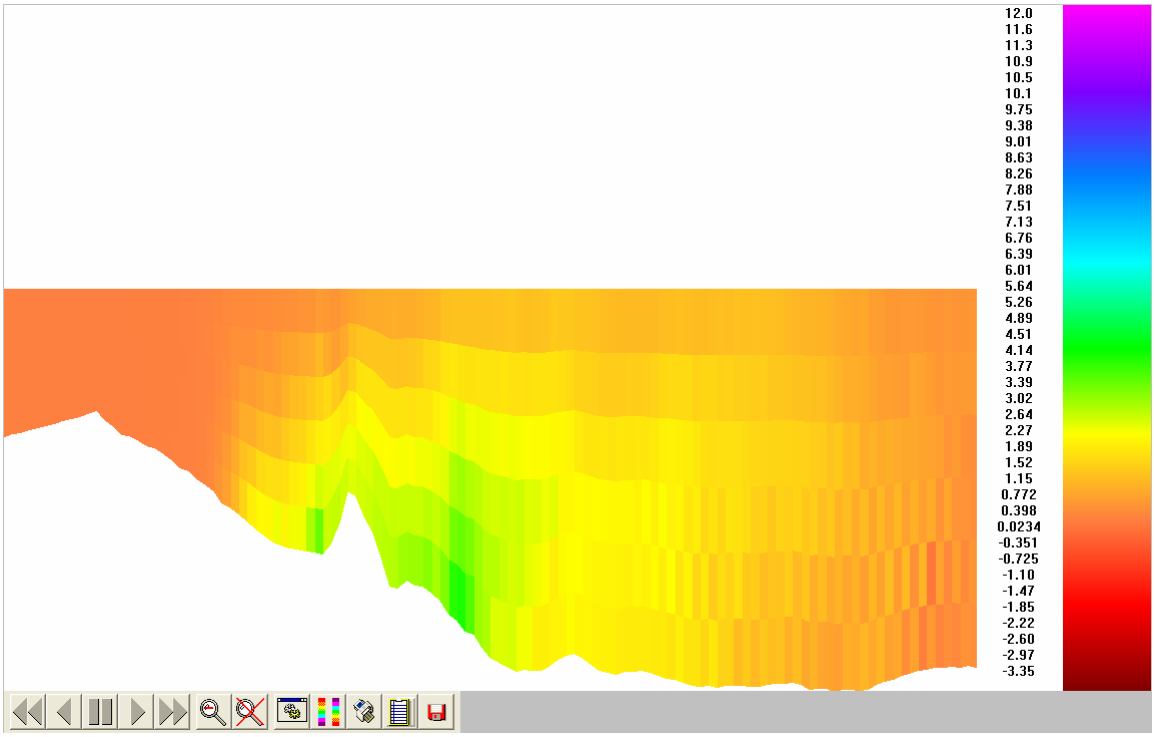
49. Figure A3.19. Snapshot of changes in 7-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 3 ft deepening



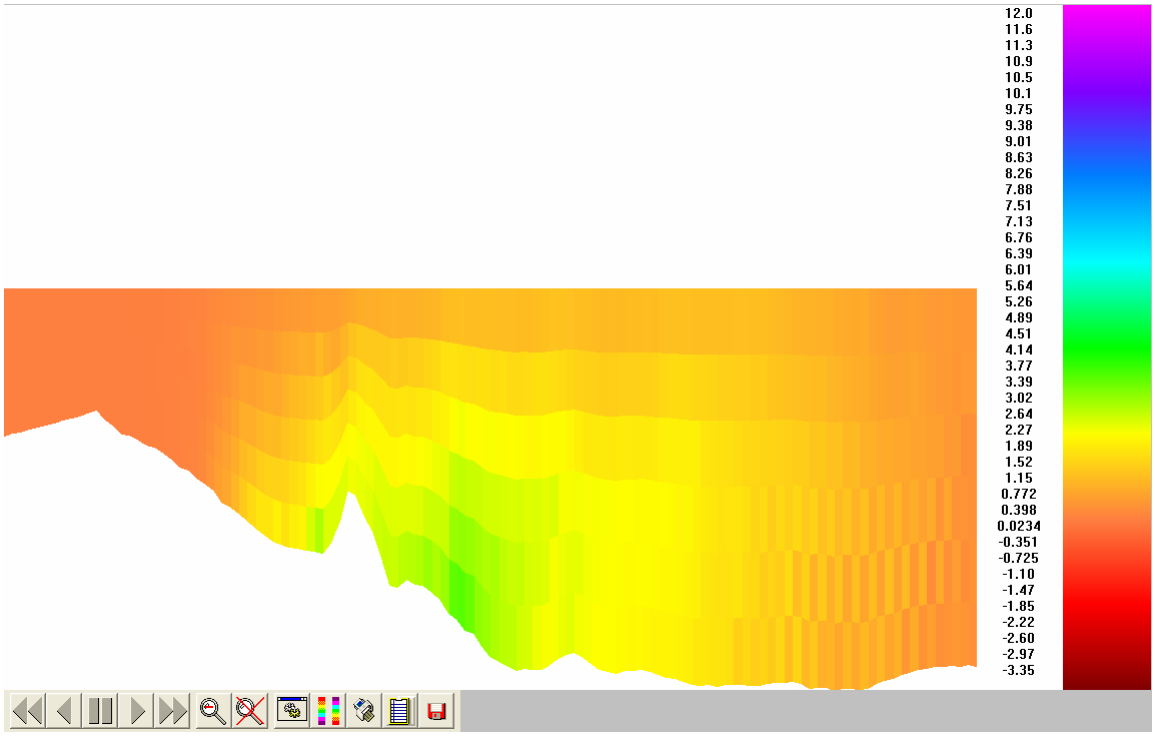
50. Figure A3.20. Snapshot of changes in 30-days averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 3 ft deepening



51. Figure A3.21. Snapshot of changes in 1-day averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 3 ft deepening



52. Figure A3.22. Snapshot of changes in 7-days averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 3 ft deepening



53. Figure A3.23. Snapshot of changes in 30-days averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 3 ft deepening

Appendix A4

BASIC EVALUATION: 2 ft DEEPENING BATHYMETRY, 2004 POINT SOURCES LOADS, 1999 HYDROLOGICAL AND METEOROLOGICAL CONDITIONS

May 1 – October 30, 1999 Simulation Period

Water Quality Review Group

1. Table A4.1. Dissolved oxygen percentiles distribution in Critical cells

Zone	D.O. Percentile (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.41	3.61	3.73	3.94	4.29	4.71	4.98	5.19	5.55
FR2	2.74	2.99	3.12	3.39	3.74	4.16	4.51	4.66	4.97
FR3	2.47	2.72	2.83	3.06	3.5	3.91	4.25	4.41	4.73
FR4	2.41	2.65	2.76	3	3.46	3.86	4.19	4.34	4.65
FR5	2.47	2.67	2.79	3.09	3.49	3.87	4.22	4.39	4.63
FR6	2.48	2.67	2.77	3.07	3.46	3.83	4.23	4.38	4.62
FR7	2.97	3.23	3.45	3.8	4.24	4.73	5.12	5.37	5.97
FR8	3.07	3.39	3.55	3.99	4.54	4.99	5.35	5.53	5.86
FR9	3.89	4.25	4.46	4.8	5.18	5.48	5.75	5.92	6.27
FR10	2.32	3.13	3.38	3.93	4.6	5.25	5.65	5.81	6.04
FR11	2.18	2.78	3.17	3.64	4.23	4.86	5.41	5.62	5.96
MR1	2.58	2.93	3.12	3.49	3.84	4.16	4.5	4.66	4.91
MR2	2.19	2.56	2.88	3.32	3.75	4.14	4.45	4.65	4.92
MR3	2.07	2.44	2.75	3.24	3.68	4.1	4.42	4.66	4.89
MR4	2.05	2.44	2.61	3.04	3.47	3.81	4.15	4.34	4.65
MR5	0.43	1.01	1.39	2.23	3.66	5.13	5.58	5.73	5.98
MR6	1.07	1.68	2.14	3.06	4.41	5.32	5.71	5.9	6.18
LBR1	2.59	3.3	3.52	3.98	4.33	4.62	4.93	5.1	5.39
LBR2	2.09	2.34	2.51	2.98	3.34	3.64	3.94	4.15	4.46
LBR3	1.41	1.92	2.14	2.65	3.22	3.7	4.02	4.25	4.63
BR1	2	2.23	2.42	2.79	3.22	3.64	4.02	4.22	4.48
BR2	1.37	1.64	1.84	2.21	2.8	3.2	3.58	3.79	4.16
BR3	1.69	2.04	2.23	2.57	3.06	3.47	3.8	4.04	4.4
SCH1	1.3	1.72	1.94	2.5	3.28	4.06	4.62	4.93	5.27
SCH2	3.07	3.29	3.43	3.68	4.02	4.43	4.76	4.93	5.27
SR	2.25	2.53	2.96	3.6	3.86	4.2	4.5	4.65	4.91

2. Table A4.2. Delta of Dissolved Oxygen percentiles distribution in Critical cells: Deepening scenario minus Existing bathymetry scenario

Zone	Delta D.O. Percentile																	
	1%		5%		10%		25%		50%		75%		90%		95%		99	
	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%
FR1	-0.02	-0.6	0	0.0	0.01	0.3	-0.01	-0.3	0	0.0	-0.01	-0.2	-0.02	-0.4	-0.01	-0.2	-0.02	-0.4
FR2	0	0.0	0	0.0	0.01	0.3	0	0.0	0	0.0	0	0.0	-0.01	-0.2	-0.01	-0.2	0	0.0
FR3	0.02	0.8	0.03	1.1	0.02	0.7	0.01	0.3	0	0.0	0	0.0	-0.01	-0.2	0	0.0	0.02	0.4
FR4	-0.1	-4.0	-0.09	-3.3	-0.09	-3.2	-0.1	-3.2	-0.06	-1.7	-0.05	-1.3	-0.06	-1.4	-0.09	-2.0	-0.06	-1.3
FR5	-0.03	-1.2	-0.02	-0.7	0.01	0.4	-0.01	-0.3	-0.01	-0.3	0	0.0	-0.01	-0.2	-0.02	-0.5	0.01	0.2
FR6	-0.06	-2.4	-0.07	-2.6	-0.04	-1.4	-0.08	-2.5	-0.05	-1.4	-0.06	-1.5	-0.07	-1.6	-0.1	-2.2	-0.07	-1.5
FR7	-0.16	-5.1	-0.18	-5.3	-0.14	-3.9	-0.15	-3.8	-0.18	-4.1	-0.14	-2.9	-0.09	-1.7	-0.08	-1.5	-0.06	-1.0
FR8	-0.13	-4.1	-0.13	-3.7	-0.14	-3.8	-0.12	-2.9	-0.15	-3.2	-0.12	-2.3	-0.07	-1.3	-0.08	-1.4	-0.04	-0.7
FR9	0.5	14.7	0.61	16.8	0.62	16.1	0.57	13.5	0.44	9.3	0.28	5.4	0.29	5.3	0.31	5.5	0.39	6.6
FR10	0.03	1.3	0	0.0	0	0.0	0.01	0.3	0.01	0.2	0.01	0.2	0	0.0	-0.01	-0.2	0.01	0.2
FR11	0.01	0.5	0	0.0	0.02	0.6	0.01	0.3	0.01	0.2	0.01	0.2	0.01	0.2	0	0.0	0.02	0.3
MR1	0	0.0	-0.06	-2.0	-0.06	-1.9	-0.06	-1.7	-0.09	-2.3	-0.09	-2.1	-0.08	-1.7	-0.09	-1.9	-0.07	-1.4
MR2	-0.01	-0.5	0	0.0	-0.03	-1.0	-0.05	-1.5	-0.07	-1.8	-0.07	-1.7	-0.08	-1.8	-0.09	-1.9	-0.08	-1.6
MR3	-0.01	-0.5	-0.01	-0.4	-0.01	-0.4	-0.04	-1.2	-0.06	-1.6	-0.07	-1.7	-0.08	-1.8	-0.07	-1.5	-0.08	-1.6
MR4	0	0.0	0	0.0	-0.02	-0.8	-0.01	-0.3	-0.01	-0.3	-0.02	-0.5	-0.03	-0.7	-0.02	-0.5	-0.03	-0.6
MR5	-0.02	-4.4	0.02	2.0	0	0.0	0.02	0.9	0.03	0.8	0.01	0.2	0.01	0.2	0	0.0	0.01	0.2
MR6	0.02	1.9	0.02	1.2	0.03	1.4	0.03	1.0	-0.01	-0.2	0.02	0.4	0	0.0	0.01	0.2	0.01	0.2
LBR1	-0.08	-3.0	0.01	0.3	0.02	0.6	0.02	0.5	0.02	0.5	0.02	0.4	0.01	0.2	0	0.0	-0.04	-0.7
LBR2	-0.01	-0.5	0.01	0.4	0	0.0	0	0.0	0.01	0.3	0	0.0	0	0.0	0.02	0.5	0.03	0.7
LBR3	0.07	5.2	0.17	9.7	0.1	4.9	0.09	3.5	0.09	2.9	0.07	1.9	0.04	1.0	0.07	1.7	0.07	1.5
BR1	0	0.0	0	0.0	0.01	0.4	0.01	0.4	0.01	0.3	0.01	0.3	0.01	0.2	0	0.0	0	0.0
BR2	0	0.0	0.03	1.9	0.01	0.5	0.01	0.5	0.02	0.7	0.01	0.3	0.01	0.3	0.01	0.3	0.01	0.2
BR3	0	0.0	0.01	0.5	0.01	0.5	0.01	0.4	0	0.0	0	0.0	0.01	0.3	-0.01	-0.2	0.01	0.2
SCH1	0.01	0.8	0.07	4.2	0.02	1.0	0.01	0.4	-0.03	-0.9	-0.04	-1.0	-0.04	-0.9	-0.05	-1.0	-0.05	-0.9
SCH2	-0.01	-0.3	-0.02	-0.6	-0.02	-0.6	-0.01	-0.3	-0.02	-0.5	-0.01	-0.2	-0.01	-0.2	-0.03	-0.6	0.02	0.4
SR	0.01	0.4	0.01	0.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.01	0.2	0	0.0

3. Table A4.3. Dissolved oxygen percentiles distribution in Zones of Savannah Estuary

Zone Name	D.O. Concentration Percentiles (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.79	3.96	4.05	4.25	4.61	5.00	5.26	5.46	5.80
FR2	3.21	3.45	3.56	3.78	4.12	4.52	4.82	4.97	5.30
FR3	2.75	2.98	3.07	3.32	3.69	4.09	4.43	4.60	4.89
FR4	2.45	2.69	2.82	3.08	3.49	3.87	4.22	4.40	4.68
FR5	2.48	2.70	2.80	3.05	3.47	3.84	4.21	4.37	4.63
FR6	2.60	2.80	2.90	3.18	3.55	3.91	4.29	4.46	4.66
FR7	2.88	3.12	3.35	3.70	4.15	4.67	5.02	5.20	5.53
FR8	3.18	3.49	3.65	4.07	4.53	4.97	5.25	5.43	5.73
FR9	3.79	4.07	4.30	4.67	5.09	5.43	5.70	5.86	6.10
FR10	4.01	4.49	4.70	4.98	5.26	5.54	5.79	5.91	6.14
FR11	2.63	3.18	3.56	3.96	4.30	4.63	4.94	5.13	5.37
MR1	2.74	2.99	3.14	3.51	3.84	4.15	4.50	4.67	4.87
MR2	2.34	2.77	3.00	3.40	3.79	4.13	4.46	4.65	4.86
MR3	2.09	2.34	2.65	3.11	3.55	3.98	4.32	4.54	4.86
MR4	2.73	2.94	3.17	3.57	3.91	4.21	4.51	4.67	4.86
MR5	1.08	1.49	1.90	2.74	4.13	5.09	5.51	5.67	5.94
MR6	1.10	1.71	2.16	3.11	4.47	5.28	5.66	5.85	6.12
LBR1	2.87	3.04	3.19	3.65	3.92	4.17	4.48	4.61	4.75
LBR2	2.03	2.26	2.50	2.91	3.30	3.60	3.90	4.09	4.31
LBR3	1.81	1.96	2.08	2.56	3.07	3.37	3.70	3.85	4.20
BR1	2.41	2.54	2.65	2.95	3.36	3.77	4.15	4.34	4.60
BR2	1.95	2.17	2.30	2.62	3.07	3.50	3.88	4.07	4.34
BR3	1.95	2.13	2.25	2.60	3.06	3.44	3.82	4.02	4.29
SCh1	2.59	2.90	3.01	3.28	3.64	4.10	4.42	4.57	4.85
SCh2	3.33	3.47	3.58	3.79	4.10	4.51	4.82	4.99	5.30
SR	2.62	2.80	3.29	3.89	4.12	4.44	4.71	4.85	5.11

4. Table A4.4. Delta of Dissolved Oxygen percentiles distribution in Zones of Savannah Estuary: Deepening scenario minus Existing bathymetry scenario

Zone	Project - Baseline Difference (mg/l)									Project - Baseline Relative Difference (%)								
Name	1%	5%	10%	25%	50%	75%	90%	95%	99%	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	-0.01	0.00	0.00	0.00	0.01	-0.01	-0.02	-0.01	-0.01	-0.3	0.1	0.0	0.1	0.2	-0.2	-0.3	-0.2	-0.2
FR2	-0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.00	-0.3	0.4	0.1	0.2	0.3	0.0	0.1	0.1	-0.1
FR3	0.01	0.03	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.3	0.9	0.9	0.3	0.3	0.3	0.3	0.2	0.1
FR4	-0.04	-0.03	0.01	0.01	-0.01	-0.01	-0.02	0.00	0.01	-1.8	-1.1	0.2	0.3	-0.3	-0.2	-0.4	0.1	0.3
FR5	-0.06	-0.05	-0.03	-0.04	-0.04	-0.04	-0.05	-0.04	0.00	-2.5	-1.8	-1.1	-1.2	-1.0	-1.0	-1.3	-0.8	0.0
FR6	-0.07	-0.07	-0.06	-0.09	-0.09	-0.09	-0.09	-0.10	-0.08	-2.7	-2.5	-2.0	-2.6	-2.5	-2.3	-2.0	-2.2	-1.7
FR7	-0.14	-0.14	-0.11	-0.13	-0.16	-0.15	-0.11	-0.11	-0.09	-4.7	-4.3	-3.1	-3.5	-3.8	-3.2	-2.1	-2.1	-1.6
FR8	-0.14	-0.13	-0.15	-0.13	-0.14	-0.11	-0.10	-0.09	-0.04	-4.2	-3.5	-3.9	-3.2	-3.0	-2.2	-1.9	-1.6	-0.7
FR9	-0.14	-0.16	-0.14	-0.14	-0.11	-0.07	-0.05	-0.04	-0.04	-3.5	-3.8	-3.1	-3.0	-2.1	-1.2	-0.9	-0.7	-0.6
FR10	0.00	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	0.0	-0.4	-0.1	-0.4	-0.4	-0.3	-0.4	-0.3	-0.3
FR11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	-0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2
MR1	-0.05	-0.06	-0.08	-0.05	-0.09	-0.09	-0.08	-0.08	-0.07	-1.9	-1.9	-2.4	-1.4	-2.3	-2.1	-1.6	-1.6	-1.3
MR2	-0.02	-0.02	-0.05	-0.05	-0.07	-0.07	-0.07	-0.09	-0.09	-0.8	-0.8	-1.5	-1.5	-1.9	-1.7	-1.6	-1.9	-1.8
MR3	0.00	-0.01	-0.01	-0.02	-0.03	-0.05	-0.05	-0.05	-0.06	0.0	-0.6	-0.5	-0.6	-0.9	-1.1	-1.1	-1.0	-1.1
MR4	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	-0.1	0.3	0.3	0.3	0.2	0.1	-0.1	-0.1	0.1
MR5	0.00	0.03	0.02	0.02	0.00	0.01	0.00	0.01	0.02	0.5	1.8	1.2	0.6	0.0	0.2	0.1	0.1	0.3
MR6	0.00	0.03	0.03	0.01	0.01	0.01	0.00	0.01	0.01	0.0	1.5	1.4	0.5	0.2	0.1	0.0	0.1	0.1
LBR1	0.01	0.01	0.02	0.01	0.00	0.01	0.01	0.01	0.00	0.2	0.5	0.5	0.4	0.1	0.2	0.3	0.2	-0.1
LBR2	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.02	-0.1	0.2	0.3	0.0	0.2	0.2	0.2	0.1	0.5
LBR3	0.06	0.06	0.08	0.04	0.03	0.04	0.04	0.03	0.04	3.1	3.1	3.9	1.5	0.9	1.4	1.1	0.8	1.1
BR1	-0.01	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.4	-0.1	-0.4	0.0	0.1	-0.1	0.0	-0.1	-0.1
BR2	0.00	0.00	0.00	0.01	0.01	0.00	-0.01	0.00	0.00	0.0	0.1	0.0	0.4	0.2	0.0	-0.2	0.0	0.1
BR3	0.03	0.02	0.01	0.02	0.00	0.01	0.01	0.00	0.00	1.6	1.0	0.5	0.8	0.0	0.2	0.3	-0.1	-0.1
SCh1	-0.02	0.02	0.00	0.01	0.00	-0.01	-0.02	-0.01	0.02	-0.6	0.9	0.2	0.3	-0.1	-0.2	-0.5	-0.2	0.4
SCh2	-0.01	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	0.01	-0.2	0.0	0.0	-0.1	0.0	-0.2	-0.2	-0.2	0.2
SR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0

5. Table A4.5. Percentage of the volume of waters with violation of Dissolved Oxygen standards for Zones of Savannah Estuary within the period of May 1 – October 30, 1999: Deepening (Project) and Existing (Baseline) bathymetry

Zones	1-Day Average			7-Day Average			30-Day Average			GA MINIMUM D.O.			SC MINIMUM D.O.		
	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B
FR1	0	0	0	0	0	0	0	0	0	0	0	0	7	7	0
FR2	0	0	0	0	0	0	3	3	0	0	1	1	31	31	0
FR3	0	0	0	2	2	0	19	19	0	3	3	0	N/A	N/A	N/A
FR4	0	0	0	5	6	1	22	23	1	6	6	0	N/A	N/A	N/A
FR5	0	0	0	4	5	1	19	21	2	5	6	1	N/A	N/A	N/A
FR6	0	0	0	2	3	1	12	16	4	4	5	1	N/A	N/A	N/A
FR7	0	0	0	0	0	0	1	1	0	0	1	1	N/A	N/A	N/A
FR8	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR9	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR10	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR11	0	0	0	0	0	0	2	2	0	1	1	0	6	6	0
MR1	0	0	0	0	1	1	5	6	1	1	1	0	N/A	N/A	N/A
MR2	0	0	0	1	1	0	6	7	1	1	2	1	N/A	N/A	N/A
MR3	0	0	0	3	3	0	10	11	1	3	4	1	N/A	N/A	N/A
MR4	0	0	0	1	1	0	5	5	0	2	2	0	N/A	N/A	N/A
MR5	0	0	0	1	1	0	5	5	0	5	5	0	11	11	0
MR6	0	0	0	0	0	0	3	3	0	3	3	0	9	9	0
LBR1	0	0	0	1	1	0	6	6	0	1	1	0	18	18	0
LBR2	1	1	0	6	6	0	18	18	0	7	7	0	34	34	0
LBR3	3	3	0	13	13	0	30	30	0	14	14	0	47	48	1
BR1	0	0	0	10	10	0	39	39	0	12	12	0	67	67	0
BR2	2	2	0	19	20	1	49	49	0	20	20	0	75	75	0
BR3	3	3	0	21	21	0	48	48	0	22	22	0	70	71	1
SCh1	1	1	0	4	3	-1	8	8	0	5	5	0	N/A	N/A	N/A
SCh2	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
SR	0	0	0	1	1	0	3	3	0	1	1	0	6	6	0

26. Table A4.6. Percentage of water volumes with salinity in %iles within the period of May 1 – October 30, 1999

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	19.1	4.8	4.4	4.5	4.4	4.3	7	3.8	86.9
10	23.1	8.6	8.8	8.9	8.9	8.7	11.2	9.5	86.9
25	35.4	20.1	22.3	22.4	22.8	22.1	25.2	19.9	86.9
50	56.9	42.3	46.6	46.6	47.2	46.2	49.5	42.7	86.9
75	79.1	69.4	72.8	72.9	73.1	72.9	73.5	69.3	86.9
90	91.2	87.3	89	89.1	89.2	89.1	88.8	87.5	93.4
95	95.4	93.6	94.4	94.5	94.6	94.6	94.2	93.7	96.9
Total Volume 100*km3:	31984.3	658.7	4807.8	24.1	39.2	136.3	9.9	9.5	43.6

27. Table A4.7. Percentage of water volumes with D.O. in %iles within the period of May 1 – October 30, 1999

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	5.2	4.9	4.9	5.5	5.3	4.8	5.3	5.6	5.7
10	10.4	9.8	9.8	11.3	10.4	9.6	10.2	10.7	11.1
25	26.1	24.7	24.8	27.5	26.1	24.2	25.5	25.7	26.4
50	52.1	49.5	49.9	53.3	51.1	49.3	50.6	51.1	51.6
75	76.9	74.6	75.1	77.5	76	74.5	75.5	76	75.8
90	90.7	89.8	90.1	91.2	90.4	89.9	90.3	90.4	90.5
95	95.3	94.9	95	95.7	95.3	94.8	95.1	95.3	95.1
Total Volume 100*km3:	31984.3	658.7	4807.8	24.1	39.2	136.3	9.9	9.5	43.6

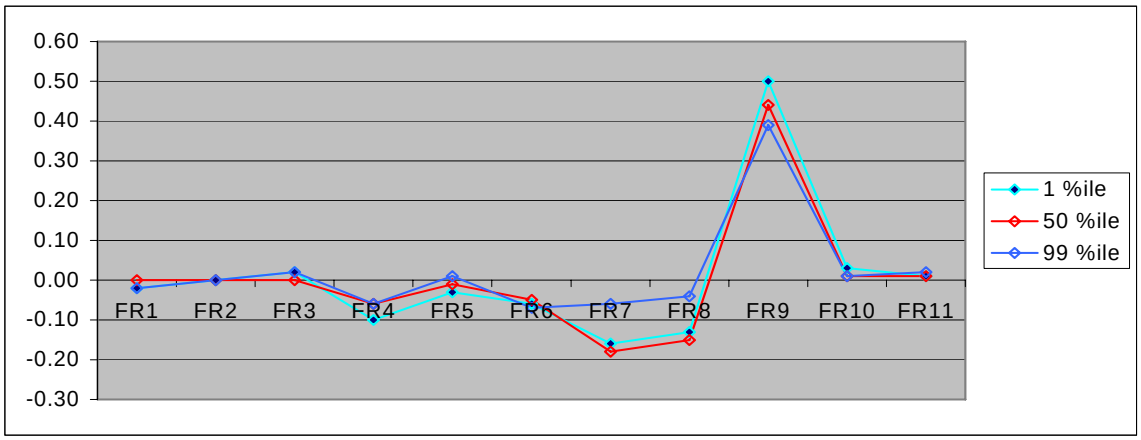
28. Table A4.8. Water volumes in Upper Harbor in increments of 1^{o} C of water temperature within the period of May 1 – October 30, 1999

Temperature C^{o}	Total Volume %
19	0.01
20	0.8
21	3.88
22	9.01
23	14.43
24	22.87
25	34.03
26	48.57
27	59.8
28	68.4
29	76.72
30	85.33
31	89.34
32	95.97
33	99.99
34	100

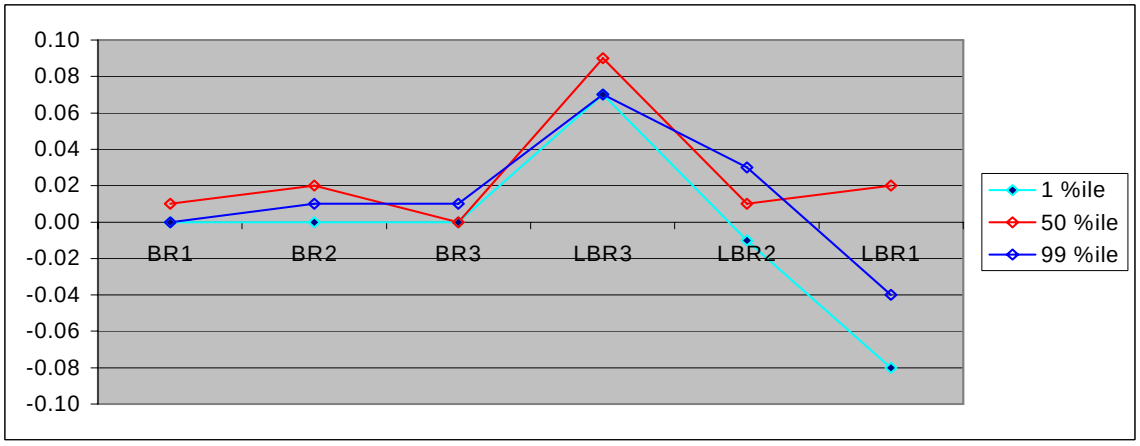
29. Table A4.9. Water volumes in Upper Harbor in increments of 0.1 mg/l of D.O. within the period of May 1 – October 30, 1999
(See file: Postprocessor Output\99-B12\99-B12_DO Increment Volume)

30. Table A4.10. Percentage of water volumes corresponding to 1-, 7-, and 30-days averages of D.O. depth-averaged concentrations in Upper Harbor within the period of May 1 – October 30, 1999
(See file: Postprocessor Output\99-B12\99-B12_volume DO in averages)

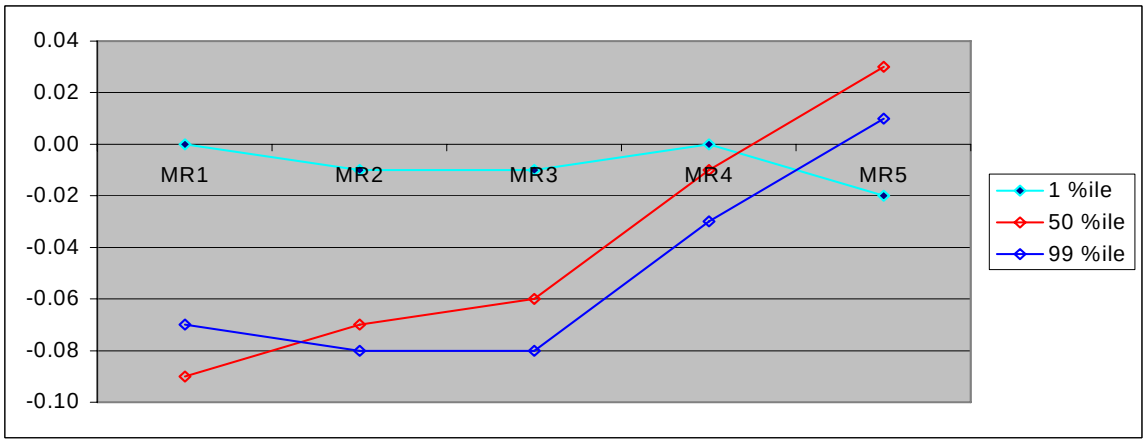
Front River



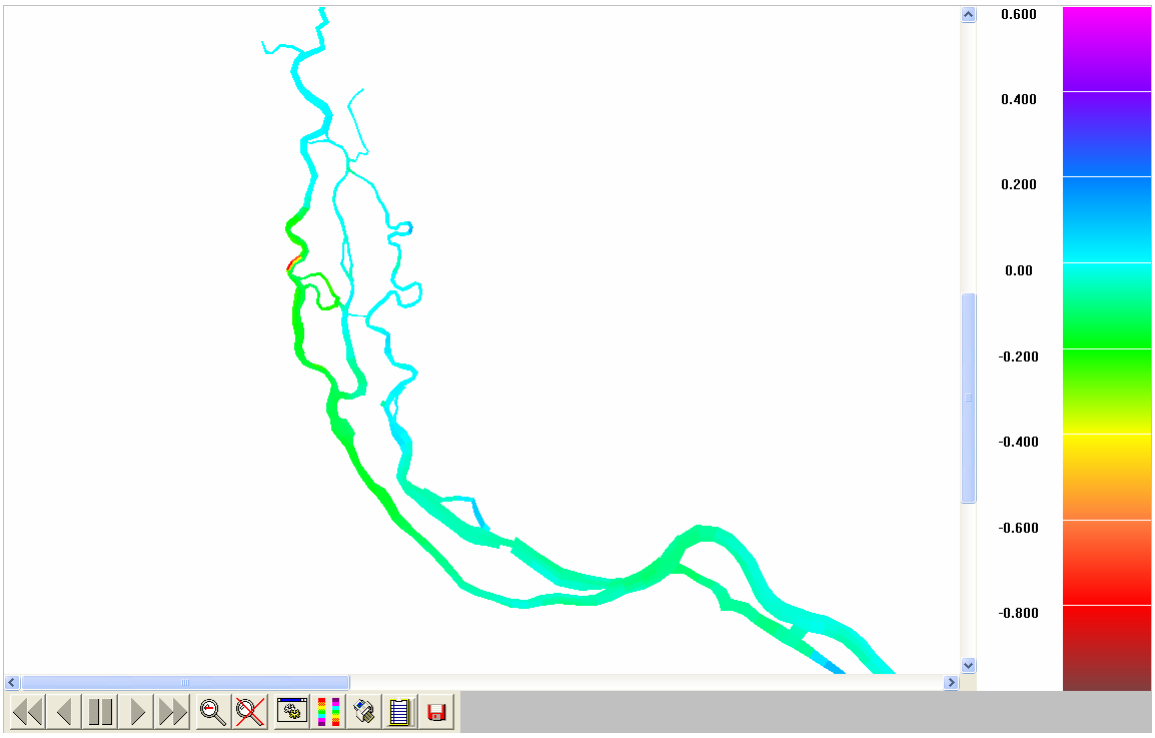
Back and Little Back Rivers



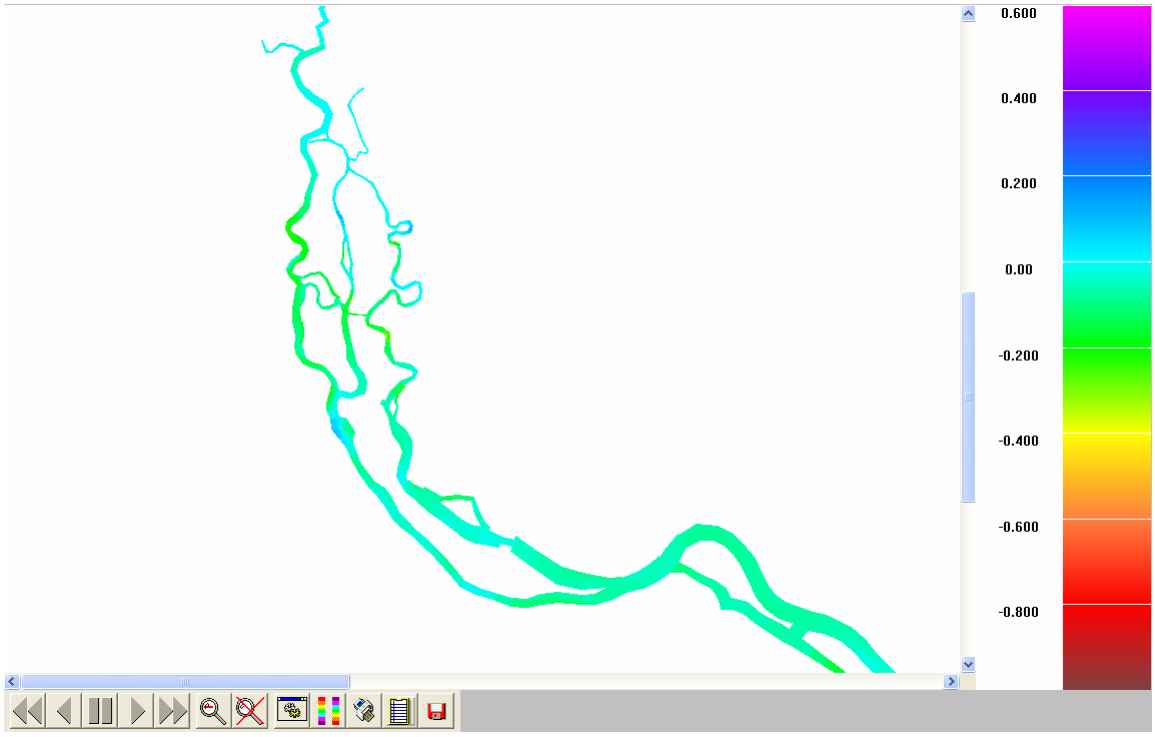
Middle River



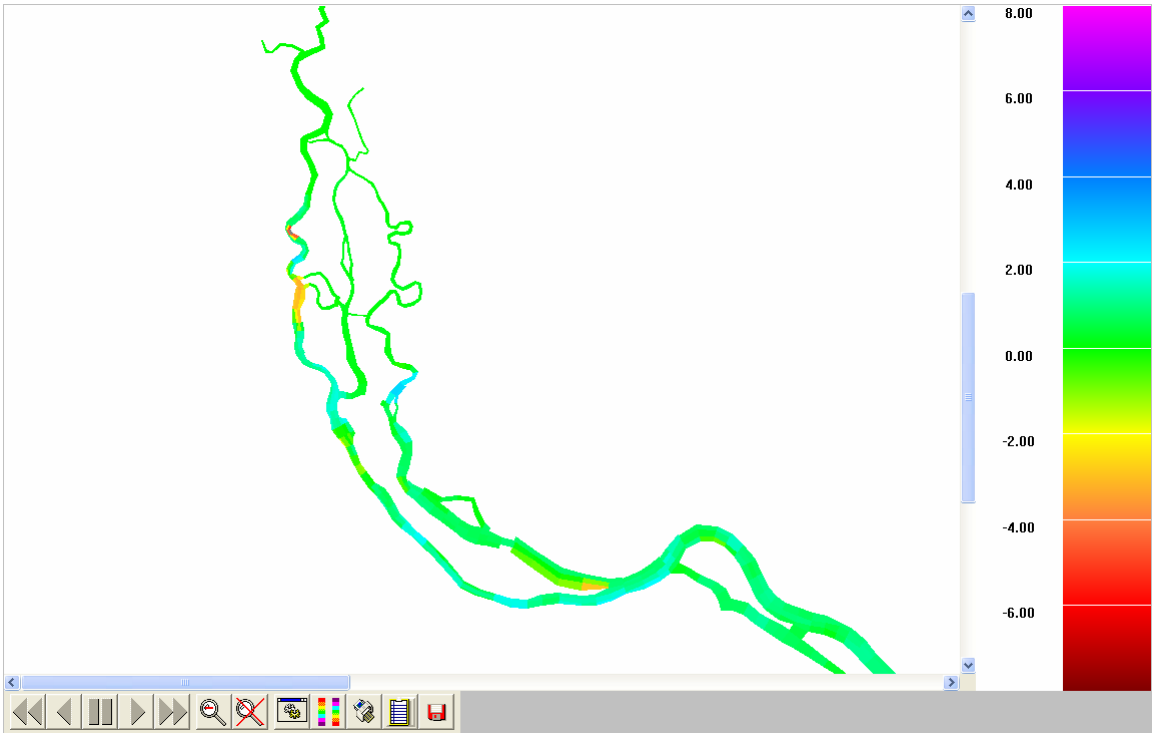
31. Figure A4.1. Changes in longitudinal profile of Dissolved Oxygen (mg/l) distribution along Critical cells of Savannah Estuary: 2 ft deepening



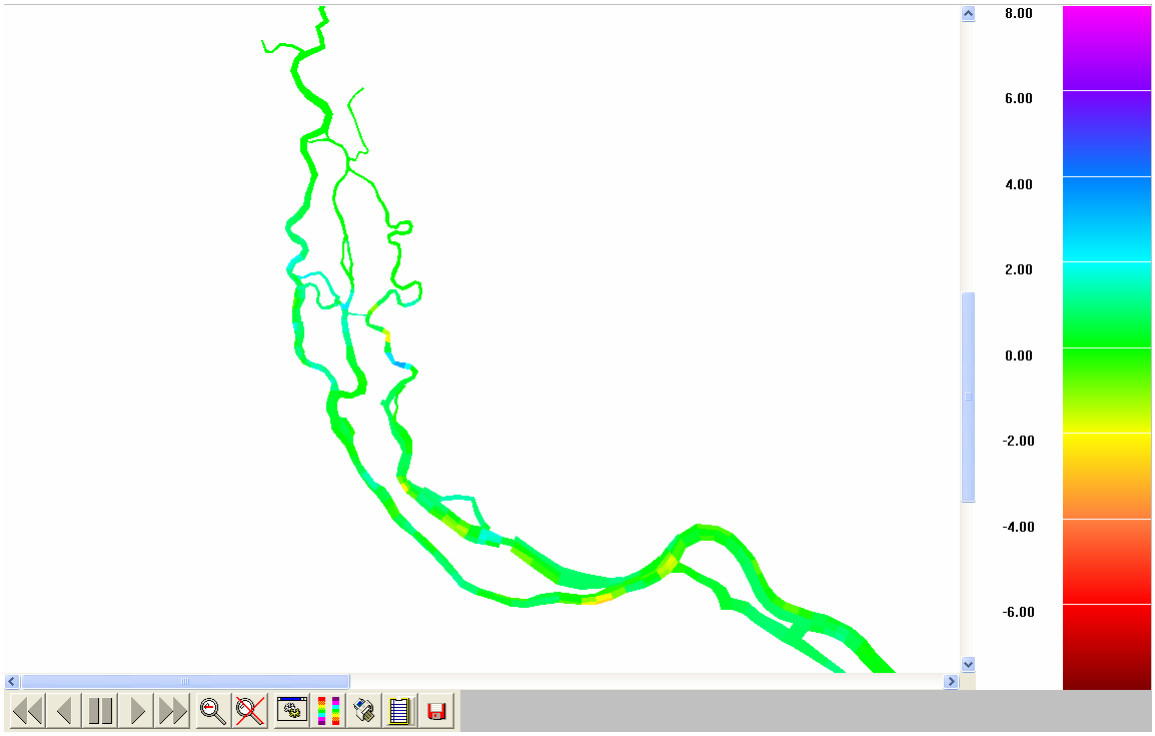
32. Figure A4.2. Changes in minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1999: 2 ft deepening



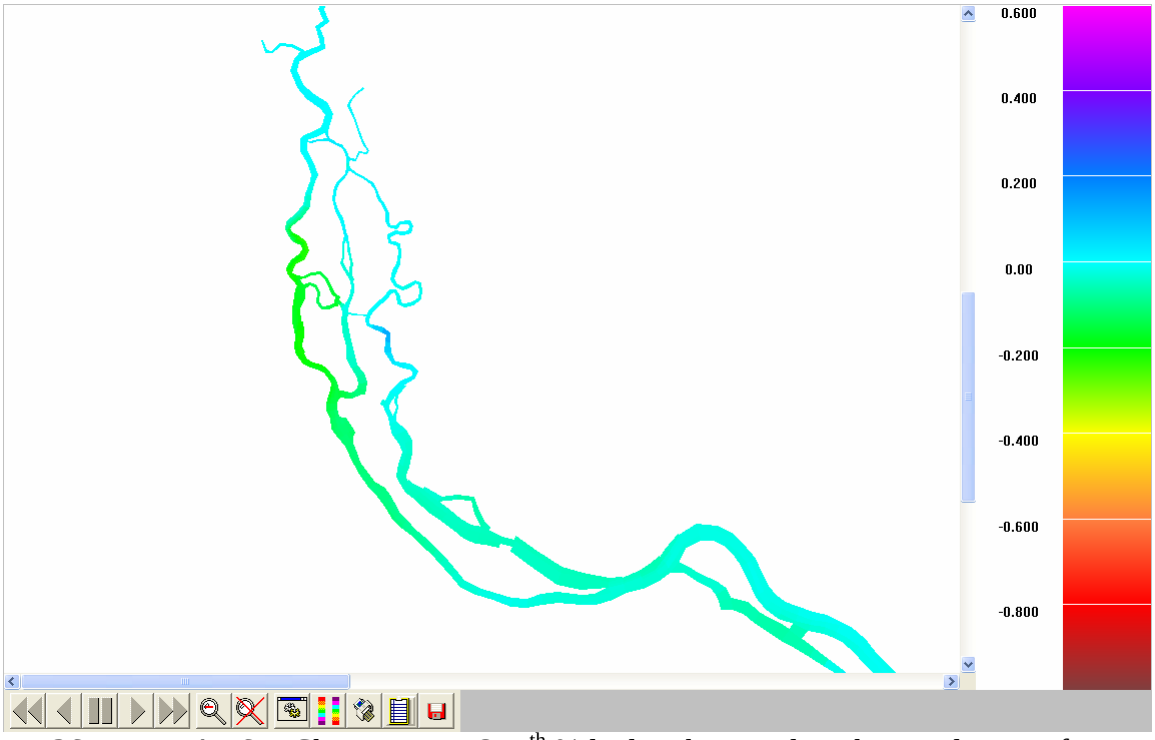
33. Figure A4.3. Changes in minimum D.O. distribution along surface layer within the analyzed period of May 1 - October 30, 1999: 2 ft deepening



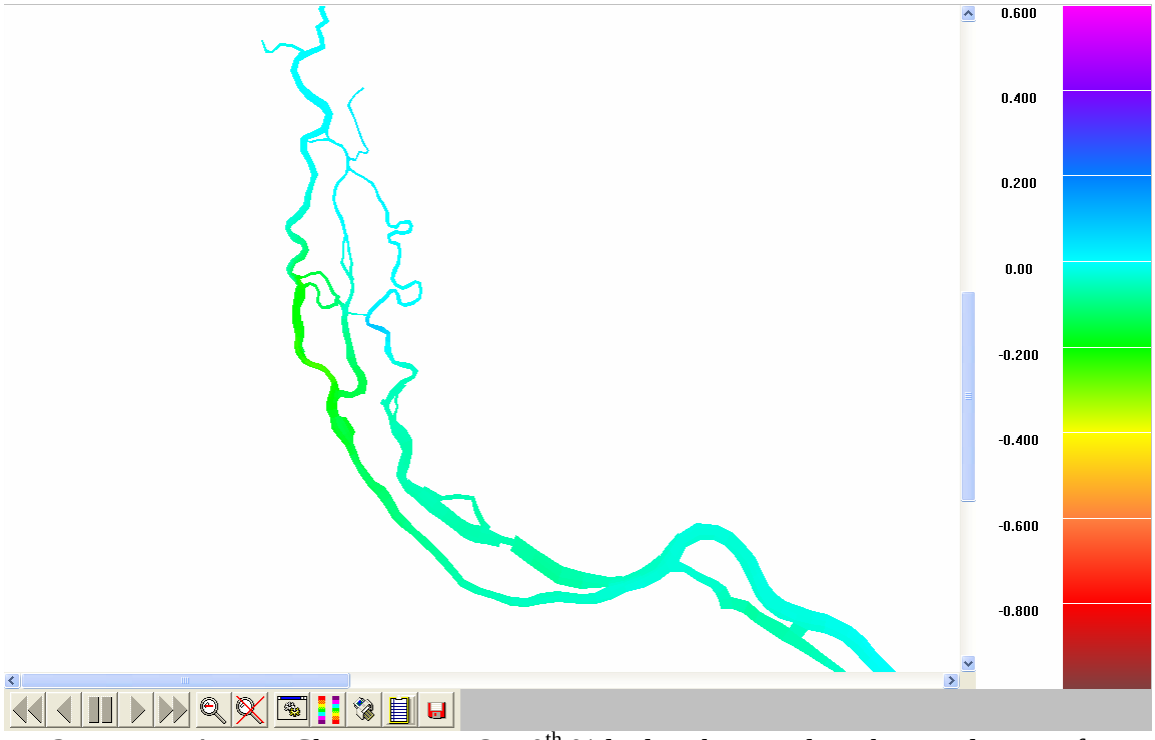
34. Figure A4.4. Changes in Salinity corresponded to Minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1999: 2 ft deepening



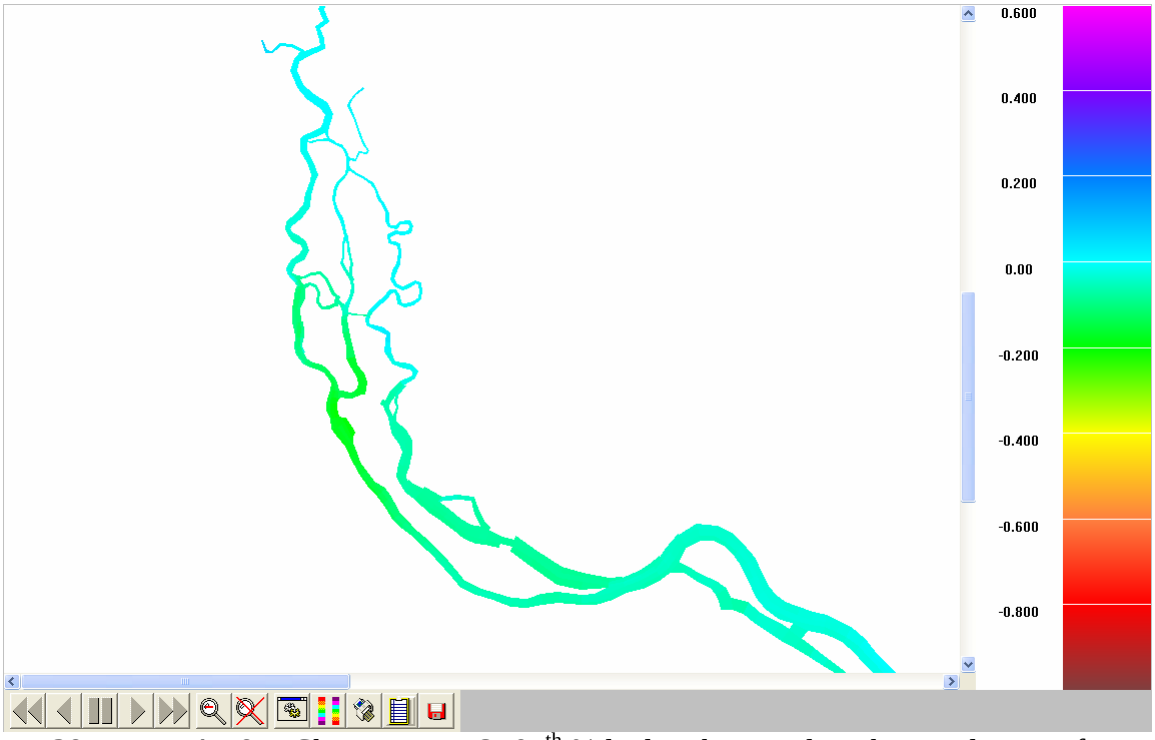
35. Figure A4.5. Changes in Salinity corresponded to Minimum D.O. distribution along Surface layer within the analyzed period of May 1 - October 30, 1999: 2 ft deepening



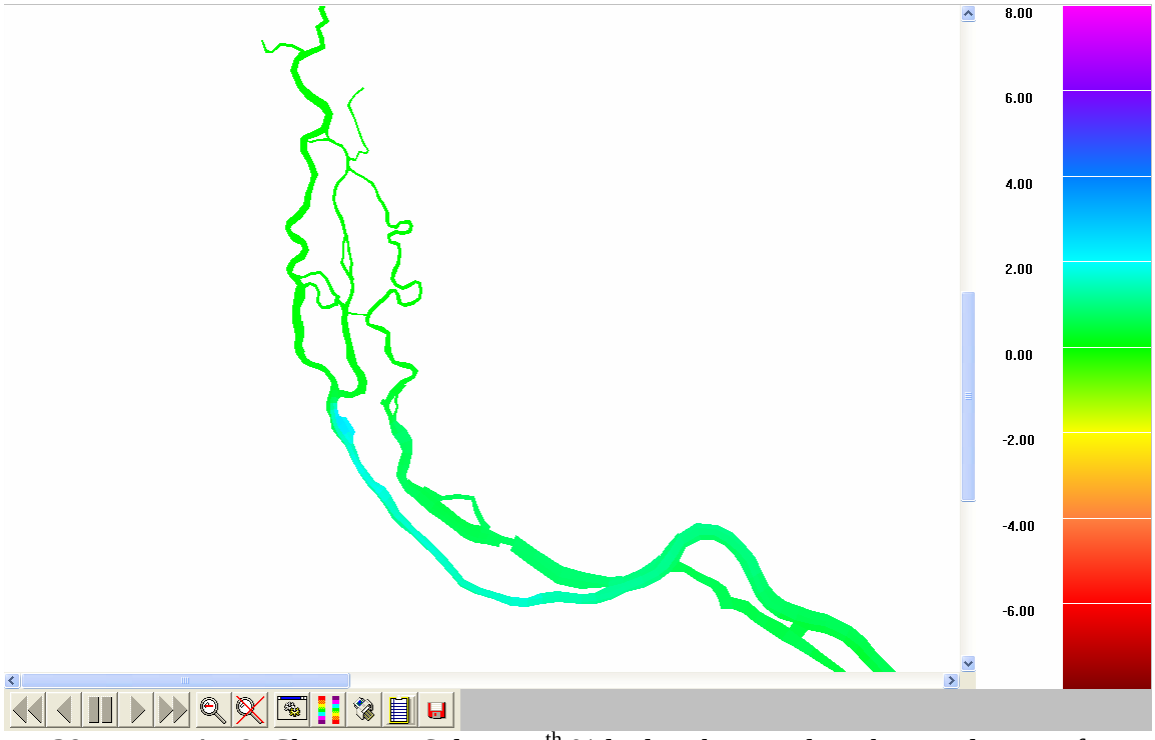
36. Figure A4.6. Changes in D.O. 5th %ile distribution along bottom layer: 2 ft deepening



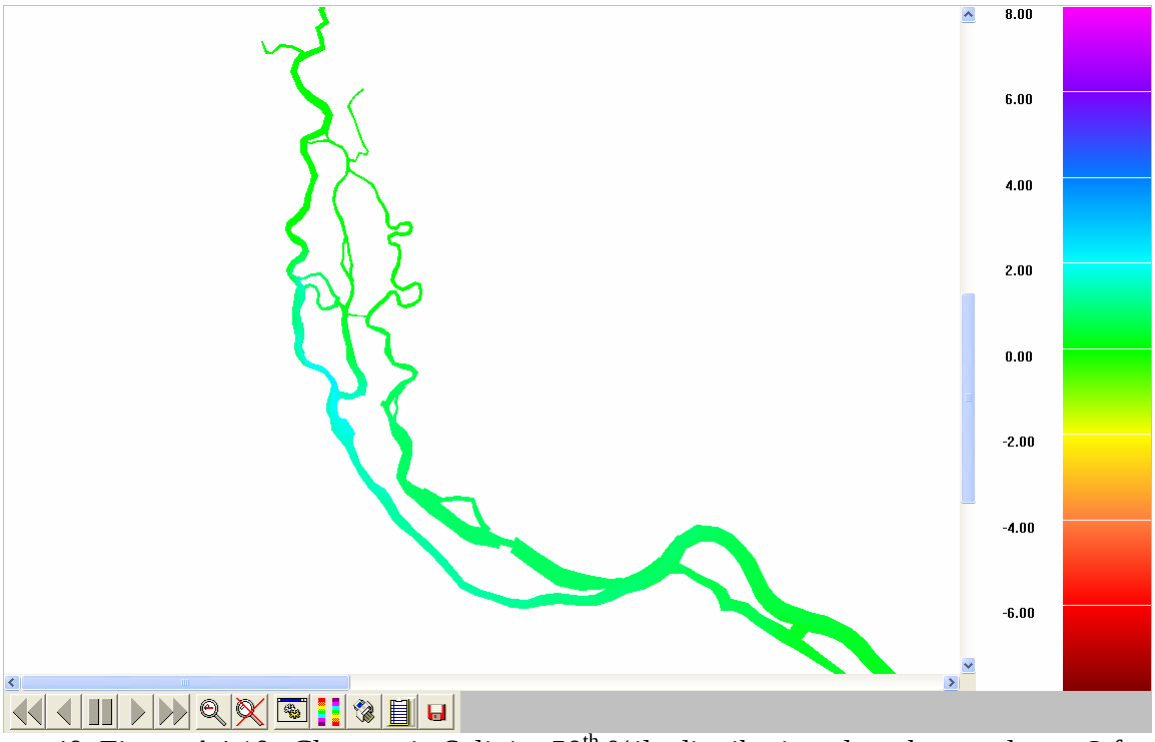
37. Figure A4.7. Changes in D.O. 50th %ile distribution along bottom layer: 2 ft deepening



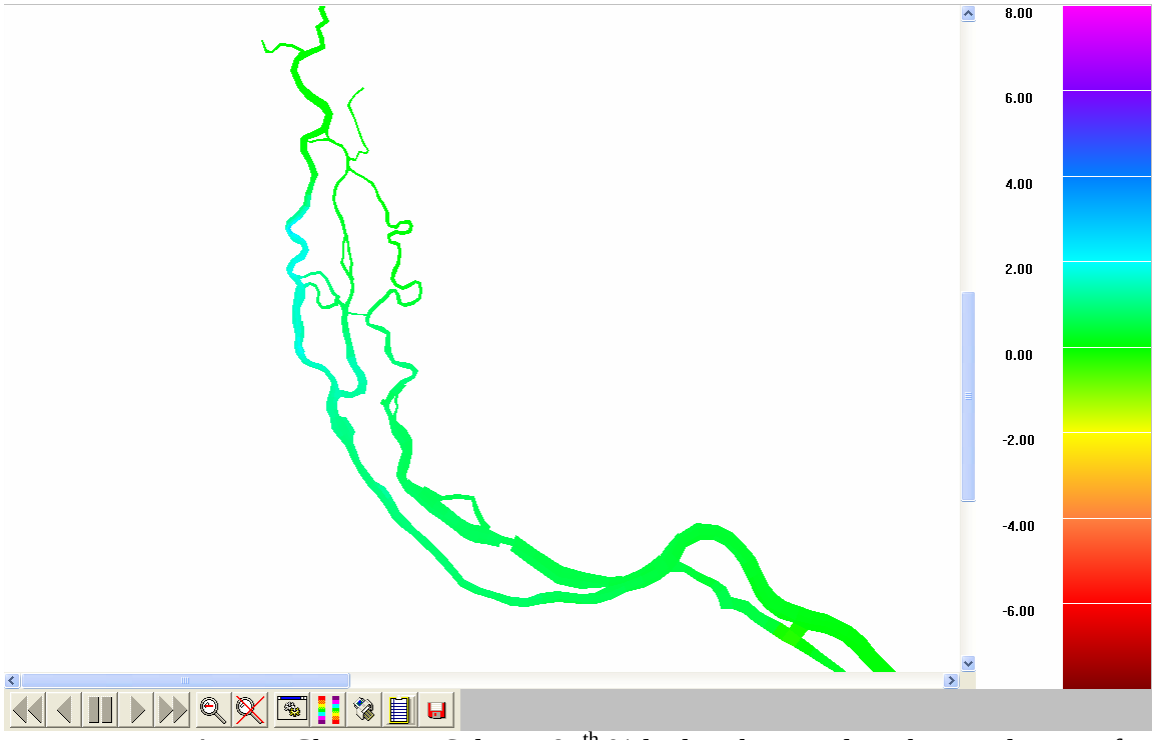
38. Figure A4.8. Changes in D.O. 95th %ile distribution along bottom layer: 2 ft deepening



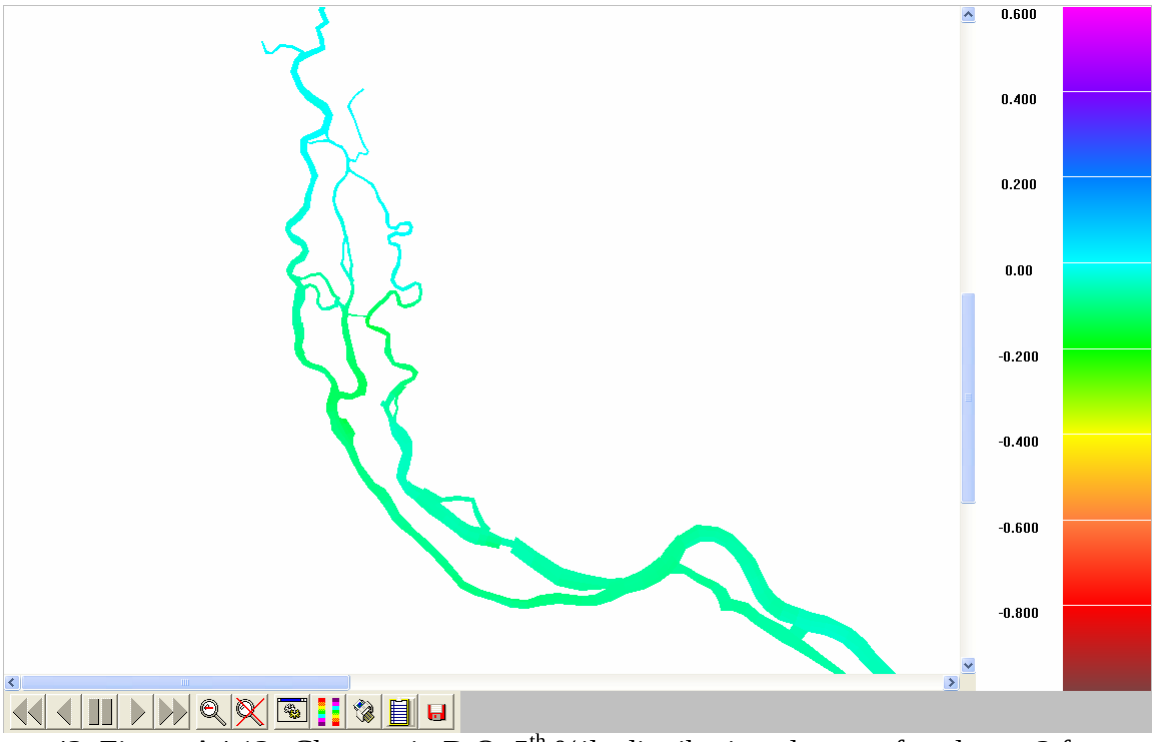
39. Figure A4.9. Changes in Salinity 5th %ile distribution along bottom layer: 2 ft deepening



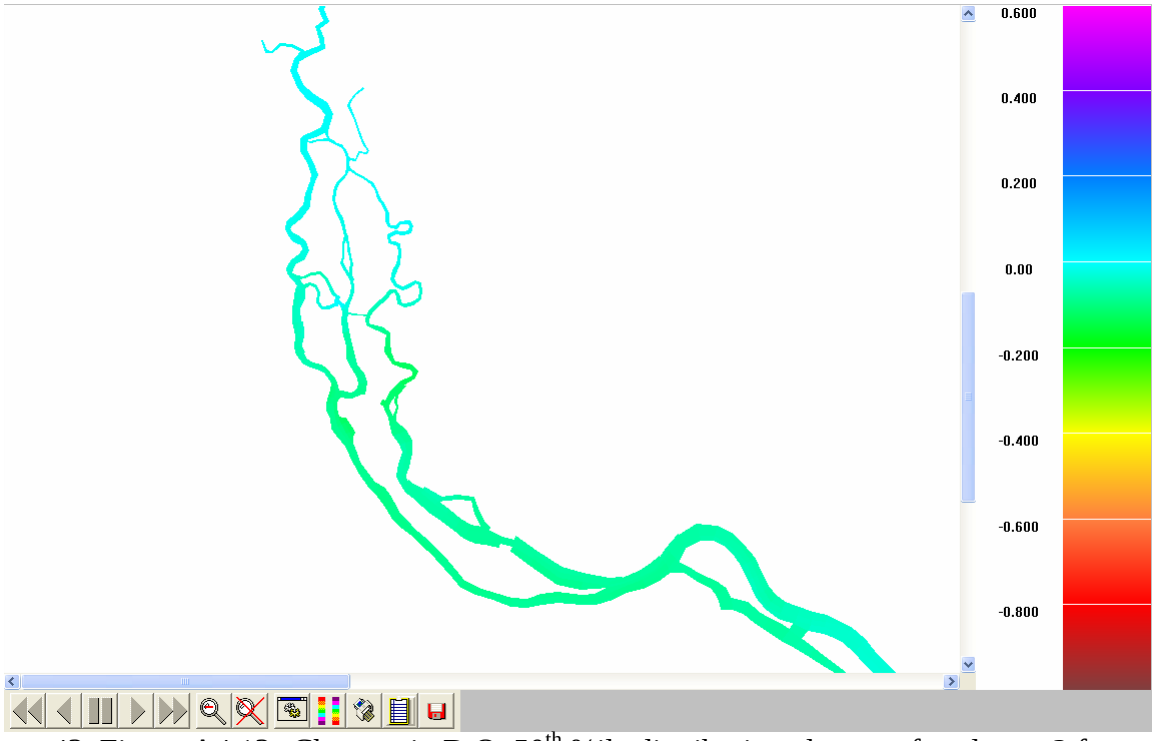
40. Figure A4.10. Changes in Salinity 50th %ile distribution along bottom layer: 2 ft deepening



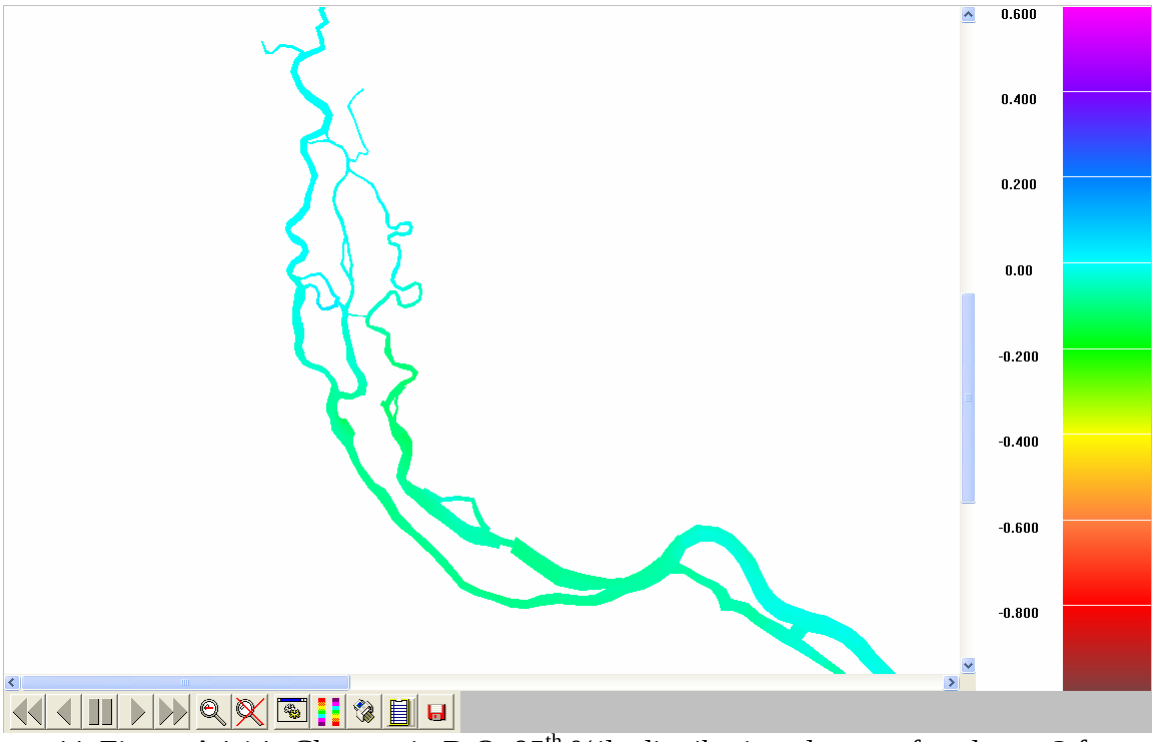
41. Figure A4.11. Changes in Salinity 95th %ile distribution along bottom layer: 2 ft deepening



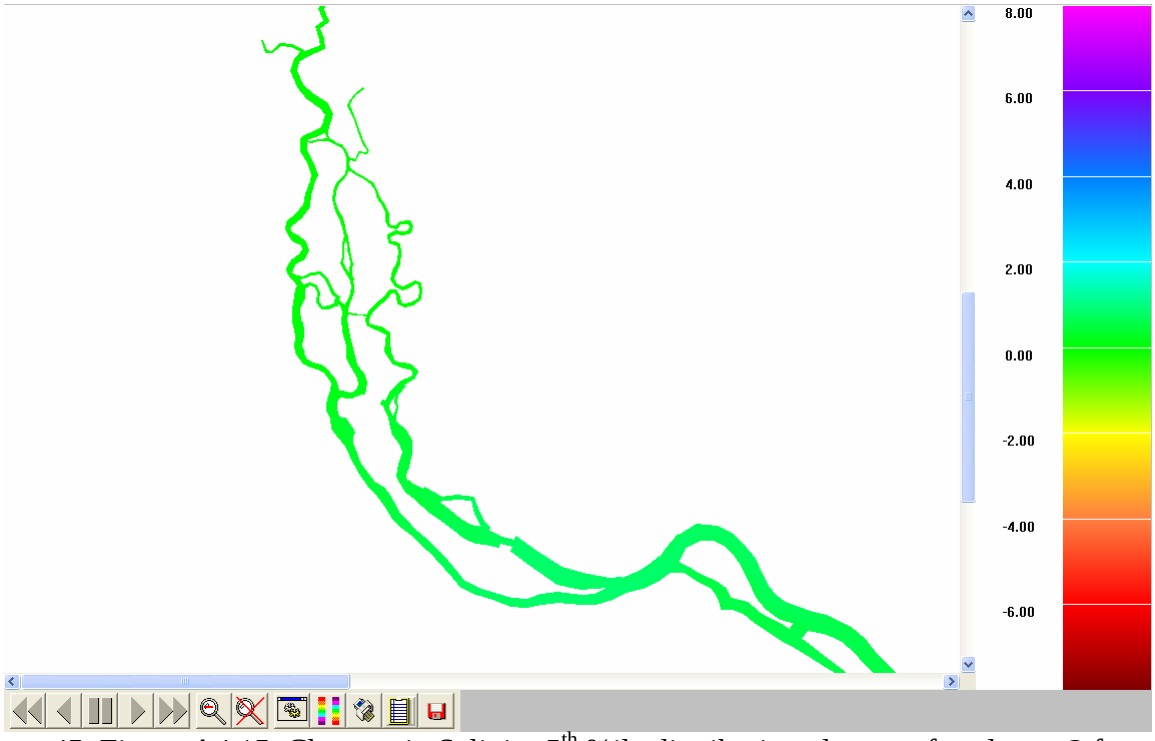
42. Figure A4.12. Changes in D.O. 5th %ile distribution along surface layer: 2 ft deepening



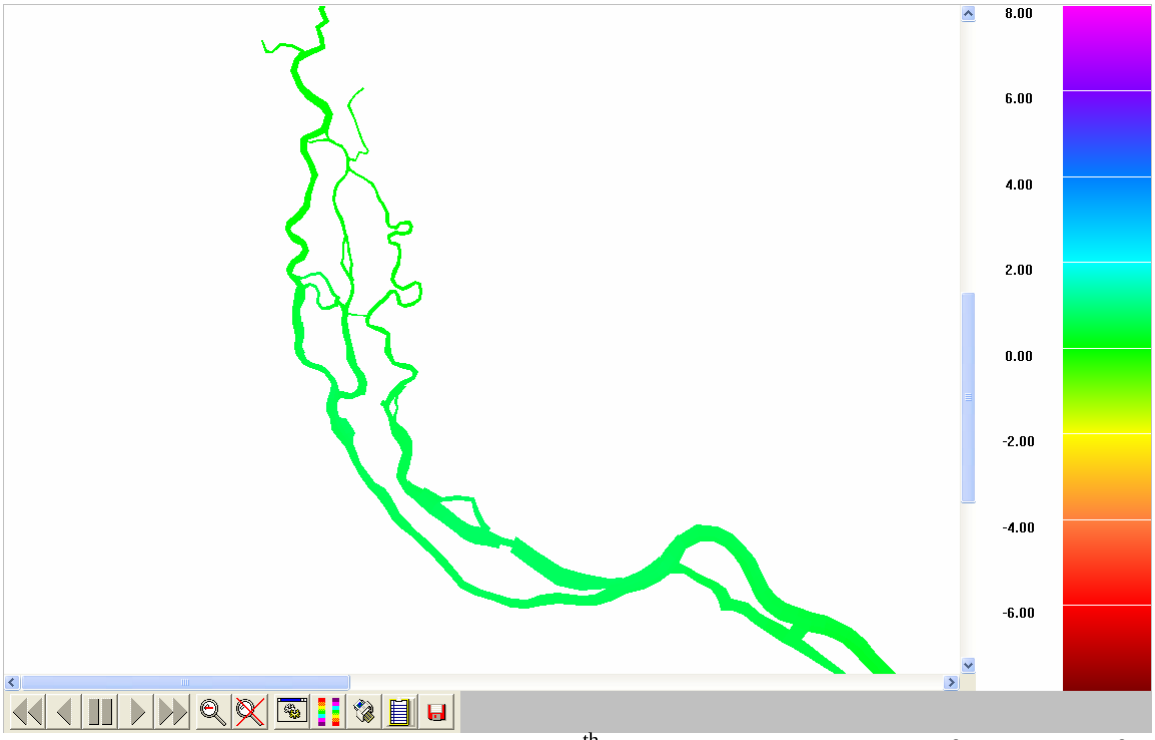
43. Figure A4.13. Changes in D.O. 50th %ile distribution along surface layer: 2 ft deepening



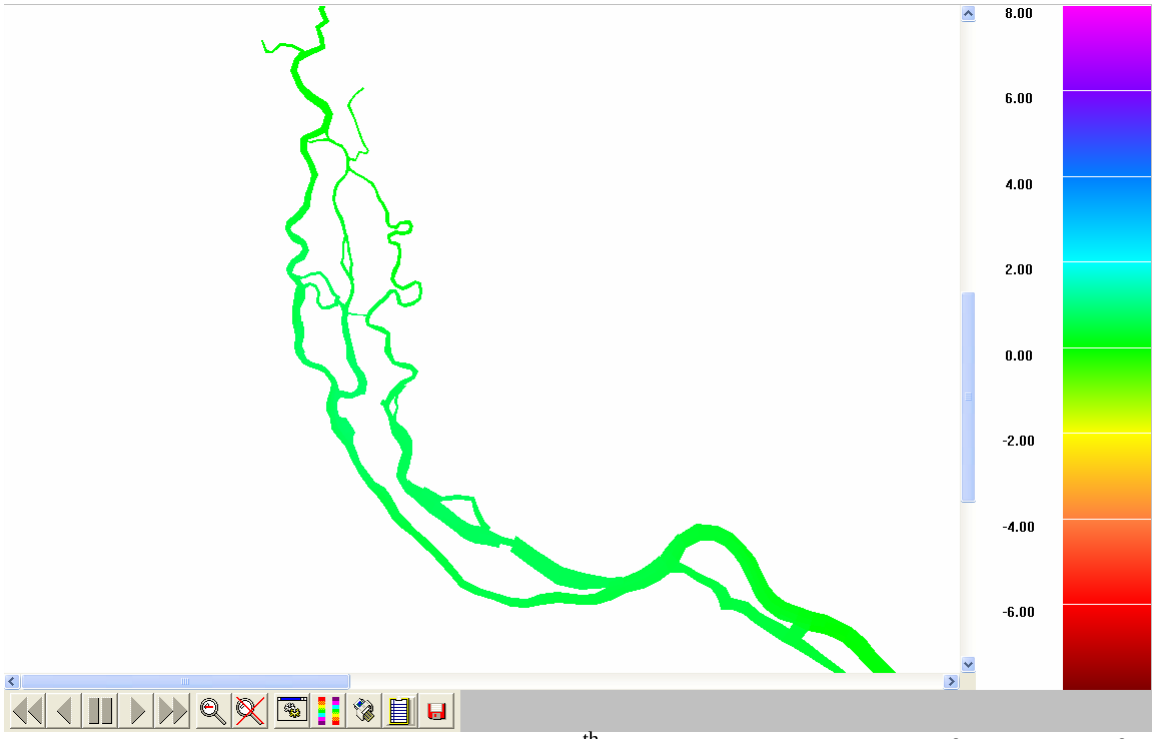
44. Figure A4.14. Changes in D.O. 95th %ile distribution along surface layer: 2 ft deepening



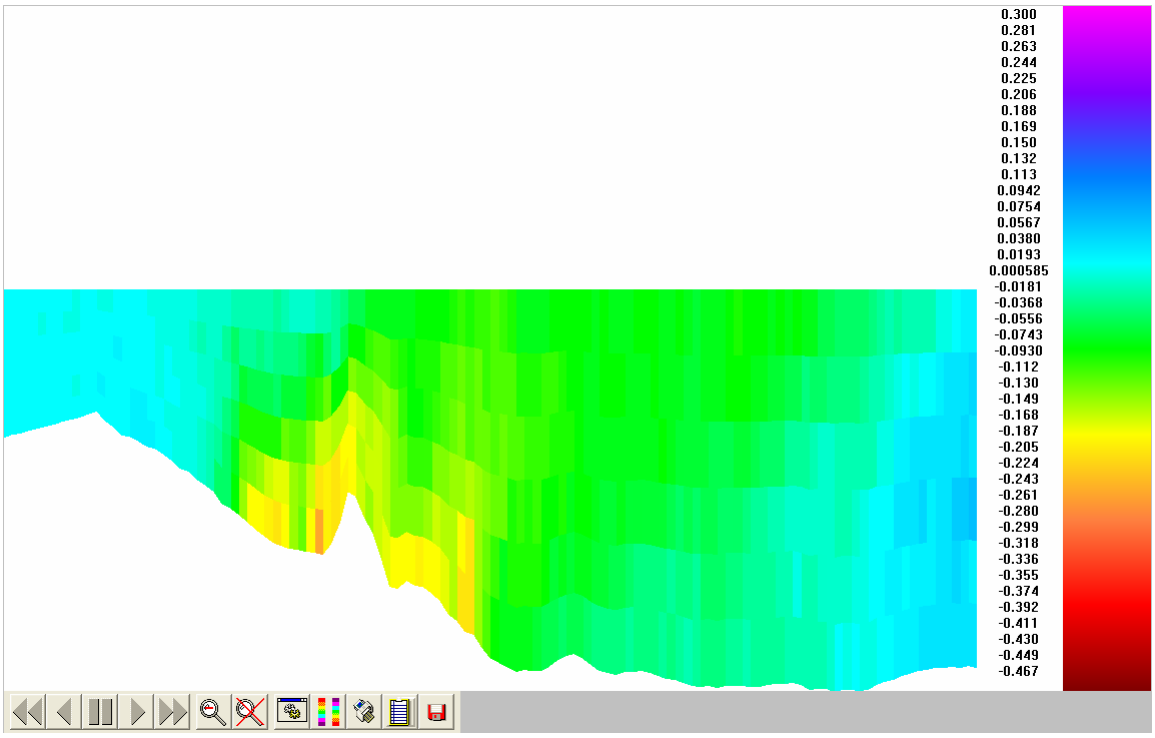
45. Figure A4.15. Changes in Salinity 5th %ile distribution along surface layer: 2 ft deepening



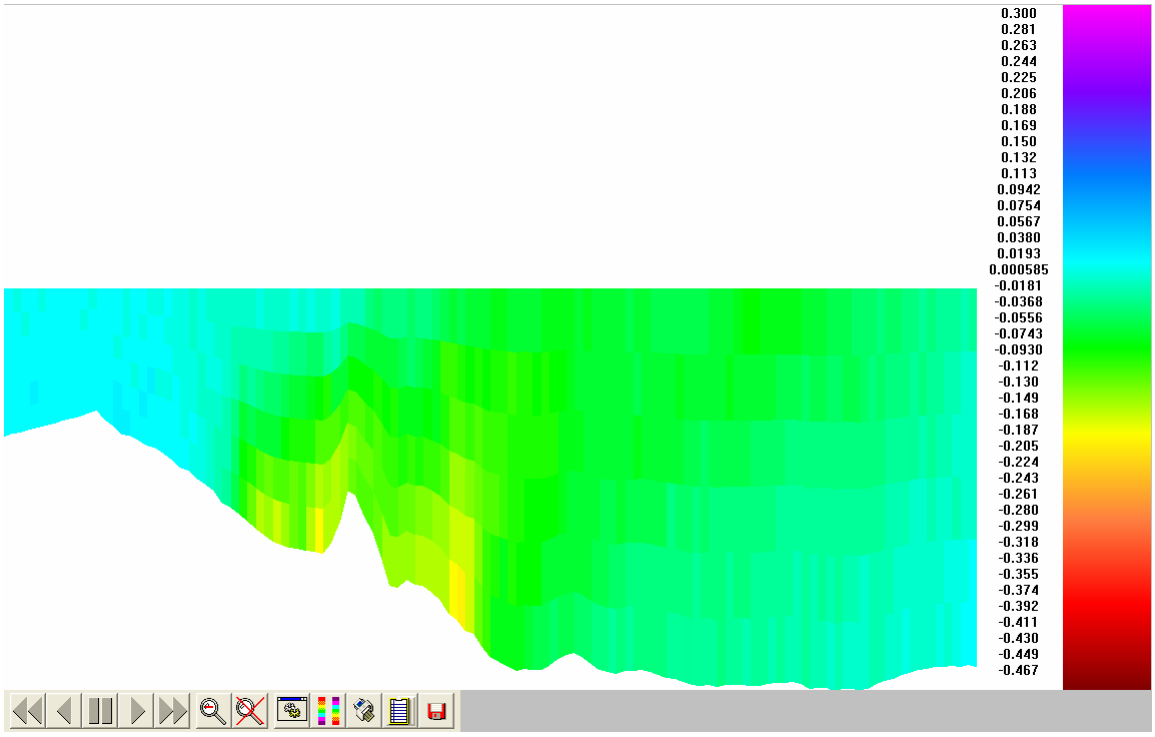
46. Figure A4.16. Changes in Salinity 50th %ile distribution along surface layer: 2 ft deepening



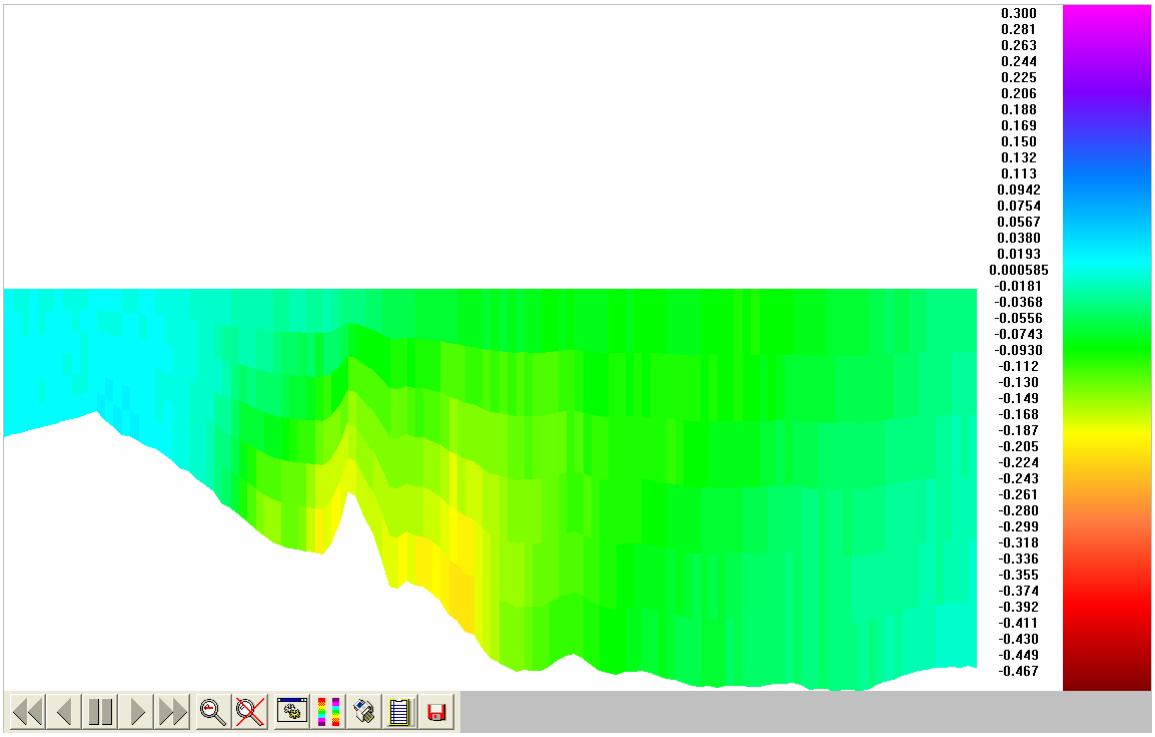
47. Figure A4.17. Changes in Salinity 95th %ile distribution along surface layer: 2 ft deepening



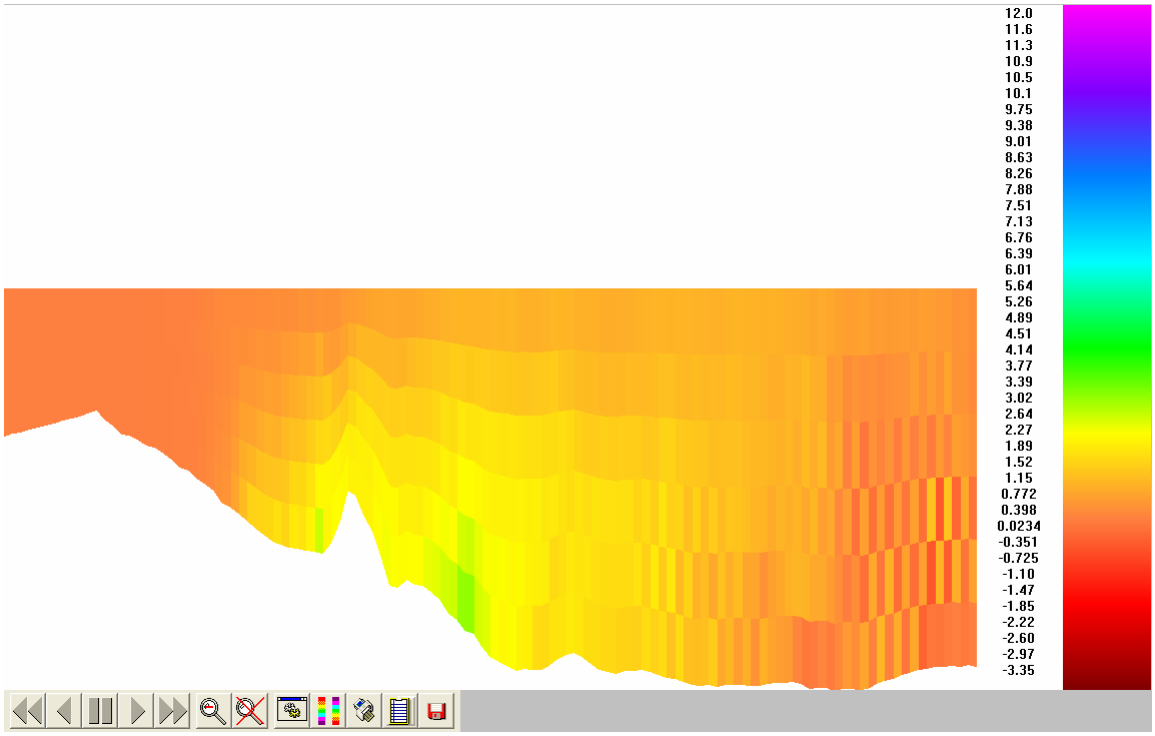
48. Figure A4.18. Snapshot of changes in 1-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 2 ft deepening



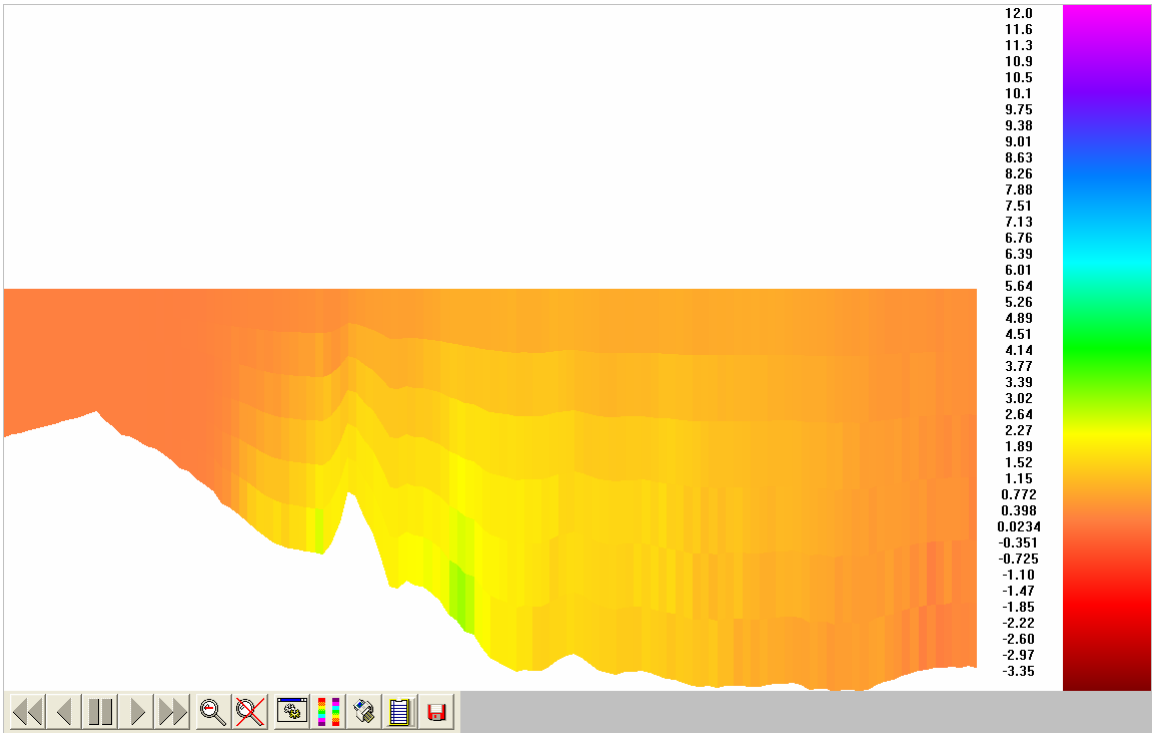
49. Figure A4.19. Snapshot of changes in 7-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 2 ft deepening



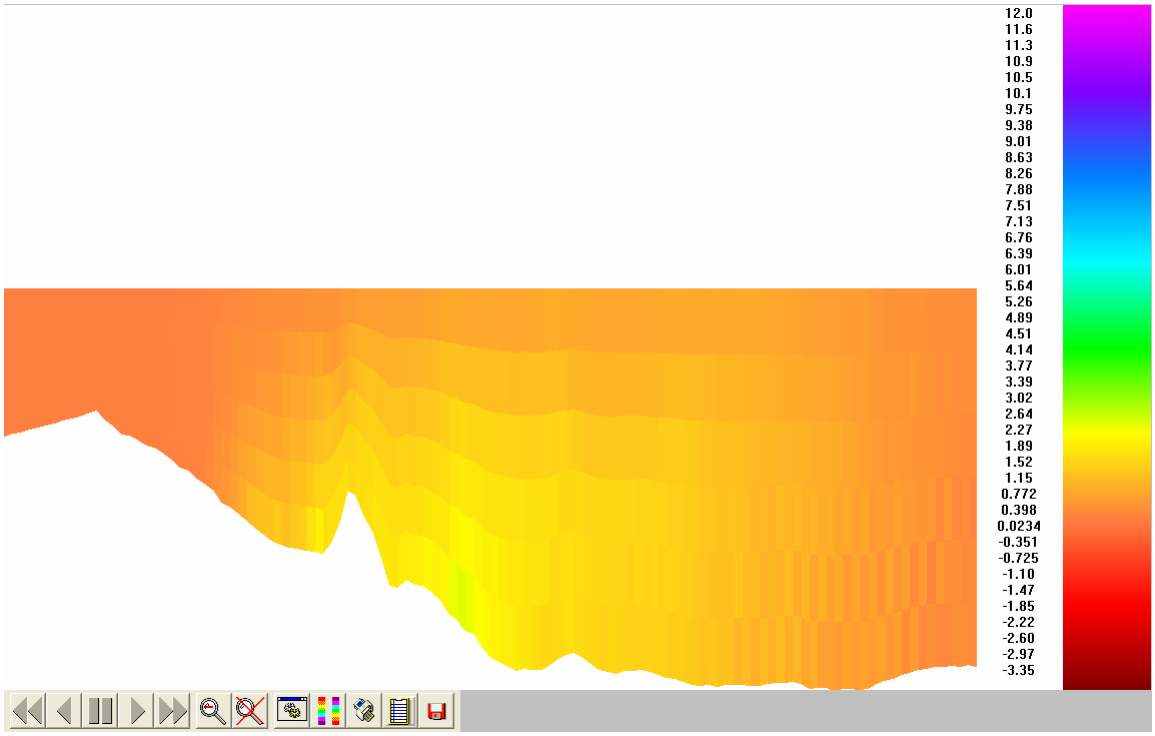
50. Figure A4.20. Snapshot of changes in 30-days averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 2 ft deepening



51. Figure A4.21. Snapshot of changes in 1-day averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 2 ft deepening



52. Figure A4.22. Snapshot of changes in 7-days averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 2 ft deepening



53. Figure A4.23. Snapshot of changes in 30-days averaged Salinity Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 2 ft deepening

Appendix B

SENSITIVITY ANALYSIS #1: EXISTING BATHYMETRY, 2004 POINT SOURCES LOADS, 1997 HYDROLOGICAL AND METEOROLOGICAL CONDITIONS

May 1 – October 30, 1997 Simulation Period

Water Quality Review Group

1. Table B.1. Dissolved oxygen percentiles distribution in Critical cells

Zone	D.O. Percentile (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.41	3.74	3.91	4.13	4.46	4.93	5.36	5.5	5.66
FR2	3.03	3.3	3.4	3.65	4.01	4.45	4.99	5.28	5.77
FR3	2.84	3.15	3.25	3.44	3.84	4.28	4.86	5.33	6.18
FR4	2.82	3.09	3.22	3.44	3.85	4.31	4.83	5.48	6.22
FR5	2.91	3.12	3.26	3.53	3.94	4.42	4.87	5.8	6.23
FR6	3.01	3.21	3.36	3.65	4.1	4.69	5.22	6.16	6.31
FR7	3.45	3.8	4.01	4.44	4.93	5.35	5.9	6.4	6.55
FR8	3.47	3.86	4.12	4.68	5.14	5.51	6.04	6.39	6.53
FR9	4.35	4.77	5	5.27	5.48	5.83	6.28	6.49	6.59
FR10	3.17	3.5	3.74	4.29	4.89	5.42	5.81	5.96	6.15
FR11	2.87	3.35	3.59	4.06	4.53	5.17	5.69	5.89	5.99
MR1	3.28	3.46	3.61	3.91	4.31	4.8	5.17	5.72	6.32
MR2	2.84	3.13	3.3	3.68	4.18	4.71	5.09	5.37	6.24
MR3	2.68	2.92	3.08	3.46	3.95	4.52	4.93	5.17	5.93
MR4	2.75	3	3.14	3.39	3.7	4.15	4.69	5.05	5.27
MR5	0.9	1.52	1.86	2.49	4.14	5.21	5.67	5.88	6.04
MR6	1.42	2.03	2.39	3.12	4.63	5.43	5.87	6.1	6.72
LBR1	2.88	3.61	3.96	4.17	4.45	4.89	5.33	5.61	5.87
LBR2	3.12	3.26	3.34	3.47	3.68	4.14	4.52	4.97	5.18
LBR3	2.1	2.38	2.55	2.88	3.3	3.81	4.31	4.45	4.81
BR1	2.45	2.68	2.82	3.08	3.47	3.98	4.51	4.78	5.13
BR2	1.84	2.19	2.39	2.79	3.19	3.72	4.23	4.56	5
BR3	2.11	2.43	2.61	2.9	3.23	3.77	4.35	4.51	4.74
SCH1	1.71	2.18	2.39	2.8	3.63	4.39	4.91	5.26	5.64
SCH2	3.14	3.42	3.63	3.95	4.23	4.68	5.11	5.32	5.56
SR	3.38	3.46	3.56	3.9	4.22	4.69	5.37	5.85	5.89

2. Table B.2. Delta of Dissolved Oxygen percentiles distribution in Critical cells: 1999 minus 1997 Existing bathymetry scenarios

Zone	Delta D.O. Percentile																	
	1%		5%		10%		25%		50%		75%		90%		95%		99	
	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%
FR1	0.02	0.6	-0.13	-3.5	-0.19	-4.9	-0.18	-4.4	-0.17	-3.8	-0.21	-4.3	-0.36	-6.7	-0.3	-5.5	-0.09	-1.6
FR2	-0.29	-9.6	-0.31	-9.4	-0.29	-8.5	-0.26	-7.1	-0.27	-6.7	-0.29	-6.5	-0.47	-9.4	-0.61	-11.6	-0.8	-13.9
FR3	-0.39	-13.7	-0.46	-14.6	-0.44	-13.5	-0.39	-11.3	-0.34	-8.9	-0.37	-8.6	-0.6	-12.3	-0.92	-17.3	-1.47	-23.8
FR4	-0.31	-11.0	-0.35	-11.3	-0.37	-11.5	-0.34	-9.9	-0.33	-8.6	-0.4	-9.3	-0.58	-12.0	-1.05	-19.2	-1.51	-24.3
FR5	-0.41	-14.1	-0.43	-13.8	-0.48	-14.7	-0.43	-12.2	-0.44	-11.2	-0.55	-12.4	-0.64	-13.1	-1.39	-24.0	-1.61	-25.8
FR6	-0.47	-15.6	-0.47	-14.6	-0.55	-16.4	-0.5	-13.7	-0.59	-14.4	-0.8	-17.1	-0.92	-17.6	-1.68	-27.3	-1.62	-25.7
FR7	-0.32	-9.3	-0.39	-10.3	-0.42	-10.5	-0.49	-11.0	-0.51	-10.3	-0.48	-9.0	-0.69	-11.7	-0.95	-14.8	-0.52	-7.9
FR8	-0.27	-7.8	-0.34	-8.8	-0.43	-10.4	-0.57	-12.2	-0.45	-8.8	-0.4	-7.3	-0.62	-10.3	-0.78	-12.2	-0.63	-9.6
FR9	-0.96	-22.1	-1.13	-23.7	-1.16	-23.2	-1.04	-19.7	-0.74	-13.5	-0.63	-10.8	-0.82	-13.1	-0.88	-13.6	-0.71	-10.8
FR10	-0.88	-27.8	-0.37	-10.6	-0.36	-9.6	-0.37	-8.6	-0.3	-6.1	-0.18	-3.3	-0.16	-2.8	-0.14	-2.3	-0.12	-2.0
FR11	-0.7	-24.4	-0.57	-17.0	-0.44	-12.3	-0.43	-10.6	-0.31	-6.8	-0.32	-6.2	-0.29	-5.1	-0.27	-4.6	-0.05	-0.8
MR1	-0.7	-21.3	-0.47	-13.6	-0.43	-11.9	-0.36	-9.2	-0.38	-8.8	-0.55	-11.5	-0.59	-11.4	-0.97	-17.0	-1.34	-21.2
MR2	-0.64	-22.5	-0.57	-18.2	-0.39	-11.8	-0.31	-8.4	-0.36	-8.6	-0.5	-10.6	-0.56	-11.0	-0.63	-11.7	-1.24	-19.9
MR3	-0.6	-22.4	-0.47	-16.1	-0.32	-10.4	-0.18	-5.2	-0.21	-5.3	-0.35	-7.7	-0.43	-8.7	-0.44	-8.5	-0.96	-16.2
MR4	-0.7	-25.5	-0.56	-18.7	-0.51	-16.2	-0.34	-10.0	-0.22	-5.9	-0.32	-7.7	-0.51	-10.9	-0.69	-13.7	-0.59	-11.2
MR5	-0.45	-50.0	-0.53	-34.9	-0.47	-25.3	-0.28	-11.2	-0.51	-12.3	-0.09	-1.7	-0.1	-1.8	-0.15	-2.6	-0.07	-1.2
MR6	-0.37	-26.1	-0.37	-18.2	-0.28	-11.7	-0.09	-2.9	-0.21	-4.5	-0.13	-2.4	-0.16	-2.7	-0.21	-3.4	-0.55	-8.2
LBR1	-0.21	-7.3	-0.32	-8.9	-0.46	-11.6	-0.21	-5.0	-0.14	-3.1	-0.29	-5.9	-0.41	-7.7	-0.51	-9.1	-0.44	-7.5
LBR2	-1.02	-32.7	-0.93	-28.5	-0.83	-24.9	-0.49	-14.1	-0.35	-9.5	-0.5	-12.1	-0.58	-12.8	-0.84	-16.9	-0.75	-14.5
LBR3	-0.76	-36.2	-0.63	-26.5	-0.51	-20.0	-0.32	-11.1	-0.17	-5.2	-0.18	-4.7	-0.33	-7.7	-0.27	-6.1	-0.25	-5.2
BR1	-0.45	-18.4	-0.45	-16.8	-0.41	-14.5	-0.3	-9.7	-0.26	-7.5	-0.35	-8.8	-0.5	-11.1	-0.56	-11.7	-0.65	-12.7
BR2	-0.47	-25.5	-0.58	-26.5	-0.56	-23.4	-0.59	-21.1	-0.41	-12.9	-0.53	-14.2	-0.66	-15.6	-0.78	-17.1	-0.85	-17.0
BR3	-0.42	-19.9	-0.4	-16.5	-0.39	-14.9	-0.34	-11.7	-0.17	-5.3	-0.3	-8.0	-0.56	-12.9	-0.46	-10.2	-0.35	-7.4
SCH1	-0.42	-24.6	-0.53	-24.3	-0.47	-19.7	-0.31	-11.1	-0.32	-8.8	-0.29	-6.6	-0.25	-5.1	-0.28	-5.3	-0.32	-5.7
SCH2	-0.06	-1.9	-0.11	-3.2	-0.18	-5.0	-0.26	-6.6	-0.19	-4.5	-0.24	-5.1	-0.34	-6.7	-0.36	-6.8	-0.31	-5.6
SR	-1.14	-33.7	-0.94	-27.2	-0.6	-16.9	-0.3	-7.7	-0.36	-8.5	-0.49	-10.4	-0.87	-16.2	-1.21	-20.7	-0.98	-16.6

3. Table B.3. Dissolved oxygen percentiles distribution in Zones of Savannah Estuary

Zone Name	D.O. Concentration Percentiles (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.75	4.07	4.22	4.41	4.70	5.19	5.57	5.68	5.79
FR2	3.35	3.58	3.76	4.00	4.31	4.77	5.25	5.44	5.59
FR3	3.01	3.28	3.40	3.61	3.98	4.40	4.98	5.28	6.04
FR4	2.89	3.16	3.28	3.46	3.88	4.31	4.86	5.39	6.26
FR5	2.97	3.17	3.31	3.54	3.94	4.42	4.87	5.74	6.29
FR6	3.12	3.23	3.44	3.68	4.11	4.65	5.07	6.07	6.34
FR7	3.33	3.67	3.86	4.30	4.89	5.29	5.77	6.35	6.45
FR8	3.60	3.99	4.25	4.71	5.16	5.52	5.97	6.39	6.53
FR9	4.19	4.64	4.91	5.25	5.49	5.85	6.26	6.47	6.60
FR10	4.68	4.88	4.99	5.20	5.44	5.81	6.16	6.30	6.46
FR11	3.63	3.83	4.01	4.26	4.59	5.00	5.54	5.92	6.00
MR1	3.34	3.54	3.70	3.95	4.34	4.80	5.19	5.79	6.32
MR2	3.04	3.30	3.45	3.79	4.24	4.71	5.12	5.45	6.27
MR3	2.77	2.95	3.10	3.43	3.90	4.45	4.91	5.14	5.83
MR4	3.40	3.52	3.62	3.81	4.07	4.49	4.93	5.27	5.49
MR5	1.44	1.98	2.28	2.91	4.47	5.16	5.61	5.85	5.99
MR6	1.46	2.07	2.40	3.17	4.68	5.39	5.81	6.03	6.60
LBR1	3.47	3.61	3.67	3.82	4.01	4.48	4.83	5.30	5.45
LBR2	2.70	2.90	3.01	3.20	3.47	3.93	4.33	4.78	5.03
LBR3	2.48	2.60	2.71	2.88	3.12	3.63	4.16	4.39	4.55
BR1	2.77	2.96	3.04	3.26	3.62	4.12	4.61	4.97	5.29
BR2	2.37	2.63	2.74	2.95	3.27	3.79	4.38	4.57	4.91
BR3	2.43	2.63	2.73	2.92	3.17	3.75	4.29	4.40	4.53
SCh1	2.76	3.07	3.35	3.58	3.85	4.38	4.93	5.09	5.25
SCh2	3.28	3.51	3.78	4.03	4.30	4.77	5.19	5.38	5.54
SR	3.70	3.75	3.81	4.14	4.44	4.90	5.54	5.97	5.99

4. Table B.4. Delta of Dissolved Oxygen percentiles distribution in Zones: 1997 minus 1999 Existing bathymetry scenarios

Zone	Project - Baseline Difference (mg/l)									Project - Baseline Relative Difference (%)								
Name	1%	5%	10%	25%	50%	75%	90%	95%	99%	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	0.05	-0.11	-0.17	-0.17	-0.10	-0.18	-0.29	-0.21	0.02	1.4	-2.7	-4.1	-3.8	-2.2	-3.5	-5.2	-3.7	0.4
FR2	-0.13	-0.14	-0.21	-0.23	-0.20	-0.25	-0.43	-0.47	-0.30	-3.8	-4.0	-5.5	-5.7	-4.7	-5.3	-8.1	-8.7	-5.3
FR3	-0.27	-0.33	-0.36	-0.30	-0.30	-0.32	-0.56	-0.69	-1.16	-9.0	-9.9	-10.4	-8.4	-7.6	-7.3	-11.2	-13.0	-19.1
FR4	-0.39	-0.44	-0.47	-0.39	-0.38	-0.44	-0.62	-1.00	-1.59	-13.5	-13.9	-14.2	-11.4	-9.9	-10.2	-12.7	-18.5	-25.4
FR5	-0.43	-0.42	-0.48	-0.45	-0.43	-0.55	-0.60	-1.34	-1.66	-14.3	-13.4	-14.4	-12.6	-10.9	-12.3	-12.4	-23.3	-26.4
FR6	-0.45	-0.36	-0.48	-0.41	-0.47	-0.65	-0.69	-1.51	-1.60	-14.4	-11.2	-14.0	-11.2	-11.4	-14.0	-13.5	-24.9	-25.2
FR7	-0.30	-0.41	-0.40	-0.46	-0.58	-0.47	-0.64	-1.04	-0.83	-9.1	-11.2	-10.5	-10.8	-11.8	-8.9	-11.0	-16.3	-12.8
FR8	-0.28	-0.37	-0.45	-0.51	-0.49	-0.43	-0.62	-0.87	-0.76	-7.8	-9.2	-10.5	-10.7	-9.5	-7.9	-10.4	-13.6	-11.6
FR9	-0.27	-0.41	-0.48	-0.44	-0.29	-0.35	-0.50	-0.57	-0.47	-6.4	-8.8	-9.7	-8.3	-5.3	-6.0	-8.0	-8.8	-7.0
FR10	-0.68	-0.38	-0.28	-0.21	-0.16	-0.25	-0.35	-0.38	-0.30	-14.4	-7.7	-5.6	-3.9	-2.9	-4.3	-5.7	-6.0	-4.7
FR11	-0.99	-0.65	-0.45	-0.30	-0.29	-0.37	-0.60	-0.79	-0.64	-27.4	-17.0	-11.3	-7.0	-6.3	-7.4	-10.9	-13.4	-10.7
MR1	-0.55	-0.50	-0.49	-0.39	-0.41	-0.56	-0.61	-1.05	-1.38	-16.4	-14.0	-13.1	-9.8	-9.5	-11.7	-11.8	-18.1	-21.9
MR2	-0.68	-0.51	-0.40	-0.34	-0.38	-0.51	-0.59	-0.71	-1.32	-22.4	-15.5	-11.5	-8.9	-8.9	-10.8	-11.6	-13.0	-21.0
MR3	-0.68	-0.59	-0.43	-0.30	-0.32	-0.42	-0.53	-0.56	-0.91	-24.5	-20.2	-13.9	-8.7	-8.2	-9.4	-10.9	-10.8	-15.7
MR4	-0.67	-0.59	-0.47	-0.25	-0.16	-0.28	-0.42	-0.60	-0.63	-19.6	-16.7	-12.8	-6.5	-4.0	-6.3	-8.6	-11.3	-11.5
MR5	-0.37	-0.51	-0.41	-0.19	-0.34	-0.08	-0.11	-0.19	-0.07	-25.7	-26.0	-17.9	-6.4	-7.6	-1.5	-2.0	-3.3	-1.1
MR6	-0.36	-0.38	-0.27	-0.08	-0.22	-0.11	-0.15	-0.19	-0.49	-24.7	-18.5	-11.4	-2.4	-4.7	-2.0	-2.6	-3.1	-7.4
LBR1	-0.60	-0.58	-0.50	-0.19	-0.10	-0.33	-0.37	-0.70	-0.69	-17.4	-16.1	-13.7	-4.9	-2.4	-7.3	-7.6	-13.1	-12.7
LBR2	-0.67	-0.64	-0.52	-0.28	-0.18	-0.33	-0.44	-0.69	-0.74	-24.8	-22.1	-17.2	-8.8	-5.2	-8.4	-10.2	-14.5	-14.7
LBR3	-0.72	-0.70	-0.71	-0.36	-0.07	-0.30	-0.50	-0.58	-0.39	-29.0	-26.8	-26.1	-12.4	-2.4	-8.4	-12.0	-13.1	-8.6
BR1	-0.35	-0.41	-0.38	-0.31	-0.26	-0.34	-0.46	-0.62	-0.69	-12.8	-13.9	-12.6	-9.4	-7.3	-8.3	-10.0	-12.6	-13.1
BR2	-0.43	-0.46	-0.44	-0.34	-0.20	-0.30	-0.49	-0.50	-0.57	-17.9	-17.6	-16.0	-11.6	-6.1	-7.8	-11.3	-10.9	-11.7
BR3	-0.52	-0.52	-0.49	-0.34	-0.11	-0.32	-0.48	-0.38	-0.23	-21.2	-19.9	-18.0	-11.6	-3.6	-8.6	-11.2	-8.5	-5.1
SCh1	-0.16	-0.19	-0.34	-0.31	-0.21	-0.27	-0.49	-0.51	-0.41	-5.6	-6.3	-10.3	-8.7	-5.3	-6.1	-10.0	-10.0	-7.8
SCh2	0.05	-0.03	-0.20	-0.24	-0.20	-0.25	-0.36	-0.39	-0.25	1.6	-1.0	-5.3	-5.9	-4.7	-5.3	-7.0	-7.2	-4.6
SR	-1.08	-0.96	-0.52	-0.26	-0.32	-0.46	-0.83	-1.11	-0.89	-29.2	-25.6	-13.6	-6.3	-7.2	-9.4	-15.1	-18.7	-14.8

5. Table B.5. Percentage of water volumes with salinity in %iles within the period of May 1 – October 30, 1997

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	21.9	8.2	5	7.1	4.5	4.3	14.4	7.3	96.3
10	25.8	11.7	9.4	10.9	9	8.7	14.4	14.3	96.3
25	37.7	24	23.2	23.3	23	22	31.1	24.1	96.3
50	58.1	45.5	47.1	47	47.5	46.1	52	45	96.3
75	80.2	70.3	72.8	72.7	73.1	72.8	75.2	70	96.3
90	91.2	87.5	88.9	88.9	89	89.1	89.3	87.6	96.3
95	95.7	93.6	94.4	94.5	94.5	94.6	94.7	93.7	96.3
Total Volume 100*km3:	31709.1	653.9	4772.9	22.5	39	135.5	9.9	9.4	43.7

6. Table B.6. Percentage of water volumes with D.O. in %iles within the period of May 1 – October 30, 1997

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	5.4	5	4.9	5.7	5.5	4.7	5.6	5.5	5.9
10	10.6	9.9	9.9	11.2	10.9	9.5	10.9	10.9	11.3
25	26.2	24.1	24.9	27.4	26.4	24.4	26.4	26.2	26.3
50	52	48.8	50.1	53.1	51.8	49.7	50.4	50.7	51
75	77.2	74.4	75.4	77	76.1	74.9	75.7	75.7	75.8
90	90.4	89.8	90.2	90.3	90.3	89.9	90.1	90.3	90
95	95.4	94.6	95	95.5	95.3	94.9	95.1	95.3	95.2
Total Volume 100*km3:	31709.1	653.9	4772.9	22.5	39	135.5	9.9	9.4	43.7

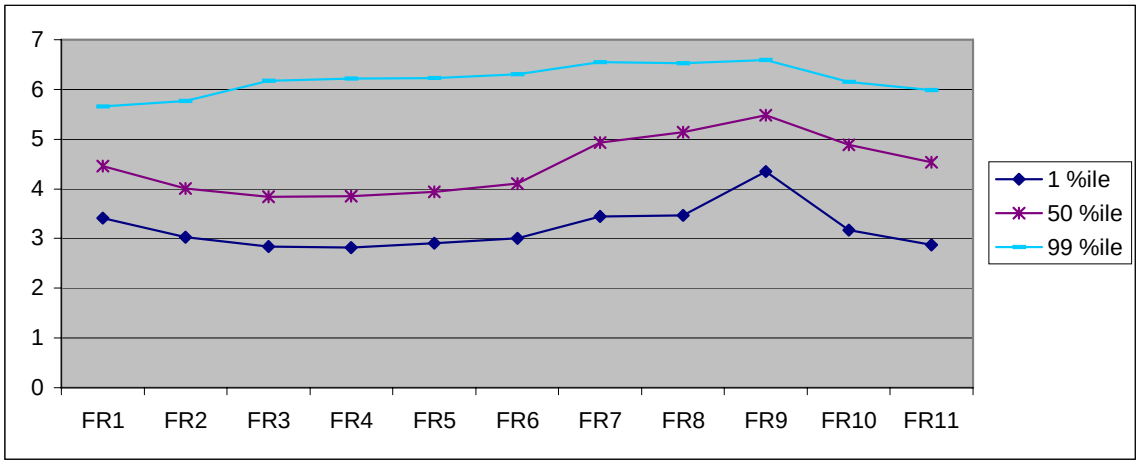
7. Table B.7. Water volumes in Upper Harbor in increments of 1^{o} C of water temperature within the period of May 1 – October 30, 1997

Temperature C^{o}	Total Volume %
17	0.12
18	0.47
19	1.31
20	4.22
21	12.79
22	17.62
23	22.2
24	32.41
25	42.87
26	50.8
27	61.7
28	81.94
29	93.58
30	99.8
31	100

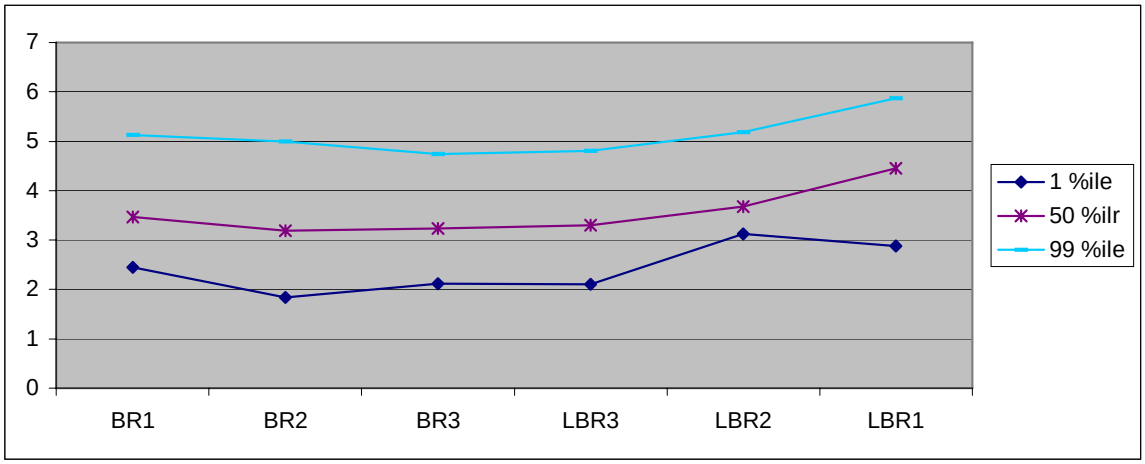
8. Table B.8. Water volumes in Upper Harbor in increments of 0.1 mg/l of D.O. within the period of May 1 – October 30, 1997
   (See file: Postprocessor Output\97-S1E\97-S1E_DO Increment Volume)

9. Table B.7. Percentage of water volumes corresponding to 1-, 7-, and 30-days averages of D.O. depth-averaged concentrations in Upper Harbor within the period of May 1 – October 30, 1997
   (See file: Postprocessor Output\97-S1E\97-S1E_volume DO in averages)

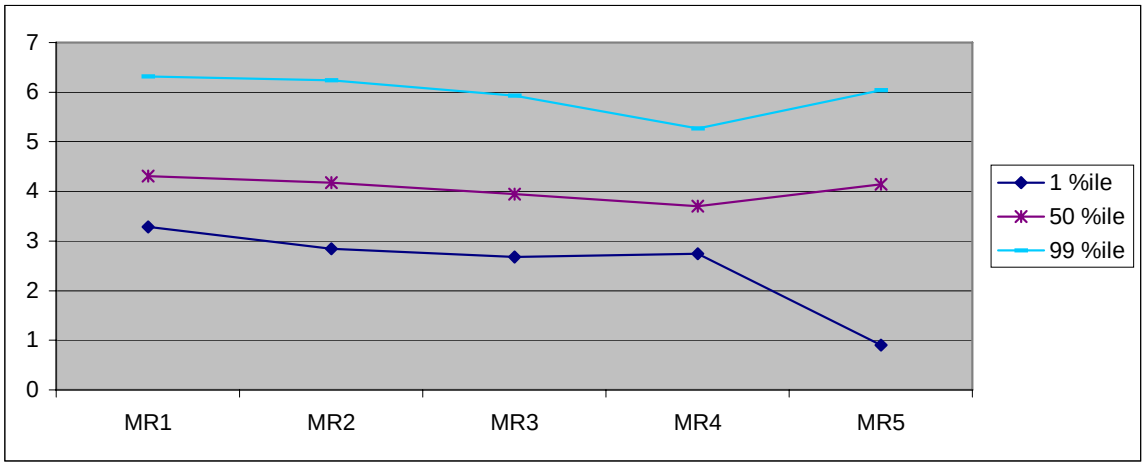
Front River



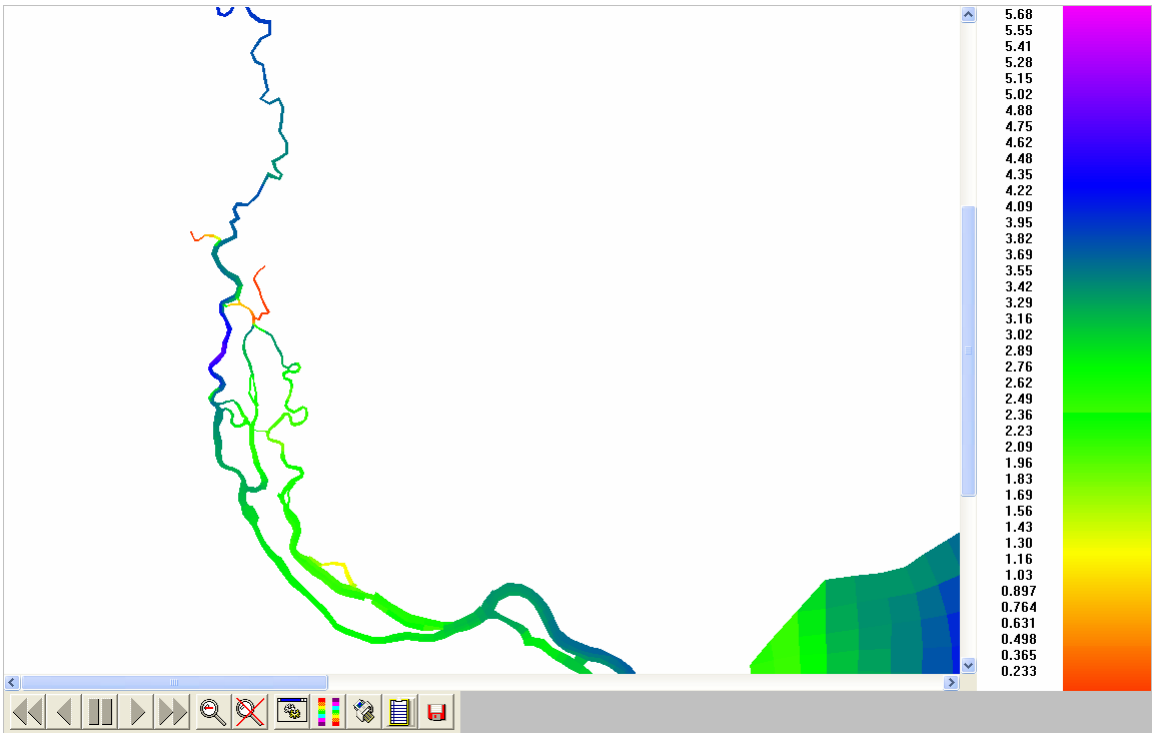
Back and Little Back Rivers



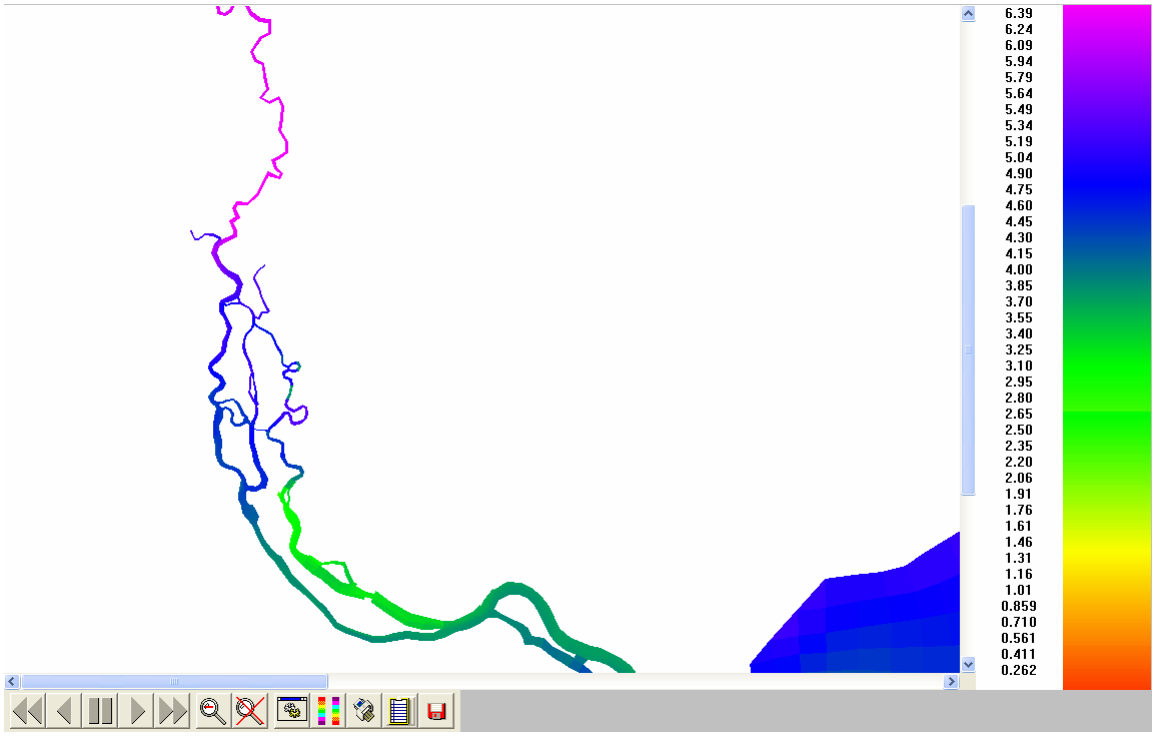
Middle River



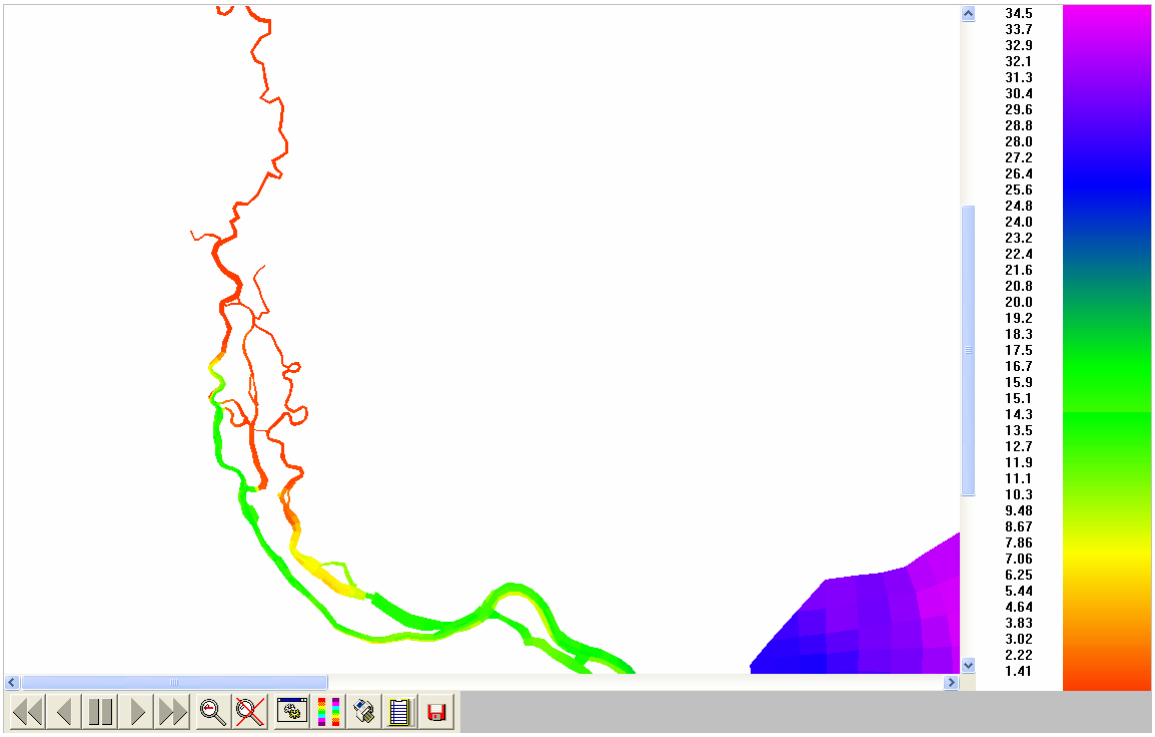
10. Figure B.1. Longitudinal profile of Dissolved Oxygen (mg/l) distribution along Critical cells of Savannah Estuary: Existing bathymetry



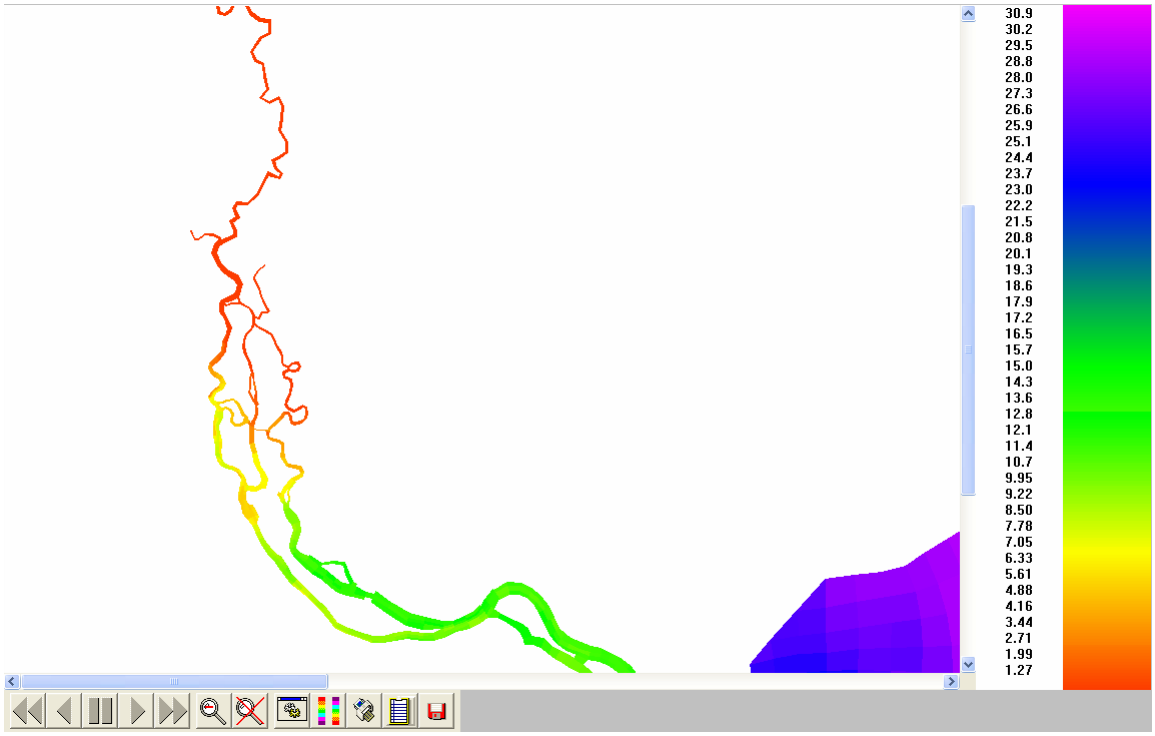
11. Figure B.2. Minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1997: Existing bathymetry



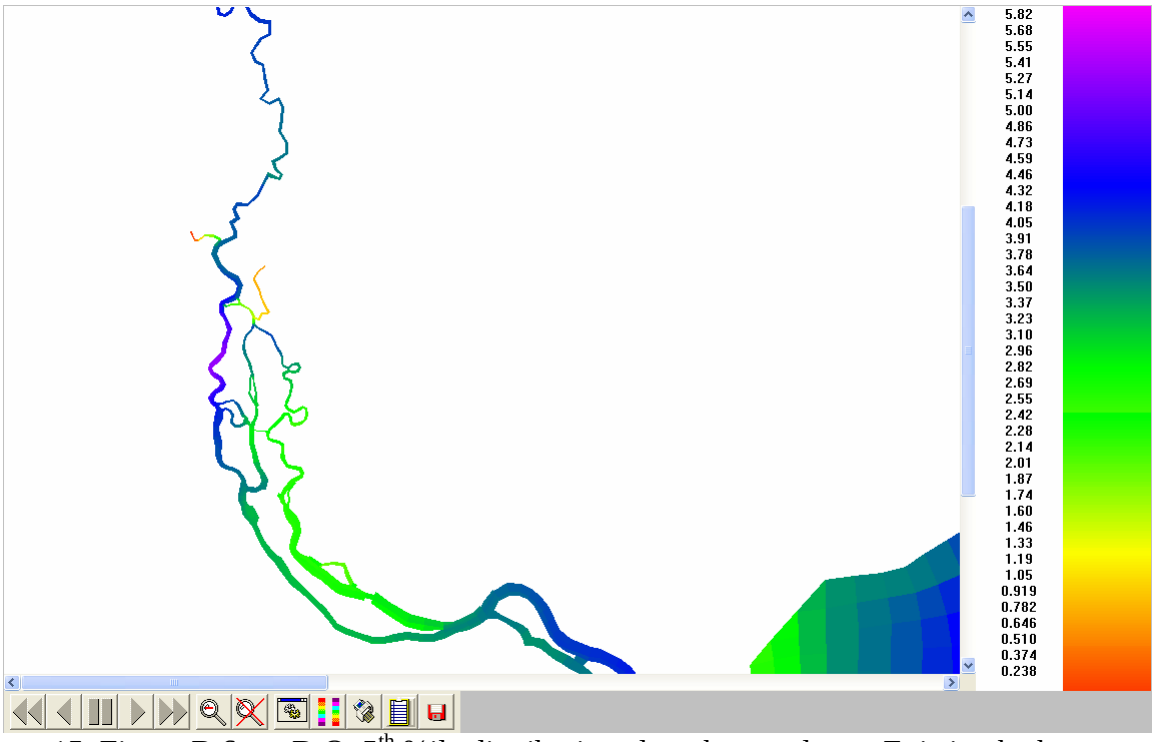
12. Figure B.3. Minimum D.O. distribution along surface layer within the analyzed period of May 1 - October 30, 1997: Existing bathymetry



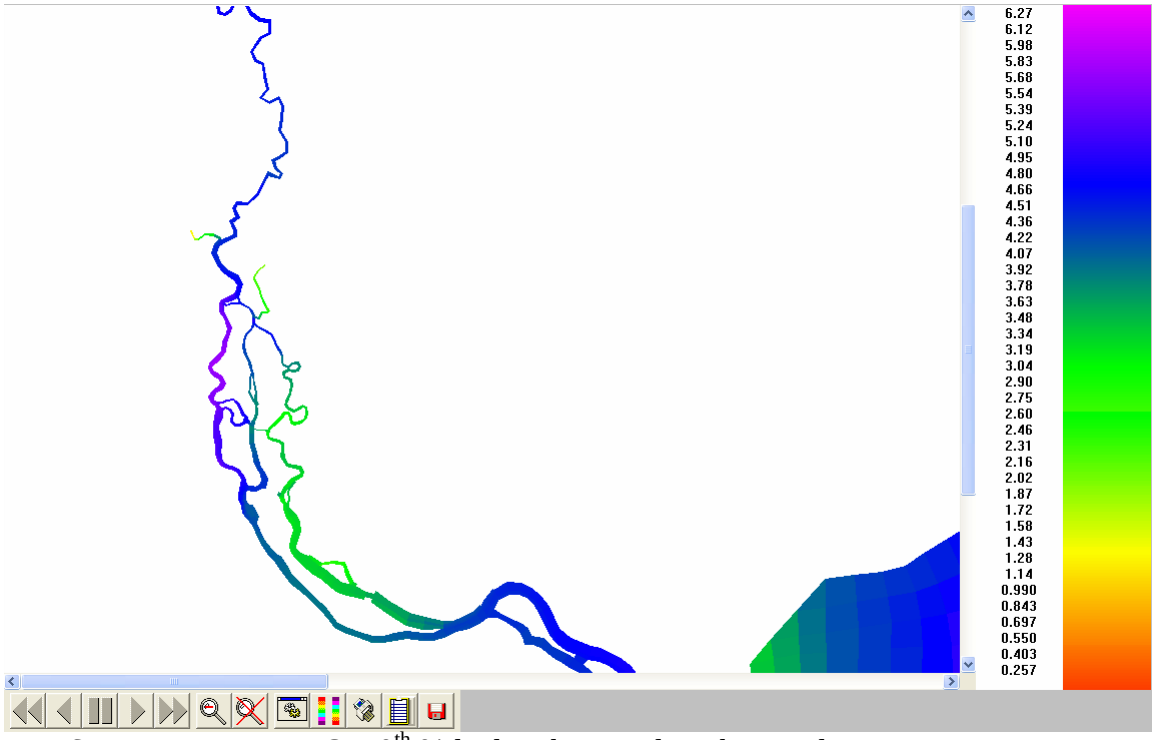
13. Figure B.4. Salinity corresponded to Minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1997: Existing bathymetry



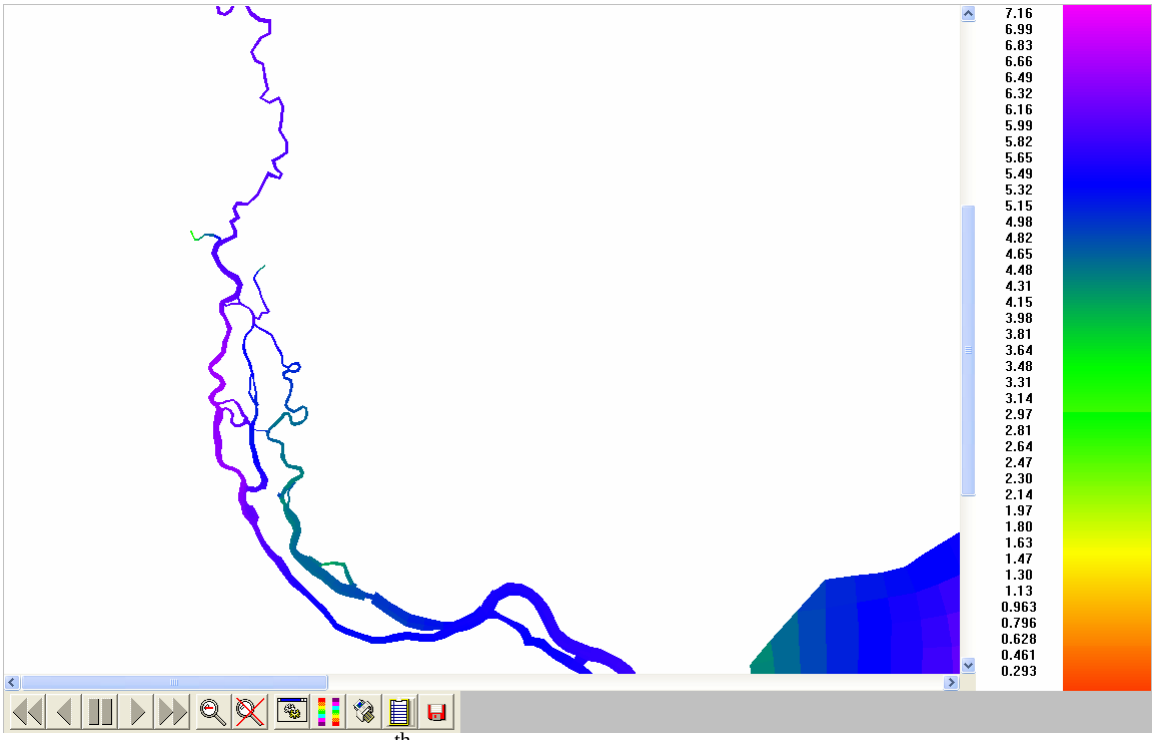
14. Figure B.5. Salinity corresponded to Minimum D.O. distribution along Surface layer within the analyzed period of May 1 - October 30, 1997: Existing bathymetry



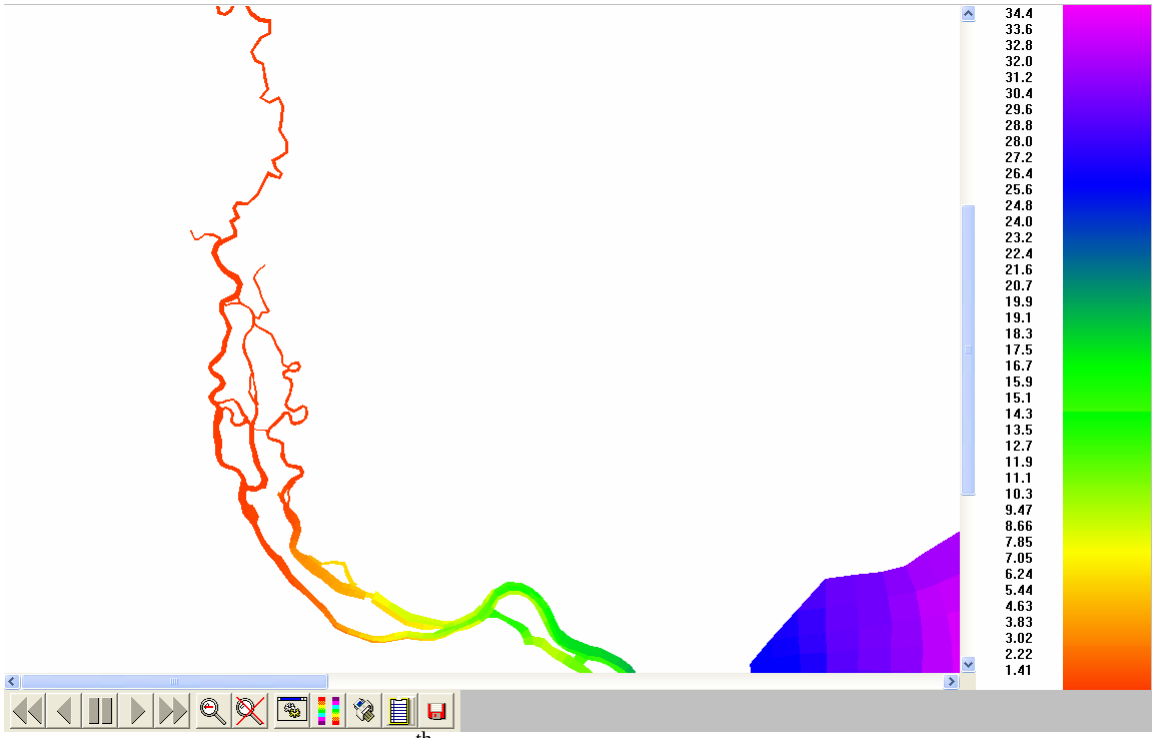
15. Figure B.6. D.O. 5th %ile distribution along bottom layer: Existing bathymetry



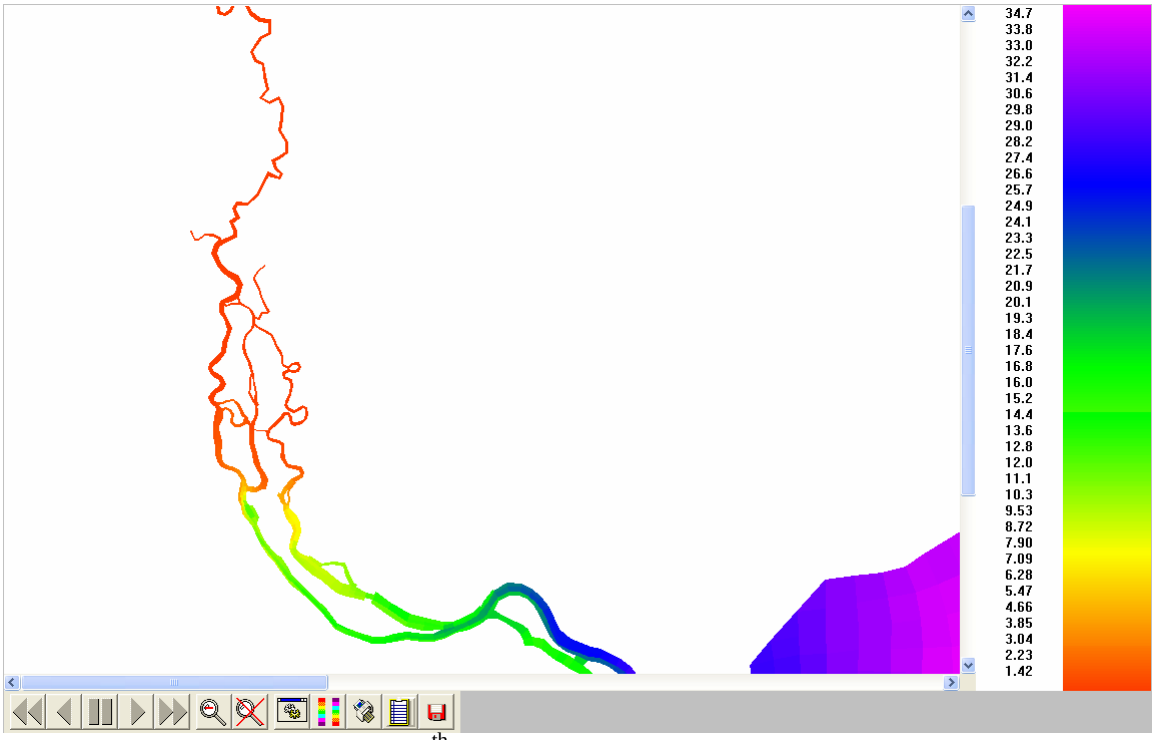
16. Figure B.7. D.O. 50th %ile distribution along bottom layer: Existing bathymetry



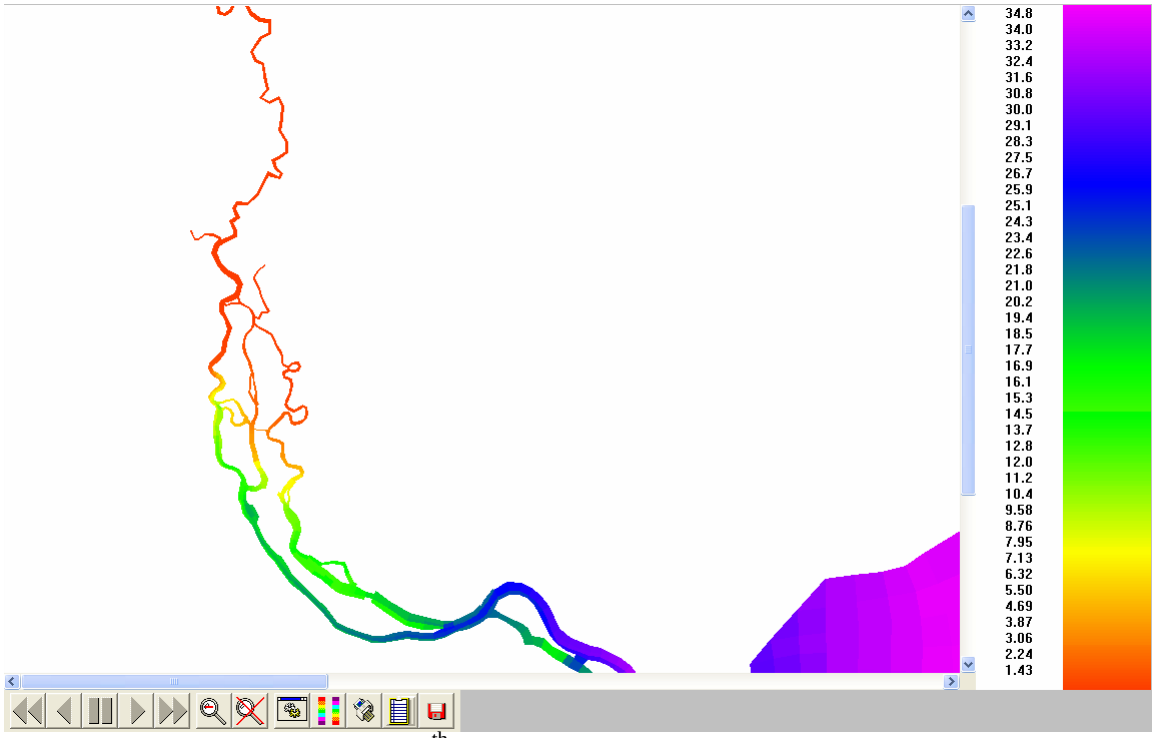
17. Figure B.8. D.O. 95th %ile distribution along bottom layer: Existing bathymetry



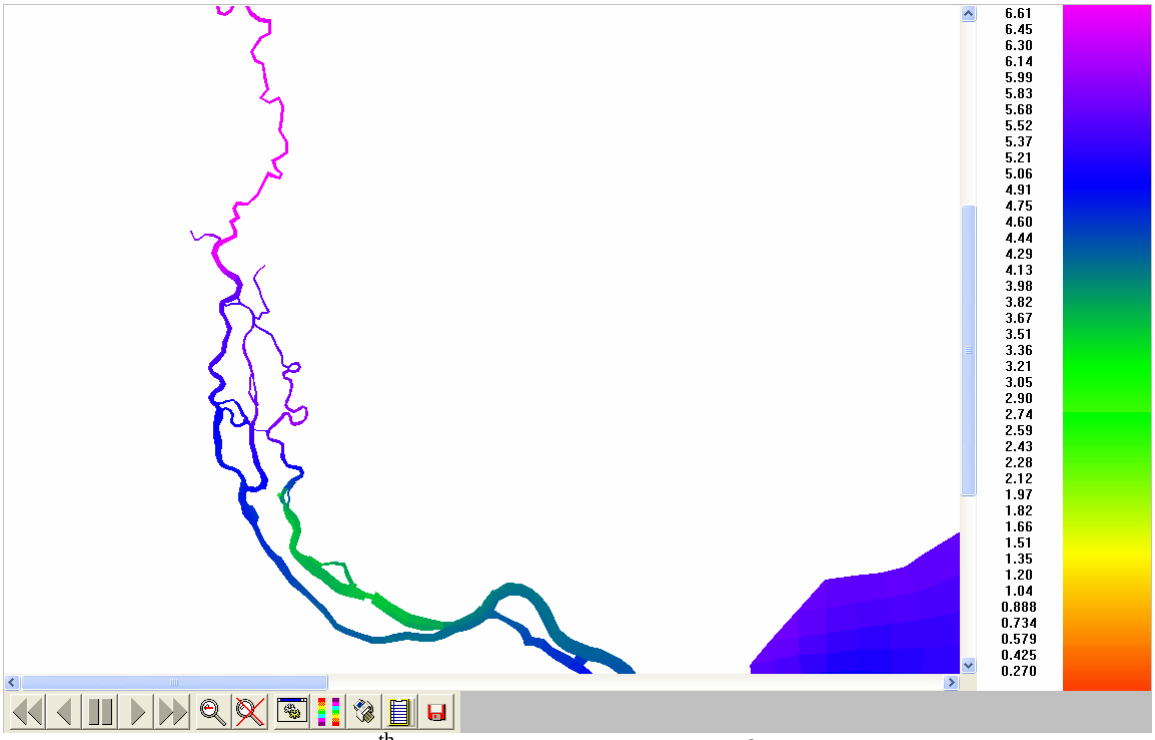
18. Figure B.9. Salinity 5th %ile distribution along bottom layer: Existing bathymetry



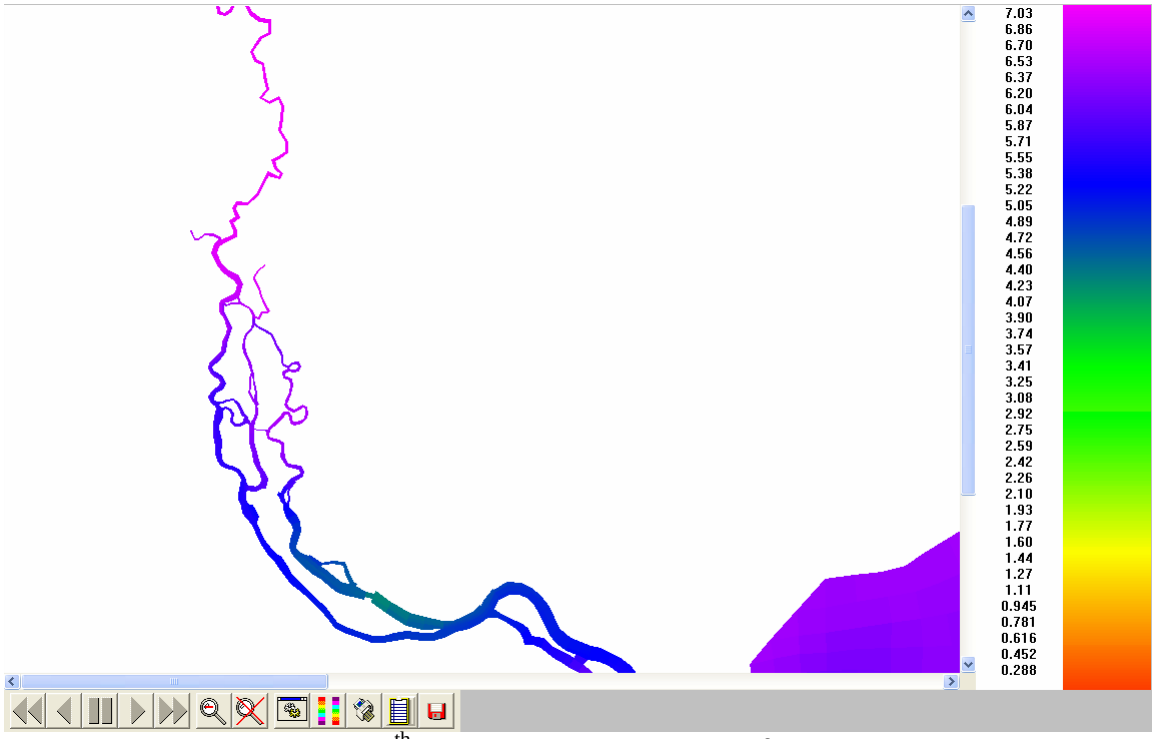
19. Figure B.10. Salinity 50th %ile distribution along bottom layer: Existing bathymetry



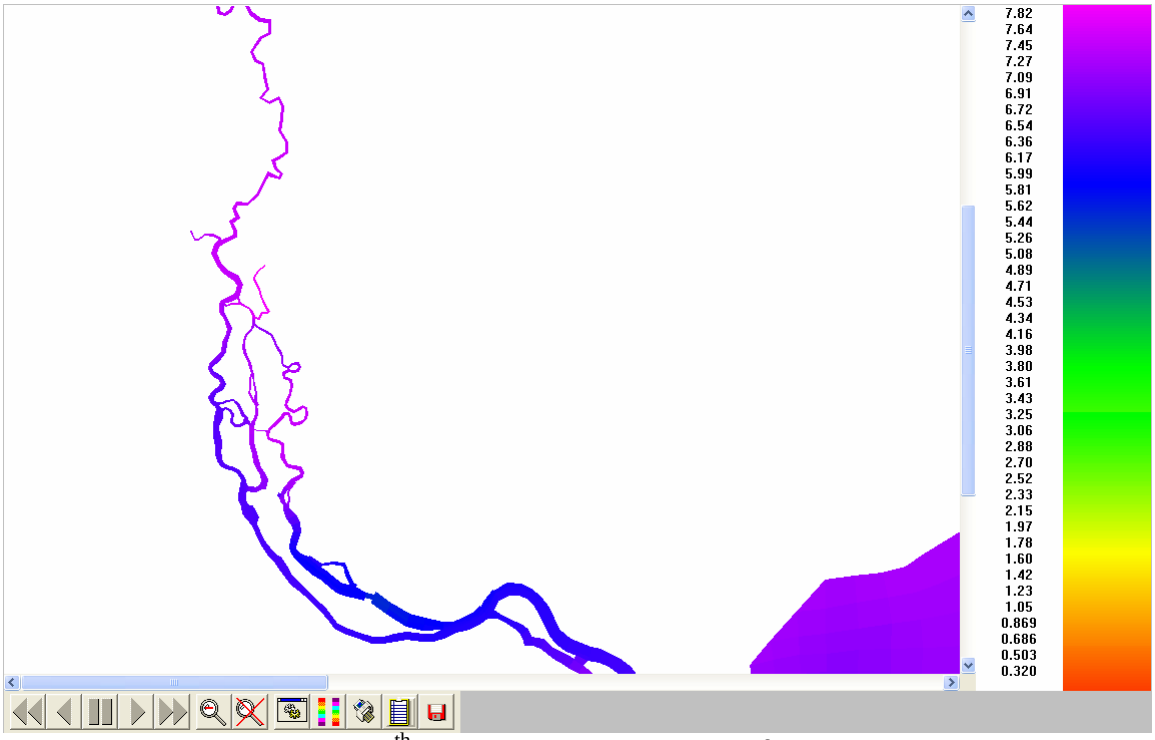
20. Figure B.11. Salinity 95th %ile distribution along bottom layer: Existing bathymetry



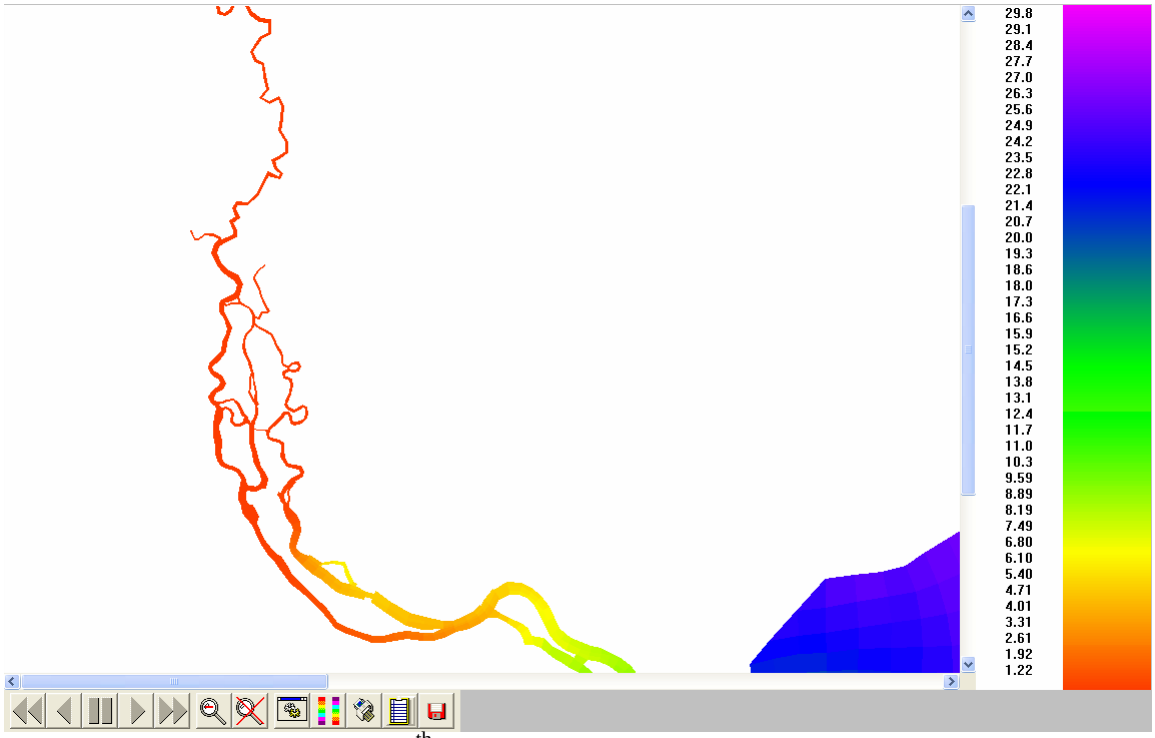
21. Figure B.12. D.O. 5th %ile distribution along surface layer: Existing bathymetry



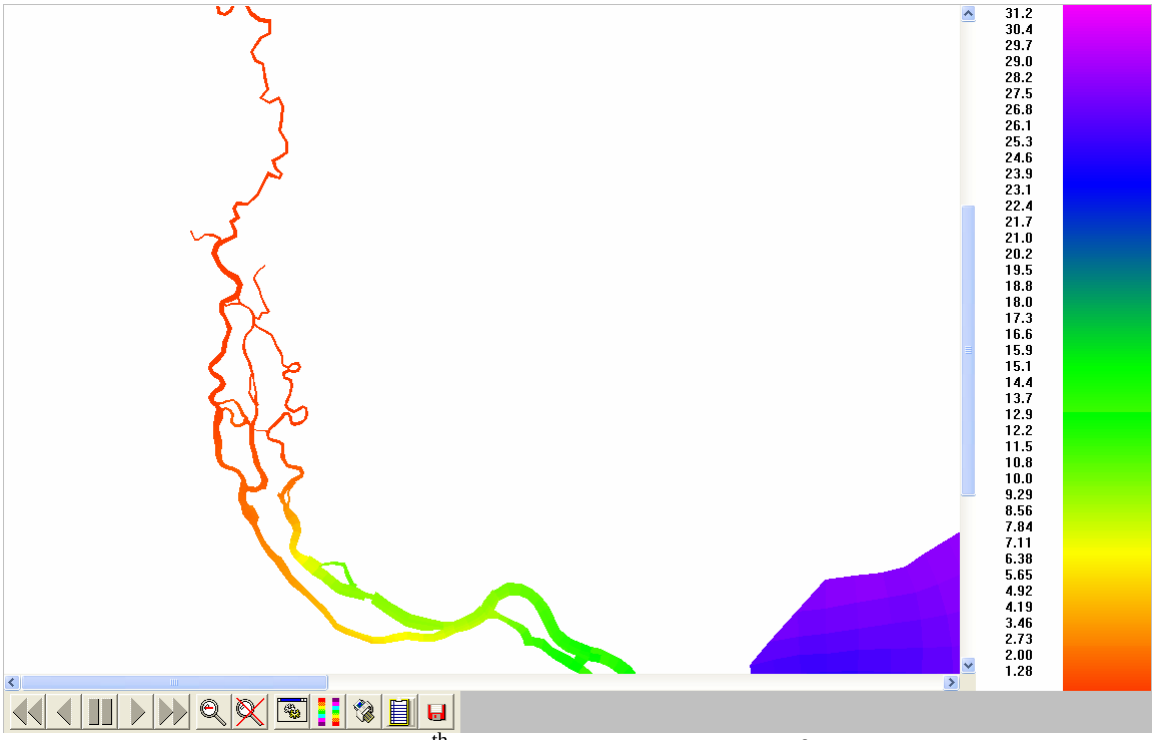
22. Figure B.13. D.O. 50th %ile distribution along surface layer: Existing bathymetry



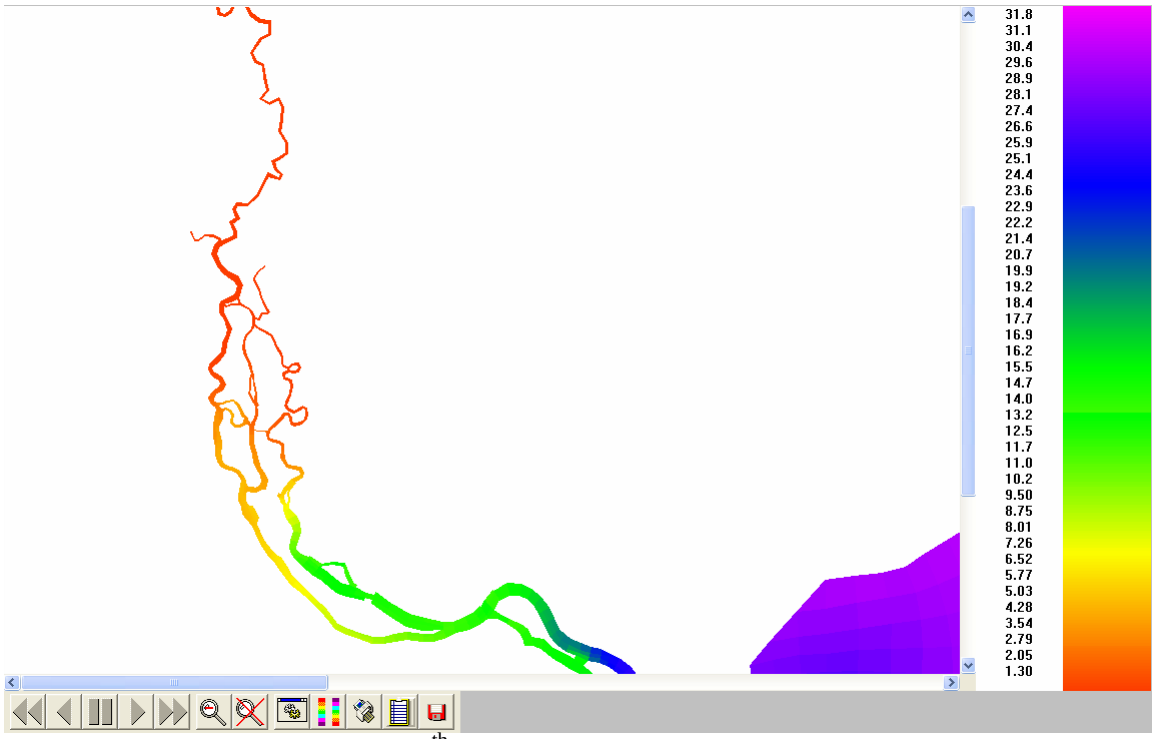
23. Figure B.14. D.O. 95th %ile distribution along surface layer: Existing bathymetry



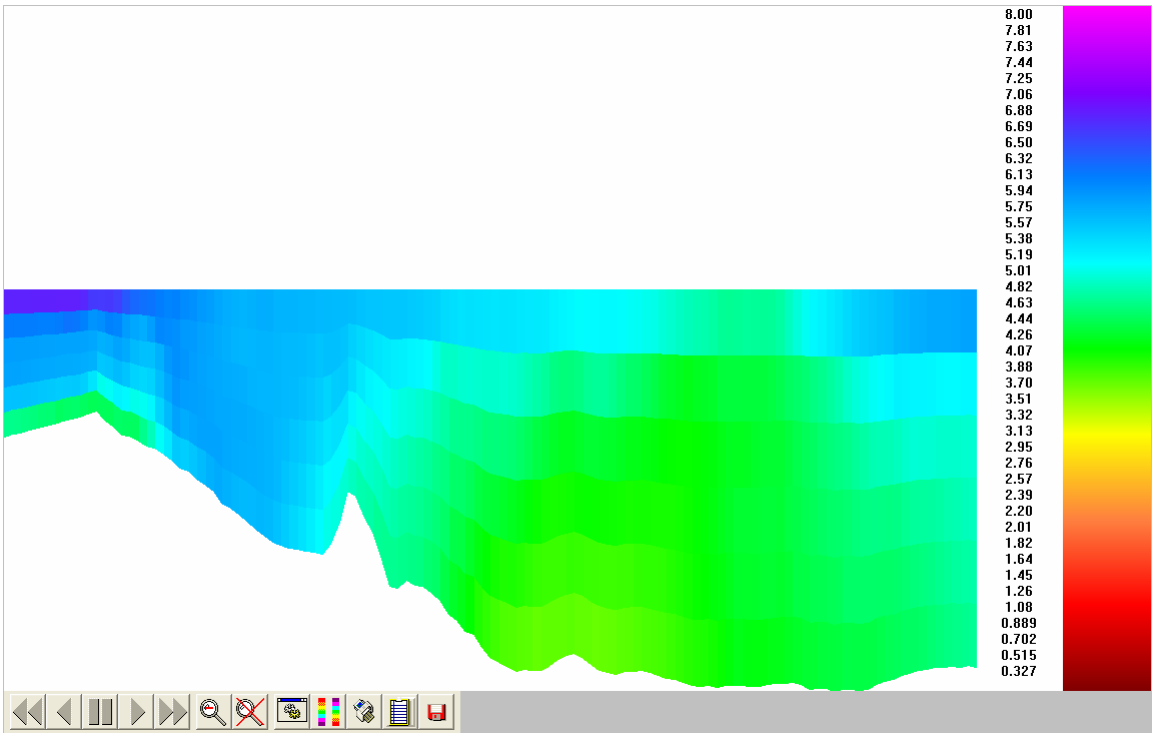
24. Figure B.15. Salinity 5th %ile distribution along surface layer: Existing bathymetry



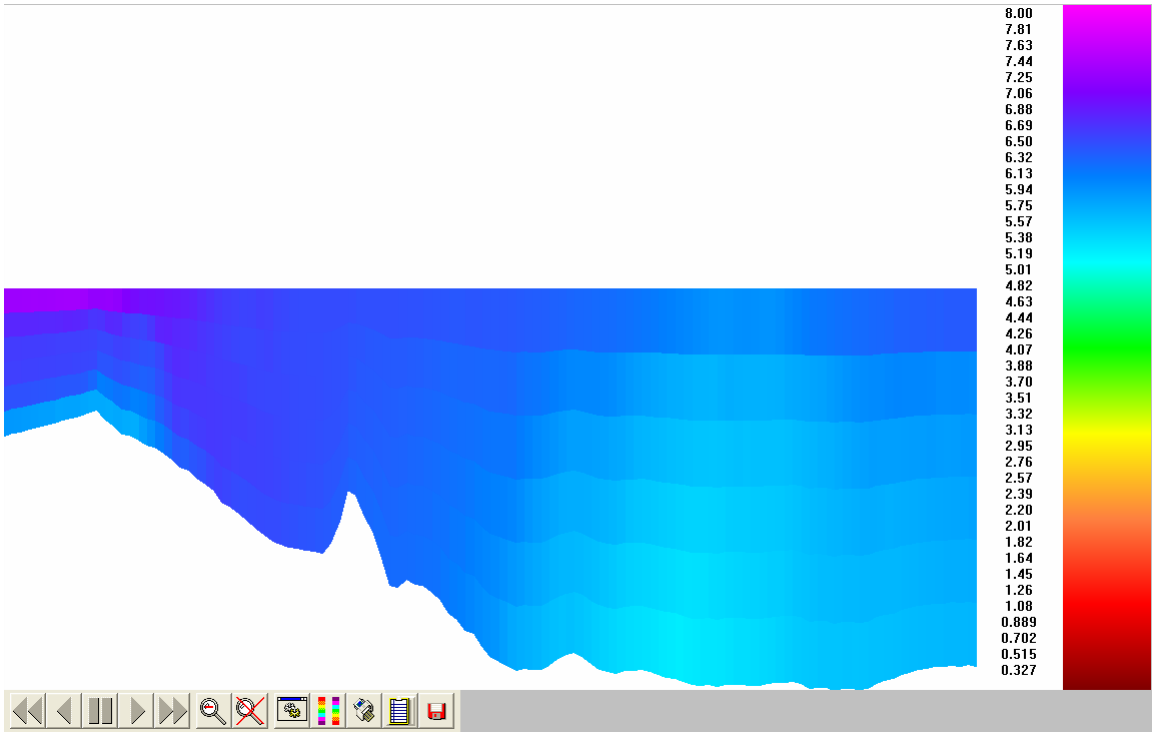
25. Figure B.16. Salinity 50th %ile distribution along surface layer: Existing bathymetry



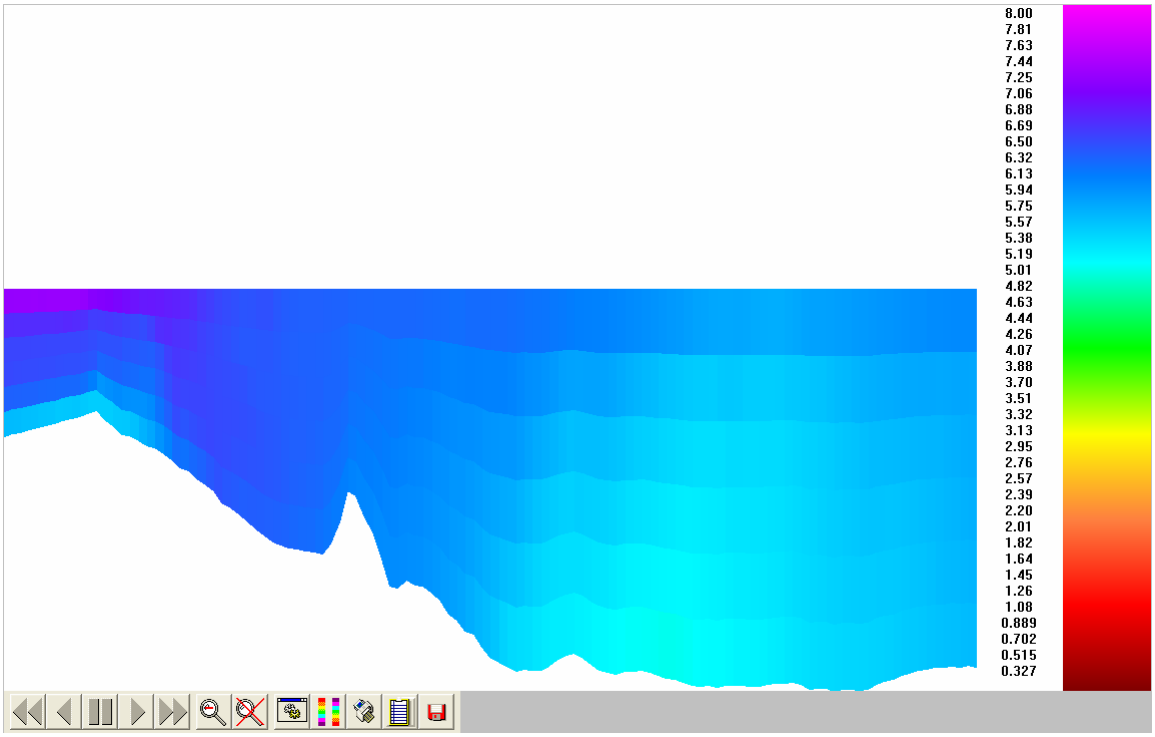
26. Figure B.17. Salinity 95th %ile distribution along surface layer: Existing bathymetry



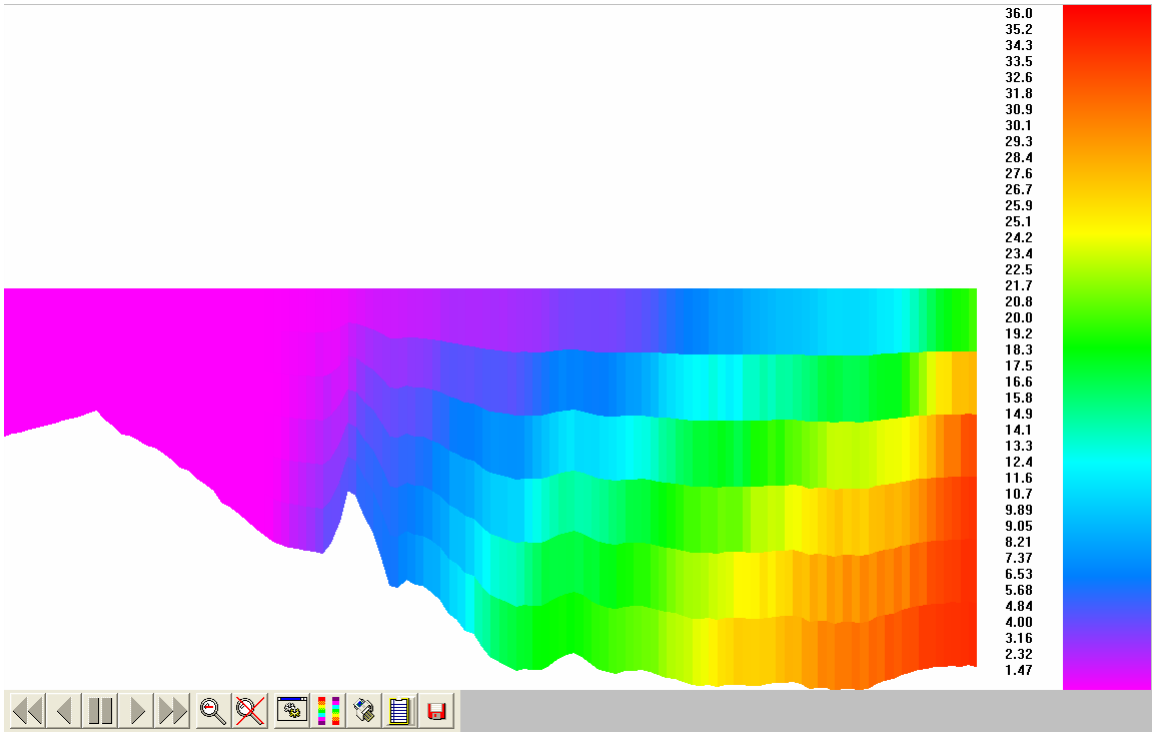
27. Figure B.18. Snapshot of 1-day averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: Existing bathymetry



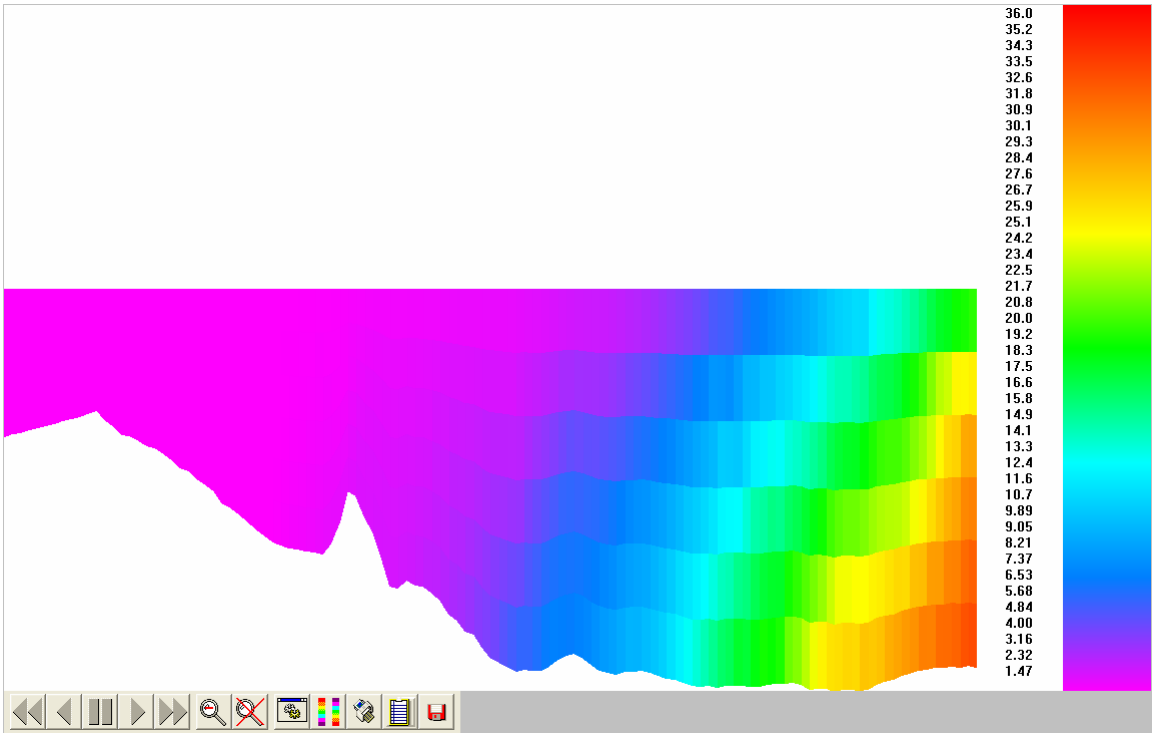
28. Figure B.19.0. Snapshot of 7-day averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: Existing bathymetry



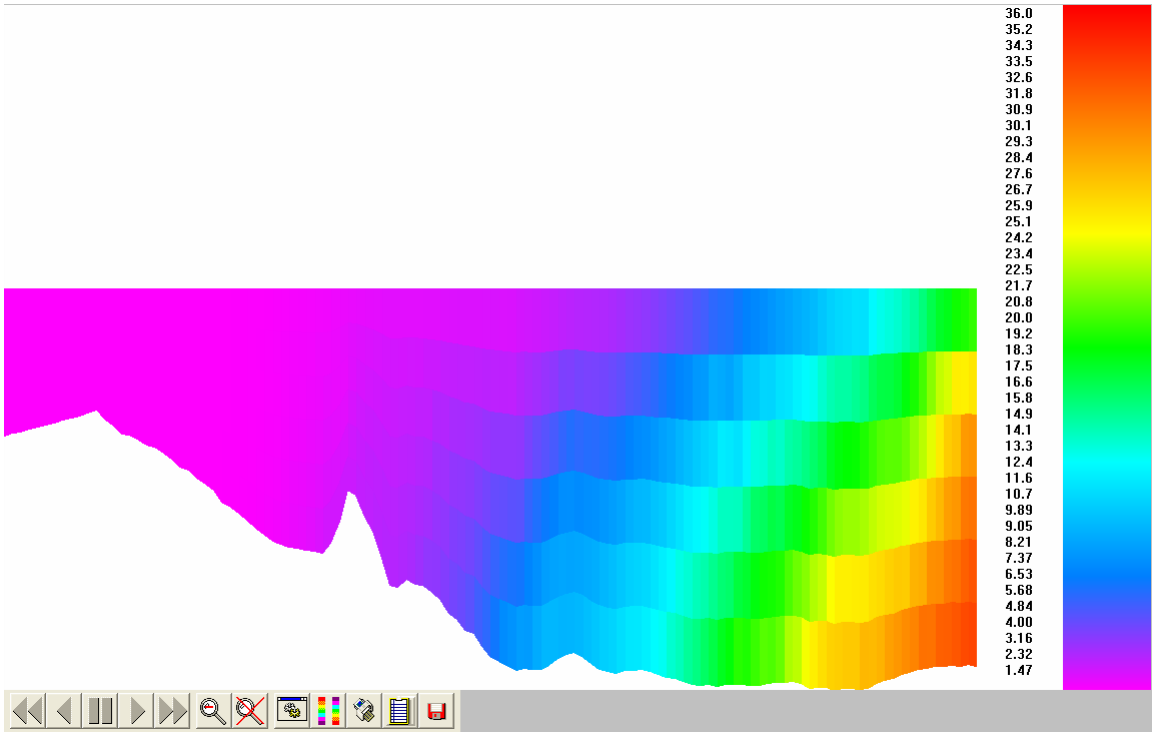
29. Figure B.20. Snapshot of 30-days averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: Existing bathymetry



30. Figure B.21. Snapshot of 1-day averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: Existing bathymetry



31. Figure B.22. Snapshot of 7-day averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: Existing bathymetry



32. Figure B.23. Snapshot of 30-days averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: Existing bathymetry

Appendix B1

SENSITIVITY ANALYSIS #1: 6 ft DEEPENING BATHYMETRY, 2004 POINT SOURCES LOADS, 1997 HYDROLOGICAL AND METEOROLOGICAL CONDITIONS

May 1 – October 30, 1997 Simulation Period

Water Quality Review Group

1. Table B1.1. Dissolved oxygen percentiles distribution in Critical cells

Zone	D.O. Percentile (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.44	3.74	3.91	4.12	4.43	4.92	5.37	5.5	5.65
FR2	2.99	3.28	3.42	3.65	3.98	4.47	5.02	5.22	5.42
FR3	2.86	3.09	3.24	3.46	3.8	4.26	4.89	5.14	5.84
FR4	2.83	3.07	3.21	3.4	3.77	4.23	4.84	5.25	5.91
FR5	2.89	3.11	3.23	3.42	3.8	4.2	4.89	5.22	5.98
FR6	2.98	3.16	3.23	3.43	3.8	4.22	4.84	5.37	6.22
FR7	3.35	3.58	3.74	4.07	4.57	5.09	5.75	6.26	6.51
FR8	3.37	3.73	3.91	4.32	4.81	5.3	5.85	6.3	6.52
FR9	3.36	3.71	3.87	4.26	4.85	5.38	5.88	6.43	6.58
FR10	3.18	3.5	3.74	4.29	4.9	5.43	5.82	5.97	6.18
FR11	2.94	3.37	3.61	4.06	4.54	5.18	5.69	5.89	6.01
MR1	3.21	3.37	3.51	3.74	4.11	4.53	5.04	5.57	6.18
MR2	2.82	3.08	3.25	3.58	4	4.48	4.92	5.22	6.15
MR3	2.64	2.81	2.94	3.21	3.64	4.29	4.84	5.08	5.89
MR4	2.77	3	3.12	3.37	3.68	4.14	4.68	5.02	5.28
MR5	0.85	1.49	1.85	2.51	4.16	5.23	5.68	5.89	6.05
MR6	1.45	2.09	2.46	3.16	4.64	5.45	5.88	6.12	6.72
LBR1	2.82	3.58	3.99	4.21	4.49	4.92	5.34	5.63	5.88
LBR2	3.11	3.26	3.35	3.49	3.71	4.16	4.51	4.98	5.21
LBR3	2.1	2.38	2.53	2.84	3.41	4.14	4.52	4.83	5.22
BR1	2.46	2.7	2.83	3.09	3.47	3.99	4.54	4.79	5.12
BR2	1.87	2.2	2.42	2.8	3.2	3.74	4.28	4.58	4.97
BR3	2.15	2.48	2.64	2.93	3.24	3.78	4.38	4.54	4.76
SCH1	1.81	2.15	2.39	2.8	3.54	4.28	4.82	5.17	5.59
SCH2	3.07	3.37	3.57	3.88	4.18	4.64	5.07	5.26	5.5
SR	3.38	3.47	3.56	3.9	4.22	4.7	5.37	5.85	5.89

2. Table B1.2. Delta of Dissolved Oxygen percentiles distribution in Critical cells: Deepening scenario minus Existing bathymetry scenario

Zone	Delta D.O. Percentile																	
	1%		5%		10%		25%		50%		75%		90%		95%		99	
	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%
FR1	0.03	0.9	0	0.0	0	0.0	-0.01	-0.2	-0.03	-0.7	-0.01	-0.2	0.01	0.2	0	0.0	-0.01	-0.2
FR2	-0.04	-1.3	-0.02	-0.6	0.02	0.6	0	0.0	-0.03	-0.7	0.02	0.4	0.03	0.6	-0.06	-1.1	-0.35	-6.1
FR3	0.02	0.7	-0.06	-1.9	-0.01	-0.3	0.02	0.6	-0.04	-1.0	-0.02	-0.5	0.03	0.6	-0.19	-3.6	-0.34	-5.5
FR4	0.01	0.4	-0.02	-0.6	-0.01	-0.3	-0.04	-1.2	-0.08	-2.1	-0.08	-1.9	0.01	0.2	-0.23	-4.2	-0.31	-5.0
FR5	-0.02	-0.7	-0.01	-0.3	-0.03	-0.9	-0.11	-3.1	-0.14	-3.6	-0.22	-5.0	0.02	0.4	-0.58	-10.0	-0.25	-4.0
FR6	-0.03	-1.0	-0.05	-1.6	-0.13	-3.9	-0.22	-6.0	-0.3	-7.3	-0.47	-10.0	-0.38	-7.3	-0.79	-12.8	-0.09	-1.4
FR7	-0.1	-2.9	-0.22	-5.8	-0.27	-6.7	-0.37	-8.3	-0.36	-7.3	-0.26	-4.9	-0.15	-2.5	-0.14	-2.2	-0.04	-0.6
FR8	-0.1	-2.9	-0.13	-3.4	-0.21	-5.1	-0.36	-7.7	-0.33	-6.4	-0.21	-3.8	-0.19	-3.1	-0.09	-1.4	-0.01	-0.2
FR9	-0.99	-22.8	-1.06	-22.2	-1.13	-22.6	-1.01	-19.2	-0.63	-11.5	-0.45	-7.7	-0.4	-6.4	-0.06	-0.9	-0.01	-0.2
FR10	0.01	0.3	0	0.0	0	0.0	0	0.0	0.01	0.2	0.01	0.2	0.01	0.2	0.01	0.2	0.03	0.5
FR11	0.07	2.4	0.02	0.6	0.02	0.6	0	0.0	0.01	0.2	0.01	0.2	0	0.0	0	0.0	0.02	0.3
MR1	-0.07	-2.1	-0.09	-2.6	-0.1	-2.8	-0.17	-4.3	-0.2	-4.6	-0.27	-5.6	-0.13	-2.5	-0.15	-2.6	-0.14	-2.2
MR2	-0.02	-0.7	-0.05	-1.6	-0.05	-1.5	-0.1	-2.7	-0.18	-4.3	-0.23	-4.9	-0.17	-3.3	-0.15	-2.8	-0.09	-1.4
MR3	-0.04	-1.5	-0.11	-3.8	-0.14	-4.5	-0.25	-7.2	-0.31	-7.8	-0.23	-5.1	-0.09	-1.8	-0.09	-1.7	-0.04	-0.7
MR4	0.02	0.7	0	0.0	-0.02	-0.6	-0.02	-0.6	-0.02	-0.5	-0.01	-0.2	-0.01	-0.2	-0.03	-0.6	0.01	0.2
MR5	-0.05	-5.6	-0.03	-2.0	-0.01	-0.5	0.02	0.8	0.02	0.5	0.02	0.4	0.01	0.2	0.01	0.2	0.01	0.2
MR6	0.03	2.1	0.06	3.0	0.07	2.9	0.04	1.3	0.01	0.2	0.02	0.4	0.01	0.2	0.02	0.3	0	0.0
LBR1	-0.06	-2.1	-0.03	-0.8	0.03	0.8	0.04	1.0	0.04	0.9	0.03	0.6	0.01	0.2	0.02	0.4	0.01	0.2
LBR2	-0.01	-0.3	0	0.0	0.01	0.3	0.02	0.6	0.03	0.8	0.02	0.5	-0.01	-0.2	0.01	0.2	0.03	0.6
LBR3	0	0.0	0	0.0	-0.02	-0.8	-0.04	-1.4	0.11	3.3	0.33	8.7	0.21	4.9	0.38	8.5	0.41	8.5
BR1	0.01	0.4	0.02	0.7	0.01	0.4	0.01	0.3	0	0.0	0.01	0.3	0.03	0.7	0.01	0.2	-0.01	-0.2
BR2	0.03	1.6	0.01	0.5	0.03	1.3	0.01	0.4	0.01	0.3	0.02	0.5	0.05	1.2	0.02	0.4	-0.03	-0.6
BR3	0.04	1.9	0.05	2.1	0.03	1.1	0.03	1.0	0.01	0.3	0.01	0.3	0.03	0.7	0.03	0.7	0.02	0.4
SCH1	0.1	5.8	-0.03	-1.4	0	0.0	0	0.0	-0.09	-2.5	-0.11	-2.5	-0.09	-1.8	-0.09	-1.7	-0.05	-0.9
SCH2	-0.07	-2.2	-0.05	-1.5	-0.06	-1.7	-0.07	-1.8	-0.05	-1.2	-0.04	-0.9	-0.04	-0.8	-0.06	-1.1	-0.06	-1.1
SR	0	0.0	0.01	0.3	0	0.0	0	0.0	0	0.0	0.01	0.2	0	0.0	0	0.0	0	0.0

3. Table B1.3. Dissolved oxygen percentiles distribution in Zones of Savannah Estuary

Zone Name	D.O. Concentration Percentiles (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.80	4.08	4.21	4.40	4.69	5.20	5.60	5.71	5.83
FR2	3.37	3.61	3.79	4.01	4.31	4.79	5.28	5.42	5.57
FR3	3.03	3.25	3.44	3.66	3.97	4.45	5.05	5.24	5.41
FR4	2.89	3.11	3.26	3.47	3.82	4.25	4.93	5.18	5.78
FR5	2.94	3.16	3.26	3.45	3.83	4.21	4.88	5.30	6.08
FR6	3.10	3.21	3.32	3.51	3.88	4.30	4.84	5.47	6.22
FR7	3.28	3.48	3.63	3.94	4.43	4.98	5.53	6.19	6.43
FR8	3.40	3.72	3.89	4.29	4.81	5.27	5.78	6.36	6.52
FR9	3.79	4.18	4.45	4.88	5.33	5.68	6.17	6.44	6.59
FR10	4.66	4.84	4.96	5.16	5.42	5.78	6.13	6.30	6.46
FR11	3.63	3.83	4.01	4.26	4.59	5.00	5.54	5.92	6.01
MR1	3.29	3.43	3.55	3.76	4.12	4.51	5.05	5.61	6.18
MR2	2.98	3.22	3.37	3.66	4.02	4.49	4.95	5.40	6.14
MR3	2.79	2.95	3.09	3.38	3.80	4.32	4.81	5.06	5.80
MR4	3.43	3.54	3.64	3.83	4.09	4.51	4.94	5.26	5.49
MR5	1.46	2.01	2.34	2.98	4.48	5.17	5.62	5.85	6.00
MR6	1.51	2.12	2.48	3.23	4.69	5.41	5.83	6.04	6.61
LBR1	3.47	3.62	3.70	3.85	4.04	4.50	4.83	5.32	5.47
LBR2	2.69	2.90	3.01	3.21	3.49	3.93	4.33	4.80	5.04
LBR3	2.60	2.72	2.82	2.99	3.21	3.72	4.23	4.39	4.58
BR1	2.77	2.96	3.04	3.25	3.59	4.12	4.64	4.93	5.21
BR2	2.40	2.64	2.76	2.96	3.28	3.82	4.41	4.60	4.90
BR3	2.50	2.68	2.77	2.95	3.20	3.76	4.33	4.46	4.61
SCh1	2.82	3.09	3.31	3.56	3.85	4.39	4.92	5.09	5.27
SCh2	3.31	3.51	3.76	4.00	4.28	4.76	5.19	5.37	5.54
SR	3.70	3.76	3.81	4.14	4.44	4.90	5.54	5.97	6.00

4. Table B1.4. Delta of Dissolved Oxygen percentiles distribution in Zones of Savannah Estuary: Deepening scenario minus Existing bathymetry scenario

Zone	Project - Baseline Difference (mg/l)									Project - Baseline Relative Difference (%)								
Name	1%	5%	10%	25%	50%	75%	90%	95%	99%	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	0.05	0.02	0.00	-0.01	-0.01	0.02	0.03	0.03	0.05	1.4	0.4	0.0	-0.2	-0.2	0.3	0.5	0.6	0.8
FR2	0.01	0.03	0.03	0.01	0.00	0.02	0.04	-0.02	-0.03	0.4	0.8	0.9	0.4	0.1	0.4	0.7	-0.3	-0.5
FR3	0.02	-0.03	0.04	0.05	-0.01	0.06	0.07	-0.03	-0.63	0.7	-0.8	1.2	1.3	-0.3	1.3	1.4	-0.6	-10.5
FR4	0.00	-0.06	-0.01	0.01	-0.06	-0.06	0.07	-0.21	-0.48	0.1	-1.7	-0.5	0.2	-1.5	-1.5	1.5	-3.9	-7.6
FR5	-0.03	-0.02	-0.05	-0.09	-0.11	-0.21	0.01	-0.45	-0.21	-1.0	-0.5	-1.4	-2.5	-2.9	-4.7	0.3	-7.8	-3.4
FR6	-0.03	-0.03	-0.12	-0.17	-0.23	-0.35	-0.22	-0.61	-0.12	-0.9	-0.8	-3.4	-4.7	-5.6	-7.5	-4.4	-10.0	-1.9
FR7	-0.04	-0.20	-0.23	-0.36	-0.45	-0.31	-0.24	-0.16	-0.01	-1.3	-5.4	-6.0	-8.4	-9.3	-5.9	-4.1	-2.4	-0.2
FR8	-0.21	-0.26	-0.36	-0.42	-0.36	-0.25	-0.19	-0.03	-0.01	-5.7	-6.6	-8.5	-8.8	-6.9	-4.6	-3.2	-0.5	-0.2
FR9	-0.40	-0.46	-0.47	-0.37	-0.16	-0.16	-0.09	-0.03	-0.01	-9.5	-9.9	-9.5	-7.0	-2.9	-2.8	-1.4	-0.5	-0.1
FR10	-0.03	-0.03	-0.03	-0.04	-0.02	-0.03	-0.03	0.00	0.00	-0.5	-0.7	-0.6	-0.8	-0.3	-0.4	-0.5	0.0	0.0
FR11	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MR1	-0.05	-0.12	-0.15	-0.19	-0.22	-0.29	-0.14	-0.19	-0.14	-1.5	-3.2	-4.1	-4.8	-5.0	-6.1	-2.6	-3.2	-2.2
MR2	-0.06	-0.07	-0.08	-0.13	-0.22	-0.23	-0.17	-0.05	-0.13	-1.9	-2.2	-2.2	-3.5	-5.2	-4.8	-3.3	-0.9	-2.0
MR3	0.02	0.01	-0.01	-0.05	-0.10	-0.12	-0.10	-0.08	-0.03	0.7	0.3	-0.3	-1.4	-2.5	-2.7	-2.0	-1.5	-0.4
MR4	0.03	0.02	0.02	0.02	0.02	0.02	0.01	-0.01	0.00	0.9	0.6	0.6	0.5	0.5	0.4	0.1	-0.2	0.1
MR5	0.02	0.04	0.05	0.06	0.01	0.01	0.00	0.00	0.02	1.3	1.8	2.4	2.1	0.1	0.2	0.1	0.0	0.3
MR6	0.04	0.05	0.08	0.06	0.00	0.02	0.02	0.01	0.02	2.8	2.4	3.3	1.8	0.1	0.4	0.3	0.1	0.3
LBR1	0.01	0.01	0.02	0.03	0.03	0.02	0.00	0.02	0.02	0.2	0.3	0.6	0.9	0.8	0.4	0.0	0.3	0.5
LBR2	-0.02	0.00	0.00	0.01	0.02	0.00	-0.01	0.02	0.01	-0.6	-0.1	0.0	0.3	0.5	0.0	-0.1	0.3	0.2
LBR3	0.12	0.13	0.11	0.11	0.09	0.09	0.07	0.00	0.03	4.9	4.9	4.0	3.7	2.9	2.5	1.6	0.1	0.6
BR1	0.00	0.00	0.00	0.00	-0.03	0.00	0.02	-0.04	-0.08	0.1	0.1	0.1	-0.1	-0.8	0.1	0.5	-0.7	-1.5
BR2	0.03	0.01	0.01	0.01	0.01	0.03	0.03	0.03	-0.02	1.2	0.4	0.4	0.4	0.4	0.7	0.7	0.6	-0.3
BR3	0.06	0.05	0.03	0.03	0.03	0.00	0.05	0.05	0.08	2.6	1.8	1.3	1.1	0.8	0.1	1.1	1.2	1.8
SCh1	0.05	0.02	-0.04	-0.02	0.00	0.01	-0.01	0.00	0.02	1.8	0.6	-1.2	-0.5	-0.1	0.3	-0.2	0.0	0.4
SCh2	0.03	0.00	-0.02	-0.02	-0.02	-0.01	0.00	-0.01	-0.01	0.9	-0.1	-0.4	-0.6	-0.3	-0.2	-0.1	-0.2	-0.1
SR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0

5. Table B1.5. Percentage of the volume of waters with violation of Dissolved Oxygen standards for Zones of Savannah Estuary within the period of May 1 – October 30, 1997: Deepening (Project) and Existing (Baseline) bathymetry

Zones	D.O. STANDARDS														
	1-Day Average			7-Day Average			30-Day Average			GA MINIMUM D.O.			SC MINIMUM D.O.		
	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B
FR1	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0
FR2	0	0	0	0	0	0	0	0	0	0	0	0	17	17	0
FR3	0	0	0	0	0	0	3	3	0	0	0	0	N/A	N/A	N/A
FR4	0	0	0	0	0	0	5	7	2	0	0	0	N/A	N/A	N/A
FR5	0	0	0	0	0	0	3	7	4	0	0	0	N/A	N/A	N/A
FR6	0	0	0	0	0	0	1	5	4	0	0	0	N/A	N/A	N/A
FR7	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR8	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR9	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR10	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR11	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
MR1	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
MR2	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
MR3	0	0	0	0	0	0	3	5	2	1	1	0	N/A	N/A	N/A
MR4	0	0	0	0	0	0	1	1	0	0	0	0	N/A	N/A	N/A
MR5	0	0	0	0	0	0	2	1	-1	4	4	0	9	9	0
MR6	0	0	0	0	0	0	0	0	0	2	2	0	7	7	0
LBR1	0	0	0	0	0	0	1	1	0	0	0	0	11	11	0
LBR2	0	0	0	2	1	-1	11	11	0	3	3	0	25	25	0
LBR3	0	0	0	6	5	-1	21	22	1	8	7	-1	36	38	2
BR1	0	0	0	1	2	1	18	20	2	2	2	0	50	51	1
BR2	0	0	0	6	6	0	36	37	1	7	7	0	60	61	1
BR3	0	0	0	9	8	-1	35	36	1	11	10	-1	57	59	2
SCh1	0	0	0	2	2	0	6	5	-1	3	3	0	N/A	N/A	N/A
SCh2	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
SR	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0

26. Table B1.6. Percentage of water volumes with salinity in %iles within the period of May 1 – October 30, 1997

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	20.4	6.5	4.6	5	4.5	4.3	8.1	7	94.2
10	24.3	10.1	9.1	9.5	9.1	8.6	18.7	10.4	94.2
25	36.5	21.6	22.8	23	23.3	22.1	26.6	20.7	94.2
50	57.4	43	46.9	47.1	47.9	46	51.2	43.3	94.2
75	78.4	69.2	72.8	73	73.5	72.9	72.5	69.3	94.2
90	91.1	87.1	88.9	89.1	89.3	89.2	89.1	87.4	94.2
95	95.4	93.5	94.4	94.5	94.6	94.6	94.3	93.6	94.7
Total Volume 100*km3:	33480.8	652.5	4769	27.2	39	135.5	9.9	9.4	43.6

27. Table B1.7. Percentage of water volumes with D.O. in %iles within the period of May 1 – October 30, 1997

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	5.3	5.2	5	5.6	5.5	4.8	5.6	5.5	5.9
10	10.5	10.3	9.9	11.2	10.6	9.6	10.9	11.1	11.3
25	26.2	24.9	25	27.2	26.1	24.2	26.4	26.8	26.6
50	51.9	49.6	50.1	52.9	51.3	49.6	50.5	51	51.3
75	76.2	74.8	75.4	76.7	75.7	74.8	75.7	76.1	76
90	90.4	89.9	90.2	90.4	90.2	89.9	90.1	90.4	90.2
95	95.2	94.7	95	95.5	95.3	94.9	95.2	95.3	95.2
Total Volume 100*km3:	33480.8	652.5	4769	27.2	39	135.5	9.9	9.4	43.6

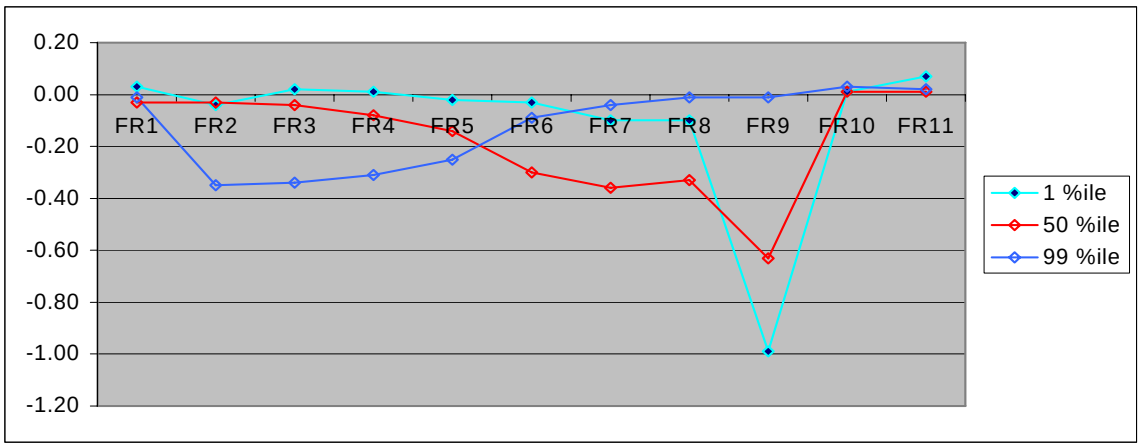
28. Table B1.8. Water volumes in Upper Harbor in increments of 1^{o} C of water temperature within the period of May 1 – October 30, 1997

Temperature C^{o}	Total Volume %
17	0.11
18	0.44
19	1.23
20	4.51
21	13.25
22	17.88
23	22.86
24	33.11
25	43.4
26	51.04
27	62.56
28	82.77
29	94.38
30	99.87
31	100

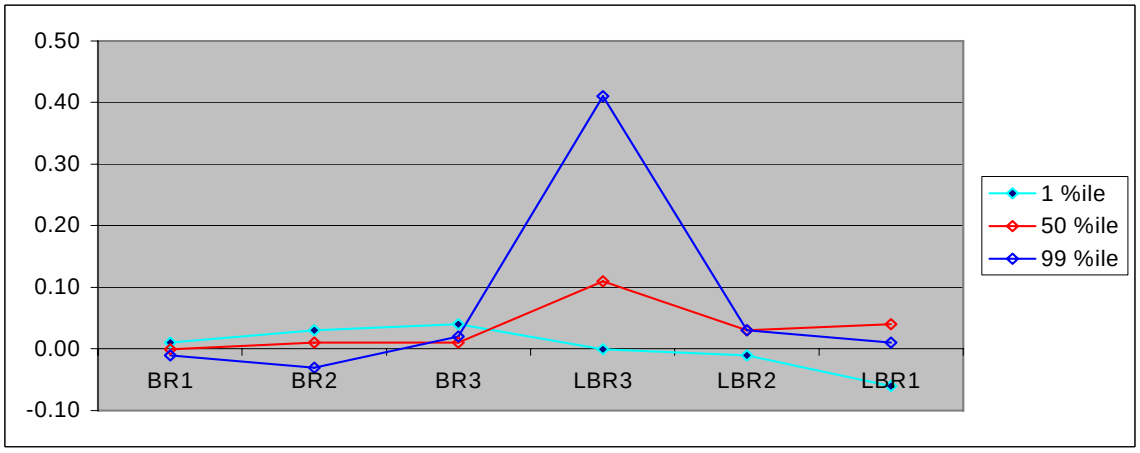
29. Table B1.9. Water volumes in Upper Harbor in increments of 0.1 mg/l of D.O. within the period of May 1 – October 30, 1997
(See file: Postprocessor Output\S16\97-S16_DO Increment Volume)

30. Table B1.10. Percentage of water volumes corresponding to 1-, 7-, and 30-days averages of D.O. depth-averaged concentrations in Upper Harbor within the period of May 1 – October 30, 1997
(See file: Postprocessor Output\S16\97-S16_volume DO in averages)

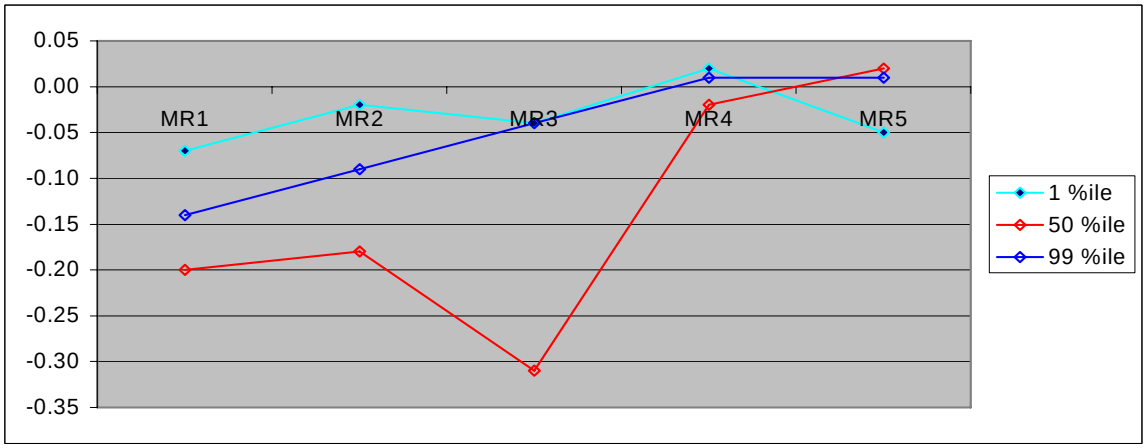
Front River



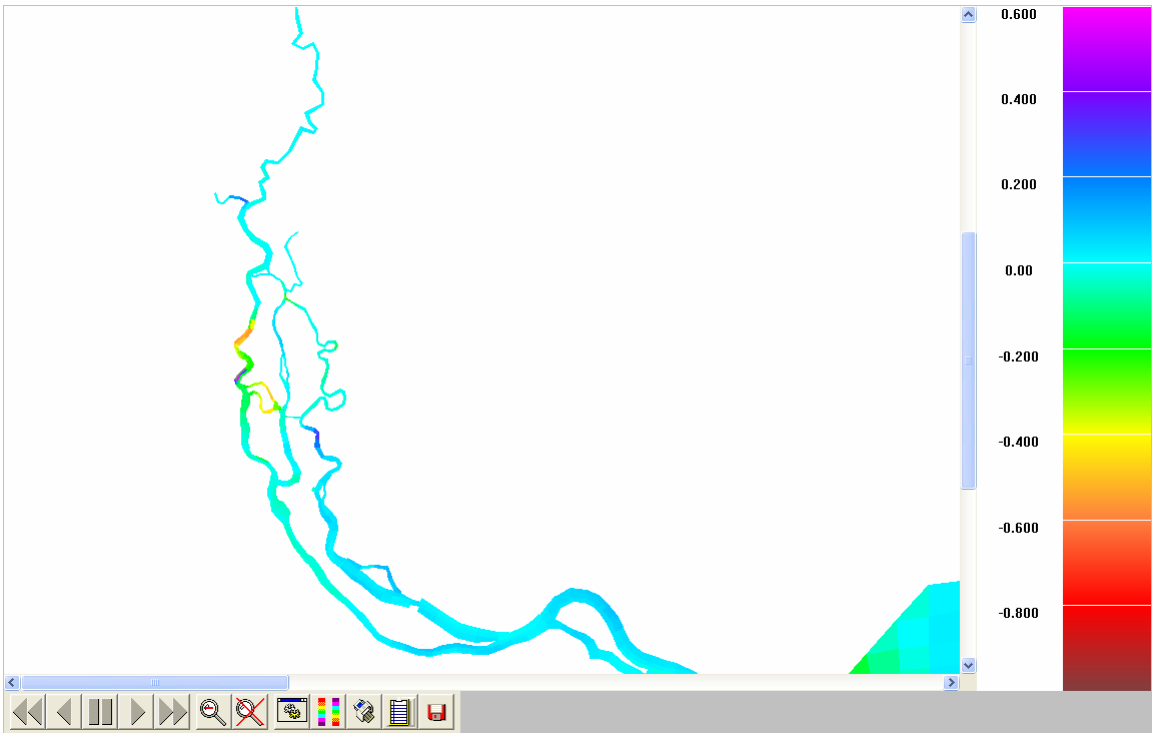
Back and Little Back Rivers



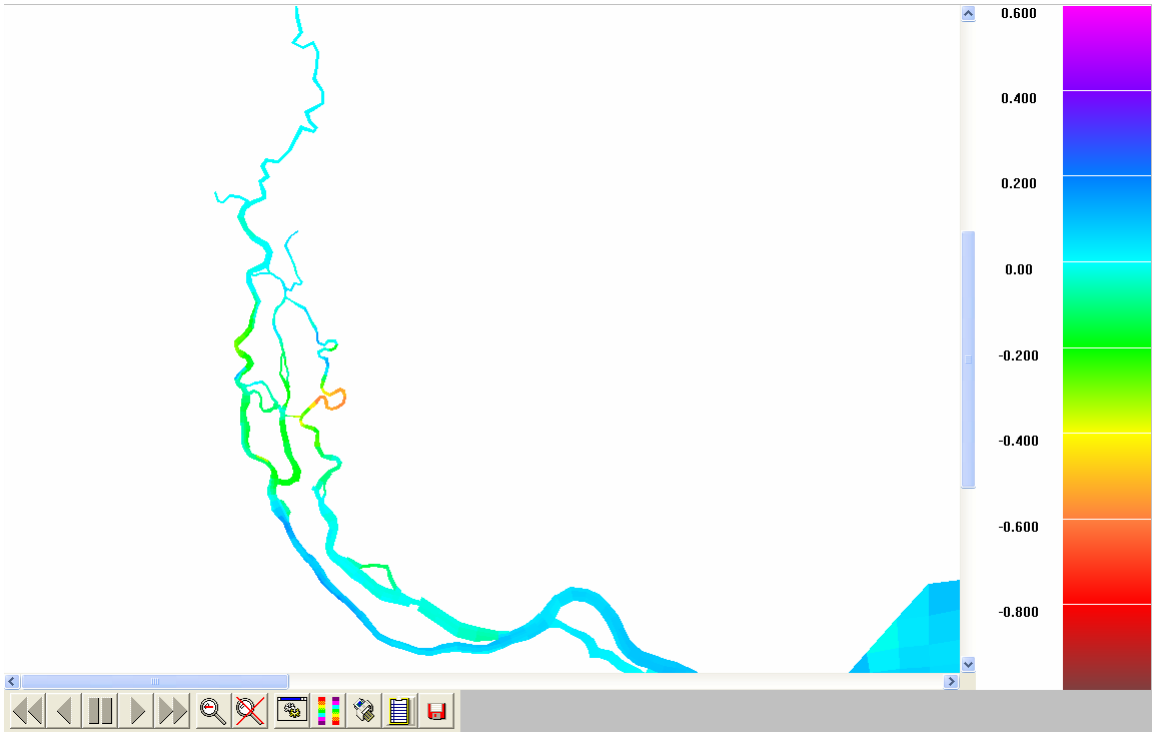
Middle River



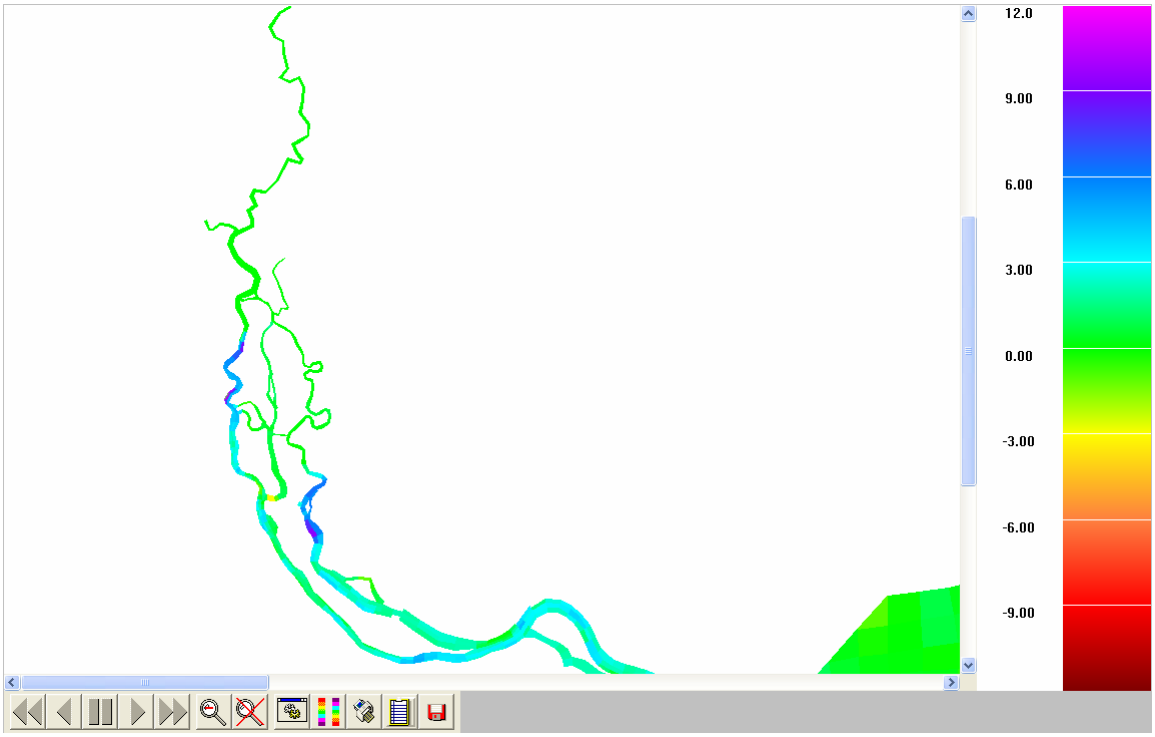
31. Figure B1.1. Changes in longitudinal profile of Dissolved Oxygen (mg/l) distribution along Critical cells of Savannah Estuary: 6 ft deepening



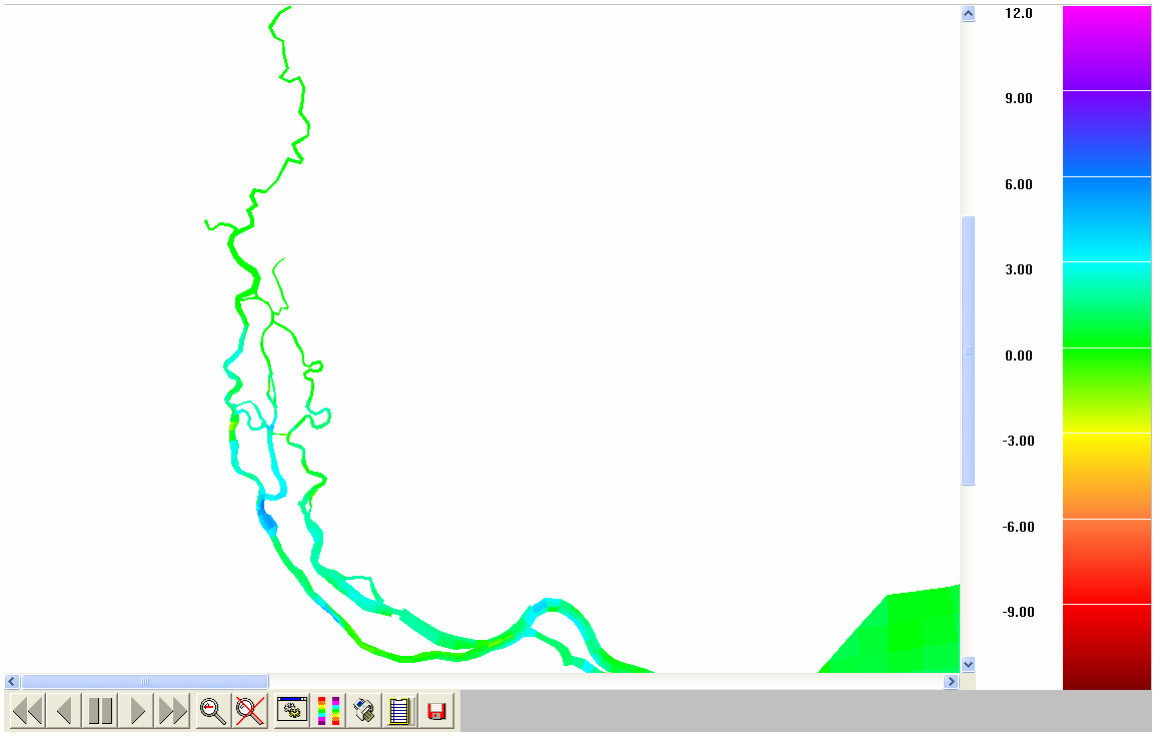
32. Figure B1.2. Changes in minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1997: 6 ft deepening



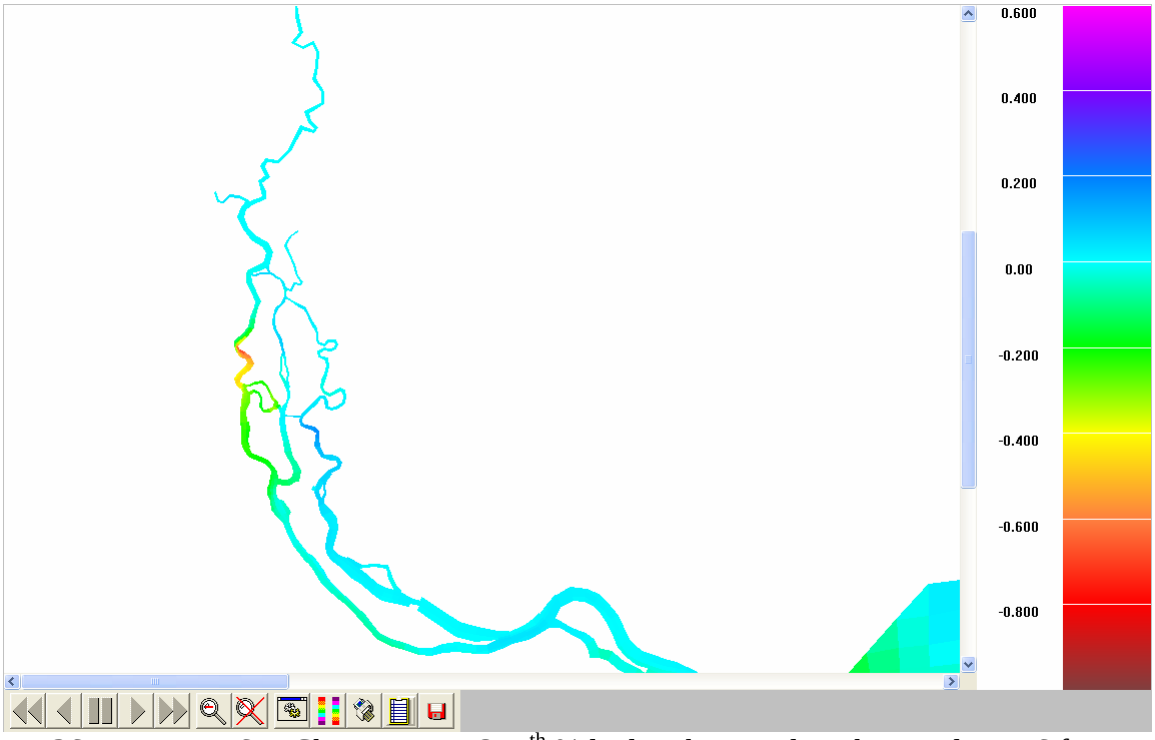
33. Figure B1.3. Changes in minimum D.O. distribution along surface layer within the analyzed period of May 1 - October 30, 1997: 6 ft deepening



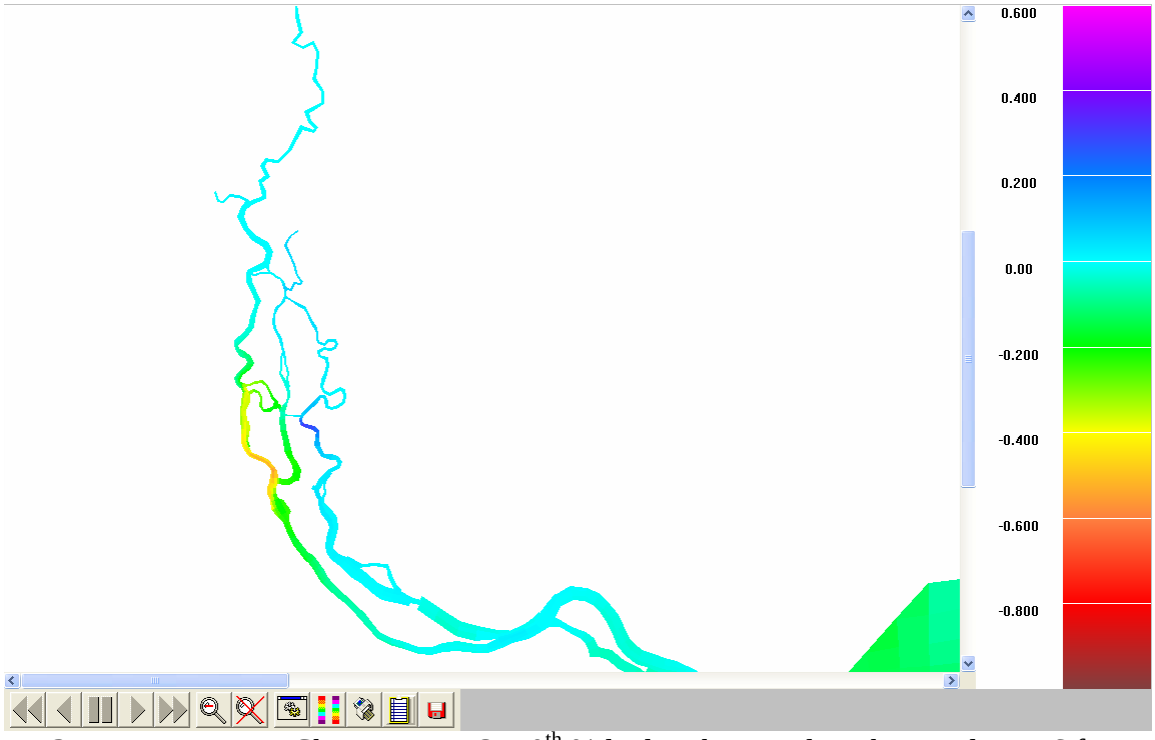
34. Figure B1.4. Changes in Salinity corresponded to Minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1997: 6 ft deepening



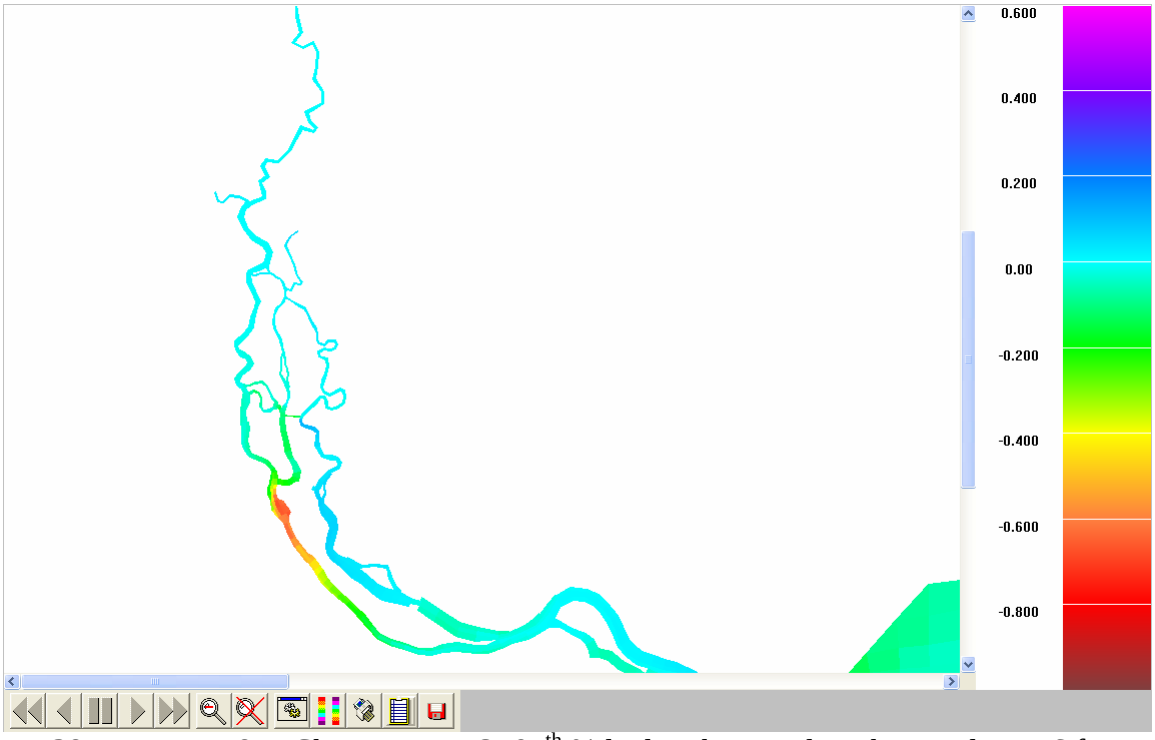
35. Figure B1.5. Changes in Salinity corresponded to Minimum D.O. distribution along Surface layer within the analyzed period of May 1 - October 30, 1997: 6 ft deepening



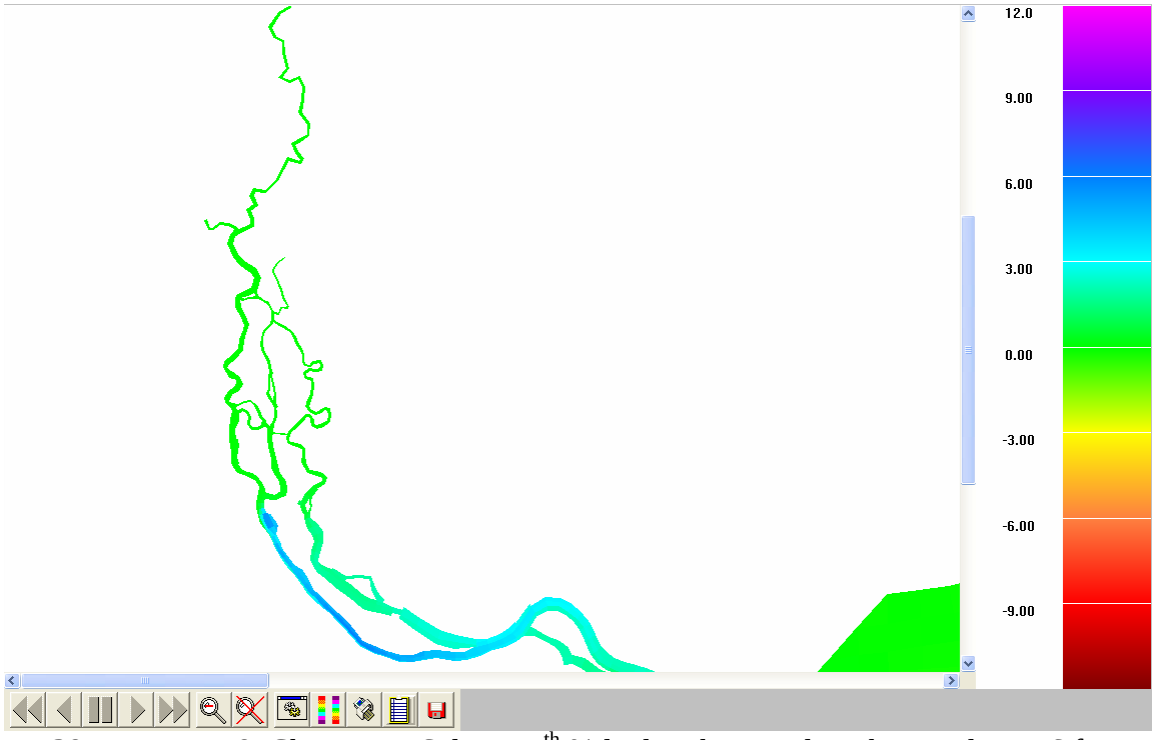
36. Figure B1.6. Changes in D.O. 5th %ile distribution along bottom layer: 6 ft deepening



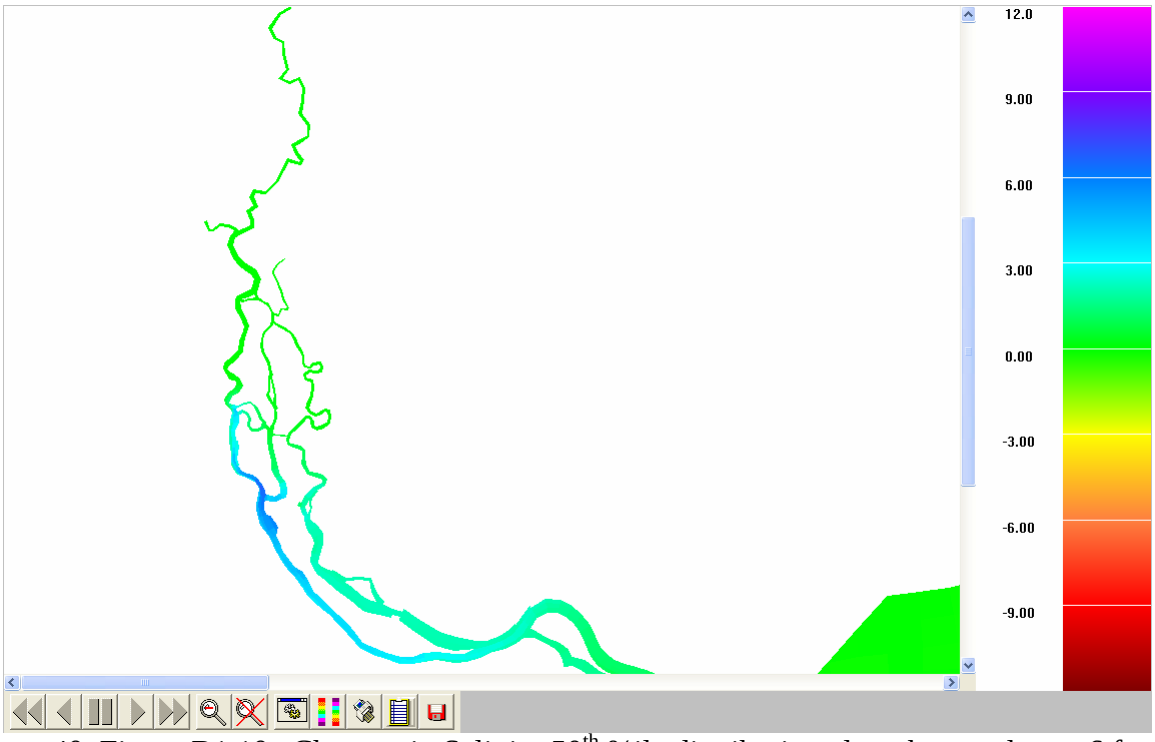
37. Figure B1.7. Changes in D.O. 50th %ile distribution along bottom layer: 6 ft deepening



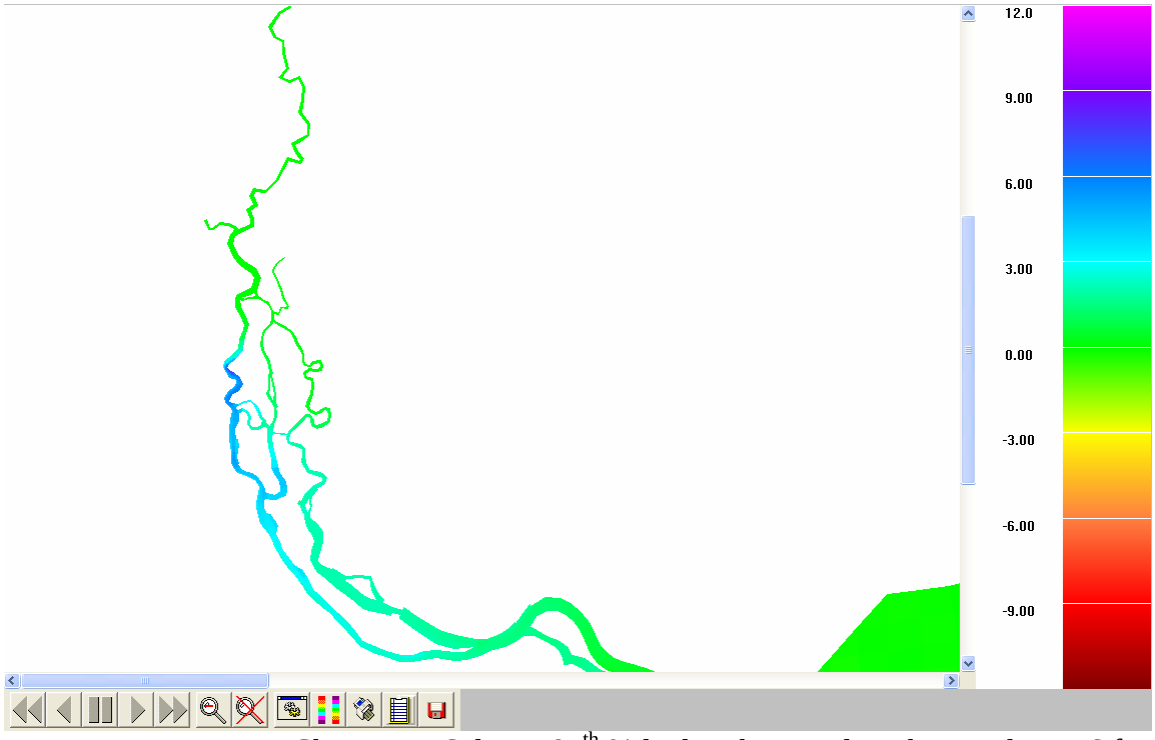
38. Figure B1.8. Changes in D.O. 95th %ile distribution along bottom layer: 6 ft deepening



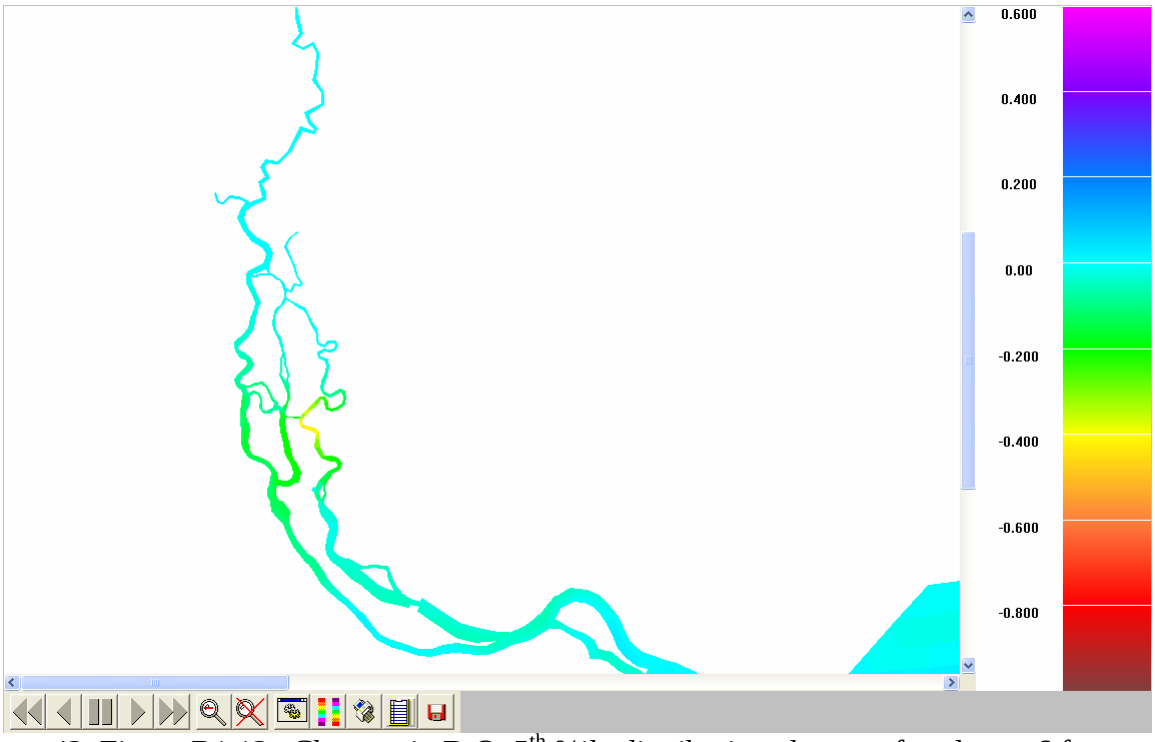
39. Figure B1.9. Changes in Salinity 5th %ile distribution along bottom layer: 6 ft deepening



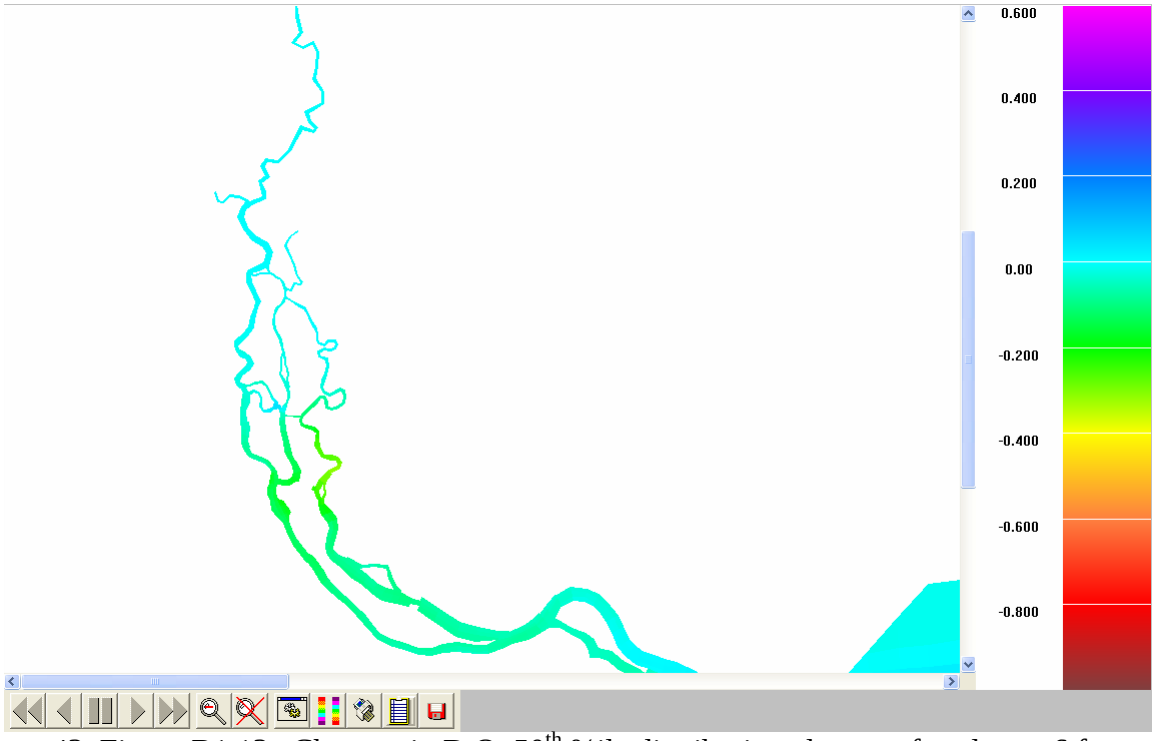
40. Figure B1.10. Changes in Salinity 50th %ile distribution along bottom layer: 6 ft deepening



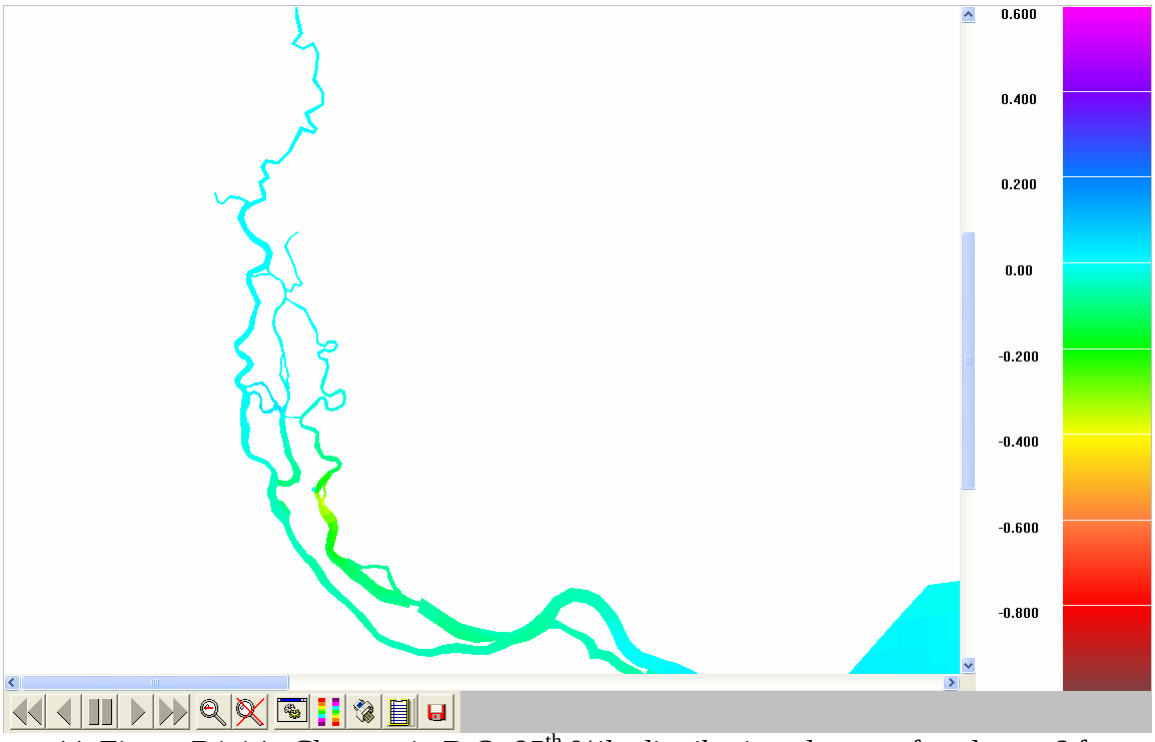
41. Figure B1.11. Changes in Salinity 95th %ile distribution along bottom layer: 6 ft deepening



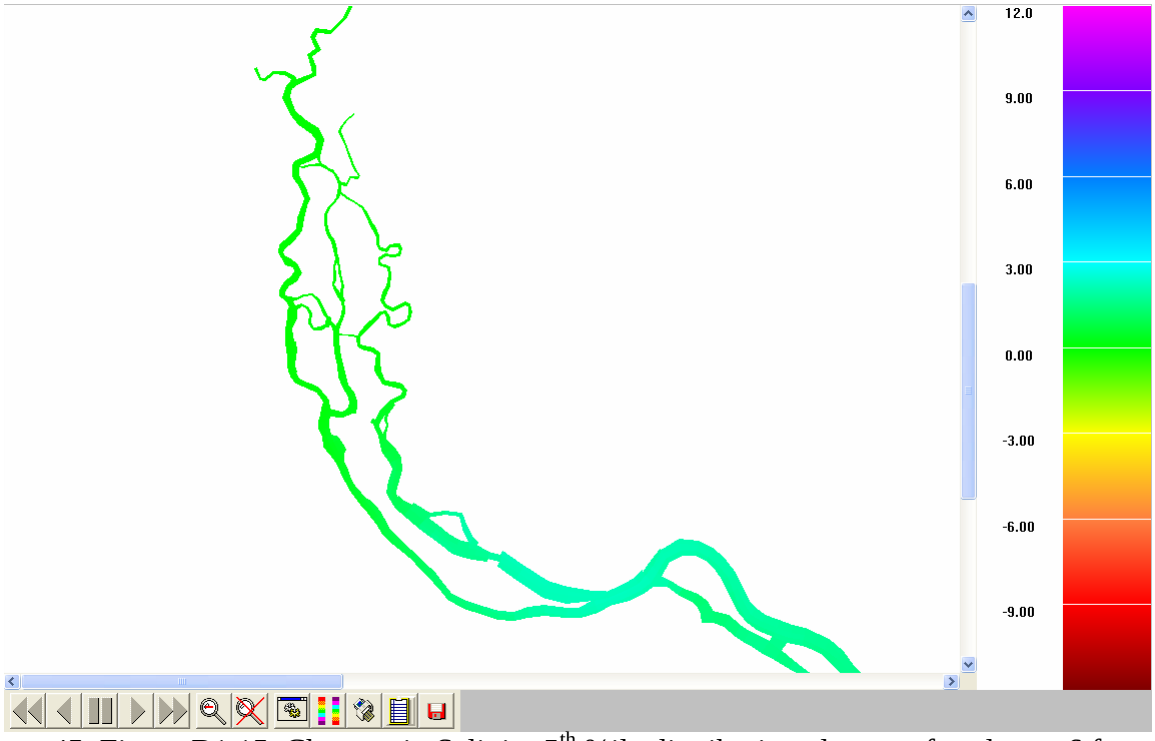
42. Figure B1.12. Changes in D.O. 5th %ile distribution along surface layer: 6 ft deepening



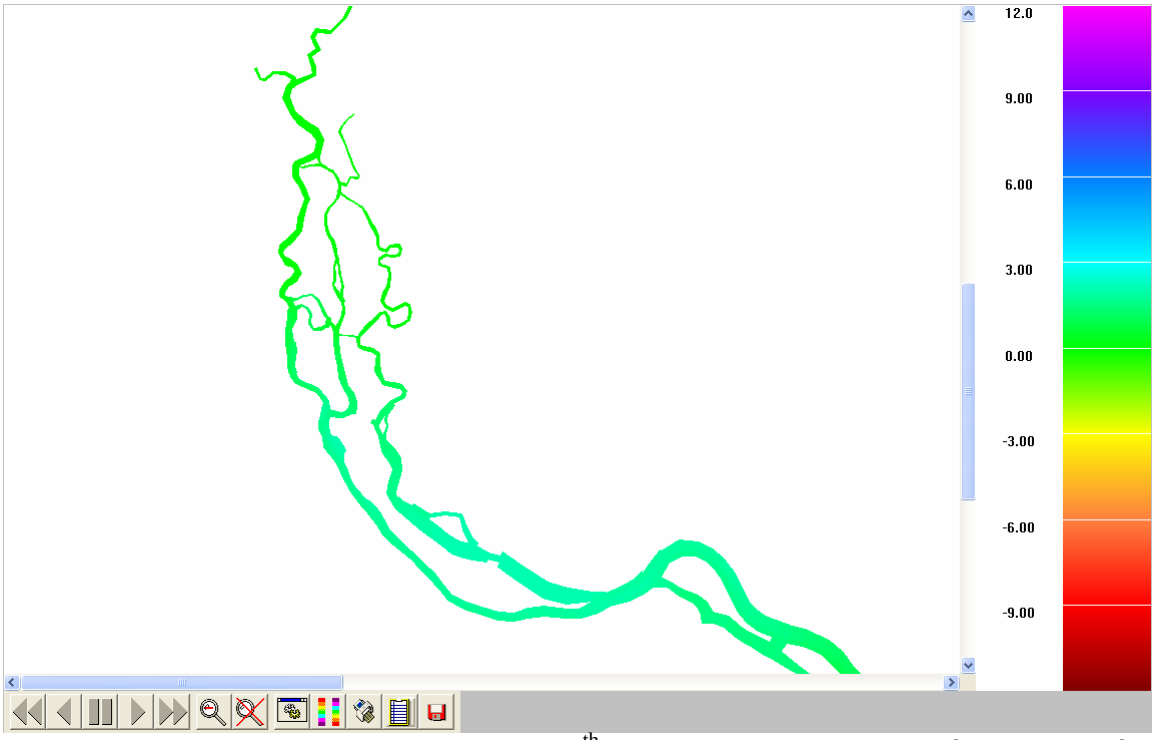
43. Figure B1.13. Changes in D.O. 50th %ile distribution along surface layer: 6 ft deepening



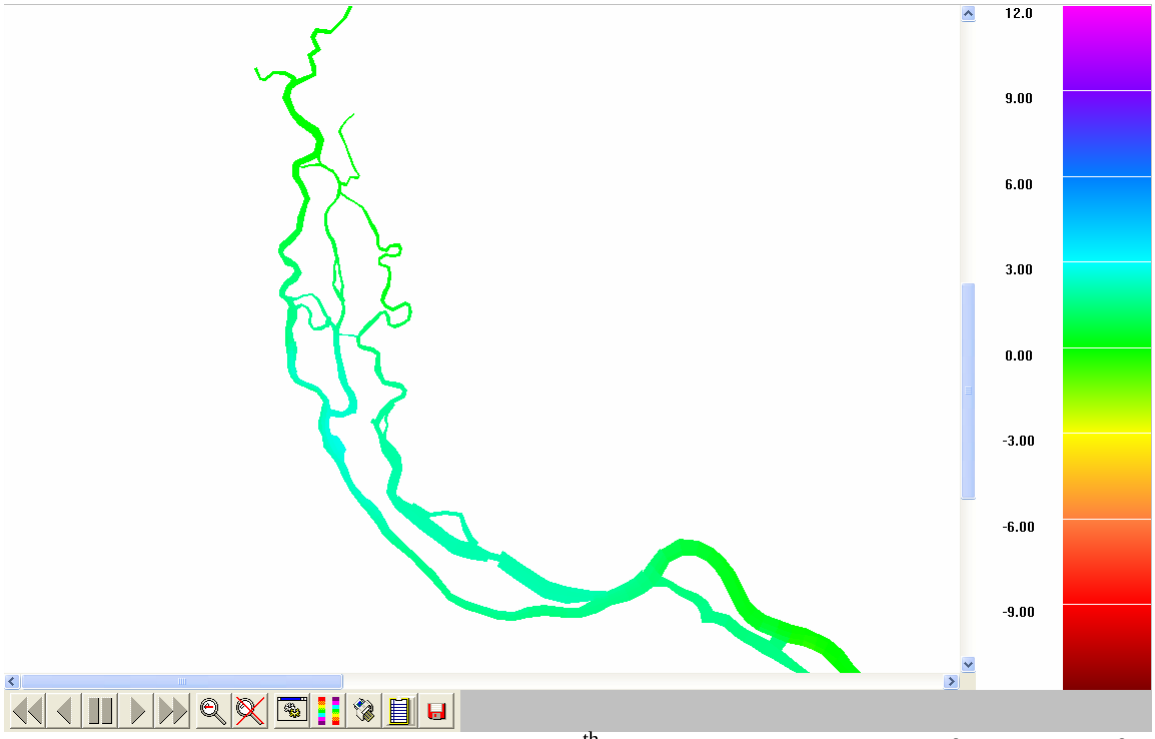
44. Figure B1.14. Changes in D.O. 95th %ile distribution along surface layer: 6 ft deepening



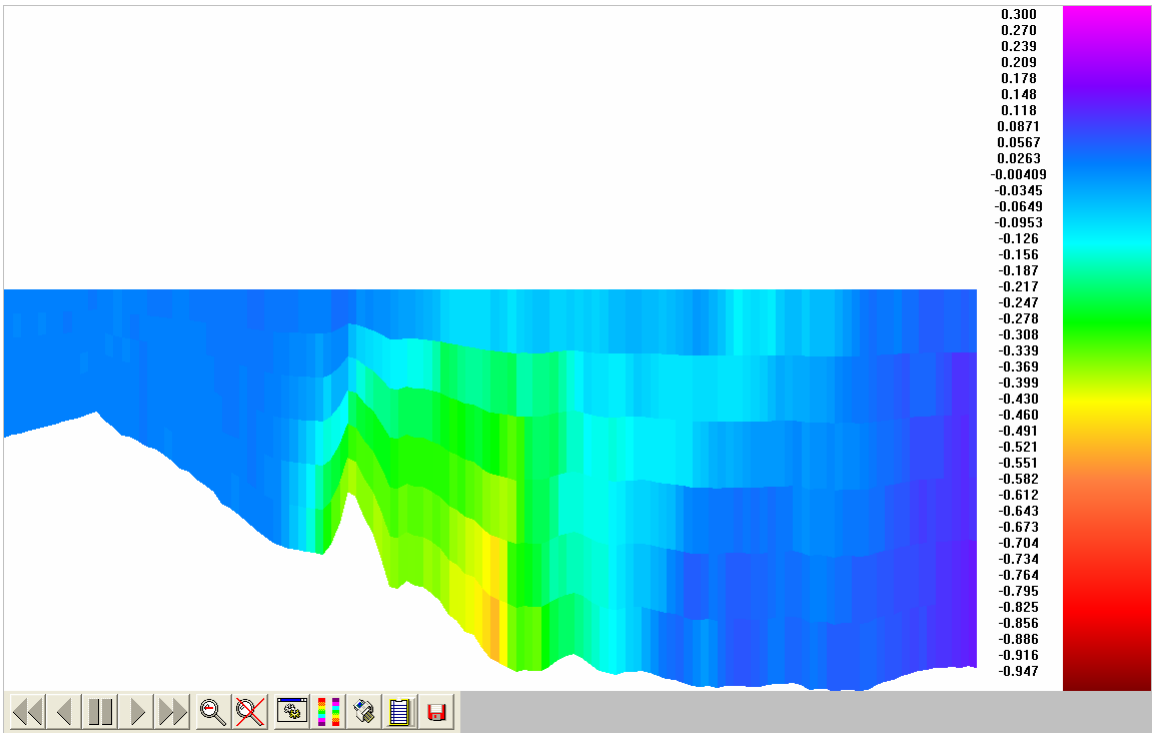
45. Figure B1.15. Changes in Salinity 5th %ile distribution along surface layer: 6 ft deepening



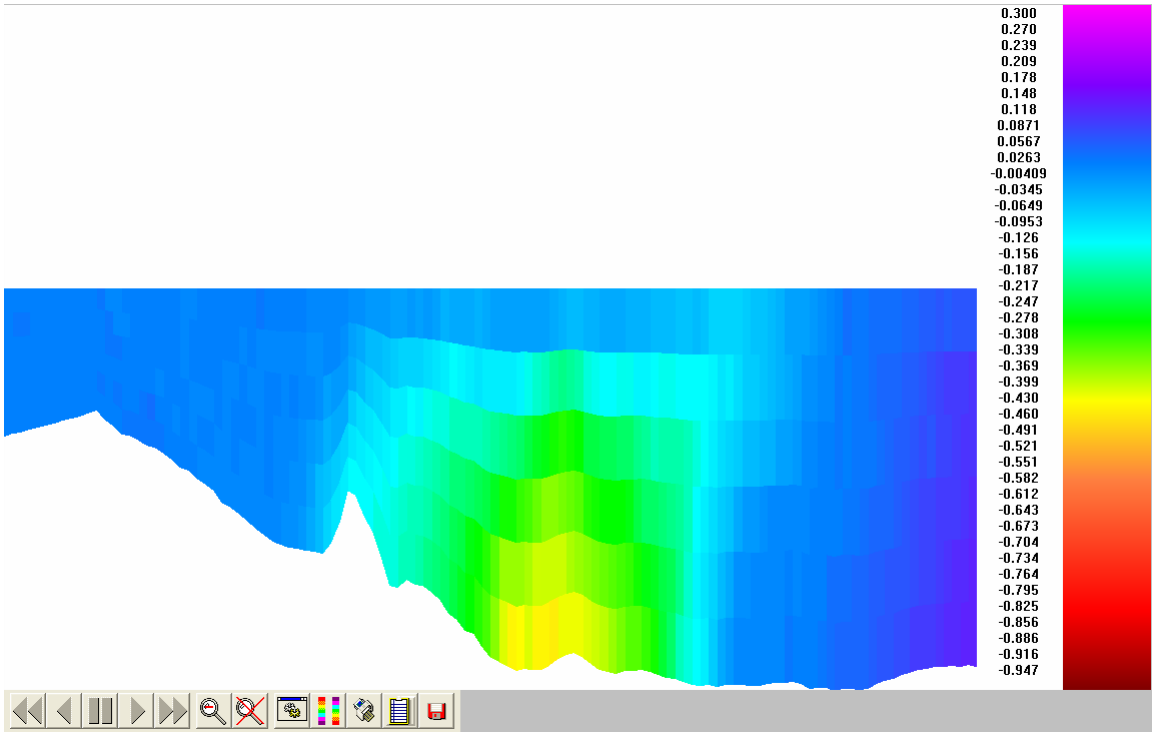
46. Figure B1.16. Changes in Salinity 50th %ile distribution along surface layer: 6 ft deepening



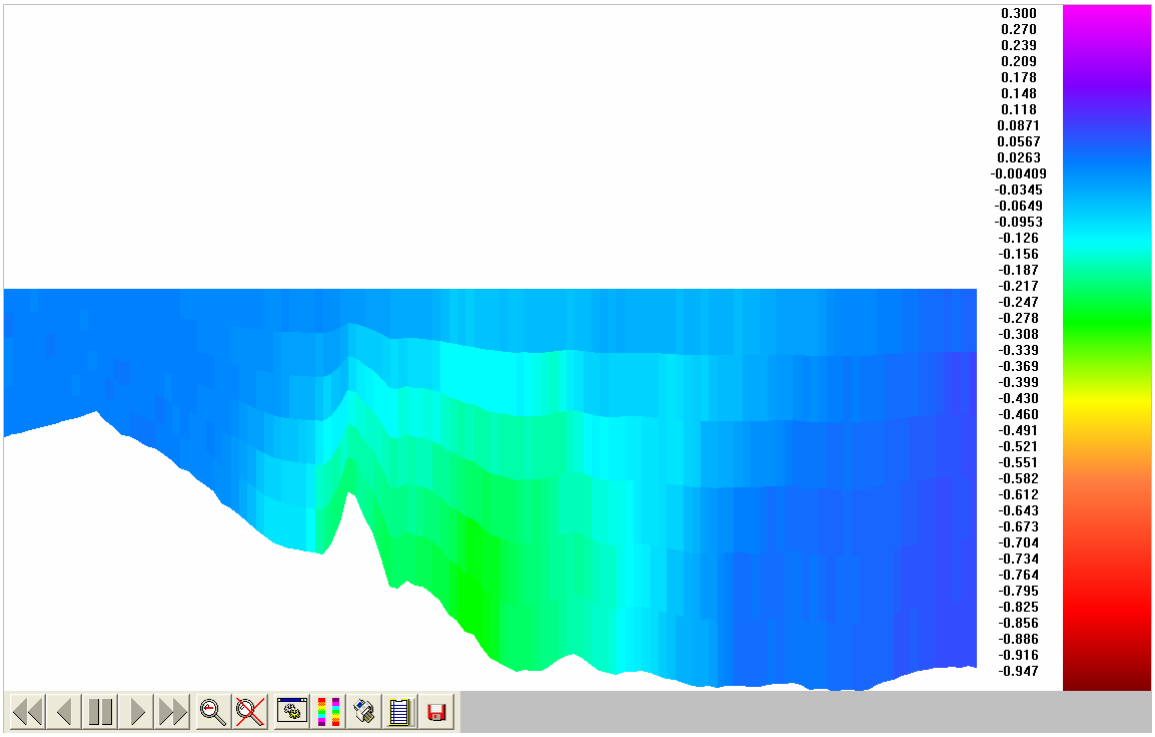
47. Figure B1.17. Changes in Salinity 95th %ile distribution along surface layer: 6 ft deepening



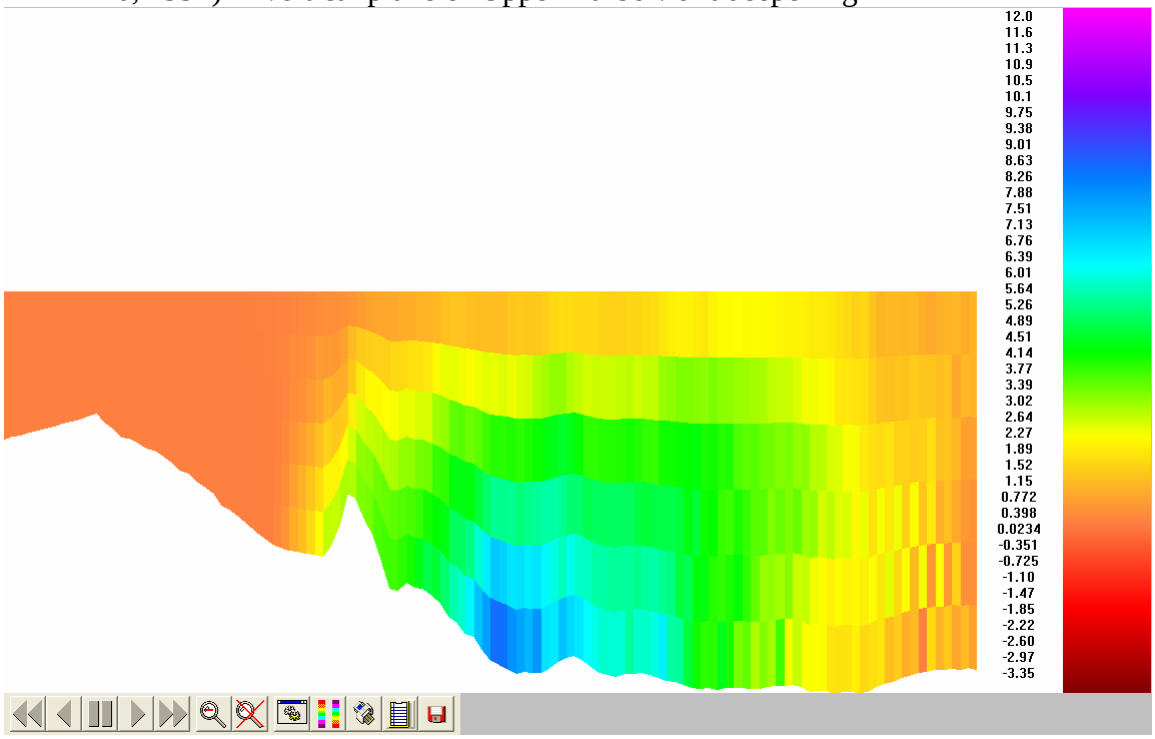
48. Figure B1.18. Snapshot of changes in 1-day averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 6 ft deepening



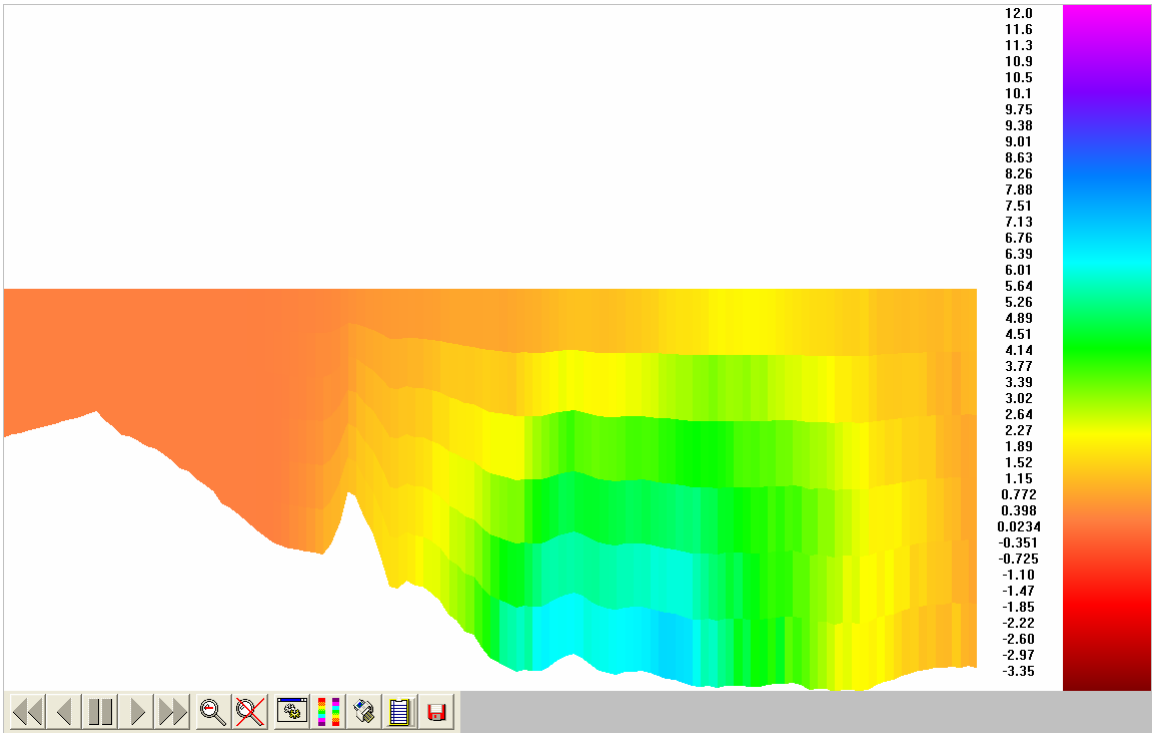
49. Figure B1.19. Snapshot of changes in 7-day averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 6 ft deepening



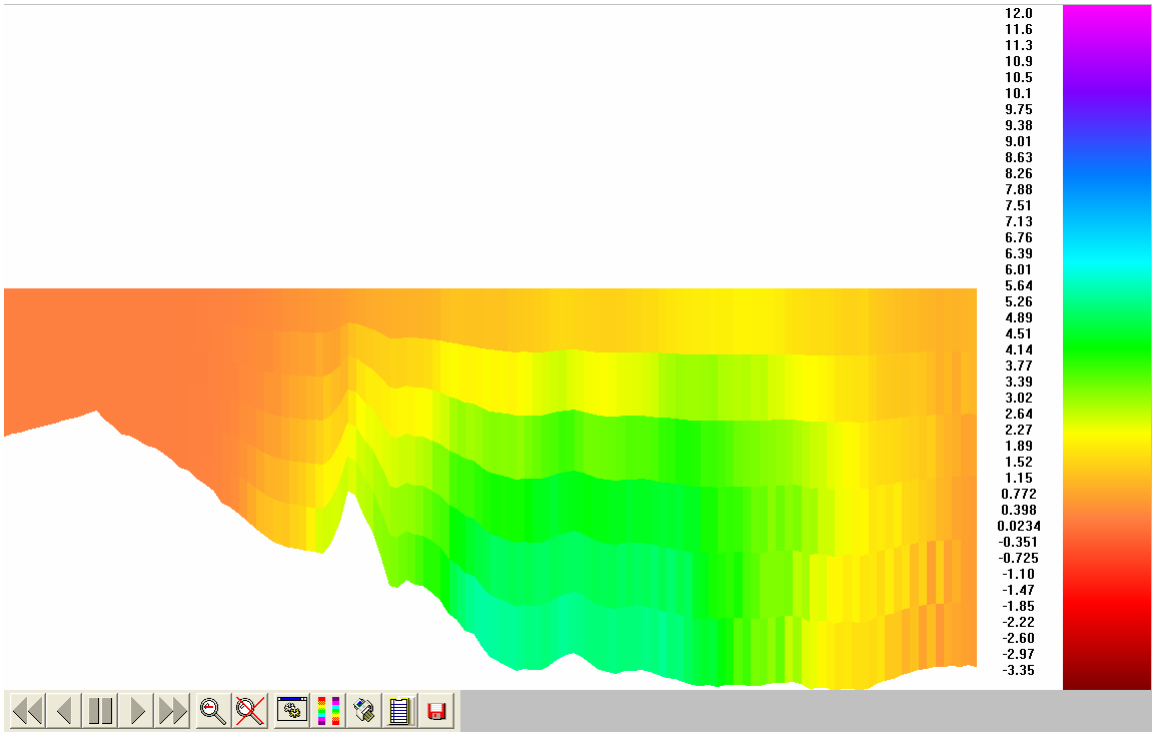
50. Figure B1.20. Snapshot of changes in 30-days averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 6 ft deepening



51. Figure B1.21. Snapshot of changes in 1-day averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 6 ft deepening



52. Figure B1.22. Snapshot of changes in 7-days averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 6 ft deepening



53. Figure B1.23. Snapshot of changes in 30-days averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 6 ft deepening

Appendix B2

SENSITIVITY ANALYSIS #1: 4 ft DEEPENING BATHYMETRY, 2004 POINT SOURCES LOADS, 1997 HYDROLOGICAL AND METEOROLOGICAL CONDITIONS

May 1 – October 30, 1997 Simulation Period

Water Quality Review Group

1. Table B2.1. Dissolved oxygen percentiles distribution in Critical cells

Zone	D.O. Percentile (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.44	3.76	3.91	4.11	4.44	4.92	5.36	5.48	5.64
FR2	3	3.28	3.41	3.64	3.98	4.45	5.01	5.23	5.46
FR3	2.84	3.1	3.23	3.44	3.81	4.26	4.86	5.18	5.92
FR4	2.84	3.1	3.22	3.41	3.82	4.28	4.83	5.39	6.11
FR5	2.91	3.15	3.25	3.46	3.85	4.27	4.87	5.47	6.19
FR6	2.98	3.15	3.24	3.45	3.83	4.28	4.83	5.51	6.3
FR7	3.32	3.63	3.78	4.16	4.67	5.15	5.87	6.35	6.52
FR8	3.38	3.73	3.93	4.41	4.96	5.42	5.94	6.37	6.54
FR9	3.41	3.78	3.96	4.39	4.99	5.47	5.95	6.45	6.58
FR10	3.18	3.5	3.75	4.29	4.89	5.42	5.82	5.96	6.18
FR11	2.92	3.37	3.6	4.06	4.54	5.18	5.69	5.88	6.01
MR1	3.21	3.39	3.53	3.78	4.16	4.61	5.06	5.63	6.29
MR2	2.84	3.09	3.25	3.6	4.05	4.56	4.97	5.25	6.2
MR3	2.65	2.82	2.95	3.23	3.68	4.35	4.86	5.12	5.87
MR4	2.76	3	3.13	3.37	3.68	4.14	4.67	5.01	5.28
MR5	0.87	1.49	1.84	2.5	4.14	5.22	5.68	5.89	6.05
MR6	1.44	2.08	2.44	3.16	4.65	5.45	5.88	6.11	6.72
LBR1	2.81	3.6	3.99	4.2	4.48	4.92	5.34	5.63	5.87
LBR2	3.12	3.26	3.35	3.49	3.71	4.16	4.52	4.99	5.21
LBR3	2.22	2.51	2.68	3.04	3.46	3.93	4.36	4.52	4.85
BR1	2.46	2.69	2.83	3.09	3.46	3.98	4.52	4.77	5.11
BR2	1.88	2.21	2.41	2.79	3.2	3.73	4.27	4.57	4.97
BR3	2.14	2.47	2.63	2.92	3.24	3.77	4.36	4.53	4.76
SCH1	1.78	2.14	2.39	2.79	3.57	4.32	4.84	5.19	5.59
SCH2	3.11	3.39	3.59	3.9	4.19	4.65	5.08	5.28	5.5
SR	3.38	3.47	3.56	3.9	4.22	4.7	5.37	5.85	5.89

2. Table B2.2. Delta of Dissolved Oxygen percentiles distribution in Critical cells: Deepening scenario minus Existing bathymetry scenario

Zone	Delta D.O. Percentile																	
	1%		5%		10%		25%		50%		75%		90%		95%		99	
	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%
FR1	0.03	0.9	0.02	0.5	0	0.0	-0.02	-0.5	-0.02	-0.4	-0.01	-0.2	0	0.0	-0.02	-0.4	-0.02	-0.4
FR2	-0.03	-1.0	-0.02	-0.6	0.01	0.3	-0.01	-0.3	-0.03	-0.7	0	0.0	0.02	0.4	-0.05	-0.9	-0.31	-5.4
FR3	0	0.0	-0.05	-1.6	-0.02	-0.6	0	0.0	-0.03	-0.8	-0.02	-0.5	0	0.0	-0.15	-2.8	-0.26	-4.2
FR4	0.02	0.7	0.01	0.3	0	0.0	-0.03	-0.9	-0.03	-0.8	-0.03	-0.7	0	0.0	-0.09	-1.6	-0.11	-1.8
FR5	0	0.0	0.03	1.0	-0.01	-0.3	-0.07	-2.0	-0.09	-2.3	-0.15	-3.4	0	0.0	-0.33	-5.7	-0.04	-0.6
FR6	-0.03	-1.0	-0.06	-1.9	-0.12	-3.6	-0.2	-5.5	-0.27	-6.6	-0.41	-8.7	-0.39	-7.5	-0.65	-10.6	-0.01	-0.2
FR7	-0.13	-3.8	-0.17	-4.5	-0.23	-5.7	-0.28	-6.3	-0.26	-5.3	-0.2	-3.7	-0.03	-0.5	-0.05	-0.8	-0.03	-0.5
FR8	-0.09	-2.6	-0.13	-3.4	-0.19	-4.6	-0.27	-5.8	-0.18	-3.5	-0.09	-1.6	-0.1	-1.7	-0.02	-0.3	0.01	0.2
FR9	-0.94	-21.6	-0.99	-20.8	-1.04	-20.8	-0.88	-16.7	-0.49	-8.9	-0.36	-6.2	-0.33	-5.3	-0.04	-0.6	-0.01	-0.2
FR10	0.01	0.3	0	0.0	0.01	0.3	0	0.0	0	0.0	0	0.0	0.01	0.2	0	0.0	0.03	0.5
FR11	0.05	1.7	0.02	0.6	0.01	0.3	0	0.0	0.01	0.2	0.01	0.2	0	0.0	-0.01	-0.2	0.02	0.3
MR1	-0.07	-2.1	-0.07	-2.0	-0.08	-2.2	-0.13	-3.3	-0.15	-3.5	-0.19	-4.0	-0.11	-2.1	-0.09	-1.6	-0.03	-0.5
MR2	0	0.0	-0.04	-1.3	-0.05	-1.5	-0.08	-2.2	-0.13	-3.1	-0.15	-3.2	-0.12	-2.4	-0.12	-2.2	-0.04	-0.6
MR3	-0.03	-1.1	-0.1	-3.4	-0.13	-4.2	-0.23	-6.6	-0.27	-6.8	-0.17	-3.8	-0.07	-1.4	-0.05	-1.0	-0.06	-1.0
MR4	0.01	0.4	0	0.0	-0.01	-0.3	-0.02	-0.6	-0.02	-0.5	-0.01	-0.2	-0.02	-0.4	-0.04	-0.8	0.01	0.2
MR5	-0.03	-3.3	-0.03	-2.0	-0.02	-1.1	0.01	0.4	0	0.0	0.01	0.2	0.01	0.2	0.01	0.2	0.01	0.2
MR6	0.02	1.4	0.05	2.5	0.05	2.1	0.04	1.3	0.02	0.4	0.02	0.4	0.01	0.2	0.01	0.2	0	0.0
LBR1	-0.07	-2.4	-0.01	-0.3	0.03	0.8	0.03	0.7	0.03	0.7	0.03	0.6	0.01	0.2	0.02	0.4	0	0.0
LBR2	0	0.0	0	0.0	0.01	0.3	0.02	0.6	0.03	0.8	0.02	0.5	0	0.0	0.02	0.4	0.03	0.6
LBR3	0.12	5.7	0.13	5.5	0.13	5.1	0.16	5.6	0.16	4.8	0.12	3.1	0.05	1.2	0.07	1.6	0.04	0.8
BR1	0.01	0.4	0.01	0.4	0.01	0.4	0.01	0.3	-0.01	-0.3	0	0.0	0.01	0.2	-0.01	-0.2	-0.02	-0.4
BR2	0.04	2.2	0.02	0.9	0.02	0.8	0	0.0	0.01	0.3	0.01	0.3	0.04	0.9	0.01	0.2	-0.03	-0.6
BR3	0.03	1.4	0.04	1.6	0.02	0.8	0.02	0.7	0.01	0.3	0	0.0	0.01	0.2	0.02	0.4	0.02	0.4
SCH1	0.07	4.1	-0.04	-1.8	0	0.0	-0.01	-0.4	-0.06	-1.7	-0.07	-1.6	-0.07	-1.4	-0.07	-1.3	-0.05	-0.9
SCH2	-0.03	-1.0	-0.03	-0.9	-0.04	-1.1	-0.05	-1.3	-0.04	-0.9	-0.03	-0.6	-0.03	-0.6	-0.04	-0.8	-0.06	-1.1
SR	0	0.0	0.01	0.3	0	0.0	0	0.0	0	0.0	0.01	0.2	0	0.0	0	0.0	0	0.0

3. Table B2.3. Dissolved oxygen percentiles distribution in Zones of Savannah Estuary

Zone Name	D.O. Concentration Percentiles (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.80	4.08	4.22	4.40	4.69	5.19	5.59	5.69	5.81
FR2	3.37	3.61	3.78	4.00	4.31	4.78	5.27	5.41	5.55
FR3	3.02	3.24	3.42	3.64	3.96	4.43	5.02	5.24	5.51
FR4	2.88	3.13	3.25	3.45	3.83	4.23	4.89	5.22	6.11
FR5	2.95	3.17	3.26	3.45	3.84	4.24	4.85	5.37	6.24
FR6	3.11	3.20	3.35	3.55	3.94	4.37	4.83	5.62	6.31
FR7	3.27	3.53	3.69	4.02	4.57	5.09	5.61	6.30	6.44
FR8	3.44	3.78	3.98	4.41	4.93	5.34	5.84	6.38	6.53
FR9	3.90	4.31	4.59	5.02	5.39	5.75	6.21	6.46	6.60
FR10	4.67	4.86	4.97	5.18	5.43	5.80	6.13	6.30	6.47
FR11	3.63	3.83	4.01	4.27	4.59	5.00	5.55	5.91	6.01
MR1	3.29	3.46	3.58	3.81	4.18	4.60	5.08	5.67	6.28
MR2	3.00	3.24	3.38	3.70	4.09	4.54	4.99	5.42	6.21
MR3	2.78	2.94	3.08	3.39	3.83	4.36	4.83	5.08	5.81
MR4	3.42	3.53	3.64	3.83	4.08	4.51	4.93	5.26	5.49
MR5	1.45	2.00	2.32	2.96	4.48	5.17	5.62	5.85	6.00
MR6	1.49	2.11	2.47	3.21	4.68	5.40	5.83	6.04	6.60
LBR1	3.48	3.62	3.69	3.84	4.03	4.50	4.84	5.31	5.48
LBR2	2.70	2.90	3.01	3.21	3.49	3.94	4.33	4.79	5.04
LBR3	2.56	2.69	2.79	2.96	3.19	3.71	4.21	4.39	4.56
BR1	2.78	2.96	3.04	3.25	3.60	4.11	4.62	4.94	5.23
BR2	2.39	2.64	2.75	2.96	3.28	3.81	4.39	4.59	4.90
BR3	2.48	2.67	2.76	2.94	3.19	3.75	4.32	4.43	4.58
SCh1	2.81	3.09	3.32	3.56	3.85	4.38	4.94	5.10	5.25
SCh2	3.31	3.51	3.76	4.00	4.28	4.76	5.19	5.36	5.53
SR	3.70	3.76	3.81	4.14	4.44	4.90	5.54	5.97	6.00

4. Table B2.4. Delta of Dissolved Oxygen percentiles distribution in Zones of Savannah Estuary: Deepening scenario minus Existing bathymetry scenario

Zone	Project - Baseline Difference (mg/l)									Project - Baseline Relative Difference (%)								
Name	1%	5%	10%	25%	50%	75%	90%	95%	99%	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	0.05	0.02	0.00	-0.01	-0.01	0.01	0.02	0.01	0.02	1.3	0.4	0.0	-0.2	-0.2	0.1	0.3	0.1	0.4
FR2	0.01	0.03	0.02	0.00	0.01	0.01	0.03	-0.03	-0.04	0.4	0.8	0.5	0.1	0.2	0.2	0.6	-0.6	-0.8
FR3	0.01	-0.03	0.02	0.03	-0.02	0.03	0.04	-0.04	-0.52	0.4	-1.0	0.5	0.8	-0.5	0.7	0.8	-0.7	-8.7
FR4	-0.01	-0.03	-0.02	-0.01	-0.05	-0.08	0.04	-0.17	-0.15	-0.3	-0.9	-0.8	-0.3	-1.3	-1.9	0.7	-3.2	-2.3
FR5	-0.02	0.00	-0.05	-0.09	-0.10	-0.18	-0.02	-0.37	-0.05	-0.6	0.0	-1.5	-2.5	-2.6	-4.1	-0.4	-6.5	-0.9
FR6	-0.02	-0.03	-0.09	-0.13	-0.17	-0.29	-0.23	-0.46	-0.02	-0.6	-1.0	-2.7	-3.6	-4.2	-6.1	-4.6	-7.5	-0.4
FR7	-0.05	-0.15	-0.17	-0.28	-0.32	-0.20	-0.16	-0.05	0.00	-1.6	-4.0	-4.3	-6.5	-6.6	-3.9	-2.7	-0.7	0.0
FR8	-0.17	-0.21	-0.27	-0.30	-0.24	-0.18	-0.13	-0.01	0.00	-4.6	-5.2	-6.4	-6.4	-4.6	-3.2	-2.1	-0.2	0.0
FR9	-0.29	-0.33	-0.32	-0.23	-0.10	-0.10	-0.05	-0.01	0.00	-6.9	-7.1	-6.5	-4.3	-1.8	-1.7	-0.8	-0.2	-0.1
FR10	-0.02	-0.01	-0.01	-0.03	-0.01	-0.01	-0.02	0.00	0.00	-0.3	-0.3	-0.3	-0.5	-0.2	-0.1	-0.3	0.0	0.1
FR11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1	0.0	-0.1	0.1	0.0	0.0	0.1	0.0	0.0
MR1	-0.05	-0.08	-0.12	-0.14	-0.16	-0.20	-0.10	-0.13	-0.04	-1.5	-2.3	-3.2	-3.5	-3.8	-4.2	-2.0	-2.2	-0.6
MR2	-0.04	-0.06	-0.06	-0.10	-0.15	-0.17	-0.13	-0.03	-0.06	-1.4	-1.7	-1.9	-2.6	-3.7	-3.6	-2.6	-0.6	-1.0
MR3	0.01	0.00	-0.01	-0.04	-0.07	-0.08	-0.07	-0.06	-0.01	0.3	-0.1	-0.4	-1.2	-1.7	-1.8	-1.5	-1.2	-0.3
MR4	0.02	0.01	0.01	0.02	0.01	0.02	0.00	-0.01	0.00	0.5	0.4	0.4	0.4	0.3	0.4	0.1	-0.2	0.1
MR5	0.01	0.02	0.04	0.04	0.01	0.01	0.00	0.00	0.01	1.0	1.2	1.8	1.5	0.1	0.1	0.1	0.1	0.2
MR6	0.03	0.04	0.06	0.03	0.00	0.01	0.01	0.00	0.00	2.0	1.9	2.7	1.1	0.0	0.3	0.2	0.1	0.0
LBR1	0.01	0.01	0.02	0.02	0.03	0.02	0.00	0.02	0.03	0.2	0.3	0.5	0.6	0.6	0.4	0.1	0.3	0.5
LBR2	0.00	0.00	0.00	0.01	0.02	0.01	-0.01	0.01	0.01	-0.1	-0.1	0.1	0.3	0.5	0.2	-0.2	0.3	0.2
LBR3	0.08	0.09	0.08	0.08	0.07	0.08	0.05	0.00	0.01	3.4	3.5	2.9	2.7	2.2	2.1	1.3	0.1	0.3
BR1	0.02	0.00	0.00	0.00	-0.02	-0.01	0.01	-0.03	-0.07	0.6	0.1	0.0	-0.1	-0.6	-0.2	0.2	-0.7	-1.3
BR2	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	-0.02	0.9	0.4	0.3	0.3	0.2	0.4	0.4	0.3	-0.3
BR3	0.04	0.04	0.03	0.03	0.02	0.00	0.03	0.03	0.05	1.8	1.7	1.1	0.9	0.7	0.0	0.7	0.7	1.2
SCh1	0.04	0.02	-0.03	-0.02	0.00	0.00	0.01	0.00	0.01	1.5	0.7	-0.9	-0.5	-0.1	0.1	0.2	0.1	0.1
SCh2	0.03	0.00	-0.02	-0.02	-0.02	-0.01	0.00	-0.03	-0.01	0.8	0.1	-0.4	-0.5	-0.4	-0.2	-0.1	-0.5	-0.3
SR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0

5. Table B2.5. Percentage of the volume of waters with violation of Dissolved Oxygen standards for Zones of Savannah Estuary within the period of May 1 – October 30, 1997: Deepening (Project) and Existing (Baseline) bathymetry

Zones	D.O. STANDARDS														
	1-Day Average			7-Day Average			30-Day Average			GA MINIMUM D.O.			SC MINIMUM D.O.		
	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B
FR1	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0
FR2	0	0	0	0	0	0	0	0	0	0	0	0	17	17	0
FR3	0	0	0	0	0	0	3	4	1	0	0	0	N/A	N/A	N/A
FR4	0	0	0	0	0	0	5	7	2	0	0	0	N/A	N/A	N/A
FR5	0	0	0	0	0	0	3	6	3	0	0	0	N/A	N/A	N/A
FR6	0	0	0	0	0	0	1	3	2	0	0	0	N/A	N/A	N/A
FR7	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR8	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR9	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR10	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR11	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
MR1	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
MR2	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
MR3	0	0	0	0	0	0	3	5	2	1	1	0	N/A	N/A	N/A
MR4	0	0	0	0	0	0	1	1	0	0	0	0	N/A	N/A	N/A
MR5	0	0	0	0	0	0	2	1	-1	4	4	0	9	9	0
MR6	0	0	0	0	0	0	0	0	0	2	2	0	7	7	0
LBR1	0	0	0	0	0	0	1	1	0	0	0	0	11	11	0
LBR2	0	0	0	2	1	-1	11	11	0	3	3	0	25	25	0
LBR3	0	0	0	6	5	-1	21	22	1	8	7	-1	36	37	1
BR1	0	0	0	1	2	1	18	20	2	2	2	0	50	51	1
BR2	0	0	0	6	6	0	36	37	1	7	7	0	60	61	1
BR3	0	0	0	9	8	-1	35	36	1	11	10	-1	57	59	2
SCh1	0	0	0	2	2	0	6	6	0	3	3	0	N/A	N/A	N/A
SCh2	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
SR	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0

26. Table B2.6. Percentage of water volumes with salinity in %iles within the period of May 1 – October 30, 1997

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	20.8	6.9	4.7	4.8	4.5	4.3	8.8	4.9	95.1
10	24.8	10.6	9.2	9.8	9.1	8.6	21.9	9	95.1
25	36.8	22.1	22.9	23	23.2	22.1	30.5	21.5	95.1
50	57.6	43.7	47	47.1	47.8	46.1	51.7	43	95.1
75	79	69.4	72.8	72.9	73.4	72.9	73.9	69.7	95.1
90	91.2	87.2	88.9	89.1	89.2	89.2	88.9	87.5	95.1
95	95.3	93.5	94.4	94.5	94.5	94.6	94.4	93.7	95.1
Total Volume 100*km3:	32890.1	653	4770.2	25.6	39	135.5	9.9	9.4	43.6

27. Table B2.7. Percentage of water volumes with D.O. in %iles within the period of May 1 – October 30, 1997

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	5.3	5.2	5	5.6	5.6	4.7	5.7	5.5	5.8
10	10.5	10.2	10	11.1	10.6	9.6	11	11	11.2
25	26.2	24.7	25	27.3	26.1	24.3	26.4	26.4	26.5
50	51.9	49.4	50.1	53.1	51.4	49.6	50.7	51	51.1
75	76.2	74.7	75.4	76.8	75.9	74.8	75.7	75.9	75.9
90	90.4	89.9	90.2	90.4	90.2	89.9	90.2	90.4	90.1
95	95	94.7	95	95.4	95.3	94.9	95.1	95.2	95.2
Total Volume 100*km3:	32890.1	653	4770.2	25.6	39	135.5	9.9	9.4	43.6

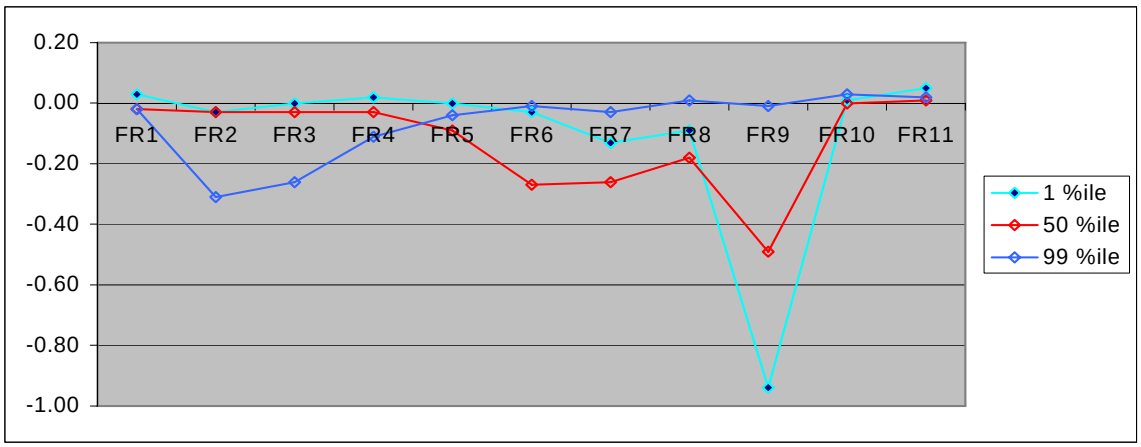
28. Table B2.8. Water volumes in Upper Harbor in increments of 1^{o} C of water temperature within the period of May 1 – October 30, 1997

Temperature C^{o}	Total Volume %
17	0.11
18	0.45
19	1.26
20	4.35
21	13.01
22	17.74
23	22.47
24	32.71
25	43.06
26	50.83
27	62.16
28	81.77
29	93.96
30	99.84
31	100

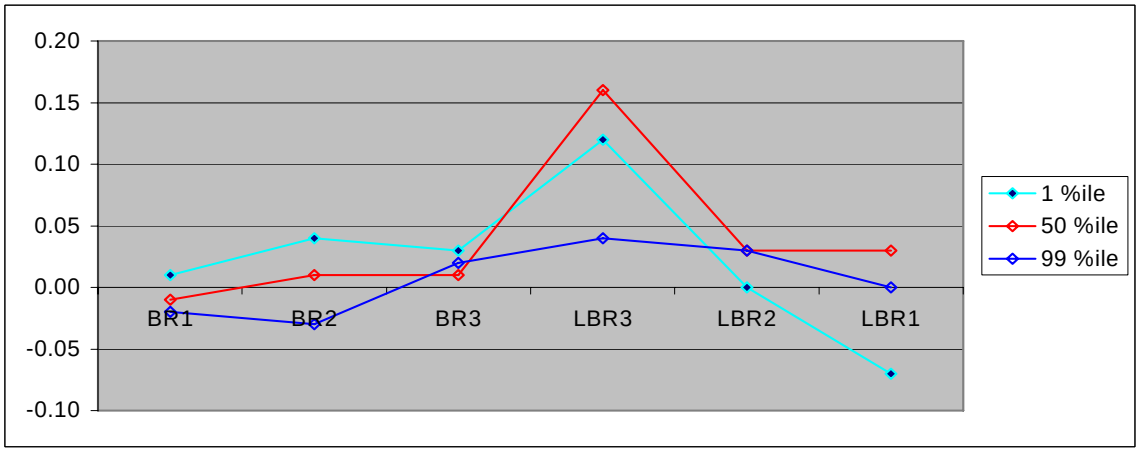
29. Table B2.9. Water volumes in Upper Harbor in increments of 0.1 mg/l of D.O. within the period of May 1 – October 30, 1997
(See file: Postprocessor Output\S14\97-S14_DO Increment Volume)

30. Table B2.10. Percentage of water volumes corresponding to 1-, 7-, and 30-days averages of D.O. depth-averaged concentrations in Upper Harbor within the period of May 1 – October 30, 1997
(See file: Postprocessor Output\S14\97-S14_volume DO in averages)

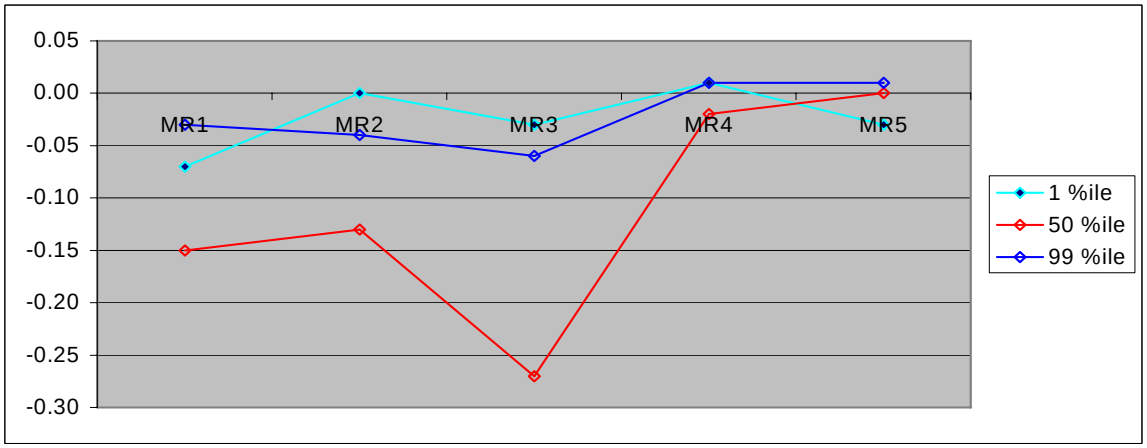
Front River



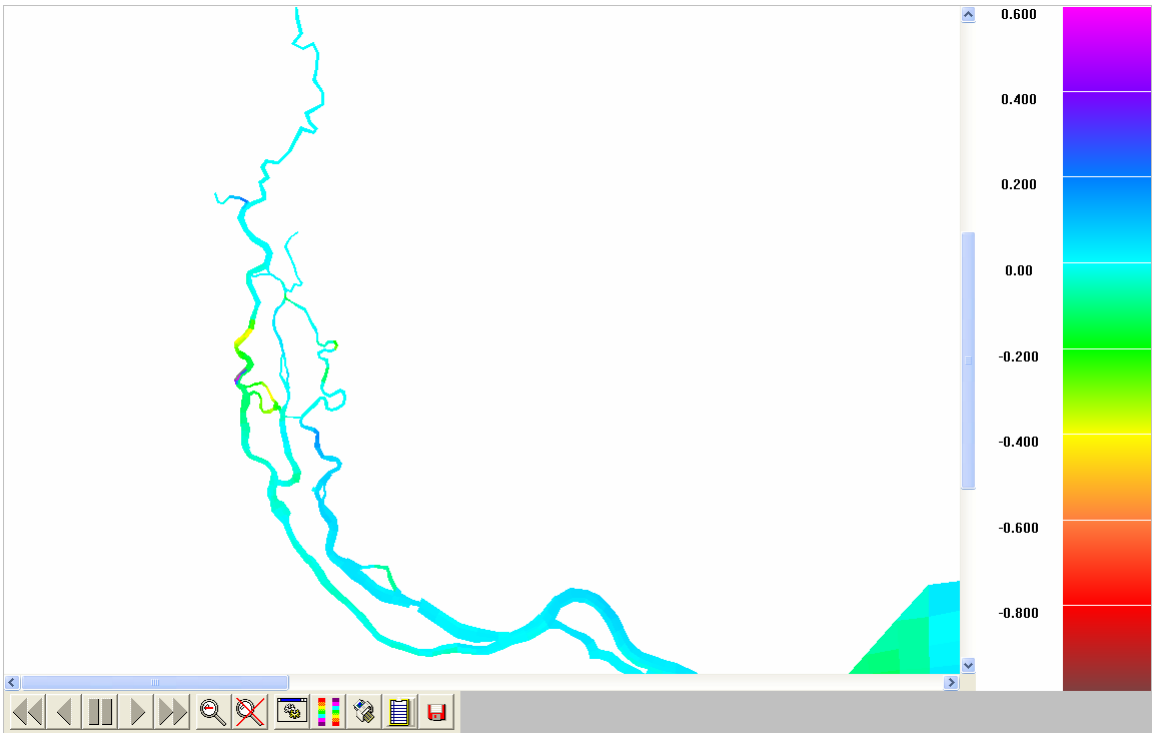
Back and Little Back Rivers



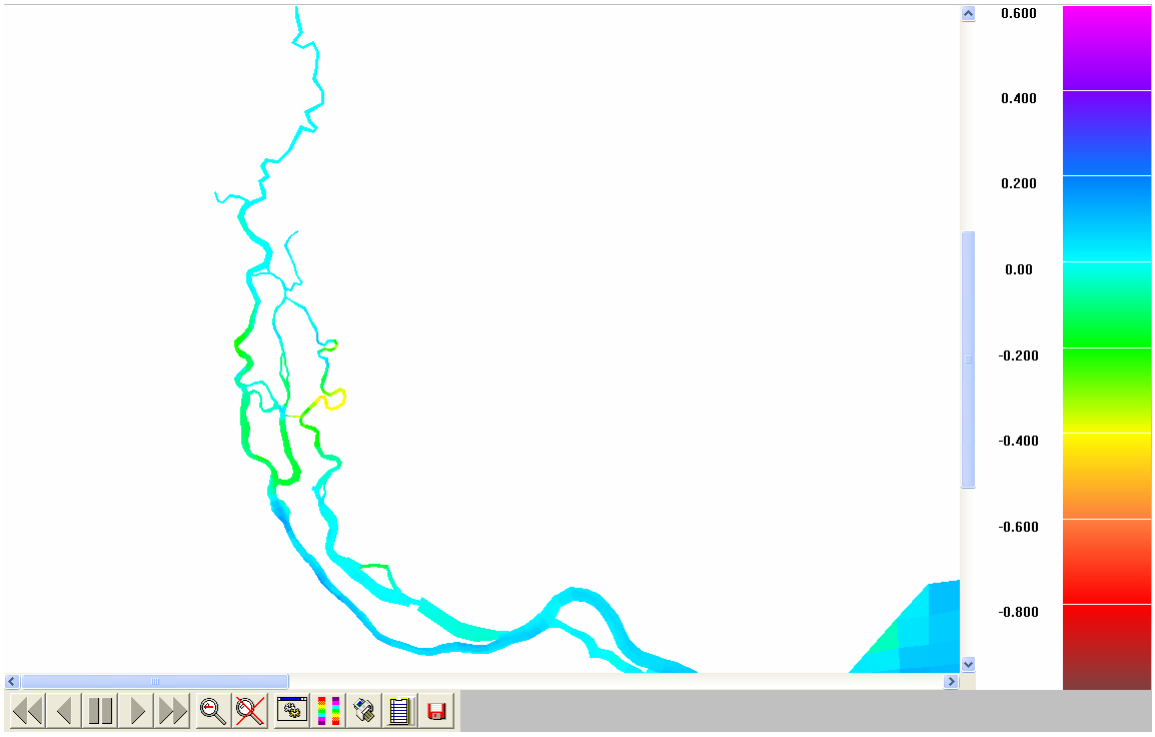
Middle River



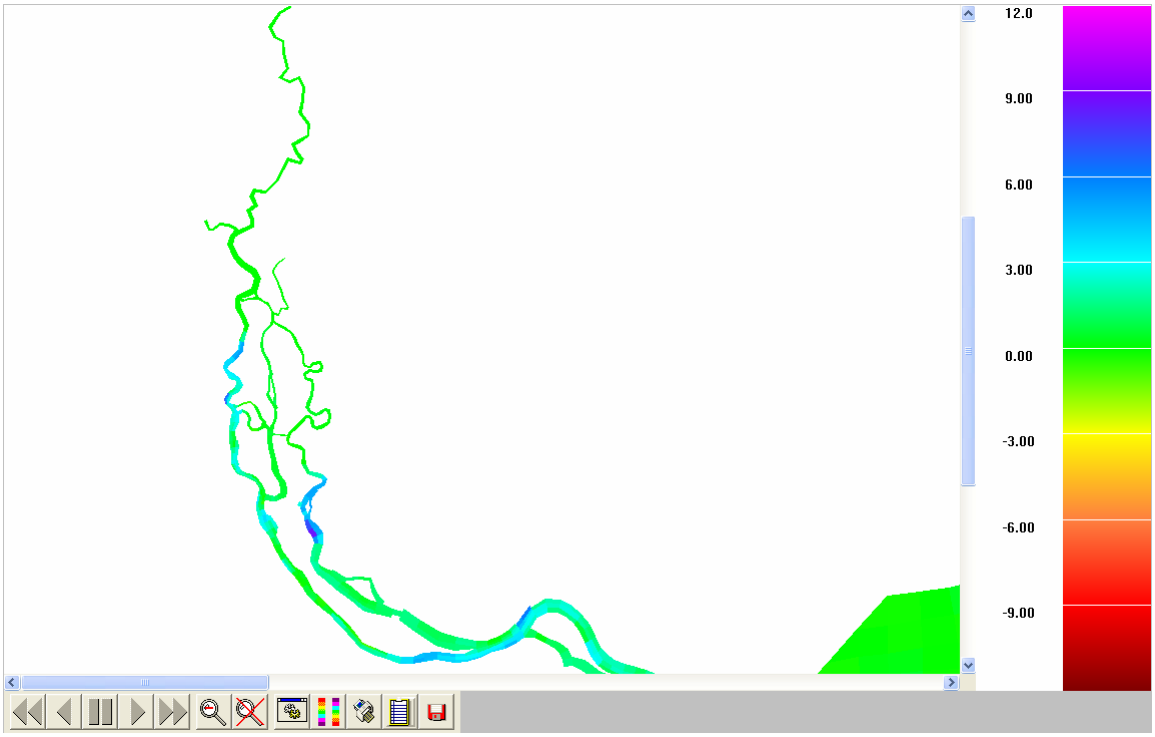
31. Figure B2.1. Changes in longitudinal profile of Dissolved Oxygen (mg/l) distribution along Critical cells of Savannah Estuary: 4 ft deepening



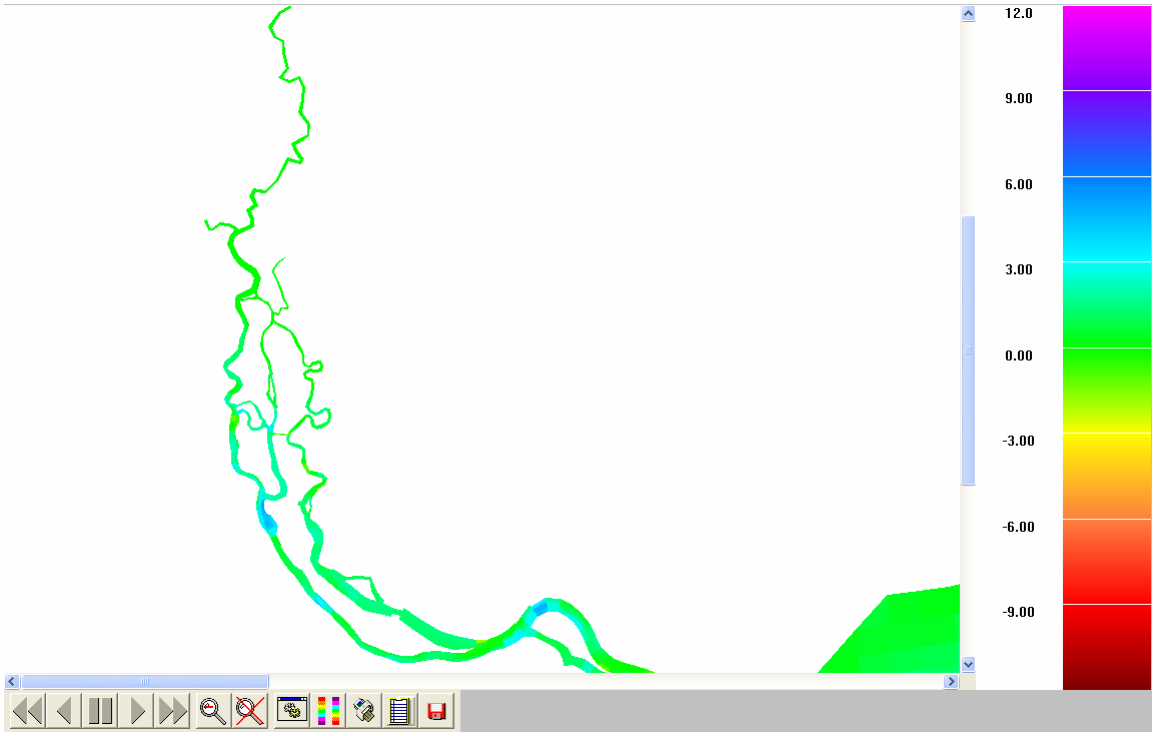
32. Figure B2.2. Changes in minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1997: 4 ft deepening



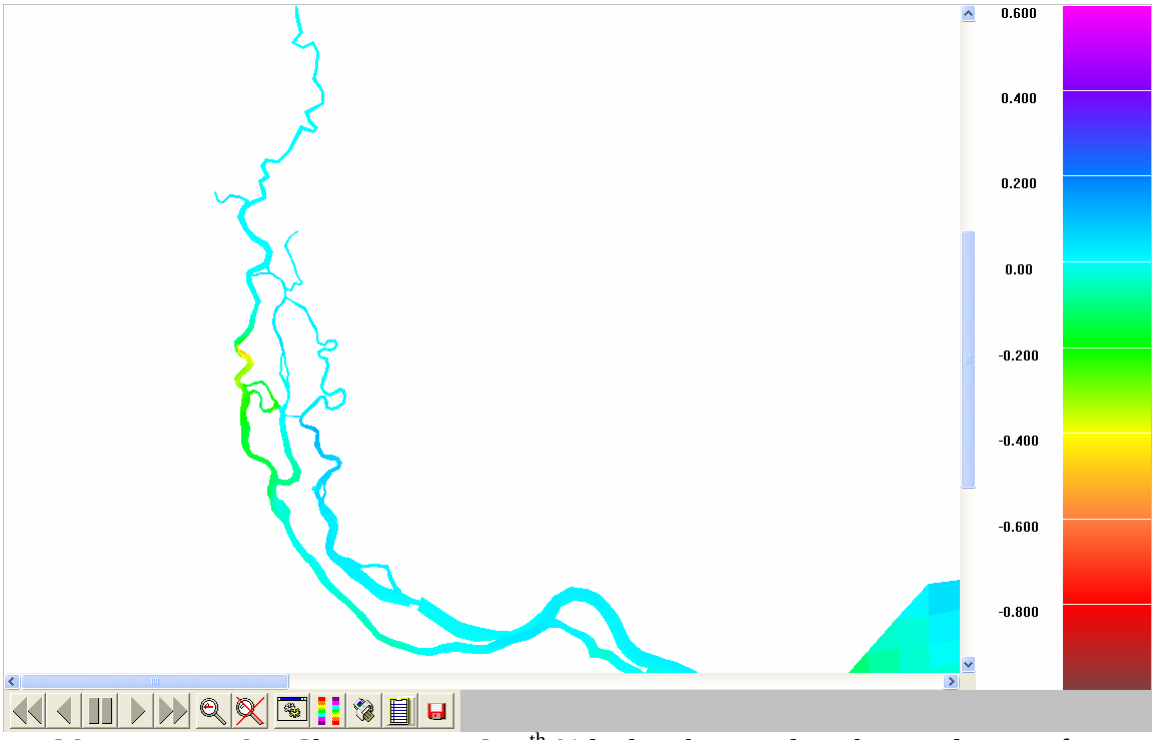
33. Figure B2.3. Changes in minimum D.O. distribution along surface layer within the analyzed period of May 1 - October 30, 1997: 4 ft deepening



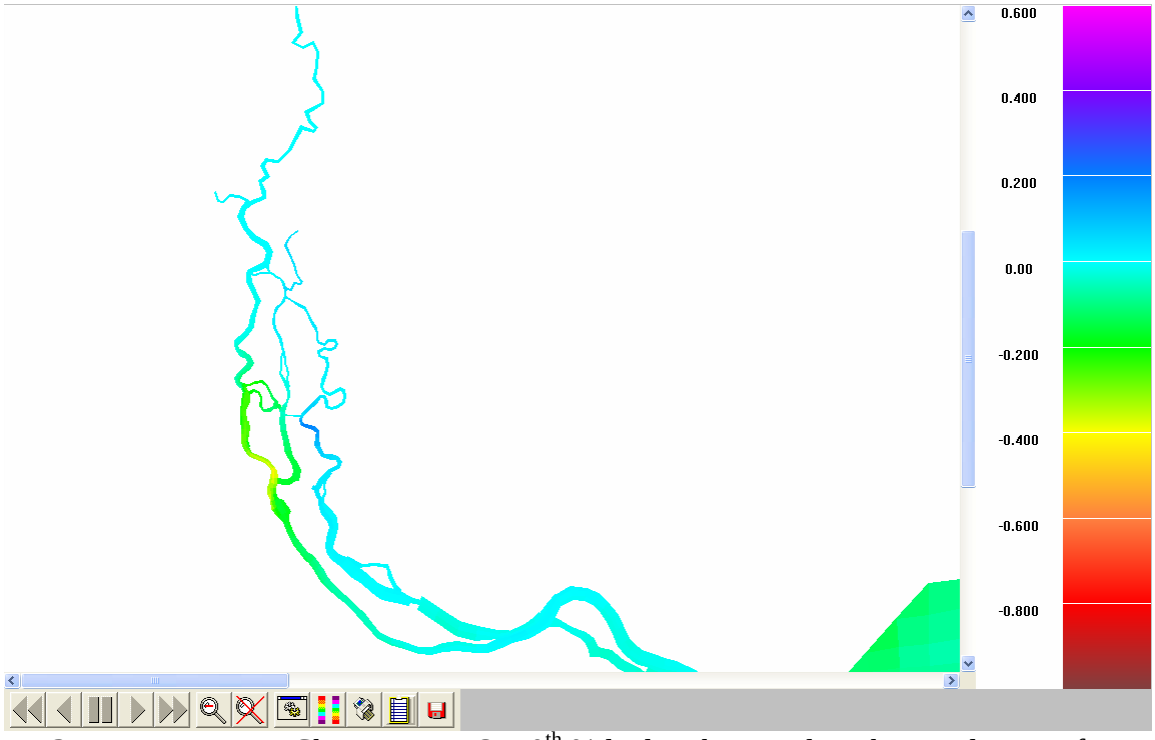
34. Figure B2.4. Changes in Salinity corresponded to Minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1997: 4 ft deepening



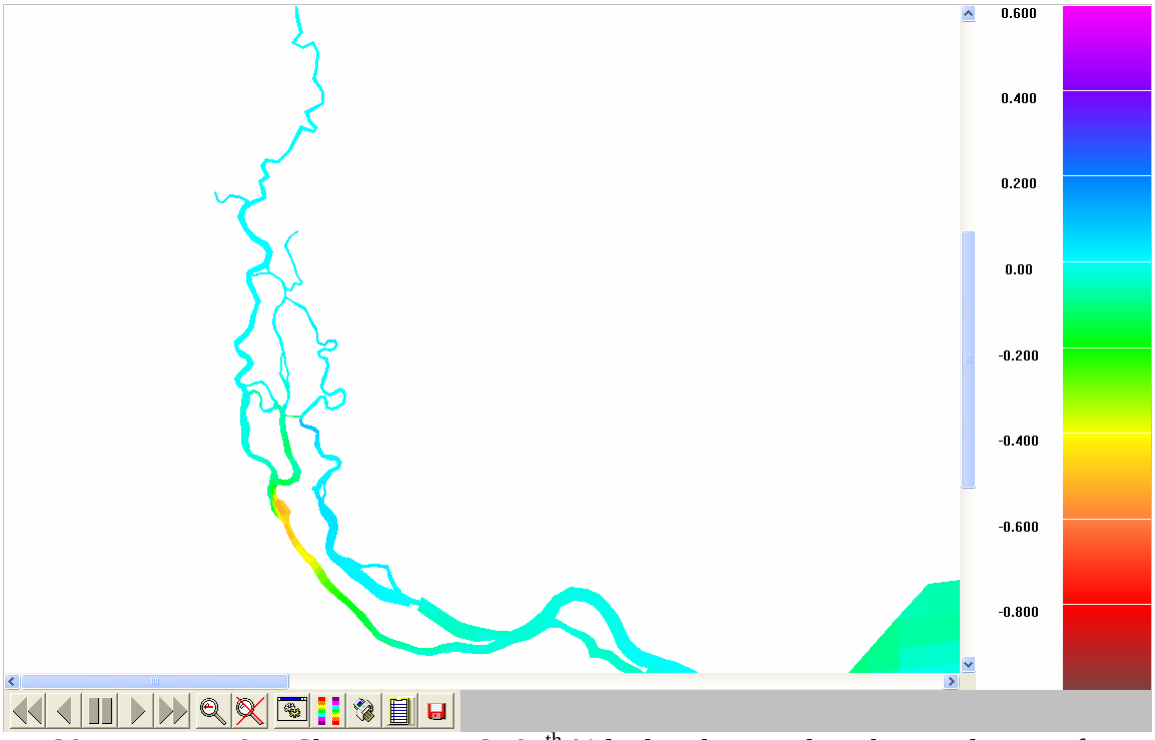
35. Figure B2.5. Changes in Salinity corresponded to Minimum D.O. distribution along Surface layer within the analyzed period of May 1 - October 30, 1997: 4 ft deepening



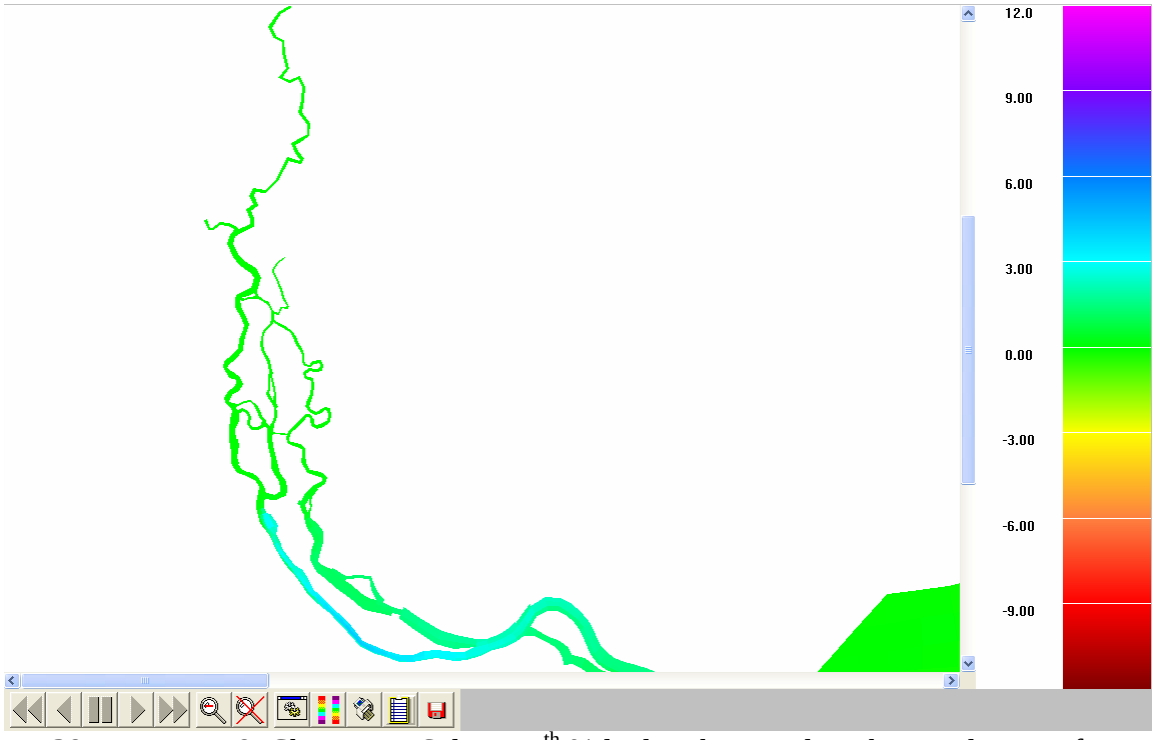
36. Figure B2.6. Changes in D.O. 5th %ile distribution along bottom layer: 4 ft deepening



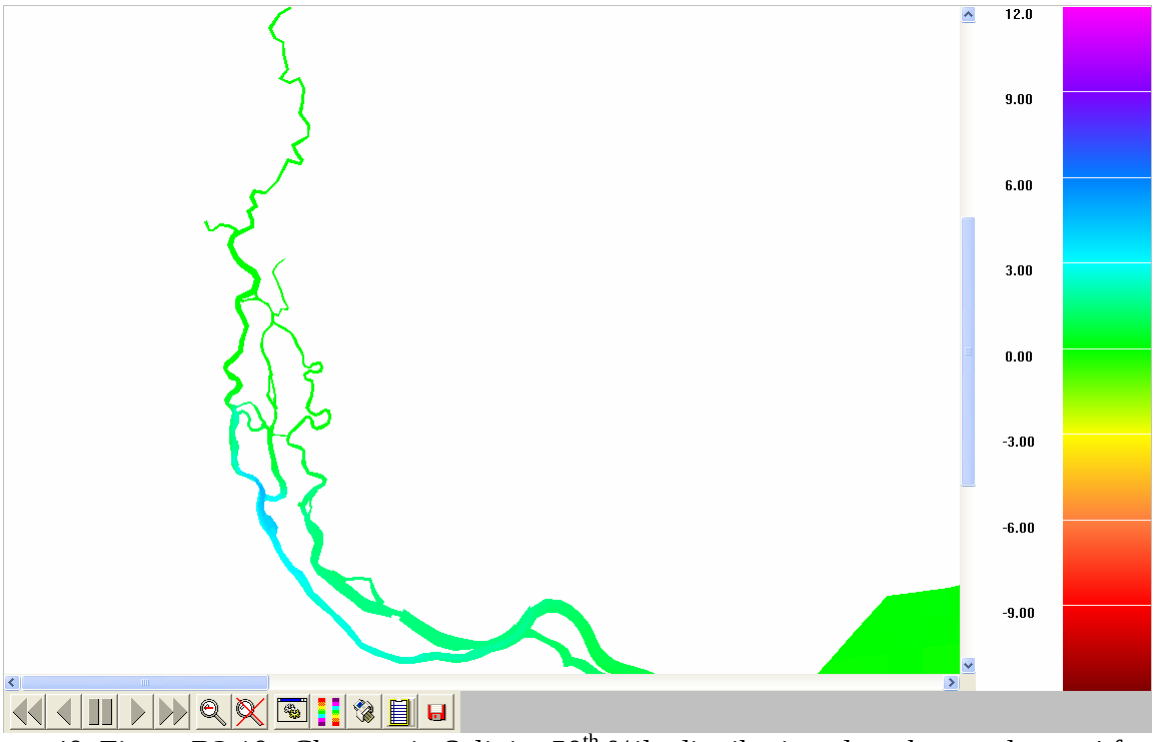
37. Figure B2.7. Changes in D.O. 50th %ile distribution along bottom layer: 4 ft deepening



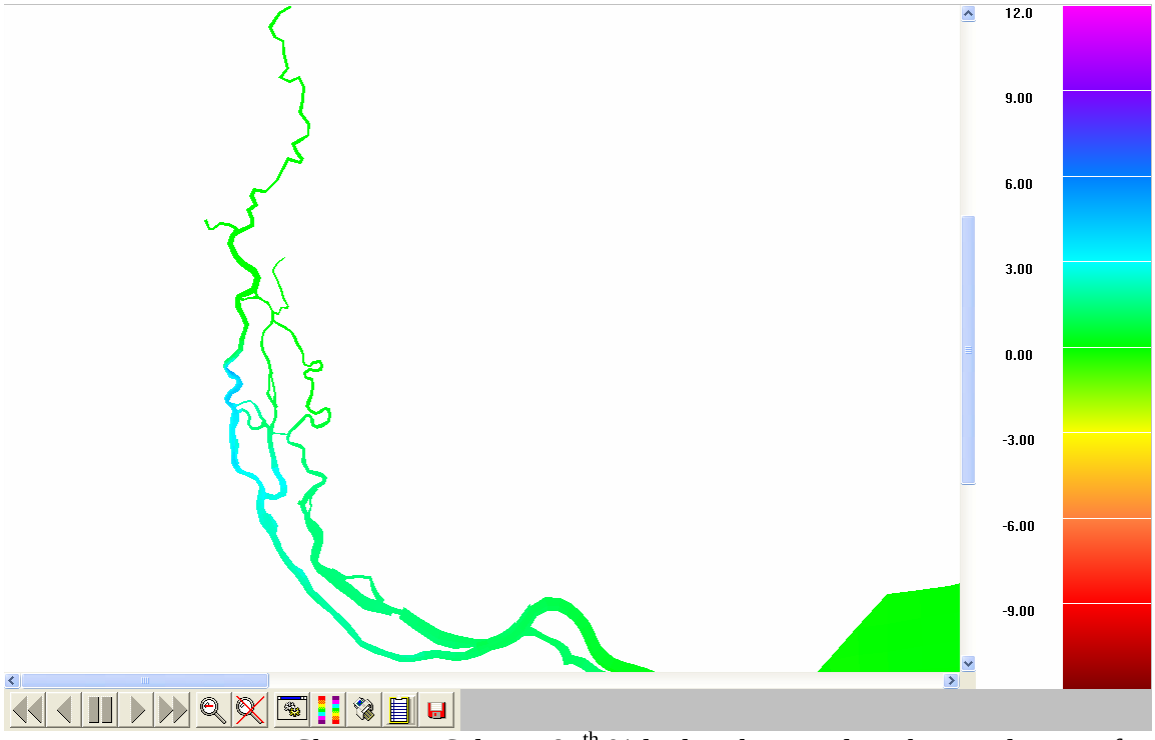
38. Figure B2.8. Changes in D.O. 95th %ile distribution along bottom layer: 4 ft deepening



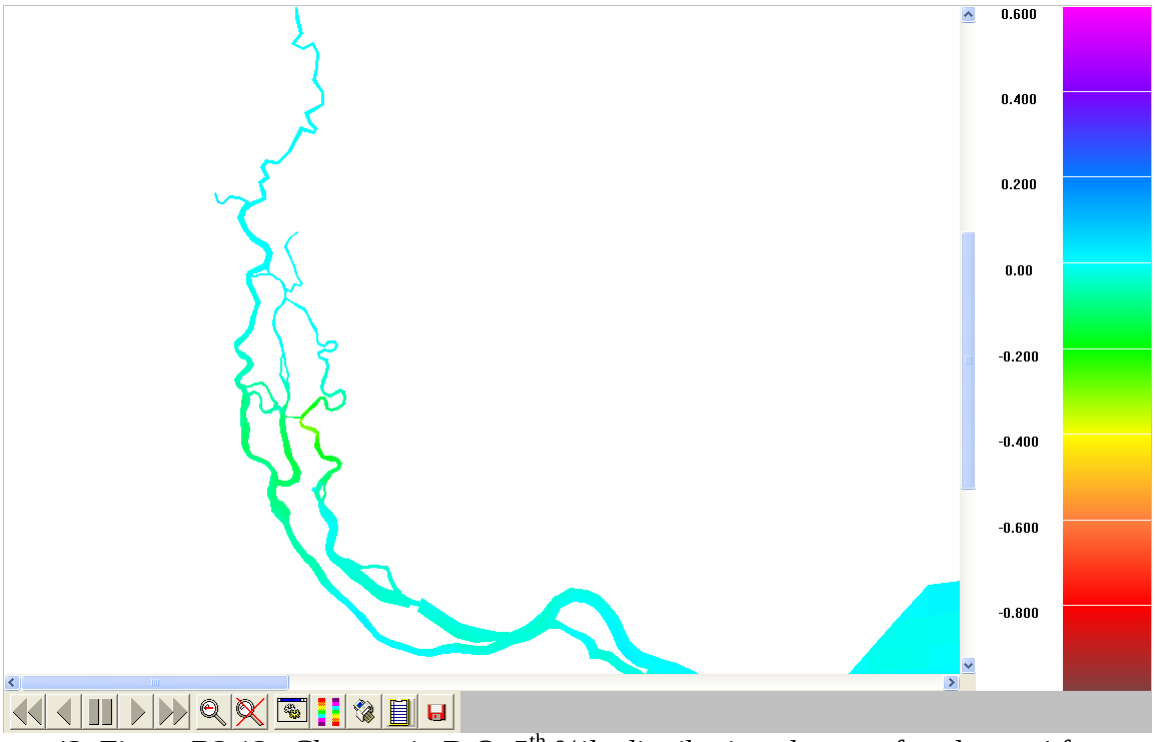
39. Figure B2.9. Changes in Salinity 5th %ile distribution along bottom layer: 4 ft deepening



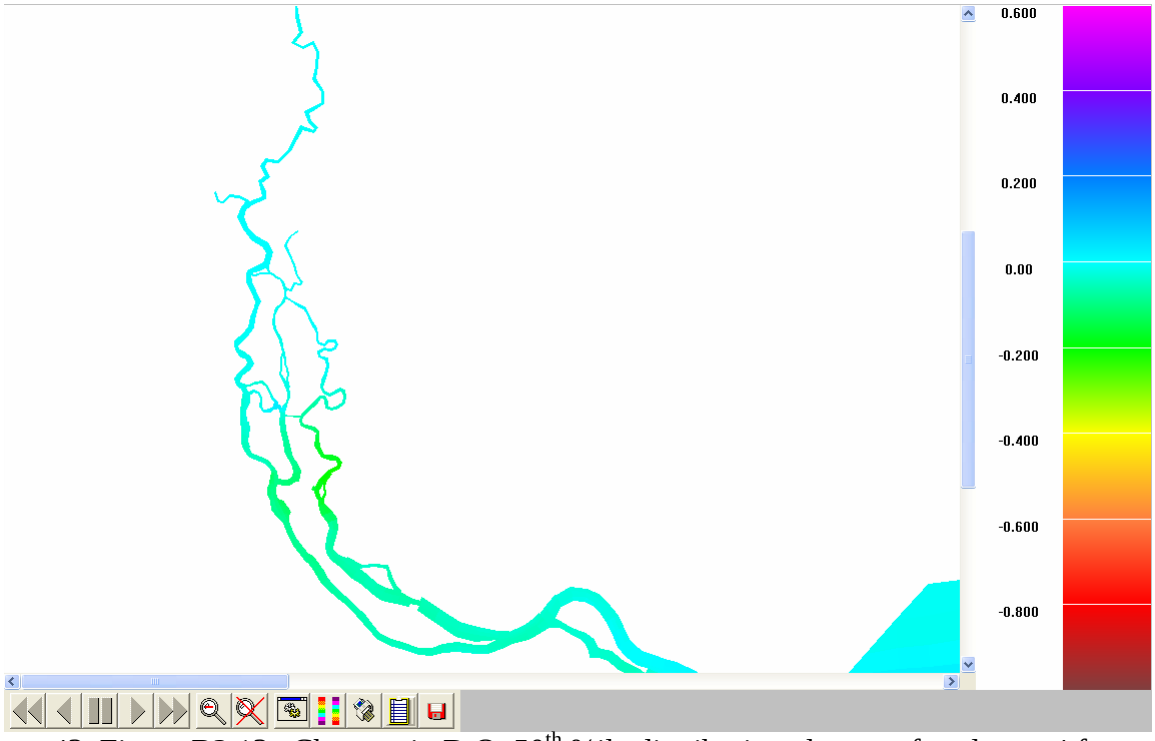
40. Figure B2.10. Changes in Salinity 50th %ile distribution along bottom layer: 4 ft deepening



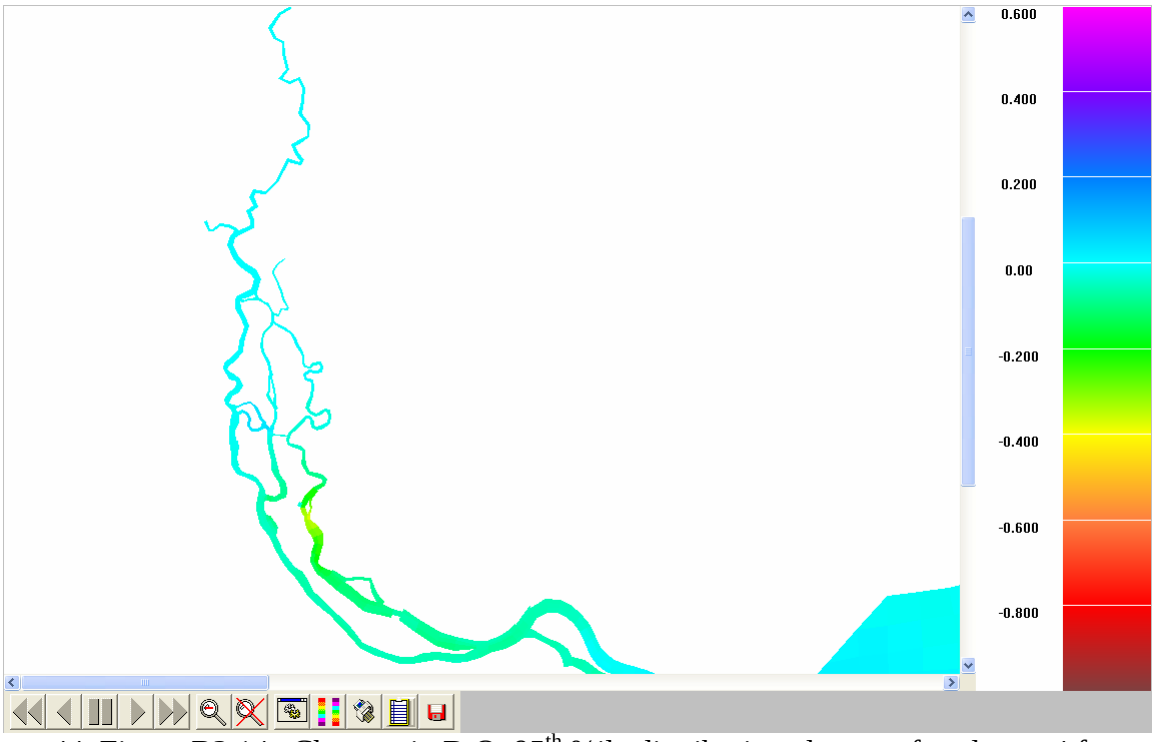
41. Figure B2.11. Changes in Salinity 95th %ile distribution along bottom layer: 4 ft deepening



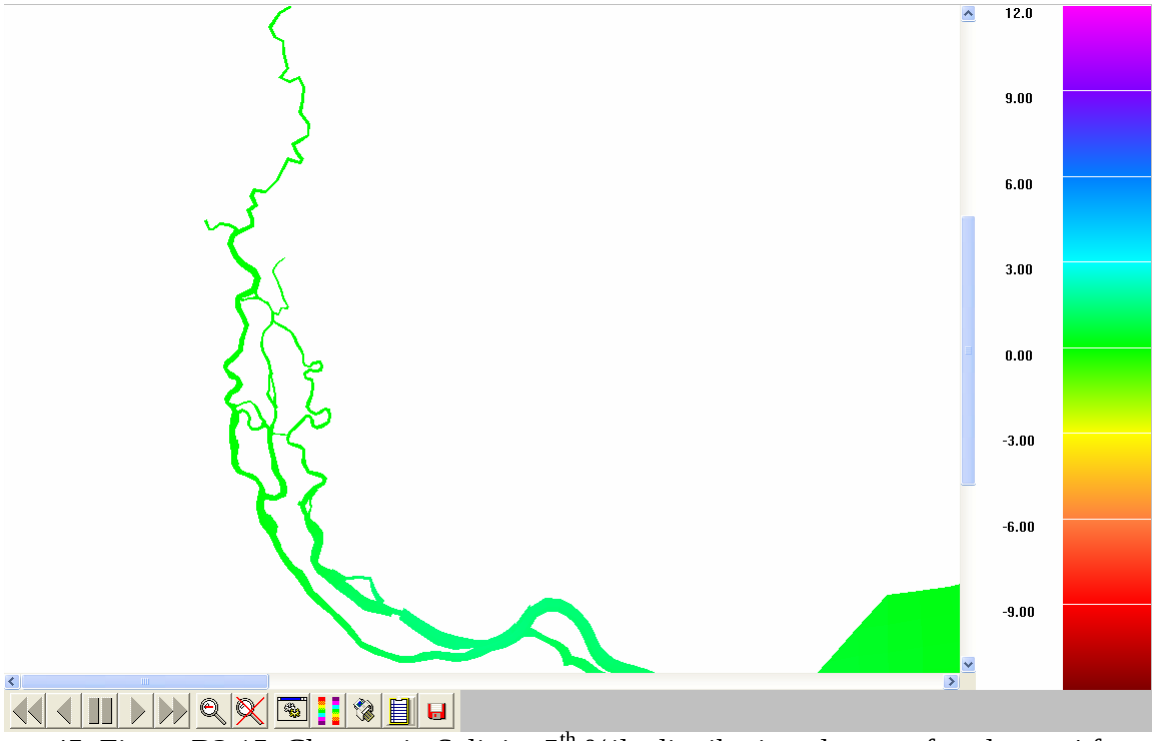
42. Figure B2.12. Changes in D.O. 5th %ile distribution along surface layer: 4 ft deepening



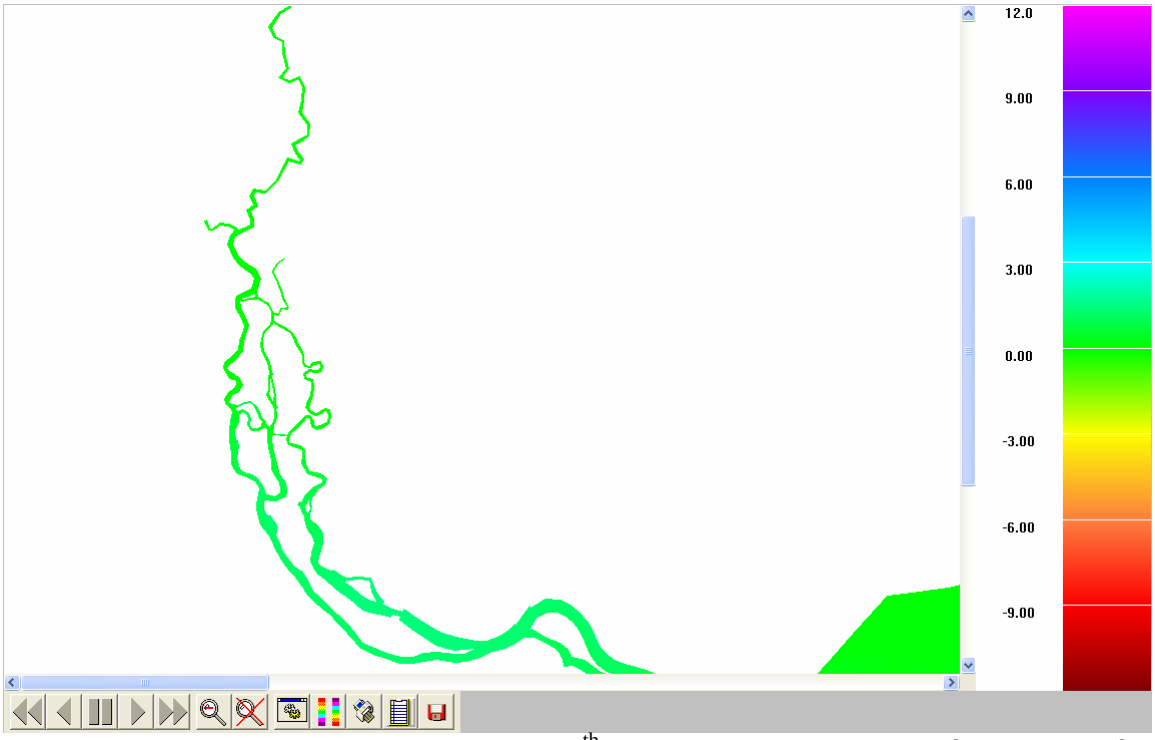
43. Figure B2.13. Changes in D.O. 50th %ile distribution along surface layer: 4 ft deepening



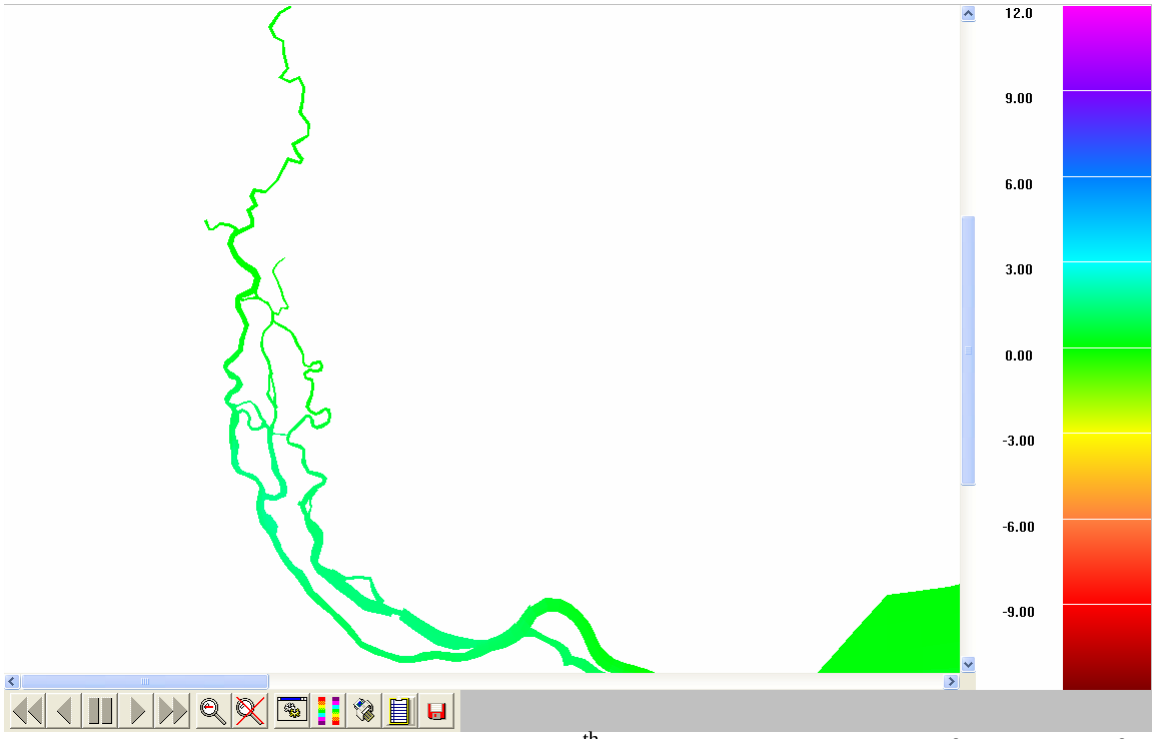
44. Figure B2.14. Changes in D.O. 95th %ile distribution along surface layer: 4 ft deepening



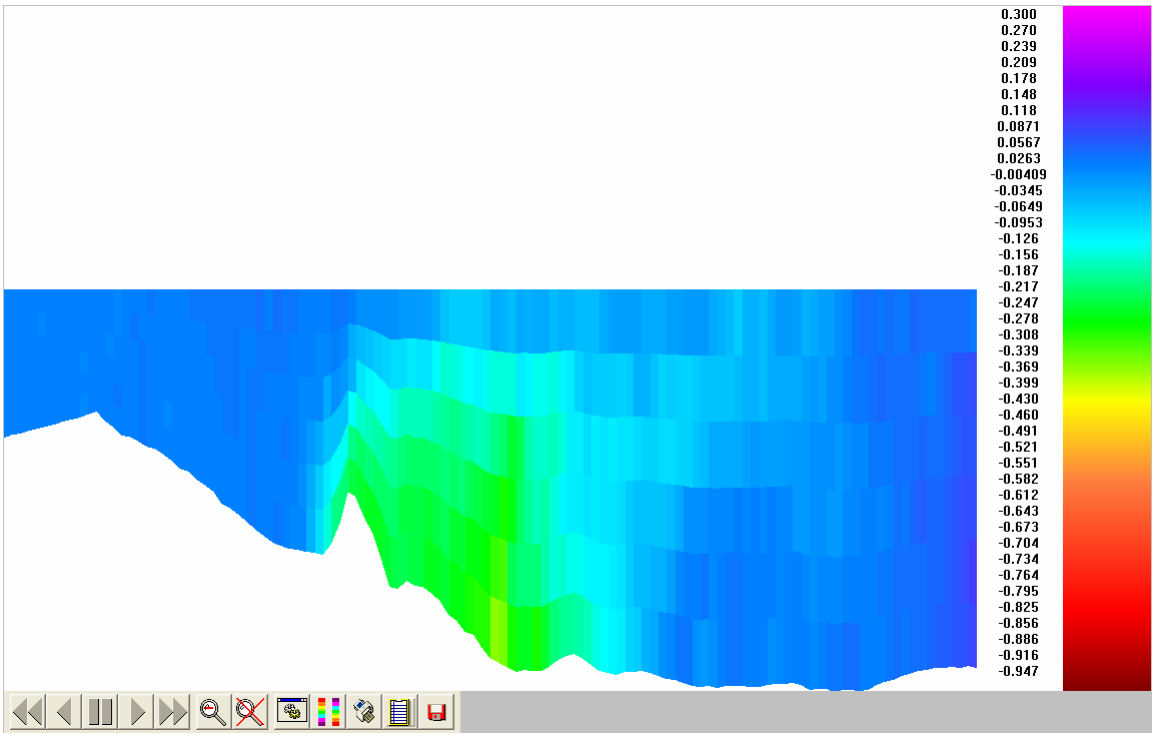
45. Figure B2.15. Changes in Salinity 5th %ile distribution along surface layer: 4 ft deepening



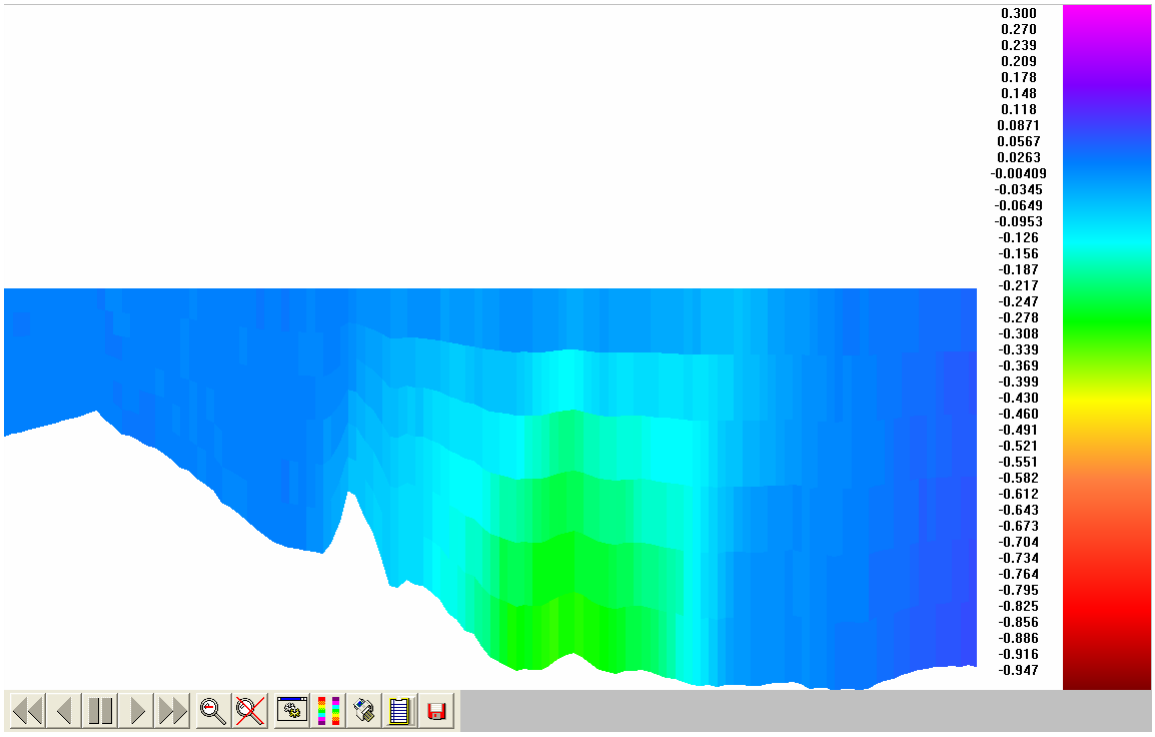
46. Figure B2.16. Changes in Salinity 50th %ile distribution along surface layer: 4 ft deepening



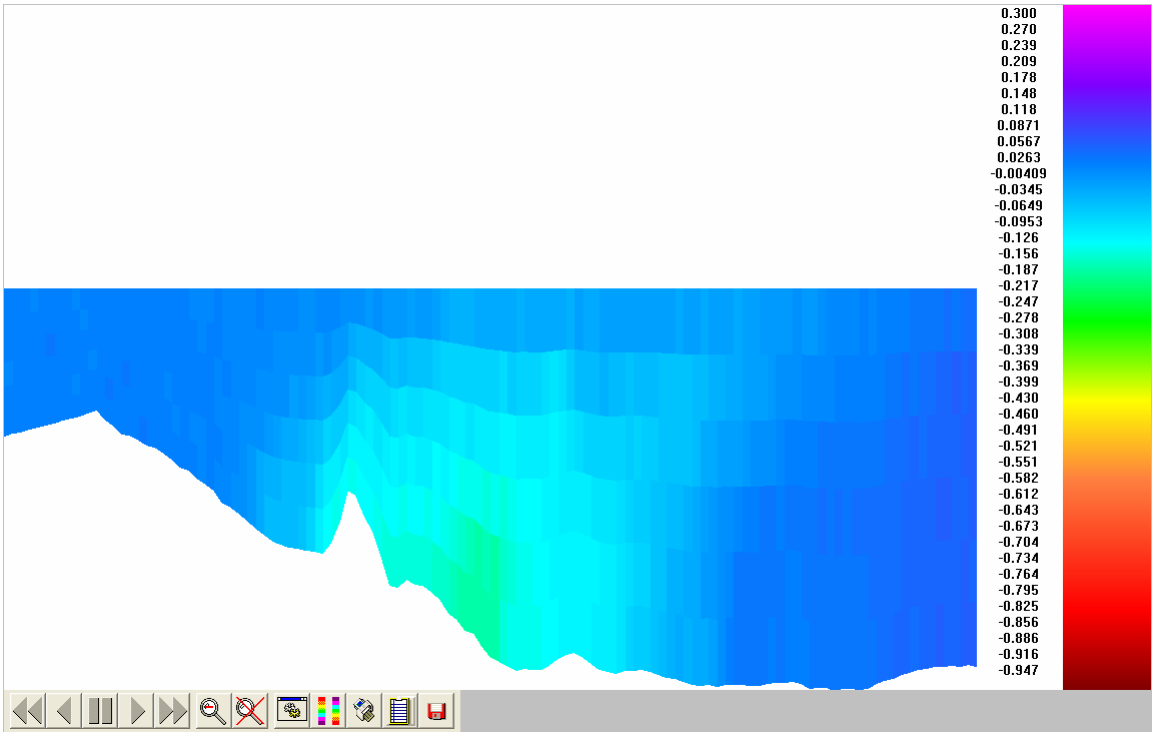
47. Figure B2.17. Changes in Salinity 95th %ile distribution along surface layer: 4 ft deepening



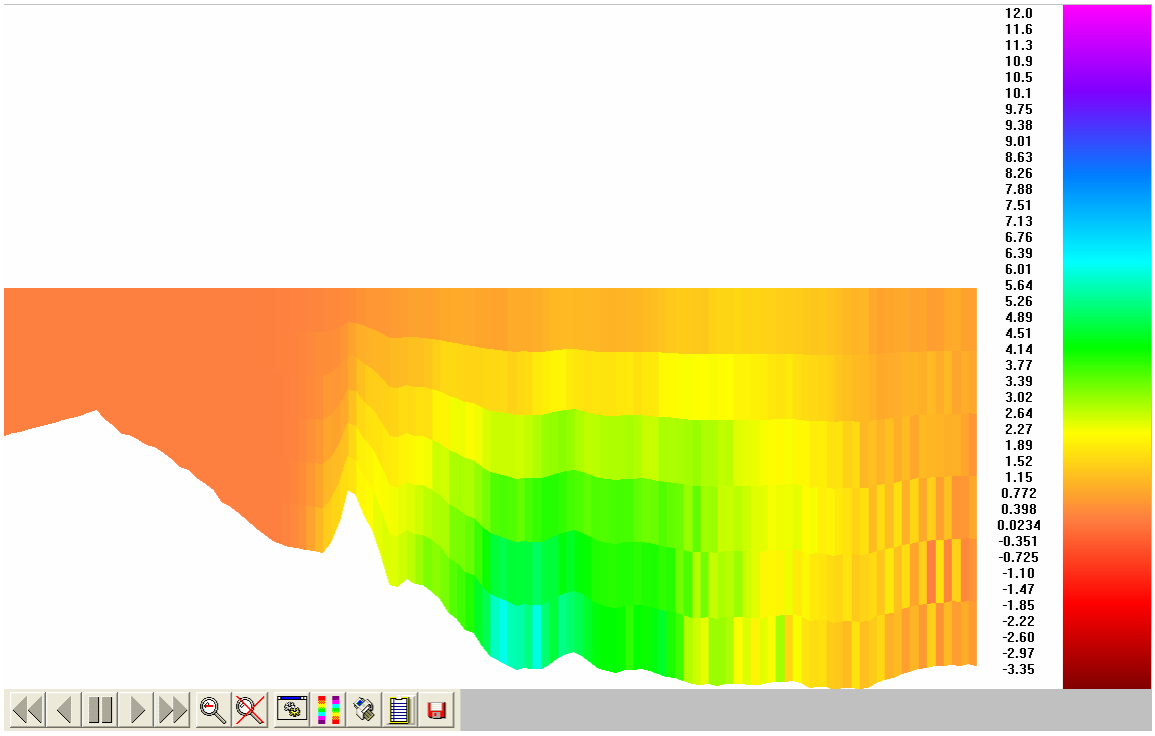
48. Figure B2.18. Snapshot of changes in 1-day averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 4 ft deepening



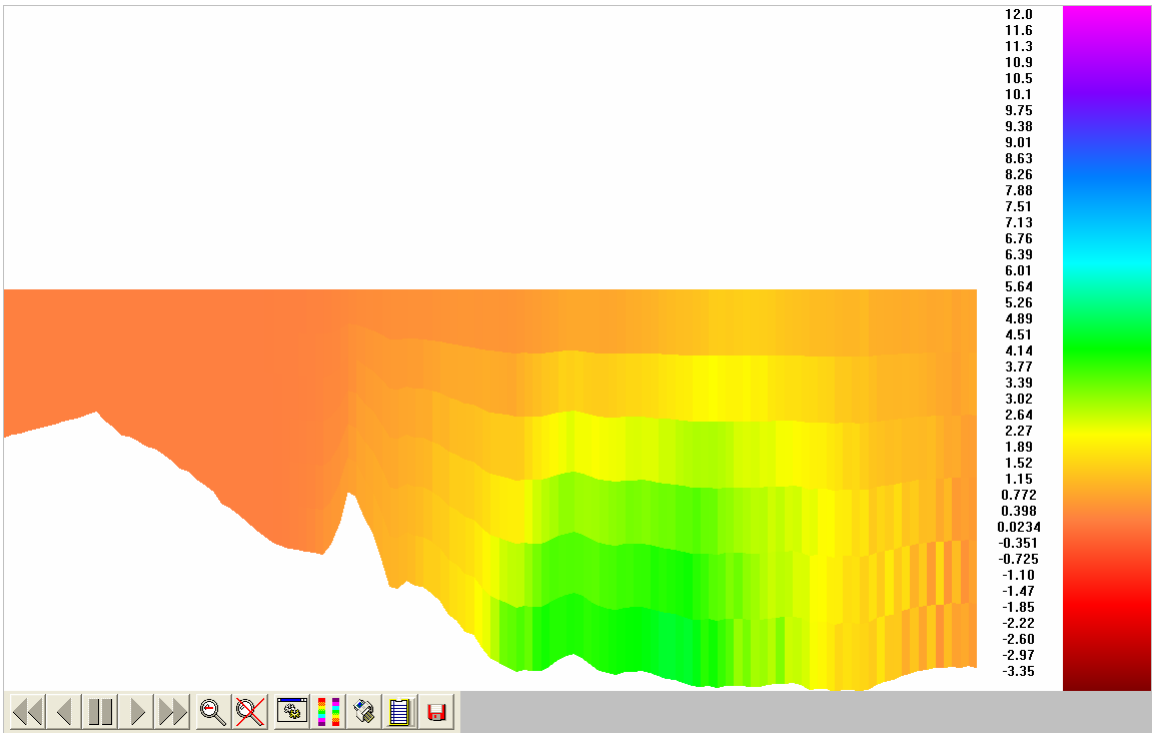
49. Figure B2.19. Snapshot of changes in 7-day averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 4 ft deepening



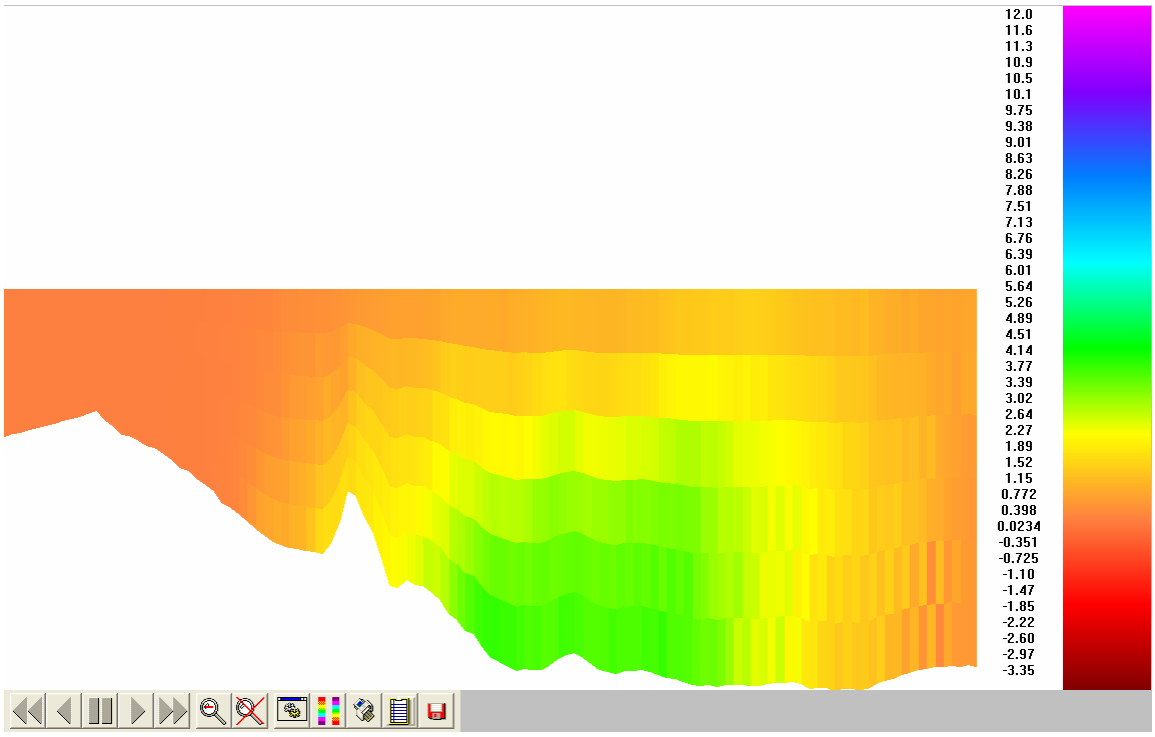
50. Figure B2.20. Snapshot of changes in 30-days averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 4 ft deepening



51. Figure B2.21. Snapshot of changes in 1-day averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 4 ft deepening



52. Figure B2.22. Snapshot of changes in 7-days averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 4 ft deepening



53. Figure B2.23. Snapshot of changes in 30-days averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 4 ft deepening

Appendix B3

SENSITIVITY ANALYSIS #1: 3 ft DEEPENING BATHYMETRY, 2004 POINT SOURCES LOADS, 1997 HYDROLOGICAL AND METEOROLOGICAL CONDITIONS

May 1 – October 30, 1997 Simulation Period

Water Quality Review Group

1. Table B3.1. Dissolved oxygen percentiles distribution in Critical cells

Zone	D.O. Percentile (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.41	3.74	3.91	4.12	4.44	4.93	5.37	5.5	5.62
FR2	3	3.27	3.4	3.64	3.98	4.46	5.01	5.25	5.48
FR3	2.82	3.1	3.23	3.43	3.81	4.26	4.87	5.19	5.97
FR4	2.8	3.09	3.21	3.4	3.79	4.25	4.83	5.35	6.18
FR5	2.91	3.15	3.25	3.47	3.86	4.29	4.87	5.54	6.21
FR6	2.99	3.16	3.26	3.48	3.86	4.32	4.86	5.59	6.31
FR7	3.18	3.32	3.49	3.73	4.2	4.81	5.41	6.22	6.44
FR8	3.41	3.76	3.98	4.48	5.01	5.45	5.99	6.38	6.55
FR9	3.45	3.81	4.02	4.48	5.08	5.51	5.99	6.45	6.57
FR10	3.18	3.5	3.75	4.29	4.89	5.42	5.81	5.97	6.18
FR11	2.93	3.36	3.6	4.06	4.54	5.17	5.69	5.88	6.01
MR1	3.24	3.41	3.55	3.81	4.21	4.66	5.09	5.64	6.31
MR2	2.82	3.1	3.27	3.63	4.09	4.6	5.01	5.29	6.2
MR3	2.63	2.8	2.94	3.22	3.66	4.33	4.87	5.16	5.95
MR4	2.75	3.01	3.13	3.38	3.68	4.14	4.68	5.02	5.29
MR5	0.85	1.49	1.84	2.49	4.13	5.22	5.68	5.89	6.05
MR6	1.44	2.07	2.42	3.16	4.65	5.45	5.88	6.11	6.72
LBR1	2.8	3.6	3.98	4.19	4.47	4.91	5.34	5.62	5.87
LBR2	3.12	3.26	3.35	3.49	3.7	4.15	4.51	4.99	5.21
LBR3	2.16	2.45	2.64	3.01	3.43	3.91	4.36	4.5	4.86
BR1	2.46	2.69	2.83	3.08	3.46	3.98	4.52	4.79	5.11
BR2	1.77	2.12	2.31	2.61	2.97	3.52	4.08	4.34	4.57
BR3	2.13	2.46	2.63	2.92	3.24	3.77	4.36	4.53	4.76
SCH1	1.73	2.16	2.4	2.81	3.57	4.33	4.86	5.2	5.61
SCH2	3.11	3.39	3.6	3.91	4.21	4.67	5.09	5.3	5.51
SR	3.38	3.47	3.56	3.9	4.22	4.7	5.37	5.85	5.89

2. Table B3.2. Delta of Dissolved Oxygen percentiles distribution in Critical cells: Deepening scenario minus Existing bathymetry scenario

Zone	Delta D.O. Percentile																	
	1%		5%		10%		25%		50%		75%		90%		95%		99	
	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%
FR1	0	0.0	0	0.0	0	0.0	-0.01	-0.2	-0.02	-0.4	0	0.0	0.01	0.2	0	0.0	-0.04	-0.7
FR2	-0.03	-1.0	-0.03	-0.9	0	0.0	-0.01	-0.3	-0.03	-0.7	0.01	0.2	0.02	0.4	-0.03	-0.6	-0.29	-5.0
FR3	-0.02	-0.7	-0.05	-1.6	-0.02	-0.6	-0.01	-0.3	-0.03	-0.8	-0.02	-0.5	0.01	0.2	-0.14	-2.6	-0.21	-3.4
FR4	-0.02	-0.7	0	0.0	-0.01	-0.3	-0.04	-1.2	-0.06	-1.6	-0.06	-1.4	0	0.0	-0.13	-2.4	-0.04	-0.6
FR5	0	0.0	0.03	1.0	-0.01	-0.3	-0.06	-1.7	-0.08	-2.0	-0.13	-2.9	0	0.0	-0.26	-4.5	-0.02	-0.3
FR6	-0.02	-0.7	-0.05	-1.6	-0.1	-3.0	-0.17	-4.7	-0.24	-5.9	-0.37	-7.9	-0.36	-6.9	-0.57	-9.3	0	0.0
FR7	-0.27	-7.8	-0.48	-12.6	-0.52	-13.0	-0.71	-16.0	-0.73	-14.8	-0.54	-10.1	-0.49	-8.3	-0.18	-2.8	-0.11	-1.7
FR8	-0.06	-1.7	-0.1	-2.6	-0.14	-3.4	-0.2	-4.3	-0.13	-2.5	-0.06	-1.1	-0.05	-0.8	-0.01	-0.2	0.02	0.3
FR9	-0.9	-20.7	-0.96	-20.1	-0.98	-19.6	-0.79	-15.0	-0.4	-7.3	-0.32	-5.5	-0.29	-4.6	-0.04	-0.6	-0.02	-0.3
FR10	0.01	0.3	0	0.0	0.01	0.3	0	0.0	0	0.0	0	0.0	0	0.0	0.01	0.2	0.03	0.5
FR11	0.06	2.1	0.01	0.3	0.01	0.3	0	0.0	0.01	0.2	0	0.0	0	0.0	-0.01	-0.2	0.02	0.3
MR1	-0.04	-1.2	-0.05	-1.4	-0.06	-1.7	-0.1	-2.6	-0.1	-2.3	-0.14	-2.9	-0.08	-1.5	-0.08	-1.4	-0.01	-0.2
MR2	-0.02	-0.7	-0.03	-1.0	-0.03	-0.9	-0.05	-1.4	-0.09	-2.2	-0.11	-2.3	-0.08	-1.6	-0.08	-1.5	-0.04	-0.6
MR3	-0.05	-1.9	-0.12	-4.1	-0.14	-4.5	-0.24	-6.9	-0.29	-7.3	-0.19	-4.2	-0.06	-1.2	-0.01	-0.2	0.02	0.3
MR4	0	0.0	0.01	0.3	-0.01	-0.3	-0.01	-0.3	-0.02	-0.5	-0.01	-0.2	-0.01	-0.2	-0.03	-0.6	0.02	0.4
MR5	-0.05	-5.6	-0.03	-2.0	-0.02	-1.1	0	0.0	-0.01	-0.2	0.01	0.2	0.01	0.2	0.01	0.2	0.01	0.2
MR6	0.02	1.4	0.04	2.0	0.03	1.3	0.04	1.3	0.02	0.4	0.02	0.4	0.01	0.2	0.01	0.2	0	0.0
LBR1	-0.08	-2.8	-0.01	-0.3	0.02	0.5	0.02	0.5	0.02	0.4	0.02	0.4	0.01	0.2	0.01	0.2	0	0.0
LBR2	0	0.0	0	0.0	0.01	0.3	0.02	0.6	0.02	0.5	0.01	0.2	-0.01	-0.2	0.02	0.4	0.03	0.6
LBR3	0.06	2.9	0.07	2.9	0.09	3.5	0.13	4.5	0.13	3.9	0.1	2.6	0.05	1.2	0.05	1.1	0.05	1.0
BR1	0.01	0.4	0.01	0.4	0.01	0.4	0	0.0	-0.01	-0.3	0	0.0	0.01	0.2	0.01	0.2	-0.02	-0.4
BR2	-0.07	-3.8	-0.07	-3.2	-0.08	-3.3	-0.18	-6.5	-0.22	-6.9	-0.2	-5.4	-0.15	-3.5	-0.22	-4.8	-0.43	-8.6
BR3	0.02	0.9	0.03	1.2	0.02	0.8	0.02	0.7	0.01	0.3	0	0.0	0.01	0.2	0.02	0.4	0.02	0.4
SCH1	0.02	1.2	-0.02	-0.9	0.01	0.4	0.01	0.4	-0.06	-1.7	-0.06	-1.4	-0.05	-1.0	-0.06	-1.1	-0.03	-0.5
SCH2	-0.03	-1.0	-0.03	-0.9	-0.03	-0.8	-0.04	-1.0	-0.02	-0.5	-0.01	-0.2	-0.02	-0.4	-0.02	-0.4	-0.05	-0.9
SR	0	0.0	0.01	0.3	0	0.0	0	0.0	0	0.0	0.01	0.2	0	0.0	0	0.0	0	0.0

3. Table B3.3. Dissolved oxygen percentiles distribution in Zones of Savannah Estuary

Zone Name	D.O. Concentration Percentiles (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.77	4.07	4.22	4.41	4.69	5.20	5.59	5.69	5.81
FR2	3.35	3.59	3.78	4.00	4.30	4.78	5.27	5.42	5.55
FR3	3.00	3.25	3.41	3.63	3.96	4.43	5.03	5.24	5.61
FR4	2.86	3.15	3.25	3.45	3.83	4.23	4.90	5.25	6.21
FR5	2.96	3.18	3.27	3.46	3.85	4.29	4.86	5.44	6.26
FR6	3.11	3.22	3.37	3.58	3.98	4.43	4.86	5.73	6.32
FR7	3.29	3.57	3.73	4.08	4.65	5.15	5.66	6.31	6.45
FR8	3.47	3.82	4.03	4.48	4.99	5.39	5.87	6.39	6.53
FR9	3.96	4.39	4.67	5.10	5.42	5.77	6.22	6.46	6.60
FR10	4.67	4.87	4.98	5.19	5.43	5.80	6.15	6.30	6.46
FR11	3.63	3.83	4.01	4.26	4.59	5.00	5.54	5.92	6.01
MR1	3.31	3.48	3.62	3.84	4.22	4.65	5.11	5.70	6.29
MR2	3.00	3.26	3.40	3.72	4.12	4.59	5.02	5.42	6.22
MR3	2.77	2.95	3.09	3.40	3.85	4.39	4.86	5.10	5.82
MR4	3.41	3.53	3.63	3.82	4.07	4.50	4.94	5.26	5.48
MR5	1.45	1.99	2.32	2.95	4.47	5.16	5.62	5.85	6.00
MR6	1.48	2.10	2.45	3.20	4.69	5.39	5.82	6.03	6.59
LBR1	3.48	3.61	3.69	3.84	4.03	4.50	4.84	5.31	5.47
LBR2	2.69	2.90	3.01	3.20	3.48	3.93	4.33	4.80	5.04
LBR3	2.54	2.66	2.77	2.94	3.18	3.69	4.21	4.39	4.57
BR1	2.77	2.96	3.04	3.25	3.60	4.11	4.63	4.94	5.24
BR2	2.38	2.63	2.75	2.95	3.27	3.81	4.40	4.60	4.90
BR3	2.47	2.66	2.76	2.94	3.19	3.76	4.32	4.43	4.59
SCh1	2.78	3.06	3.35	3.57	3.85	4.39	4.95	5.10	5.25
SCh2	3.29	3.49	3.78	4.01	4.29	4.77	5.19	5.37	5.52
SR	3.70	3.76	3.81	4.14	4.44	4.90	5.54	5.97	6.00

4. Table B3.4. Delta of Dissolved Oxygen percentiles distribution in Zones of Savannah Estuary: Deepening scenario minus Existing bathymetry scenario

Zone	Project - Baseline Difference (mg/l)									Project - Baseline Relative Difference (%)								
Name	1%	5%	10%	25%	50%	75%	90%	95%	99%	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	0.02	0.00	0.00	0.00	-0.01	0.02	0.02	0.01	0.02	0.5	0.0	0.0	-0.1	-0.2	0.3	0.3	0.2	0.4
FR2	-0.01	0.01	0.02	0.00	0.00	0.01	0.03	-0.02	-0.04	-0.2	0.2	0.5	0.1	0.0	0.3	0.6	-0.3	-0.8
FR3	-0.01	-0.03	0.01	0.02	-0.02	0.03	0.05	-0.03	-0.43	-0.3	-0.8	0.2	0.6	-0.6	0.7	1.0	-0.6	-7.2
FR4	-0.03	-0.02	-0.02	-0.01	-0.04	-0.08	0.04	-0.14	-0.04	-0.9	-0.6	-0.7	-0.3	-1.2	-1.9	0.8	-2.5	-0.7
FR5	-0.01	0.01	-0.04	-0.08	-0.09	-0.14	-0.01	-0.30	-0.03	-0.5	0.4	-1.2	-2.3	-2.3	-3.1	-0.3	-5.3	-0.5
FR6	-0.01	-0.02	-0.07	-0.11	-0.13	-0.23	-0.20	-0.35	-0.02	-0.3	-0.6	-2.1	-2.9	-3.2	-4.8	-4.0	-5.7	-0.3
FR7	-0.03	-0.11	-0.13	-0.22	-0.24	-0.14	-0.10	-0.04	0.00	-1.0	-2.9	-3.4	-5.2	-4.9	-2.7	-1.8	-0.6	0.1
FR8	-0.13	-0.17	-0.22	-0.23	-0.18	-0.13	-0.10	0.00	0.00	-3.6	-4.2	-5.1	-4.9	-3.4	-2.3	-1.6	0.0	0.0
FR9	-0.23	-0.25	-0.24	-0.15	-0.07	-0.07	-0.04	-0.01	0.00	-5.6	-5.4	-4.9	-2.9	-1.2	-1.2	-0.7	-0.2	0.0
FR10	-0.01	-0.01	-0.01	-0.02	-0.01	0.00	-0.01	0.00	0.00	-0.2	-0.2	-0.2	-0.3	-0.1	-0.1	-0.2	0.0	0.0
FR11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1	-0.1	-0.1	0.0	0.0	0.1	0.0	0.0	0.0
MR1	-0.03	-0.06	-0.08	-0.11	-0.12	-0.15	-0.08	-0.10	-0.03	-0.8	-1.7	-2.2	-2.8	-2.9	-3.2	-1.5	-1.7	-0.5
MR2	-0.04	-0.04	-0.04	-0.07	-0.12	-0.13	-0.10	-0.03	-0.05	-1.3	-1.2	-1.3	-1.9	-2.9	-2.7	-2.0	-0.5	-0.7
MR3	0.01	0.00	-0.01	-0.03	-0.05	-0.06	-0.05	-0.04	-0.01	0.2	0.1	-0.3	-0.8	-1.4	-1.3	-1.0	-0.8	-0.1
MR4	0.01	0.01	0.01	0.01	0.01	0.01	0.00	-0.01	0.00	0.3	0.3	0.2	0.3	0.2	0.3	0.1	-0.2	0.0
MR5	0.01	0.02	0.04	0.04	0.00	0.00	0.00	0.00	0.01	0.6	0.9	1.6	1.3	0.1	0.1	0.1	0.0	0.2
MR6	0.02	0.03	0.05	0.03	0.00	0.01	0.01	0.00	0.00	1.0	1.5	2.1	0.9	0.1	0.2	0.2	0.0	-0.1
LBR1	0.01	0.01	0.01	0.02	0.02	0.01	0.00	0.02	0.02	0.3	0.2	0.4	0.5	0.5	0.2	0.1	0.3	0.3
LBR2	-0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.02	0.01	-0.3	0.0	0.1	0.3	0.3	0.1	-0.1	0.4	0.2
LBR3	0.06	0.07	0.06	0.06	0.06	0.06	0.05	0.00	0.02	2.3	2.6	2.2	2.2	1.8	1.6	1.1	0.1	0.5
BR1	0.00	0.01	0.00	-0.01	-0.02	-0.01	0.01	-0.03	-0.05	0.0	0.2	0.0	-0.3	-0.5	-0.1	0.3	-0.5	-1.0
BR2	0.01	0.00	0.00	0.00	0.01	0.01	0.02	0.02	-0.01	0.5	0.2	0.2	0.2	0.2	0.3	0.4	0.5	-0.3
BR3	0.03	0.03	0.03	0.03	0.02	0.00	0.03	0.03	0.06	1.4	1.3	1.1	0.9	0.6	0.0	0.7	0.7	1.3
SCh1	0.01	-0.01	0.00	-0.01	0.00	0.01	0.02	0.00	0.01	0.4	-0.3	0.0	-0.2	-0.1	0.3	0.3	0.1	0.1
SCh2	0.00	-0.02	0.00	-0.02	-0.01	0.00	0.00	-0.01	-0.02	0.2	-0.5	0.0	-0.4	-0.3	0.0	-0.1	-0.2	-0.3
SR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0

5. Table B3.5. Percentage of the volume of waters with violation of Dissolved Oxygen standards for Zones of Savannah Estuary within the period of May 1 – October 30, 1997: Deepening (Project) and Existing (Baseline) bathymetry

Zones	D.O. STANDARDS														
	1-Day Average			7-Day Average			30-Day Average			GA MINIMUM D.O.			SC MINIMUM D.O.		
	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B
FR1	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0
FR2	0	0	0	0	0	0	0	0	0	0	0	0	17	17	0
FR3	0	0	0	0	0	0	3	4	1	0	0	0	N/A	N/A	N/A
FR4	0	0	0	0	0	0	5	7	2	0	0	0	N/A	N/A	N/A
FR5	0	0	0	0	0	0	3	5	2	0	0	0	N/A	N/A	N/A
FR6	0	0	0	0	0	0	1	3	2	0	0	0	N/A	N/A	N/A
FR7	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR8	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR9	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR10	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR11	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
MR1	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
MR2	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
MR3	0	0	0	0	0	0	3	4	1	1	1	0	N/A	N/A	N/A
MR4	0	0	0	0	0	0	1	1	0	0	0	0	N/A	N/A	N/A
MR5	0	0	0	0	0	0	2	1	-1	4	4	0	9	9	0
MR6	0	0	0	0	0	0	0	0	0	2	2	0	7	7	0
LBR1	0	0	0	0	0	0	1	1	0	0	0	0	11	11	0
LBR2	0	0	0	2	1	-1	11	11	0	3	3	0	25	25	0
LBR3	0	0	0	6	5	-1	21	21	0	8	7	-1	36	37	1
BR1	0	0	0	1	2	1	18	19	1	2	2	0	50	51	1
BR2	0	0	0	6	6	0	36	36	0	7	7	0	60	61	1
BR3	0	0	0	9	8	-1	35	36	1	11	10	-1	57	58	1
SCh1	0	0	0	2	2	0	6	6	0	3	3	0	N/A	N/A	N/A
SCh2	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
SR	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0

26. Table B3.6. Percentage of water volumes with salinity in %iles within the period of May 1 – October 30, 1997

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	21.1	7.1	4.7	5.7	4.5	4.3	9.3	5.2	95.5
10	25	10.7	9.2	9.9	9.1	8.6	9.3	9.9	95.5
25	37.1	22.4	22.9	23	23.1	22.1	23.4	20.7	95.5
50	57.8	44	47	47.1	47.7	46.1	49.3	43.7	95.5
75	79.3	69.6	72.8	72.8	73.3	72.9	72.4	69.7	95.5
90	91.3	87.3	88.9	89	89.2	89.2	89	87.4	95.5
95	95.3	93.5	94.4	94.5	94.5	94.6	94.4	93.7	95.5
Total Volume 100*km3:	32564.8	653.2	4770.8	24.8	39	135.5	9.9	9.4	43.6

27. Table B3.7. Percentage of water volumes with D.O. in %iles within the period of May 1 – October 30, 1997

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	5.3	5.1	5	5.7	5.5	4.7	5.7	5.6	5.8
10	10.6	10.1	10	11.2	10.8	9.6	11.2	11	11.2
25	26.2	24.5	25	27.5	26.2	24.2	26.4	26.3	26.5
50	52	49.3	50.1	53.2	51.5	49.5	50.6	51	51.1
75	76.3	74.6	75.4	76.8	75.9	74.7	75.7	75.8	75.9
90	90.4	89.8	90.2	90.4	90.3	90	90.1	90.4	90.2
95	95.1	94.7	95	95.5	95.4	94.9	95.1	95.3	95.2
Total Volume 100*km3:	32564.8	653.2	4770.8	24.8	39	135.5	9.9	9.4	43.6

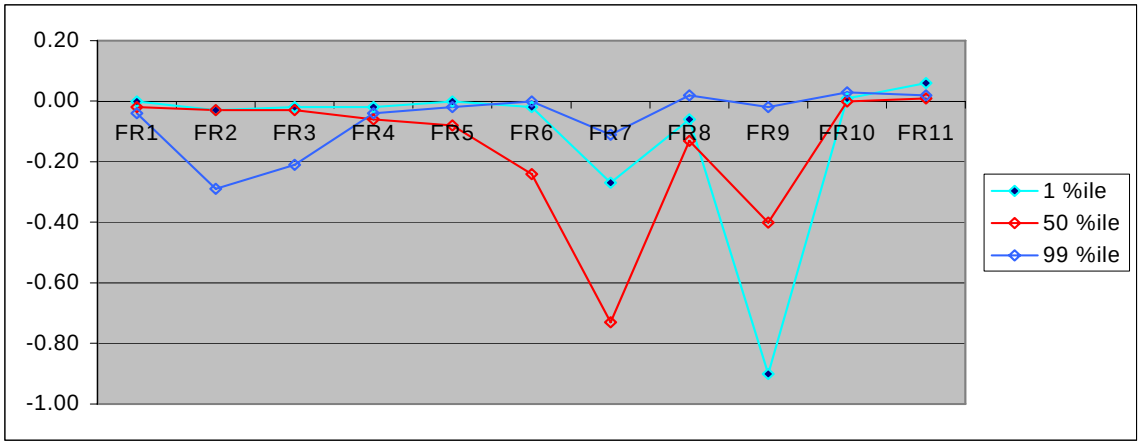
28. Table B3.8. Water volumes in Upper Harbor in increments of 1^{o} C of water temperature within the period of May 1 – October 30, 1997

Temperature C^{o}	Total Volume %
17	0.11
18	0.46
19	1.27
20	4.39
21	12.97
22	17.69
23	22.31
24	32.56
25	42.94
26	50.88
27	62.05
28	81.56
29	94
30	99.83
31	100

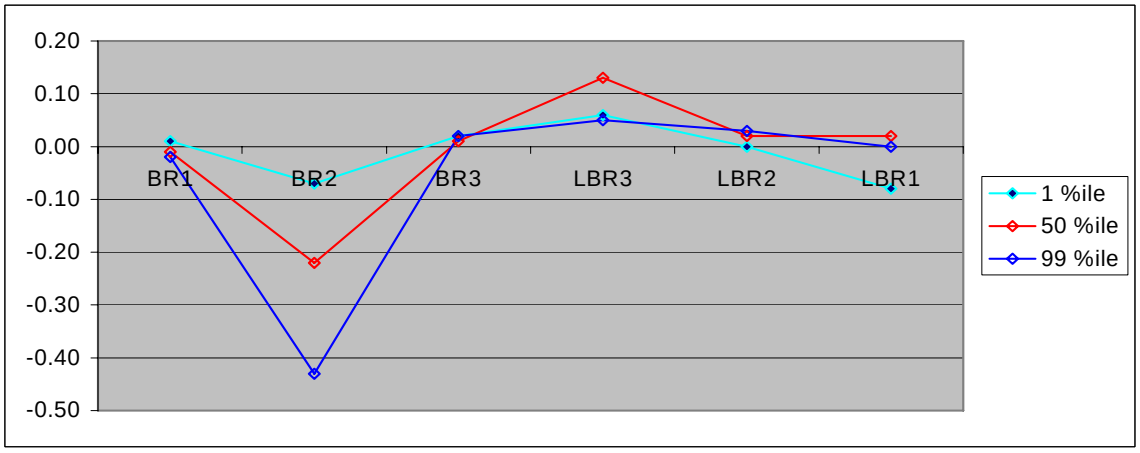
29. Table B3.9. Water volumes in Upper Harbor in increments of 0.1 mg/l of D.O. within the period of May 1 – October 30, 1997
(See file: Postprocessor Output\S13\97-S13_DO Increment Volume)

30. Table B3.10. Percentage of water volumes corresponding to 1-, 7-, and 30-days averages of D.O. depth-averaged concentrations in Upper Harbor within the period of May 1 – October 30, 1997
(See file: Postprocessor Output\S13\97-S13_volume DO in averages)

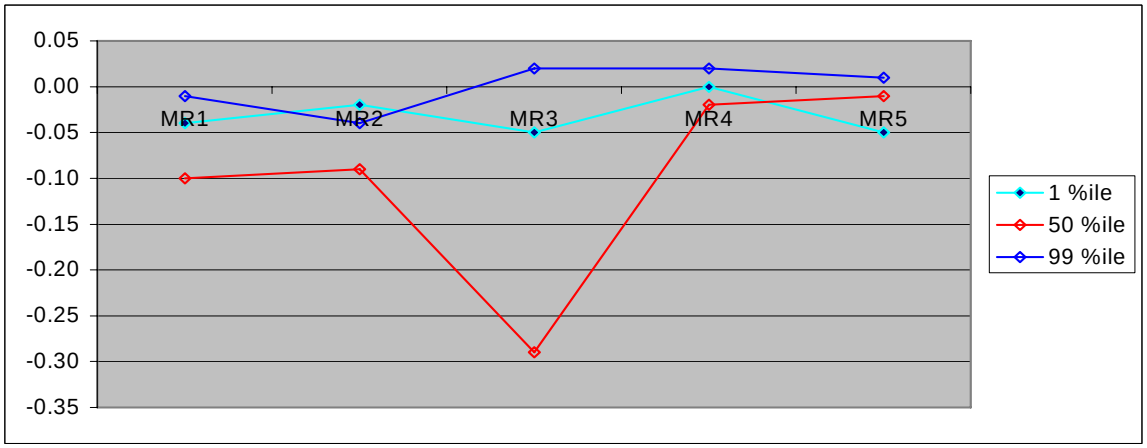
Front River



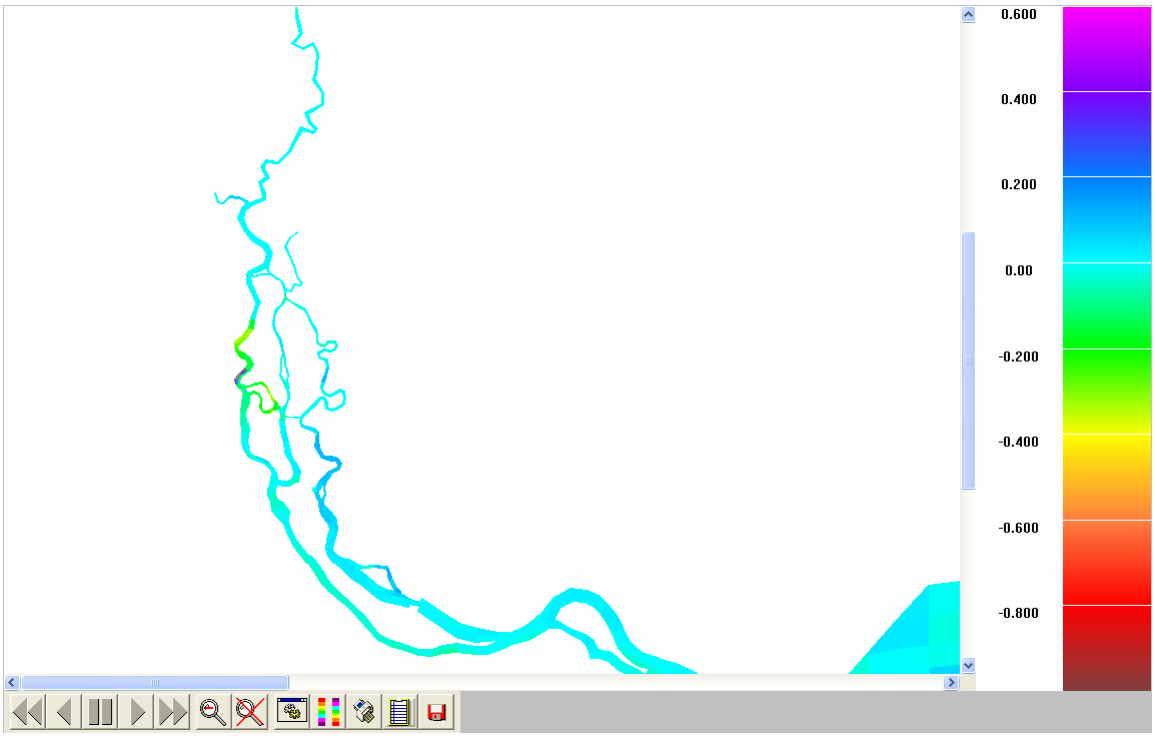
Back and Little Back Rivers



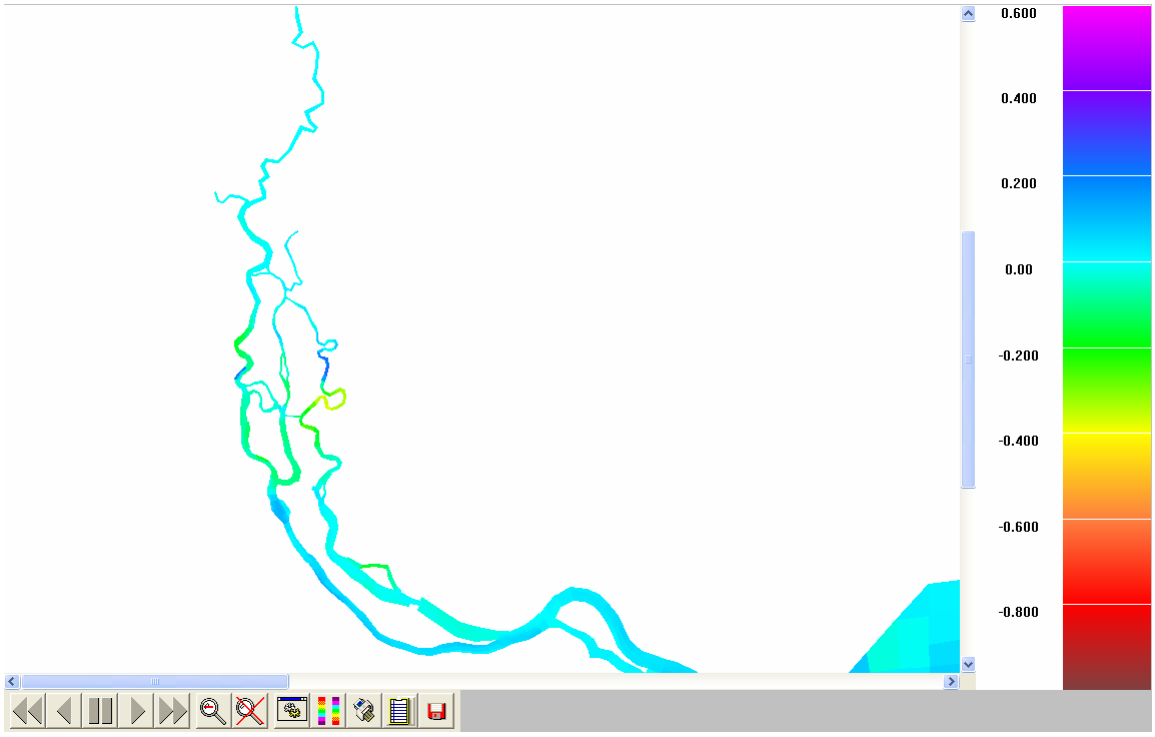
Middle River



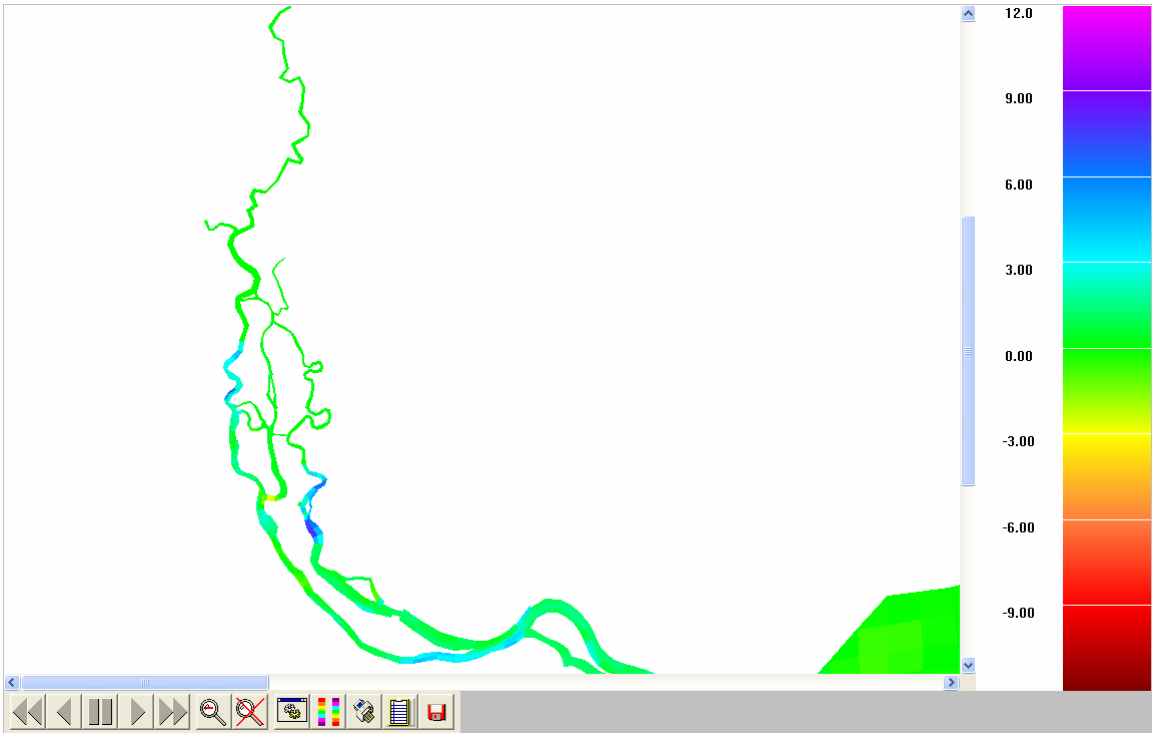
31. Figure B3.1. Changes in longitudinal profile of Dissolved Oxygen (mg/l) distribution along Critical cells of Savannah Estuary: 3 ft deepening



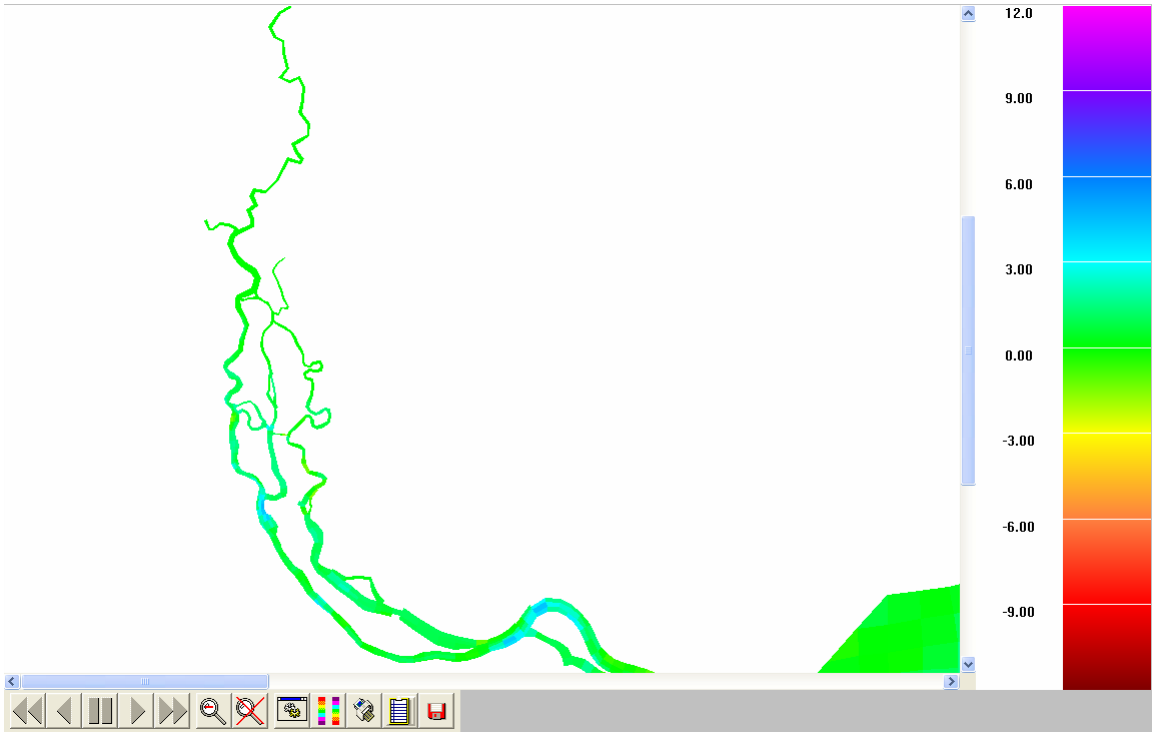
32. Figure B3.2. Changes in minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1997: 3 ft deepening



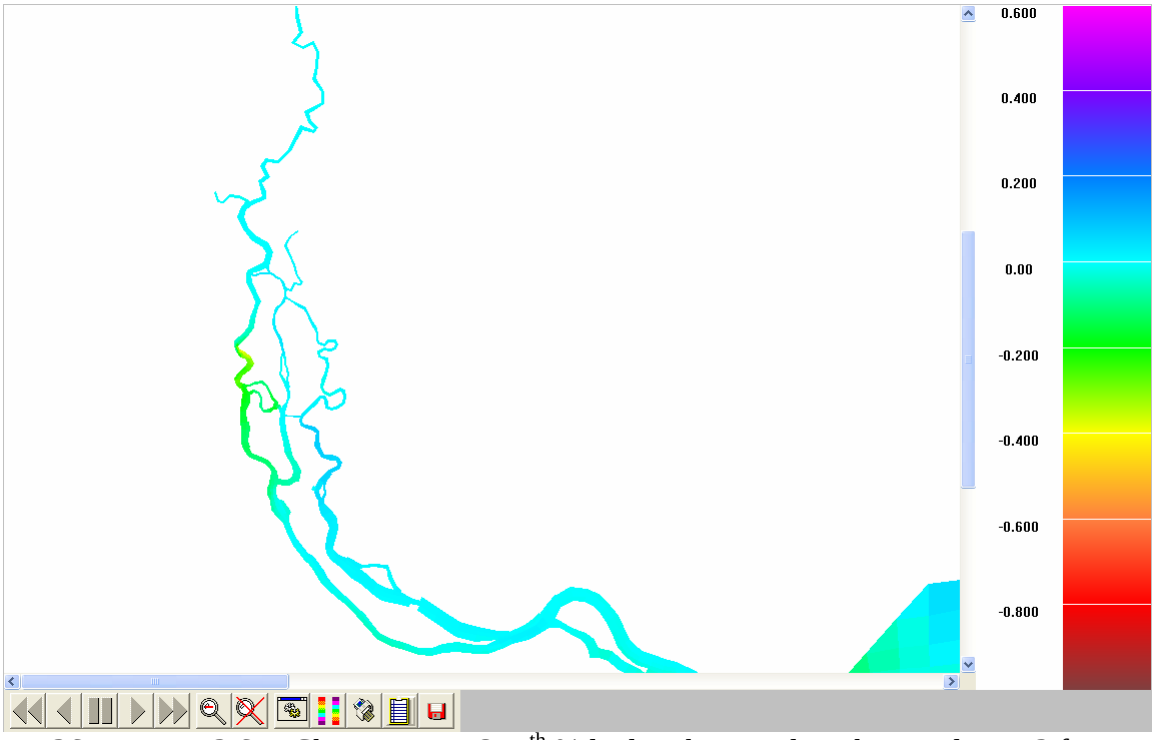
33. Figure B3.3. Changes in minimum D.O. distribution along surface layer within the analyzed period of May 1 - October 30, 1997: 3 ft deepening



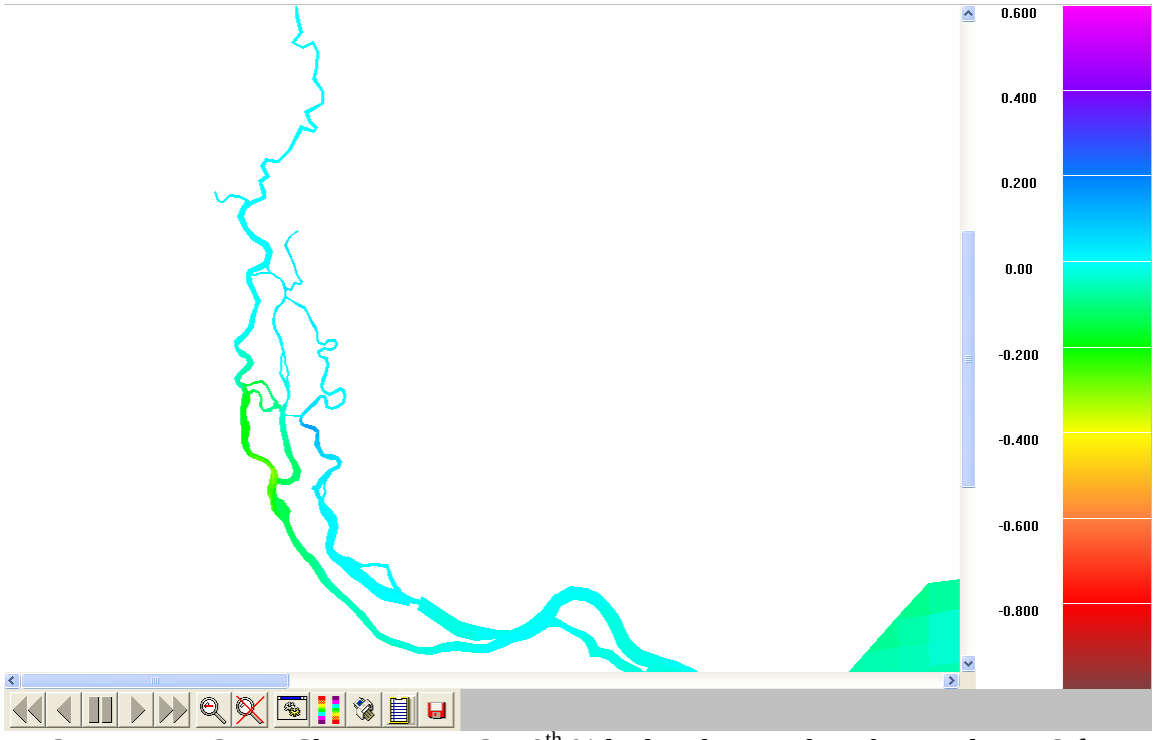
34. Figure B3.4. Changes in Salinity corresponded to Minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1997: 3 ft deepening



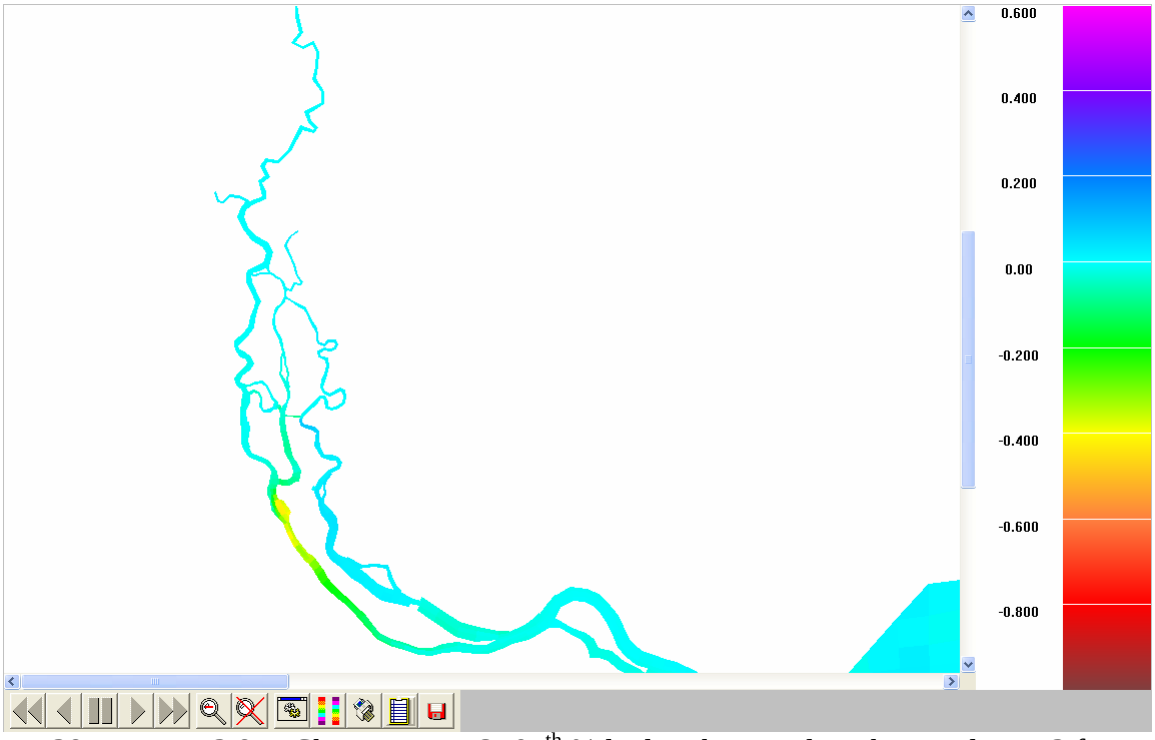
35. Figure B3.5. Changes in Salinity corresponded to Minimum D.O. distribution along Surface layer within the analyzed period of May 1 - October 30, 1997: 3 ft deepening



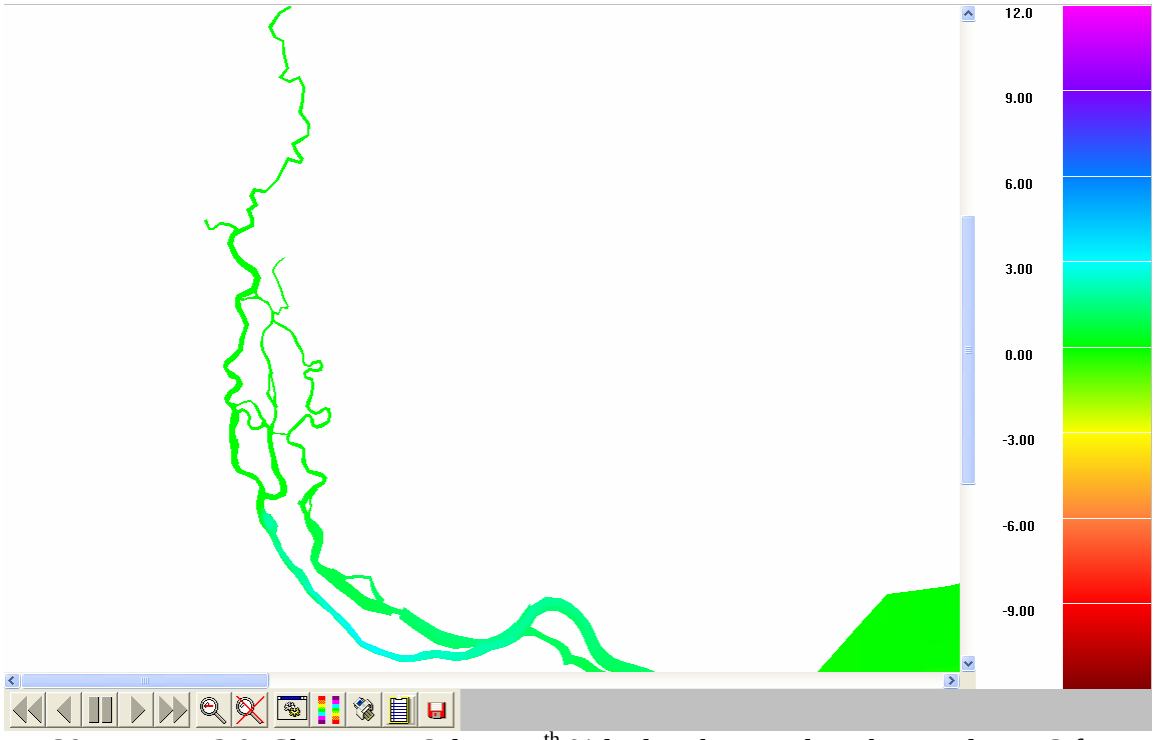
36. Figure B3.6. Changes in D.O. 5th %ile distribution along bottom layer: 3 ft deepening



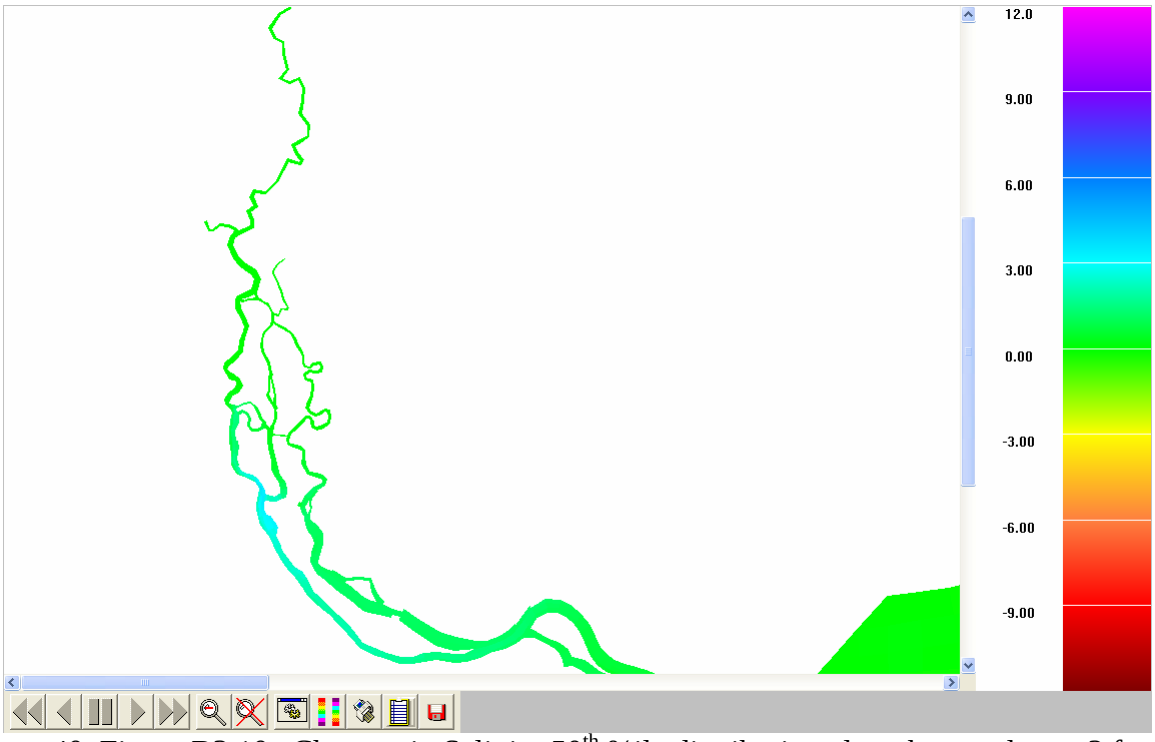
37. Figure B3.7. Changes in D.O. 50th %ile distribution along bottom layer: 3 ft deepening



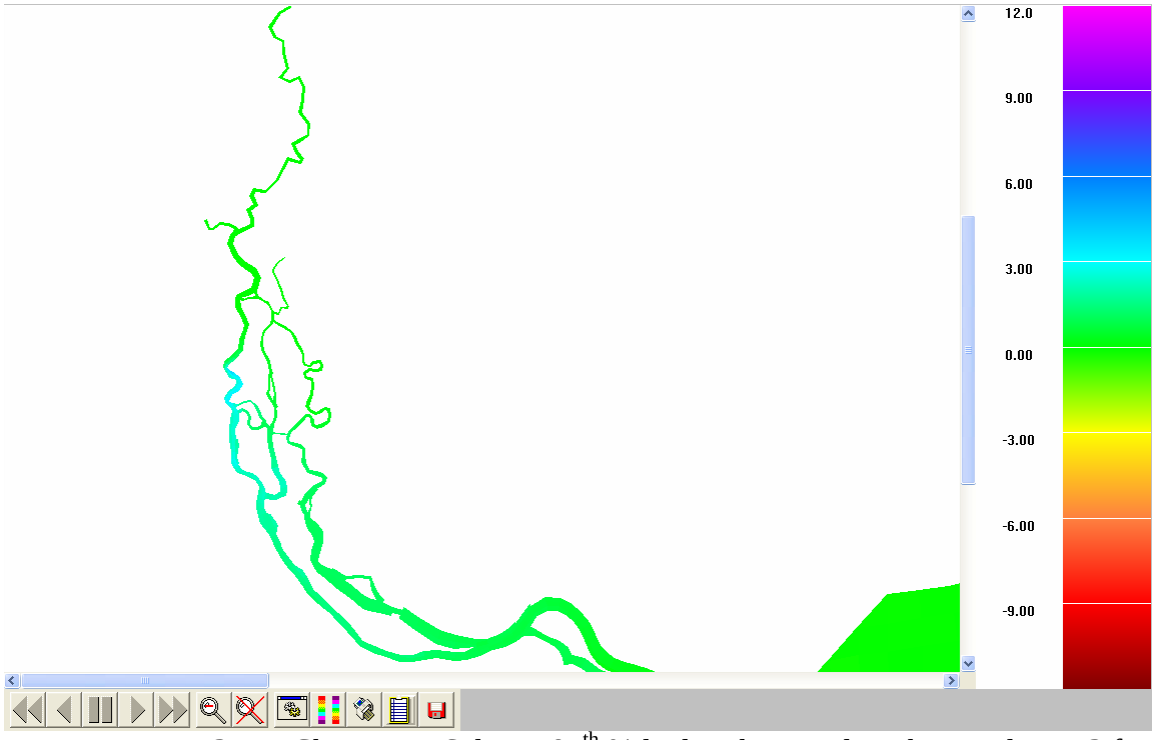
38. Figure B3.8. Changes in D.O. 95th %ile distribution along bottom layer: 3 ft deepening



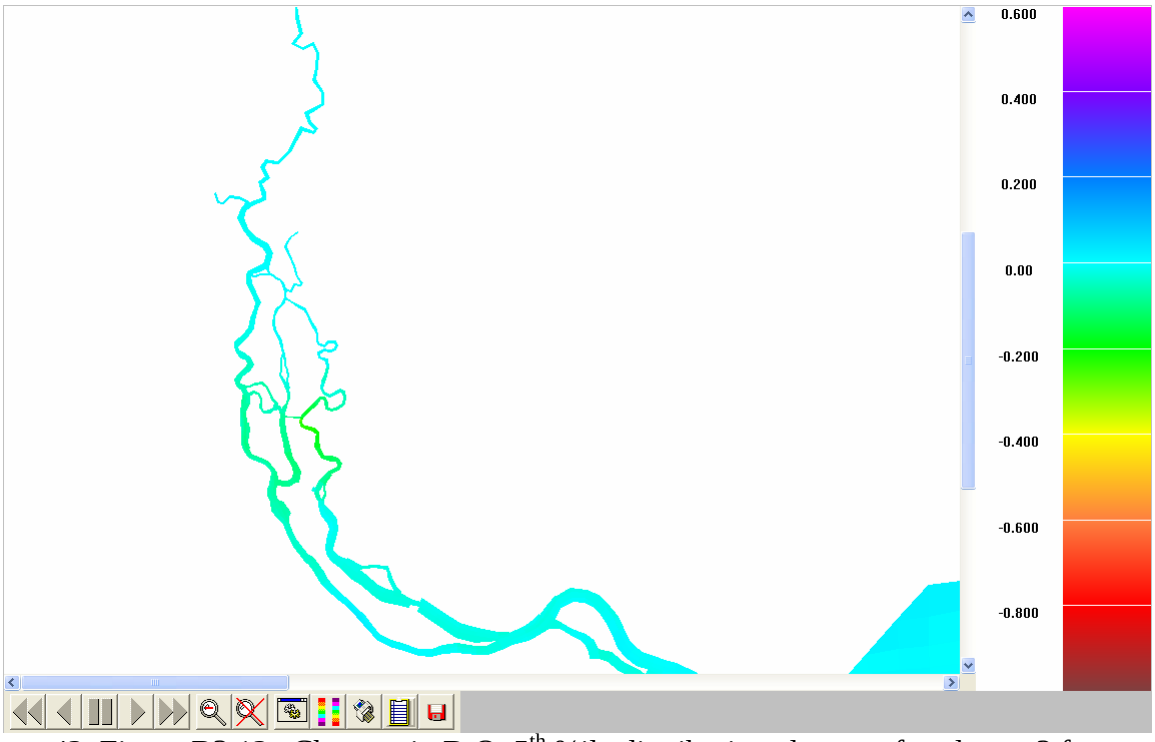
39. Figure B3.9. Changes in Salinity 5th %ile distribution along bottom layer: 3 ft deepening



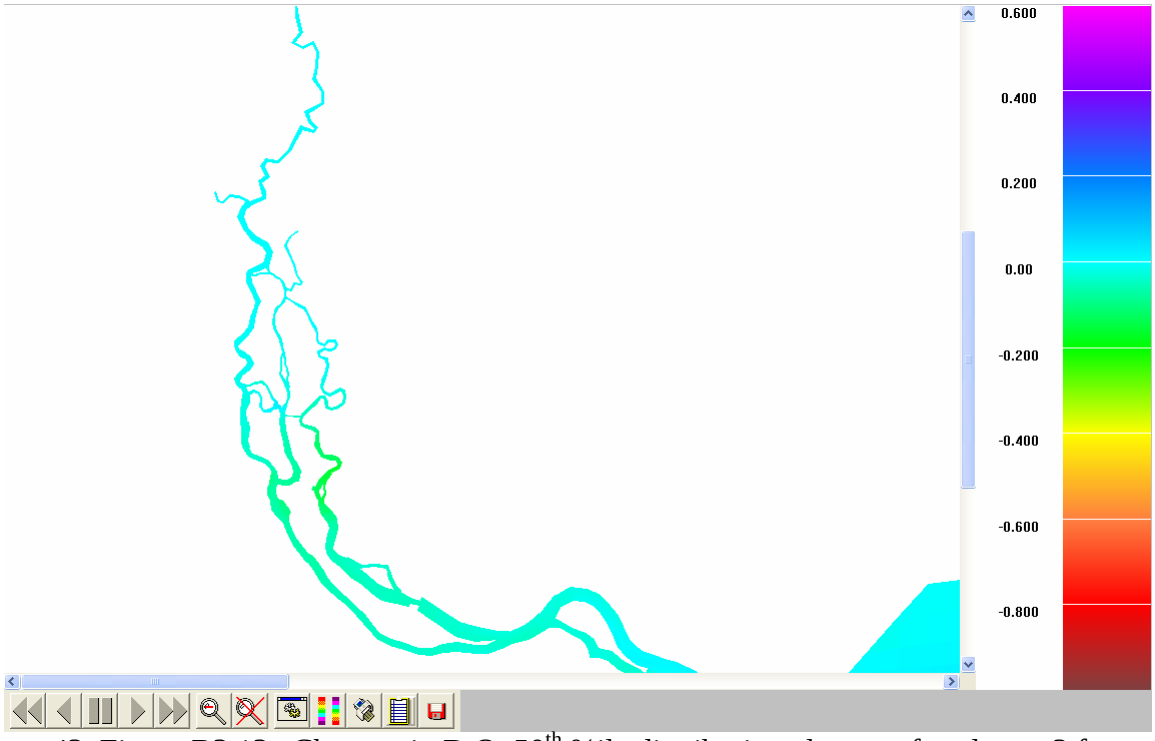
40. Figure B3.10. Changes in Salinity 50th %ile distribution along bottom layer: 3 ft deepening



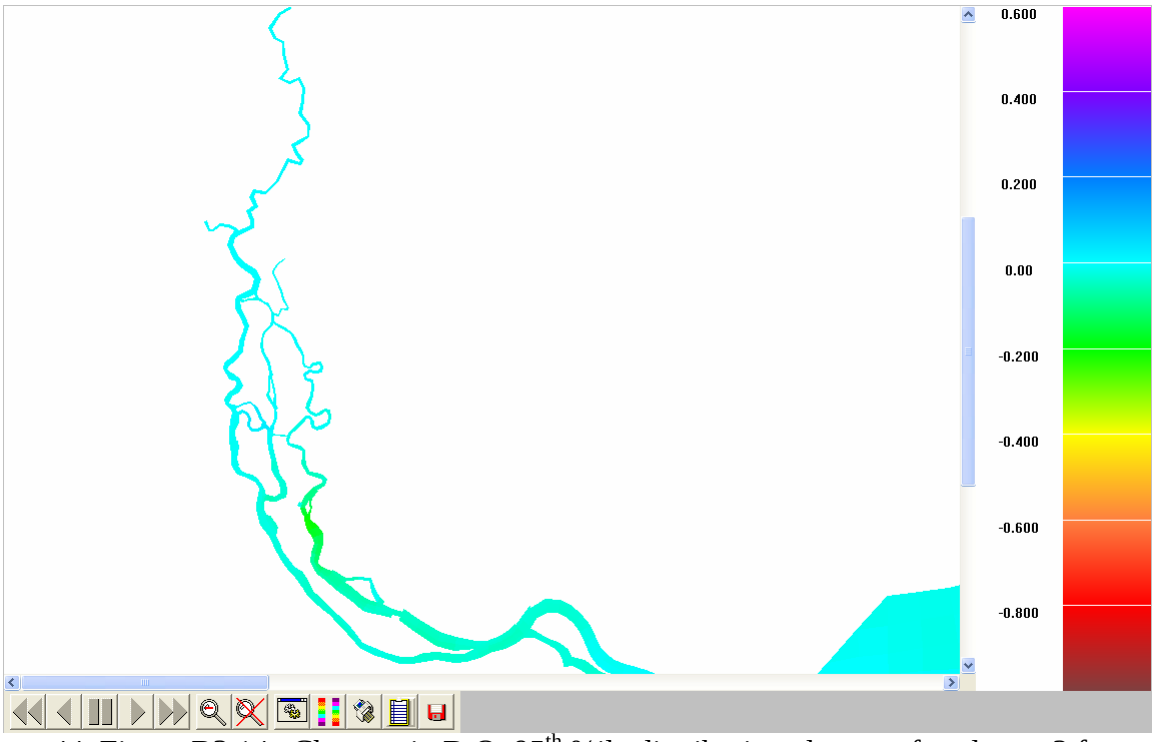
41. Figure B3.11. Changes in Salinity 95th %ile distribution along bottom layer: 3 ft deepening



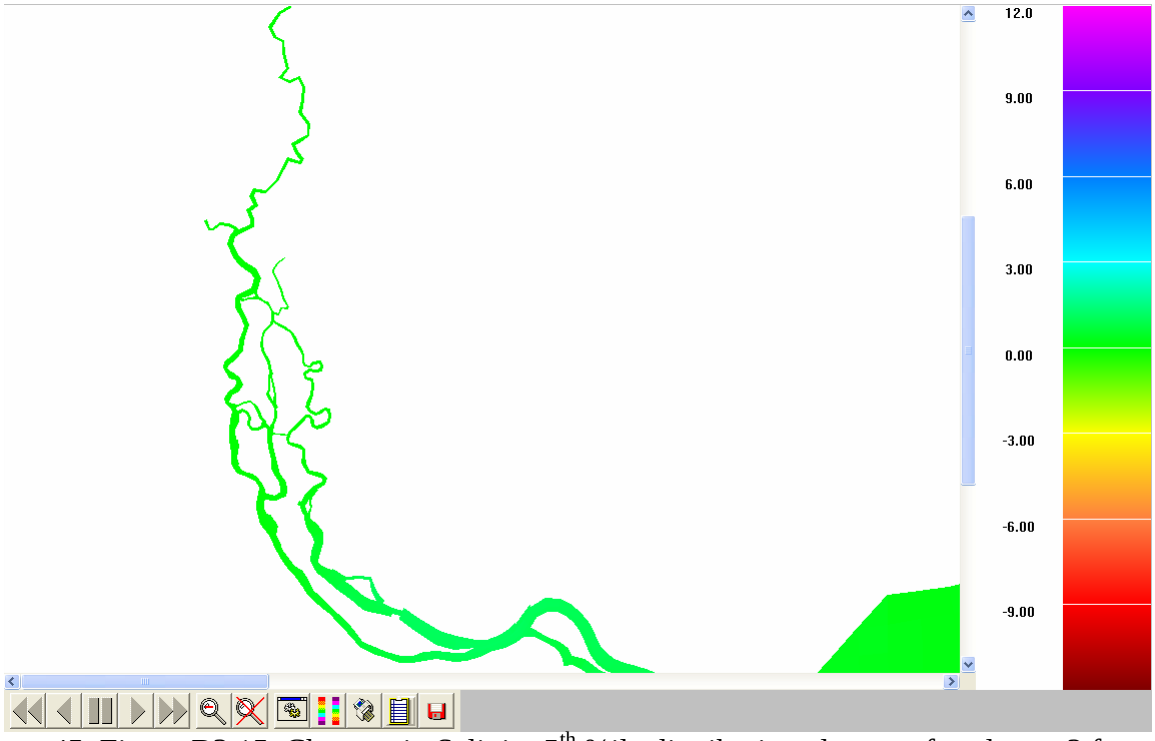
42. Figure B3.12. Changes in D.O. 5th %ile distribution along surface layer: 3 ft deepening



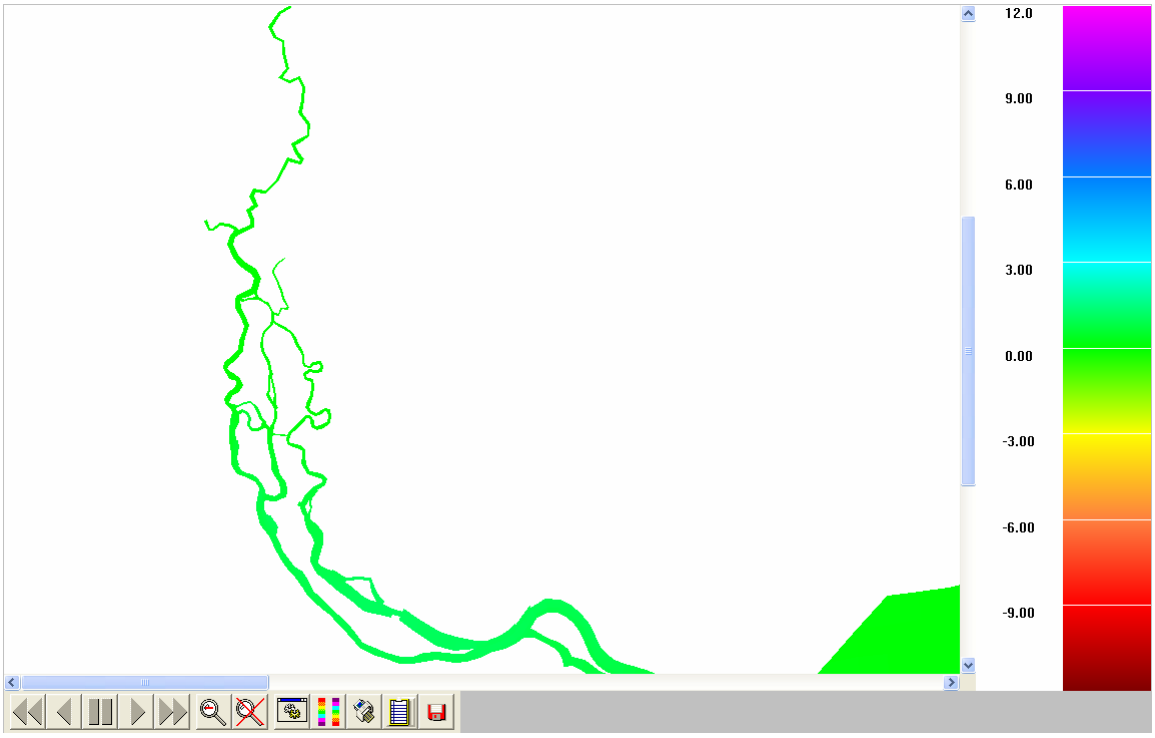
43. Figure B3.13. Changes in D.O. 50th %ile distribution along surface layer: 3 ft deepening



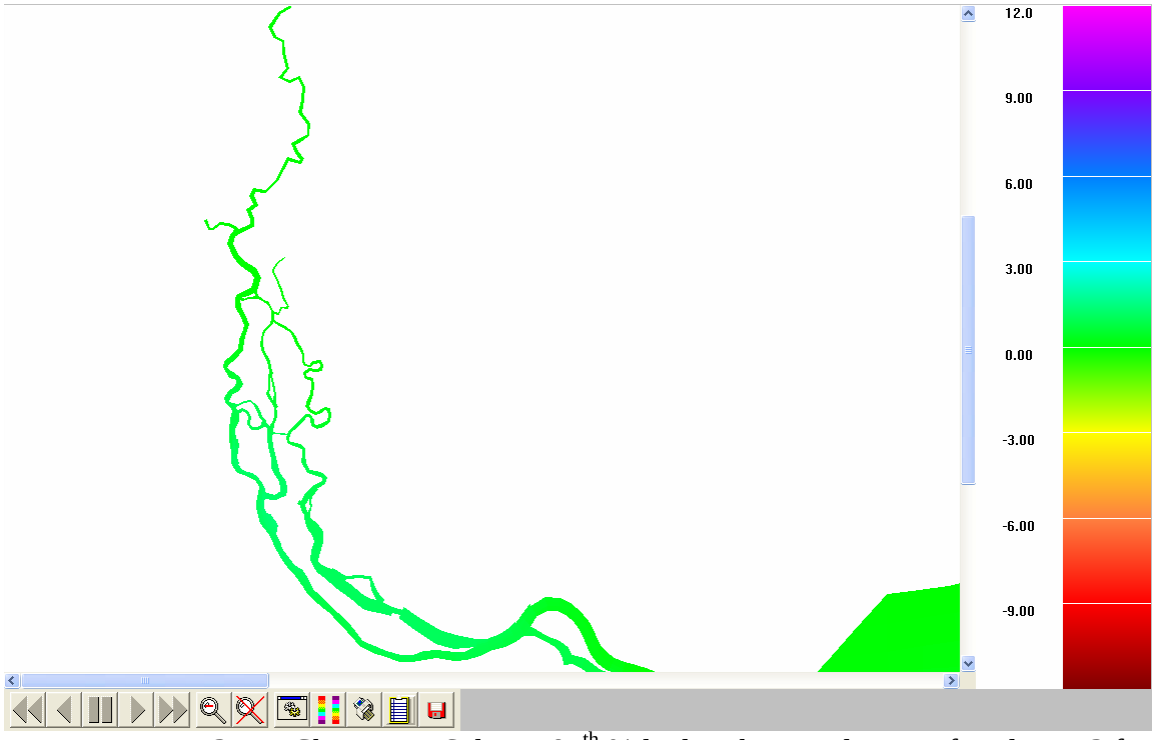
44. Figure B3.14. Changes in D.O. 95th %ile distribution along surface layer: 3 ft deepening



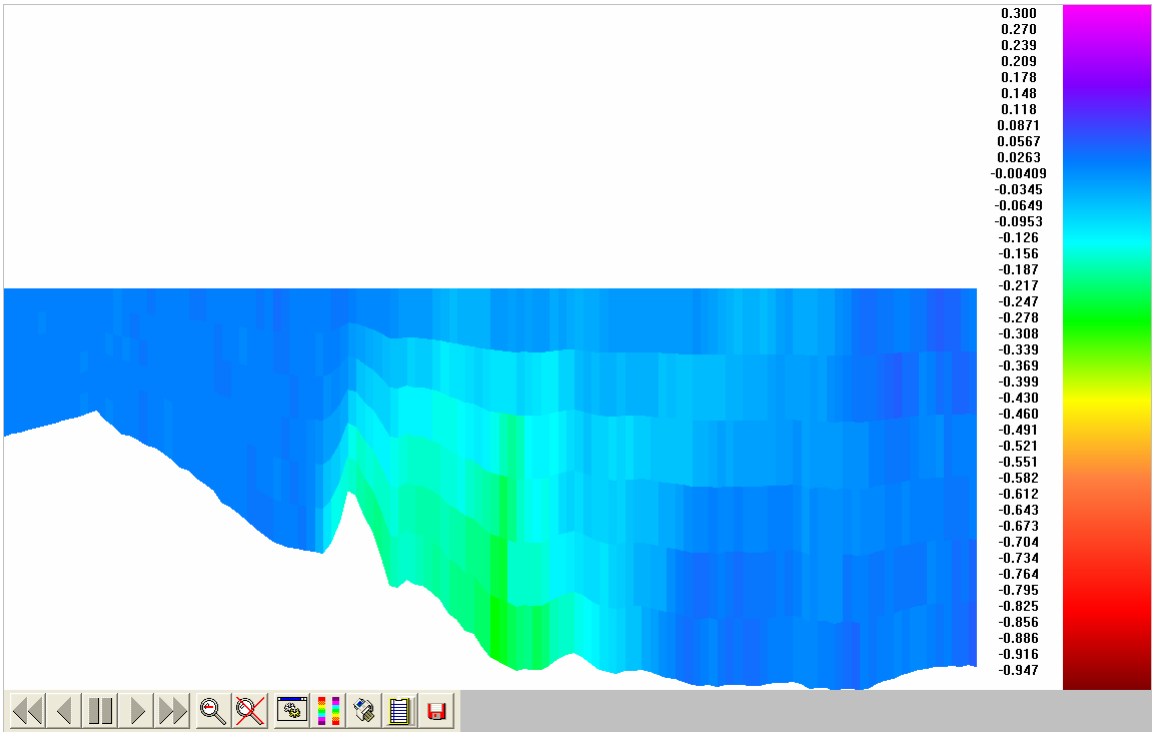
45. Figure B3.15. Changes in Salinity 5th %ile distribution along surface layer: 3 ft deepening



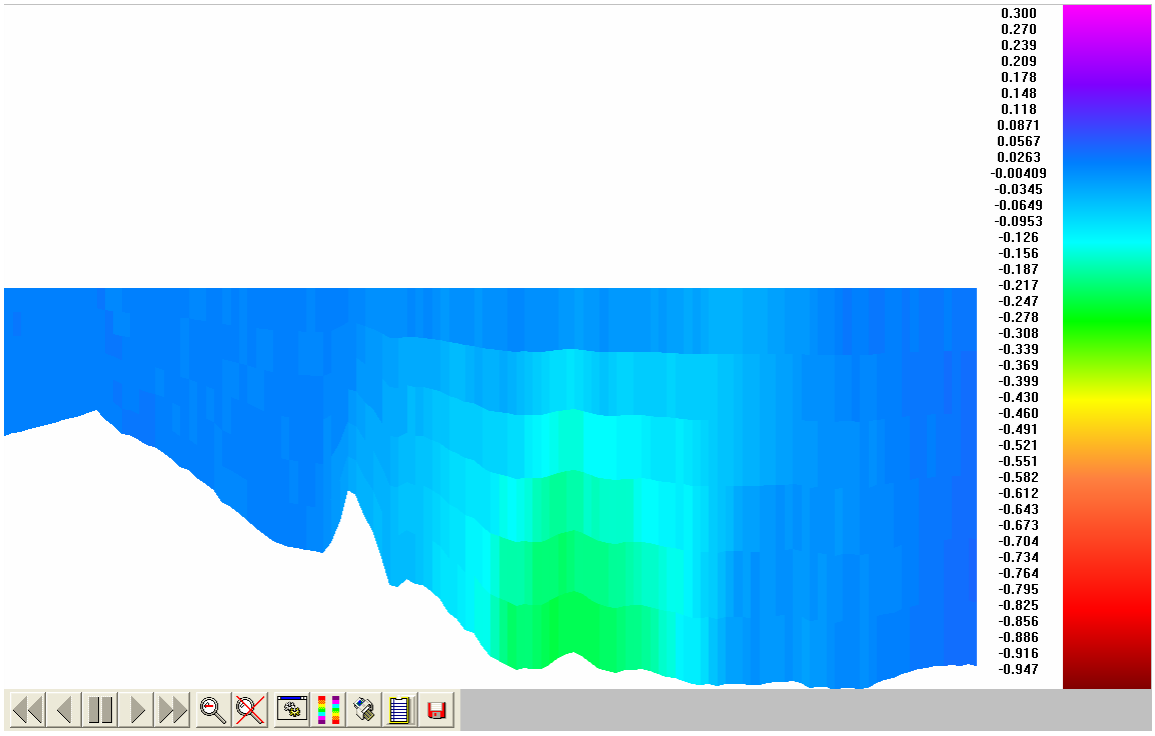
46. Figure B3.16. Changes in Salinity 50th %ile distribution along surface layer: 3 ft deepening



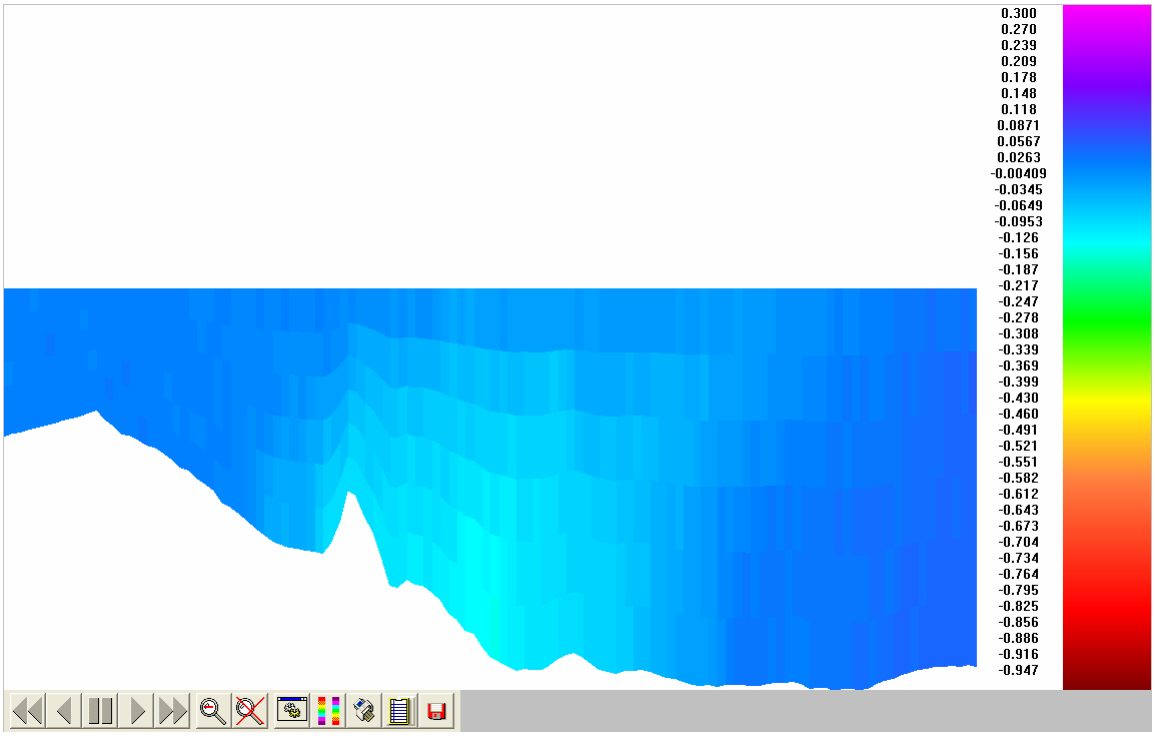
47. Figure B3.17. Changes in Salinity 95th %ile distribution along surface layer: 3 ft deepening



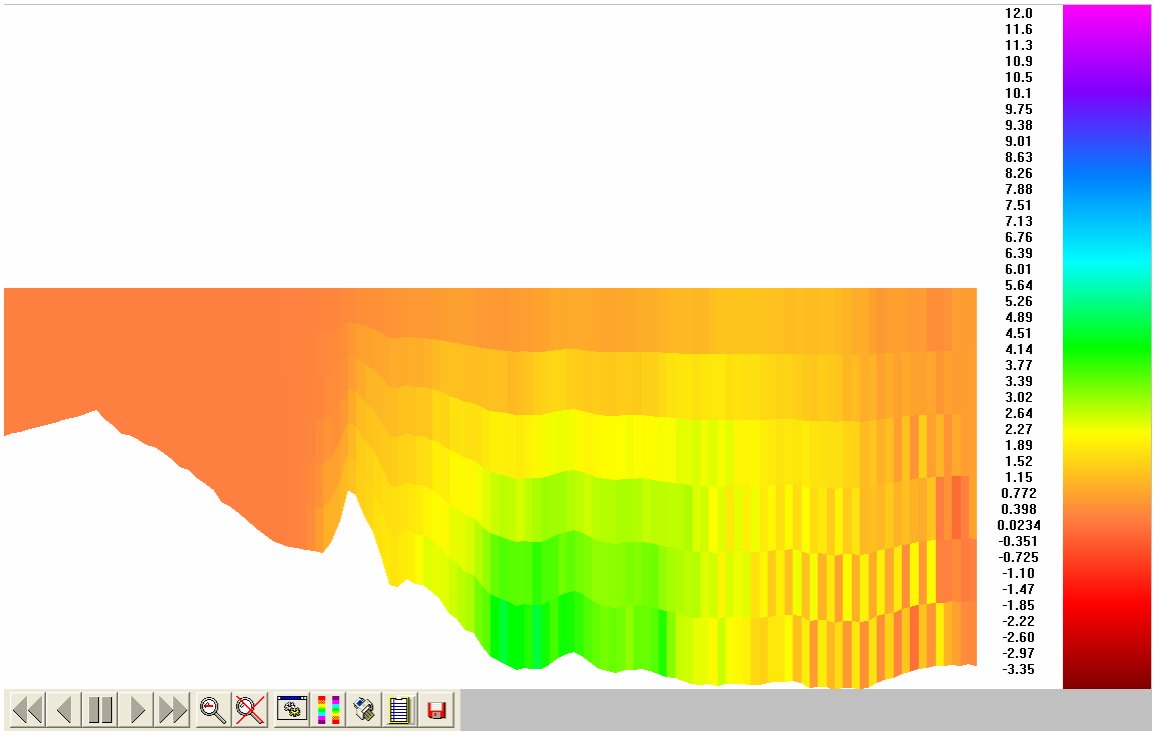
48. Figure B3.18. Snapshot of changes in 1-day averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 3 ft deepening



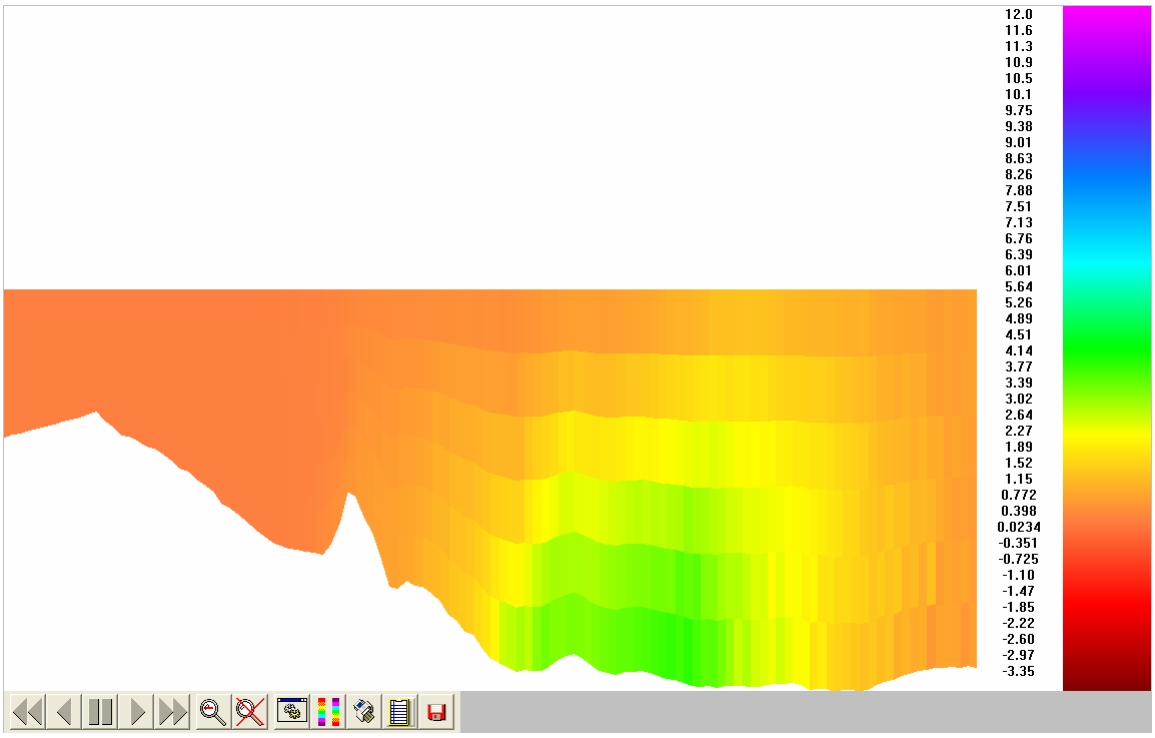
49. Figure B3.19. Snapshot of changes in 7-day averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 3 ft deepening



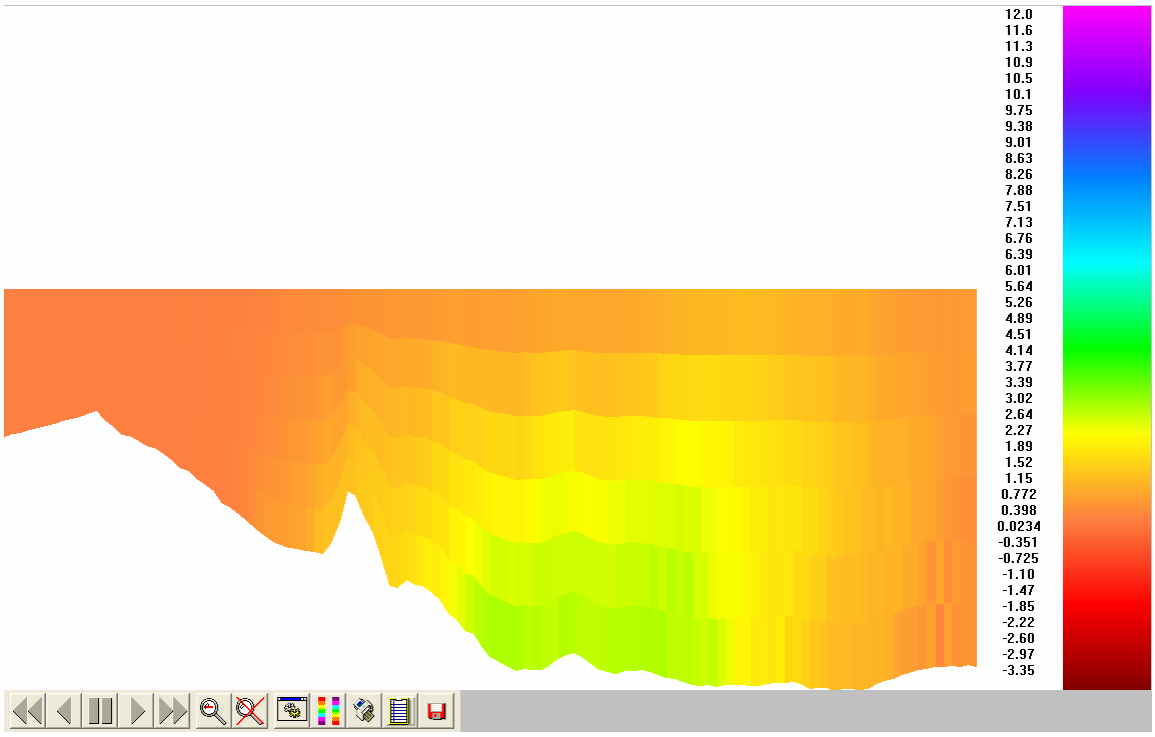
50. Figure B3.20. Snapshot of changes in 30-days averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 3 ft deepening



51. Figure B3.21. Snapshot of changes in 1-day averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 3 ft deepening



52. Figure B3.22. Snapshot of changes in 7-days averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 3 ft deepening



53. Figure B3.23. Snapshot of changes in 30-days averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 3 ft deepening

Appendix B4

SENSITIVITY ANALYSIS #1: 2 ft DEEPENING BATHYMETRY, 2004 POINT SOURCES LOADS, 1997 HYDROLOGICAL AND METEOROLOGICAL CONDITIONS

May 1 – October 30, 1997 Simulation Period

Water Quality Review Group

1. Table B4.1. Dissolved oxygen percentiles distribution in Critical cells

Zone	D.O. Percentile (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.43	3.77	3.91	4.12	4.45	4.92	5.37	5.49	5.66
FR2	3.02	3.28	3.4	3.64	3.99	4.45	5	5.25	5.53
FR3	2.83	3.12	3.21	3.41	3.81	4.26	4.84	5.31	6.15
FR4	2.82	3.1	3.22	3.41	3.81	4.26	4.83	5.39	6.2
FR5	2.95	3.17	3.26	3.5	3.89	4.32	4.85	5.57	6.29
FR6	2.99	3.15	3.26	3.5	3.9	4.38	4.89	5.69	6.32
FR7	3.34	3.7	3.86	4.26	4.78	5.23	5.82	6.38	6.53
FR8	3.41	3.8	4.04	4.55	5.06	5.47	6.02	6.39	6.53
FR9	3.99	4.48	4.82	5.2	5.48	5.83	6.3	6.47	6.59
FR10	3.18	3.5	3.75	4.29	4.89	5.42	5.81	5.97	6.17
FR11	2.91	3.36	3.6	4.06	4.54	5.17	5.69	5.89	6
MR1	3.25	3.42	3.57	3.85	4.23	4.7	5.1	5.68	6.3
MR2	2.82	3.11	3.28	3.65	4.12	4.63	5.04	5.32	6.22
MR3	2.62	2.8	2.93	3.22	3.67	4.34	4.89	5.18	5.94
MR4	2.74	3.01	3.13	3.38	3.69	4.14	4.67	5.03	5.28
MR5	0.85	1.48	1.84	2.48	4.11	5.22	5.67	5.89	6.05
MR6	1.43	2.06	2.42	3.15	4.64	5.44	5.88	6.11	6.72
LBR1	2.82	3.59	3.98	4.18	4.47	4.9	5.34	5.62	5.88
LBR2	2.64	2.94	3.07	3.23	3.51	3.96	4.39	4.84	5.11
LBR3	2.11	2.38	2.53	2.87	3.34	3.93	4.37	4.59	5.02
BR1	2.46	2.69	2.83	3.08	3.46	3.98	4.52	4.78	5.11
BR2	1.76	2.11	2.3	2.61	2.98	3.52	4.08	4.33	4.55
BR3	2.13	2.46	2.62	2.91	3.24	3.77	4.35	4.53	4.75
SCH1	1.75	2.14	2.39	2.82	3.61	4.36	4.88	5.22	5.63
SCH2	3.12	3.4	3.61	3.92	4.21	4.68	5.11	5.3	5.53
SR	3.38	3.47	3.56	3.9	4.22	4.7	5.37	5.85	5.89

2. Table B4.2. Delta of Dissolved Oxygen percentiles distribution in Critical cells: Deepening scenario minus Existing bathymetry scenario

Zone	Delta D.O. Percentile																	
	1%		5%		10%		25%		50%		75%		90%		95%		99%	
	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%
FR1	0.02	0.6	0.03	0.8	0	0.0	-0.01	-0.2	-0.01	-0.2	-0.01	-0.2	0.01	0.2	-0.01	-0.2	0	0.0
FR2	-0.01	-0.3	-0.02	-0.6	0	0.0	-0.01	-0.3	-0.02	-0.5	0	0.0	0.01	0.2	-0.03	-0.6	-0.24	-4.2
FR3	-0.01	-0.4	-0.03	-1.0	-0.04	-1.2	-0.03	-0.9	-0.03	-0.8	-0.02	-0.5	-0.02	-0.4	-0.02	-0.4	-0.03	-0.5
FR4	0	0.0	0.01	0.3	0	0.0	-0.03	-0.9	-0.04	-1.0	-0.05	-1.2	0	0.0	-0.09	-1.6	-0.02	-0.3
FR5	0.04	1.4	0.05	1.6	0	0.0	-0.03	-0.8	-0.05	-1.3	-0.1	-2.3	-0.02	-0.4	-0.23	-4.0	0.06	1.0
FR6	-0.02	-0.7	-0.06	-1.9	-0.1	-3.0	-0.15	-4.1	-0.2	-4.9	-0.31	-6.6	-0.33	-6.3	-0.47	-7.6	0.01	0.2
FR7	-0.11	-3.2	-0.1	-2.6	-0.15	-3.7	-0.18	-4.1	-0.15	-3.0	-0.12	-2.2	-0.08	-1.4	-0.02	-0.3	-0.02	-0.3
FR8	-0.06	-1.7	-0.06	-1.6	-0.08	-1.9	-0.13	-2.8	-0.08	-1.6	-0.04	-0.7	-0.02	-0.3	0	0.0	0	0.0
FR9	-0.36	-8.3	-0.29	-6.1	-0.18	-3.6	-0.07	-1.3	0	0.0	0	0.0	0.02	0.3	-0.02	-0.3	0	0.0
FR10	0.01	0.3	0	0.0	0.01	0.3	0	0.0	0	0.0	0	0.0	0	0.0	0.01	0.2	0.02	0.3
FR11	0.04	1.4	0.01	0.3	0.01	0.3	0	0.0	0.01	0.2	0	0.0	0	0.0	0	0.0	0.01	0.2
MR1	-0.03	-0.9	-0.04	-1.2	-0.04	-1.1	-0.06	-1.5	-0.08	-1.9	-0.1	-2.1	-0.07	-1.4	-0.04	-0.7	-0.02	-0.3
MR2	-0.02	-0.7	-0.02	-0.6	-0.02	-0.6	-0.03	-0.8	-0.06	-1.4	-0.08	-1.7	-0.05	-1.0	-0.05	-0.9	-0.02	-0.3
MR3	-0.06	-2.2	-0.12	-4.1	-0.15	-4.9	-0.24	-6.9	-0.28	-7.1	-0.18	-4.0	-0.04	-0.8	0.01	0.2	0.01	0.2
MR4	-0.01	-0.4	0.01	0.3	-0.01	-0.3	-0.01	-0.3	-0.01	-0.3	-0.01	-0.2	-0.02	-0.4	-0.02	-0.4	0.01	0.2
MR5	-0.05	-5.6	-0.04	-2.6	-0.02	-1.1	-0.01	-0.4	-0.03	-0.7	0.01	0.2	0	0.0	0.01	0.2	0.01	0.2
MR6	0.01	0.7	0.03	1.5	0.03	1.3	0.03	1.0	0.01	0.2	0.01	0.2	0.01	0.2	0.01	0.2	0	0.0
LBR1	-0.06	-2.1	-0.02	-0.6	0.02	0.5	0.01	0.2	0.02	0.4	0.01	0.2	0.01	0.2	0.01	0.2	0.01	0.2
LBR2	-0.48	-15.4	-0.32	-9.8	-0.27	-8.1	-0.24	-6.9	-0.17	-4.6	-0.18	-4.3	-0.13	-2.9	-0.13	-2.6	-0.07	-1.4
LBR3	0.01	0.5	0	0.0	-0.02	-0.8	-0.01	-0.3	0.04	1.2	0.12	3.1	0.06	1.4	0.14	3.1	0.21	4.4
BR1	0.01	0.4	0.01	0.4	0.01	0.4	0	0.0	-0.01	-0.3	0	0.0	0.01	0.2	0	0.0	-0.02	-0.4
BR2	-0.08	-4.3	-0.08	-3.7	-0.09	-3.8	-0.18	-6.5	-0.21	-6.6	-0.2	-5.4	-0.15	-3.5	-0.23	-5.0	-0.45	-9.0
BR3	0.02	0.9	0.03	1.2	0.01	0.4	0.01	0.3	0.01	0.3	0	0.0	0	0.0	0.02	0.4	0.01	0.2
SCH1	0.04	2.3	-0.04	-1.8	0	0.0	0.02	0.7	-0.02	-0.6	-0.03	-0.7	-0.03	-0.6	-0.04	-0.8	-0.01	-0.2
SCH2	-0.02	-0.6	-0.02	-0.6	-0.02	-0.6	-0.03	-0.8	-0.02	-0.5	0	0.0	0	0.0	-0.02	-0.4	-0.03	-0.5
SR	0	0.0	0.01	0.3	0	0.0	0	0.0	0	0.0	0.01	0.2	0	0.0	0	0.0	0	0.0

3. Table B4.3. Dissolved oxygen percentiles distribution in Zones of Savannah Estuary

Zone Name	D.O. Concentration Percentiles (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.80	4.09	4.22	4.41	4.70	5.19	5.59	5.70	5.81
FR2	3.36	3.61	3.78	4.00	4.31	4.77	5.26	5.43	5.58
FR3	3.03	3.27	3.40	3.62	3.97	4.41	5.00	5.25	5.78
FR4	2.88	3.16	3.26	3.44	3.84	4.25	4.88	5.30	6.23
FR5	2.96	3.18	3.28	3.47	3.87	4.32	4.84	5.52	6.28
FR6	3.12	3.20	3.39	3.61	4.02	4.49	4.89	5.85	6.33
FR7	3.29	3.59	3.75	4.15	4.73	5.19	5.69	6.33	6.44
FR8	3.50	3.86	4.10	4.54	5.04	5.43	5.90	6.39	6.52
FR9	4.03	4.46	4.75	5.15	5.45	5.80	6.24	6.47	6.59
FR10	4.67	4.87	4.98	5.19	5.44	5.80	6.15	6.30	6.47
FR11	3.63	3.83	4.01	4.26	4.59	5.00	5.55	5.92	6.01
MR1	3.30	3.49	3.64	3.88	4.25	4.70	5.12	5.73	6.29
MR2	3.01	3.26	3.41	3.74	4.17	4.63	5.04	5.42	6.23
MR3	2.76	2.95	3.09	3.41	3.86	4.40	4.87	5.10	5.83
MR4	3.40	3.52	3.63	3.82	4.07	4.50	4.93	5.27	5.48
MR5	1.45	1.99	2.31	2.94	4.48	5.16	5.61	5.85	5.99
MR6	1.47	2.09	2.44	3.19	4.69	5.39	5.82	6.03	6.58
LBR1	3.48	3.62	3.69	3.84	4.02	4.50	4.83	5.30	5.46
LBR2	2.69	2.90	3.01	3.20	3.48	3.93	4.33	4.78	5.03
LBR3	2.52	2.64	2.75	2.93	3.16	3.67	4.19	4.39	4.55
BR1	2.77	2.96	3.04	3.25	3.61	4.11	4.62	4.95	5.26
BR2	2.39	2.63	2.75	2.95	3.27	3.80	4.39	4.58	4.91
BR3	2.47	2.66	2.75	2.94	3.19	3.75	4.31	4.42	4.57
SCh1	2.81	3.09	3.33	3.57	3.86	4.39	4.92	5.10	5.28
SCh2	3.30	3.52	3.77	4.02	4.29	4.77	5.20	5.38	5.54
SR	3.70	3.76	3.81	4.14	4.44	4.90	5.54	5.97	5.99

4. Table B4.4. Delta of Dissolved Oxygen percentiles distribution in Zones of Savannah Estuary: Deepening scenario minus Existing bathymetry scenario

Zone	Project - Baseline Difference (mg/l)									Project - Baseline Relative Difference (%)								
Name	1%	5%	10%	25%	50%	75%	90%	95%	99%	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	0.05	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.03	1.3	0.5	0.0	-0.1	0.0	0.0	0.3	0.4	0.5
FR2	0.01	0.03	0.02	0.00	0.00	0.00	0.02	-0.01	-0.02	0.2	0.7	0.4	0.0	0.0	0.0	0.3	-0.2	-0.3
FR3	0.02	-0.01	0.00	0.01	-0.01	0.02	0.03	-0.02	-0.26	0.6	-0.3	0.0	0.3	-0.3	0.4	0.5	-0.5	-4.2
FR4	-0.01	-0.01	-0.01	-0.02	-0.03	-0.06	0.02	-0.09	-0.02	-0.3	-0.2	-0.4	-0.5	-0.8	-1.5	0.4	-1.7	-0.4
FR5	-0.01	0.01	-0.03	-0.07	-0.07	-0.11	-0.03	-0.22	-0.02	-0.4	0.2	-0.9	-2.0	-1.9	-2.4	-0.6	-3.8	-0.3
FR6	-0.01	-0.03	-0.05	-0.07	-0.10	-0.16	-0.18	-0.22	-0.01	-0.3	-0.9	-1.5	-2.0	-2.3	-3.5	-3.6	-3.7	-0.2
FR7	-0.04	-0.08	-0.11	-0.15	-0.16	-0.10	-0.07	-0.02	0.00	-1.2	-2.3	-2.7	-3.5	-3.2	-1.9	-1.3	-0.4	0.0
FR8	-0.10	-0.13	-0.15	-0.17	-0.12	-0.09	-0.07	0.00	-0.01	-2.8	-3.1	-3.4	-3.6	-2.4	-1.6	-1.1	0.0	-0.1
FR9	-0.17	-0.18	-0.17	-0.10	-0.04	-0.05	-0.02	0.00	-0.01	-4.0	-3.9	-3.4	-1.8	-0.8	-0.9	-0.4	0.0	-0.1
FR10	-0.01	0.00	-0.01	-0.01	0.00	0.00	-0.01	0.00	0.00	-0.2	-0.1	-0.1	-0.2	-0.1	-0.1	-0.1	0.0	0.1
FR11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
MR1	-0.04	-0.05	-0.06	-0.07	-0.09	-0.11	-0.07	-0.06	-0.03	-1.1	-1.4	-1.6	-1.8	-2.1	-2.2	-1.3	-1.1	-0.5
MR2	-0.03	-0.03	-0.04	-0.05	-0.08	-0.09	-0.08	-0.03	-0.04	-0.9	-1.0	-1.1	-1.3	-1.8	-1.8	-1.6	-0.5	-0.6
MR3	0.00	0.00	0.00	-0.02	-0.04	-0.05	-0.04	-0.04	0.00	-0.1	0.0	0.0	-0.5	-1.0	-1.0	-0.8	-0.7	0.0
MR4	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.2	0.1	0.2	0.3	0.2	0.2	0.0	-0.1	-0.1
MR5	0.01	0.01	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.3	0.8	1.2	0.9	0.1	0.1	0.0	0.0	0.1
MR6	0.00	0.03	0.04	0.02	0.00	0.01	0.01	0.00	-0.01	0.1	1.3	1.6	0.6	0.1	0.1	0.2	0.0	-0.2
LBR1	0.01	0.01	0.01	0.02	0.01	0.01	0.00	0.01	0.02	0.3	0.2	0.3	0.4	0.4	0.3	0.0	0.1	0.3
LBR2	-0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01	-0.3	0.0	0.1	0.2	0.3	0.1	0.0	0.1	0.1
LBR3	0.04	0.05	0.04	0.05	0.04	0.04	0.03	0.00	0.00	1.6	1.8	1.4	1.7	1.4	1.2	0.7	0.0	-0.1
BR1	0.00	0.00	0.00	-0.01	-0.01	-0.01	0.01	-0.02	-0.03	0.1	0.1	-0.1	-0.3	-0.2	-0.2	0.2	-0.5	-0.5
BR2	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.6	0.1	0.1	0.2	0.2	0.1	0.3	0.2	-0.1
BR3	0.03	0.03	0.02	0.02	0.02	0.00	0.02	0.02	0.04	1.3	1.1	0.6	0.7	0.6	0.0	0.5	0.4	0.9
SCh1	0.04	0.02	-0.02	-0.01	0.01	0.01	-0.01	0.01	0.04	1.6	0.5	-0.5	-0.3	0.2	0.3	-0.1	0.2	0.7
SCh2	0.02	0.01	-0.01	-0.01	-0.01	0.00	0.00	-0.01	0.00	0.5	0.2	-0.2	-0.2	-0.2	0.0	0.1	-0.1	0.0
SR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0

5. Table B4.5. Percentage of the volume of waters with violation of Dissolved Oxygen standards for Zones of Savannah Estuary within the period of May 1 – October 30, 1997: Deepening (Project) and Existing (Baseline) bathymetry

Zones	D.O. STANDARDS														
	1-Day Average			7-Day Average			30-Day Average			GA MINIMUM D.O.			SC MINIMUM D.O.		
	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B
FR1	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0
FR2	0	0	0	0	0	0	0	0	0	0	0	0	17	17	0
FR3	0	0	0	0	0	0	3	3	0	0	0	0	N/A	N/A	N/A
FR4	0	0	0	0	0	0	5	6	1	0	0	0	N/A	N/A	N/A
FR5	0	0	0	0	0	0	3	4	1	0	0	0	N/A	N/A	N/A
FR6	0	0	0	0	0	0	1	2	1	0	0	0	N/A	N/A	N/A
FR7	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR8	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR9	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR10	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR11	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
MR1	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
MR2	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
MR3	0	0	0	0	0	0	3	4	1	1	1	0	N/A	N/A	N/A
MR4	0	0	0	0	0	0	1	1	0	0	0	0	N/A	N/A	N/A
MR5	0	0	0	0	0	0	2	1	-1	4	4	0	9	9	0
MR6	0	0	0	0	0	0	0	0	0	2	2	0	7	7	0
LBR1	0	0	0	0	0	0	1	1	0	0	0	0	11	11	0
LBR2	0	0	0	2	1	-1	11	11	0	3	3	0	25	25	0
LBR3	0	0	0	6	6	0	21	21	0	8	7	-1	36	37	1
BR1	0	0	0	1	2	1	18	19	1	2	2	0	50	51	1
BR2	0	0	0	6	6	0	36	36	0	7	7	0	60	60	0
BR3	0	0	0	9	8	-1	35	36	1	11	10	-1	57	58	1
SCh1	0	0	0	2	2	0	6	6	0	3	3	0	N/A	N/A	N/A
SCh2	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
SR	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0

26. Table B4.6. Percentage of water volumes with salinity in %iles within the period of May 1 – October 30, 1997

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	21.4	7.3	4.8	6.5	4.5	4.3	10.6	5.7	95.7
10	25.3	11	9.2	10.4	9.1	8.6	10.6	10.9	95.7
25	37.3	22.9	23	23.2	23.1	22.1	25.1	22.8	95.7
50	57.9	44.5	47.1	47.1	47.6	46.1	51.9	44.1	95.7
75	79.7	69.8	72.8	72.8	73.3	72.8	74.8	69.9	95.7
90	91.3	87.4	88.9	89	89.1	89.3	89	87.7	95.7
95	95.5	93.6	94.4	94.5	94.5	94.7	94.4	93.7	95.7
Total Volume 100*km3:	32274.8	653.4	4771.5	24.1	39	135.5	9.9	9.4	43.6

27. Table B4.7. Percentage of water volumes with D.O. in %iles within the period of May 1 – October 30, 1997

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	5.3	5.1	5	5.6	5.5	4.8	5.5	5.4	5.9
10	10.6	10	9.9	11.2	10.9	9.7	11	10.8	11.2
25	26.2	24.4	25	27.5	26.4	24.4	26.7	26.1	26.5
50	52	49.1	50.1	53.3	51.5	49.6	50.5	50.8	51.1
75	76.7	74.5	75.4	76.7	76	74.9	75.8	75.9	75.8
90	90.5	89.8	90.2	90.4	90.3	89.8	90.1	90.3	90.3
95	95.2	94.7	95	95.5	95.3	94.9	95.1	95.3	95.2
Total Volume 100*km3:	32274.8	653.4	4771.5	24.1	39	135.5	9.9	9.4	43.6

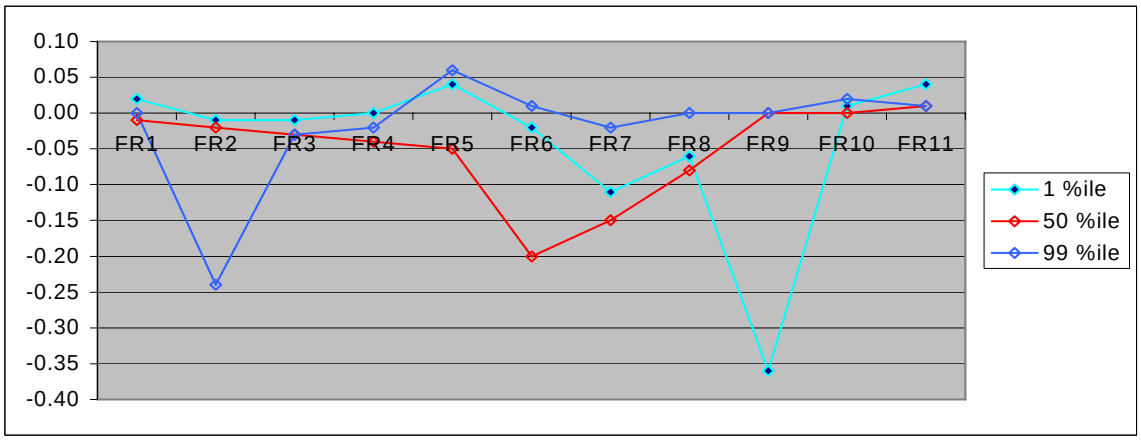
28. Table B4.8. Water volumes in Upper Harbor in increments of 1^{o} C of water temperature within the period of May 1 – October 30, 1997

Temperature C^{o}	Total Volume %
17	0.12
18	0.46
19	1.29
20	4.41
21	12.94
22	17.7
23	22.35
24	32.54
25	42.91
26	50.88
27	61.86
28	81.47
29	93.9
30	99.8
31	100

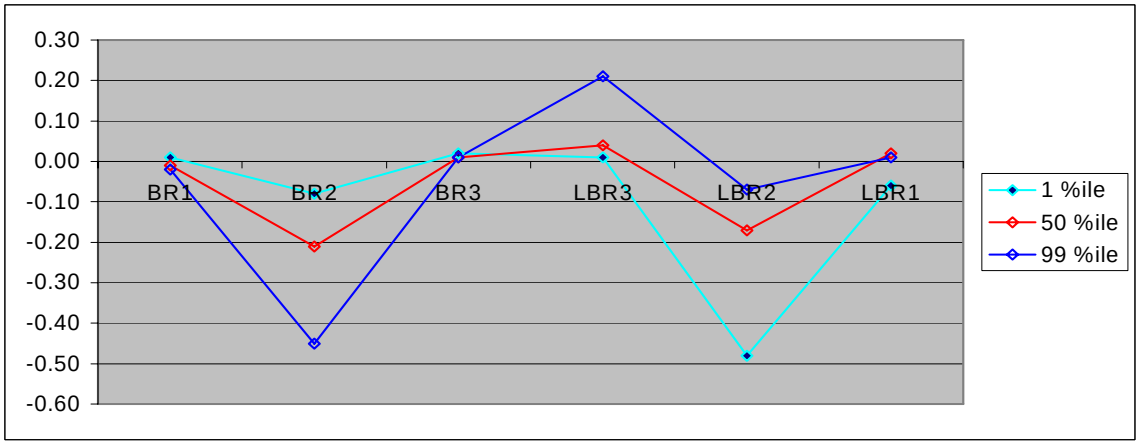
29. Table B4.9. Water volumes in Upper Harbor in increments of 0.1 mg/l of D.O. within the period of May 1 – October 30, 1997
(See file: Postprocessor Output\S12\97-S12_DO Increment Volume)

30. Table B4.10. Percentage of water volumes corresponding to 1-, 7-, and 30-days averages of D.O. depth-averaged concentrations in Upper Harbor within the period of May 1 – October 30, 1997
(See file: Postprocessor Output\S12\97-S12_volume DO in averages)

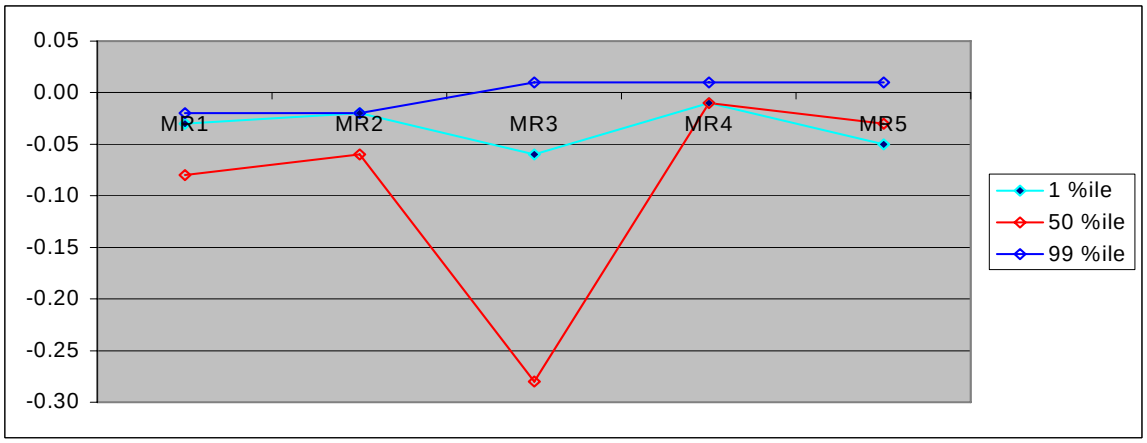
Front River



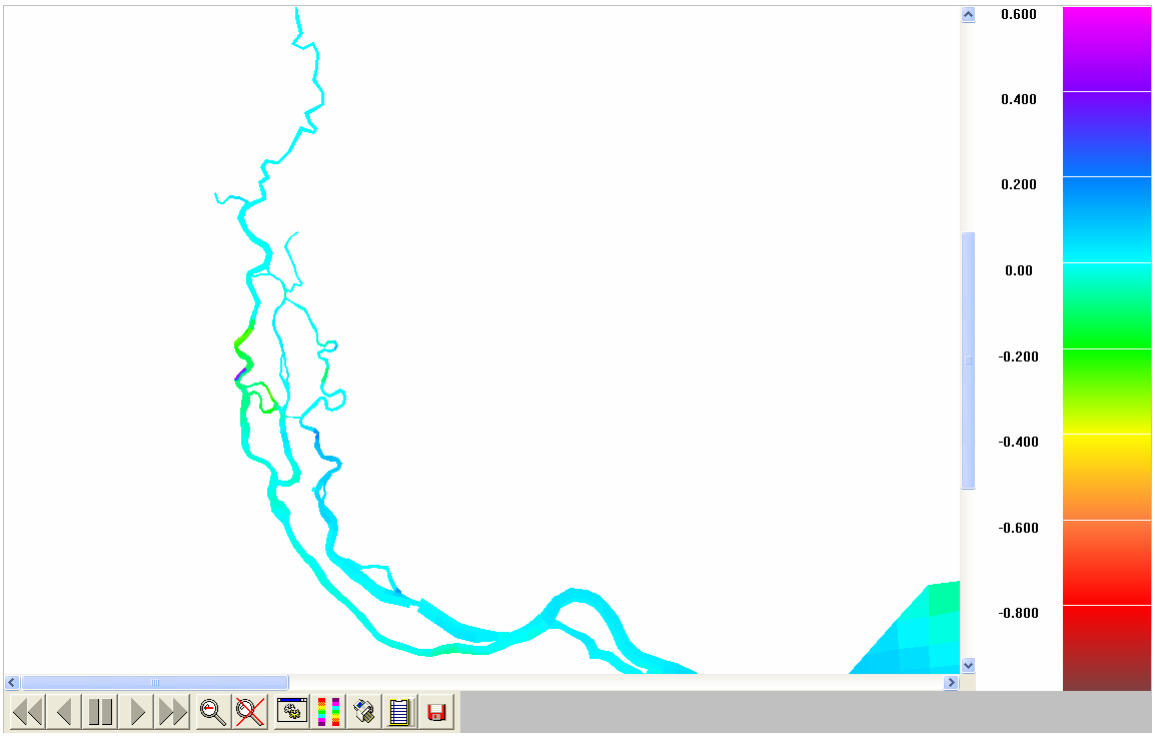
Back and Little Back Rivers



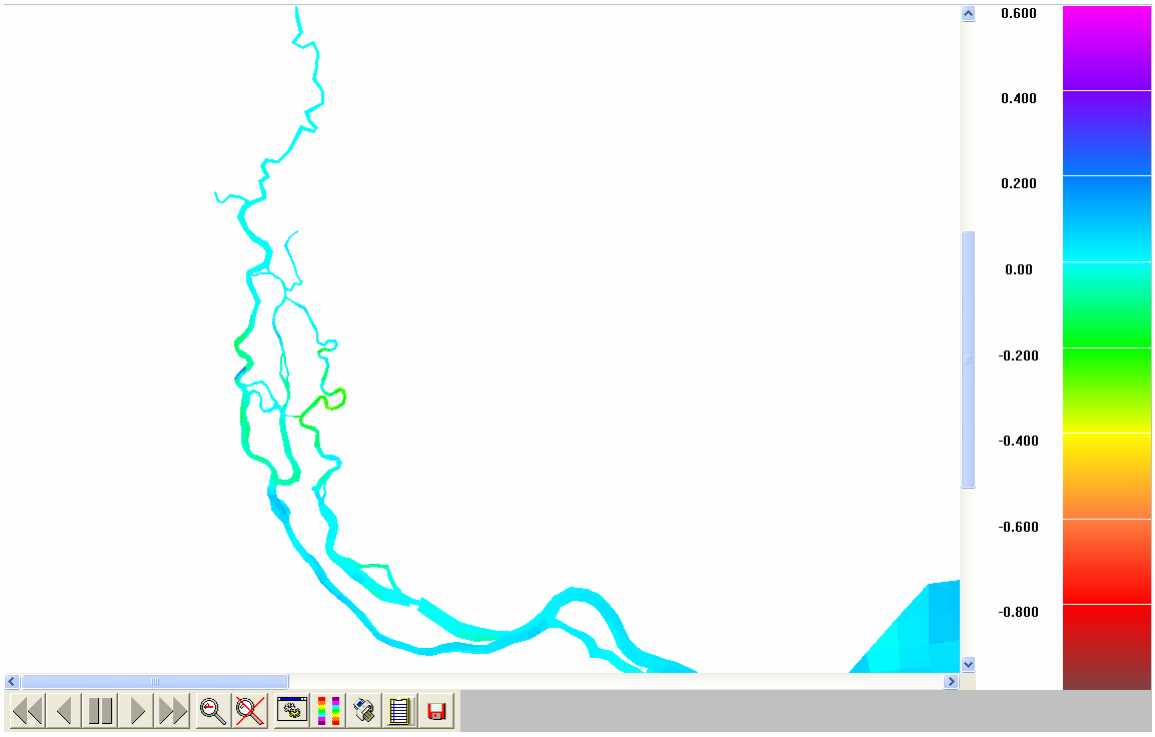
Middle River



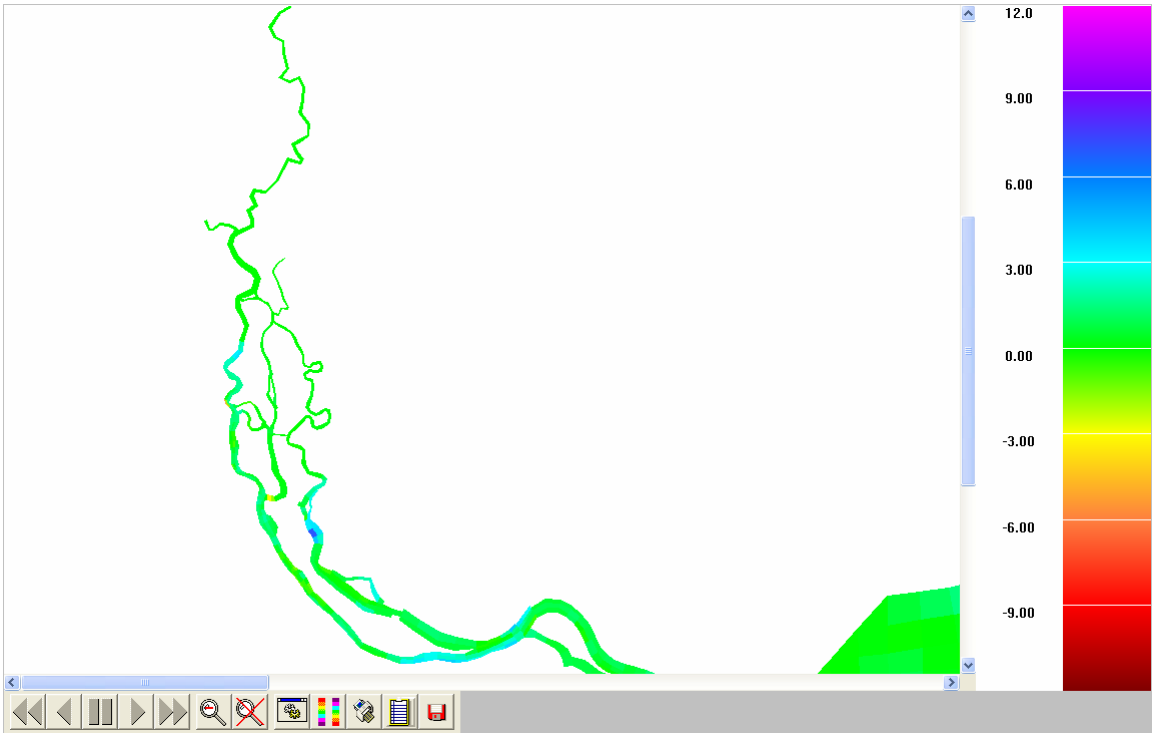
31. Figure B4.1. Changes in longitudinal profile of Dissolved Oxygen (mg/l) distribution along Critical cells of Savannah Estuary: 2 ft deepening



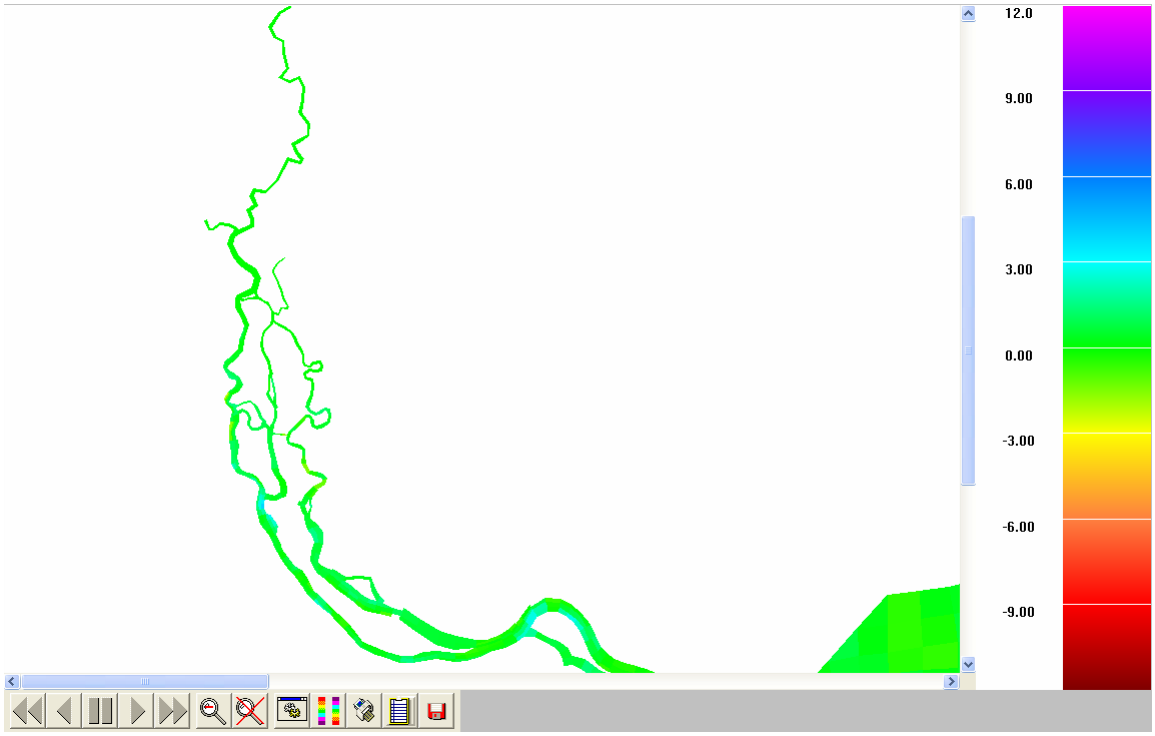
32. Figure B4.2. Changes in minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1997: 2 ft deepening



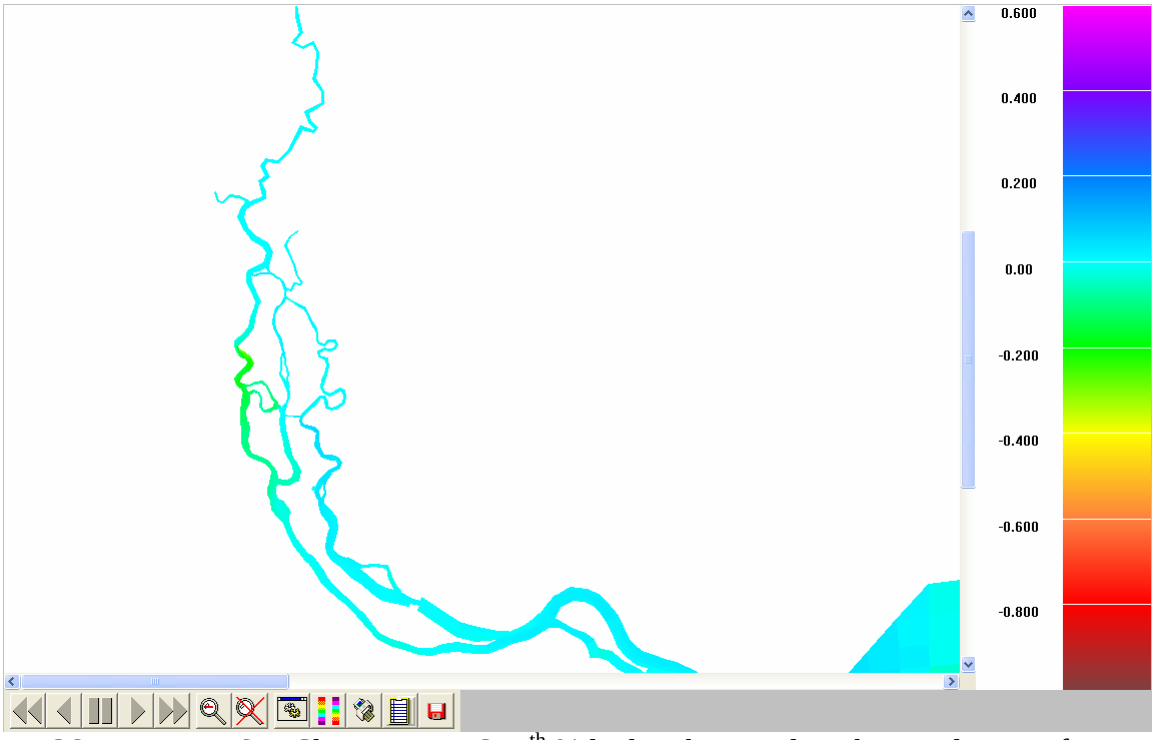
33. Figure B4.3. Changes in minimum D.O. distribution along surface layer within the analyzed period of May 1 - October 30, 1997: 2 ft deepening



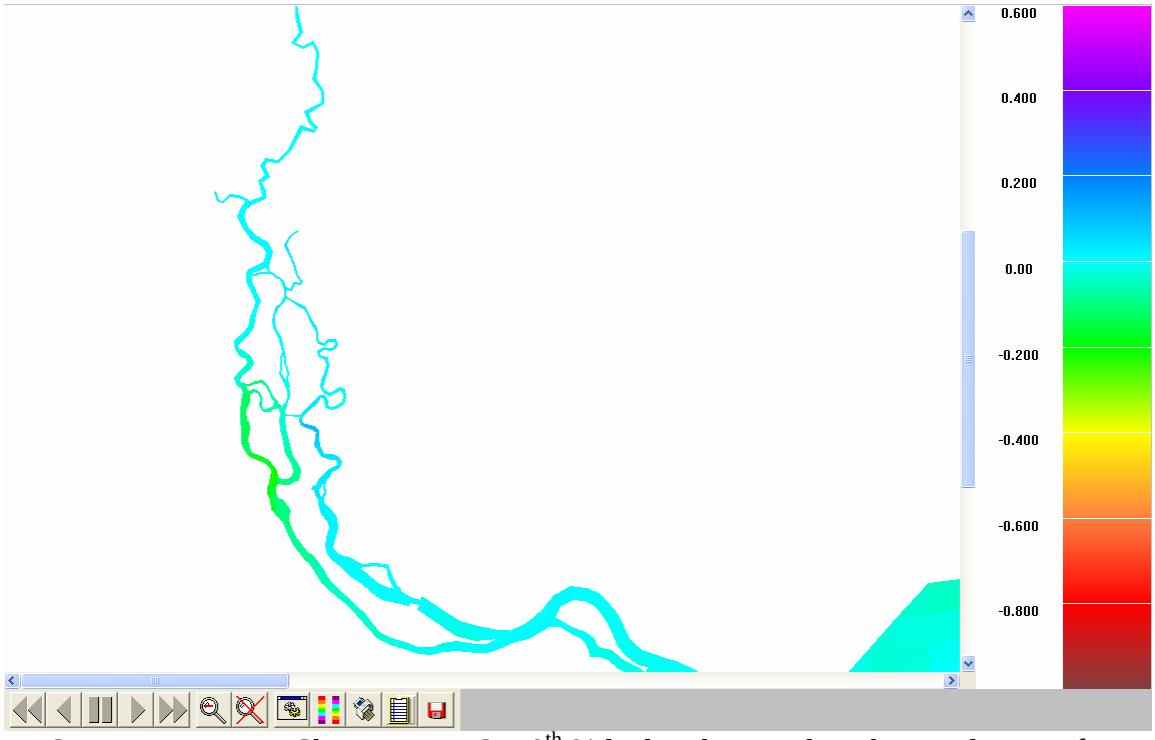
34. Figure B4.4. Changes in Salinity corresponded to Minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1997: 2 ft deepening



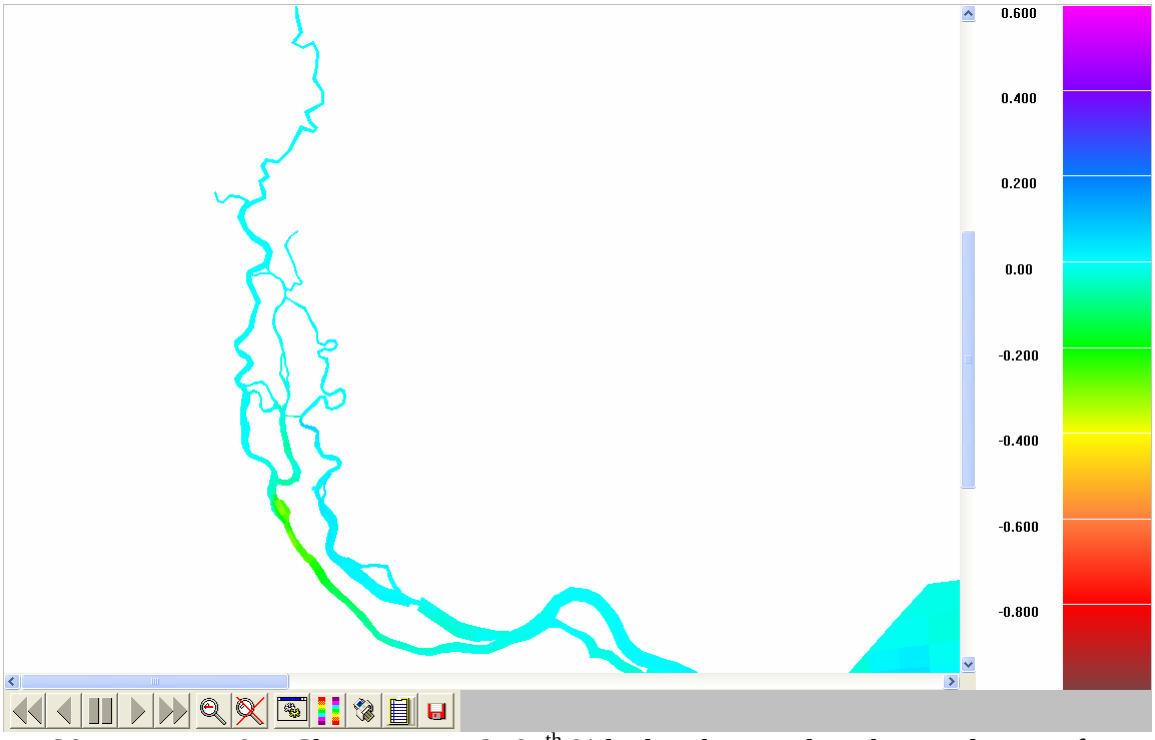
35. Figure B4.5. Changes in Salinity corresponded to Minimum D.O. distribution along Surface layer within the analyzed period of May 1 - October 30, 1997: 2 ft deepening



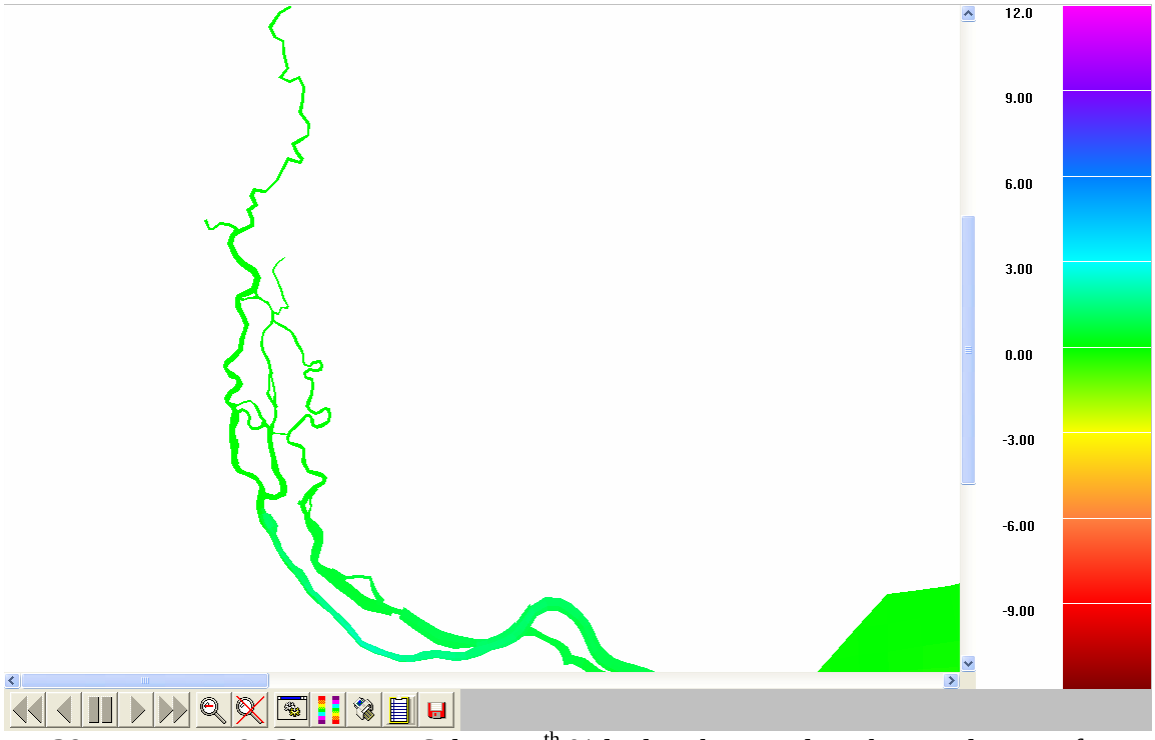
36. Figure B4.6. Changes in D.O. 5th %ile distribution along bottom layer: 2 ft deepening



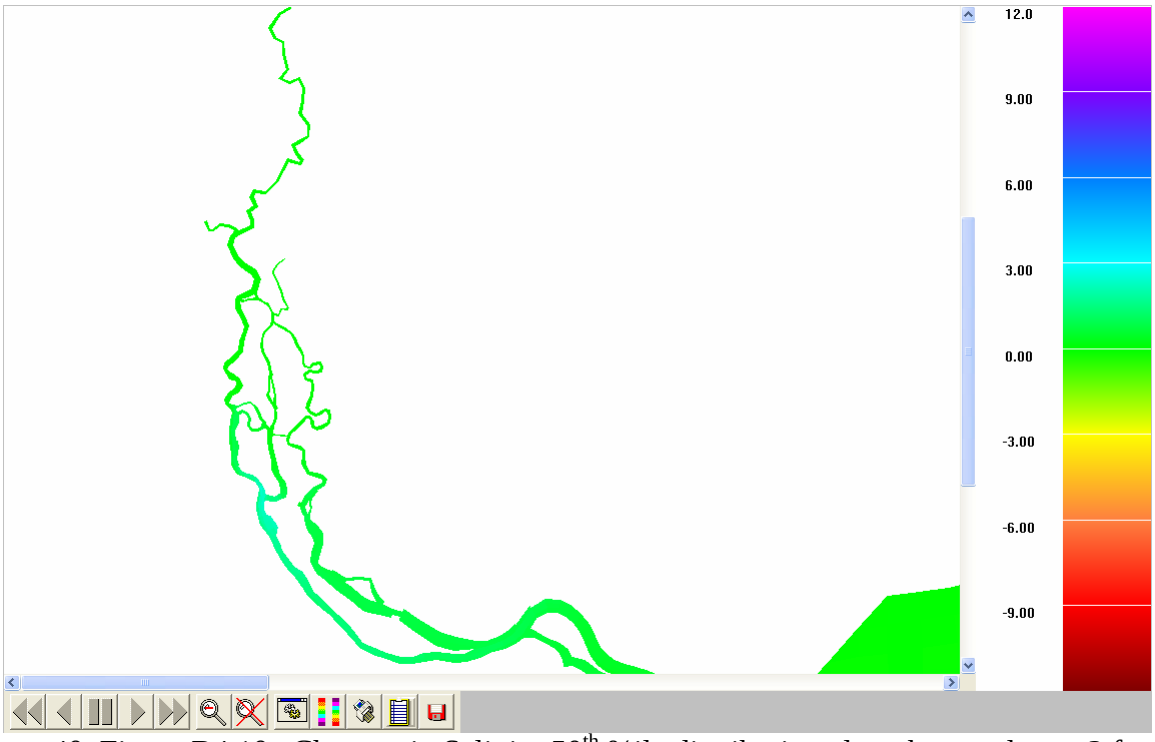
37. Figure B4.7. Changes in D.O. 50th %ile distribution along bottom layer: 2 ft deepening



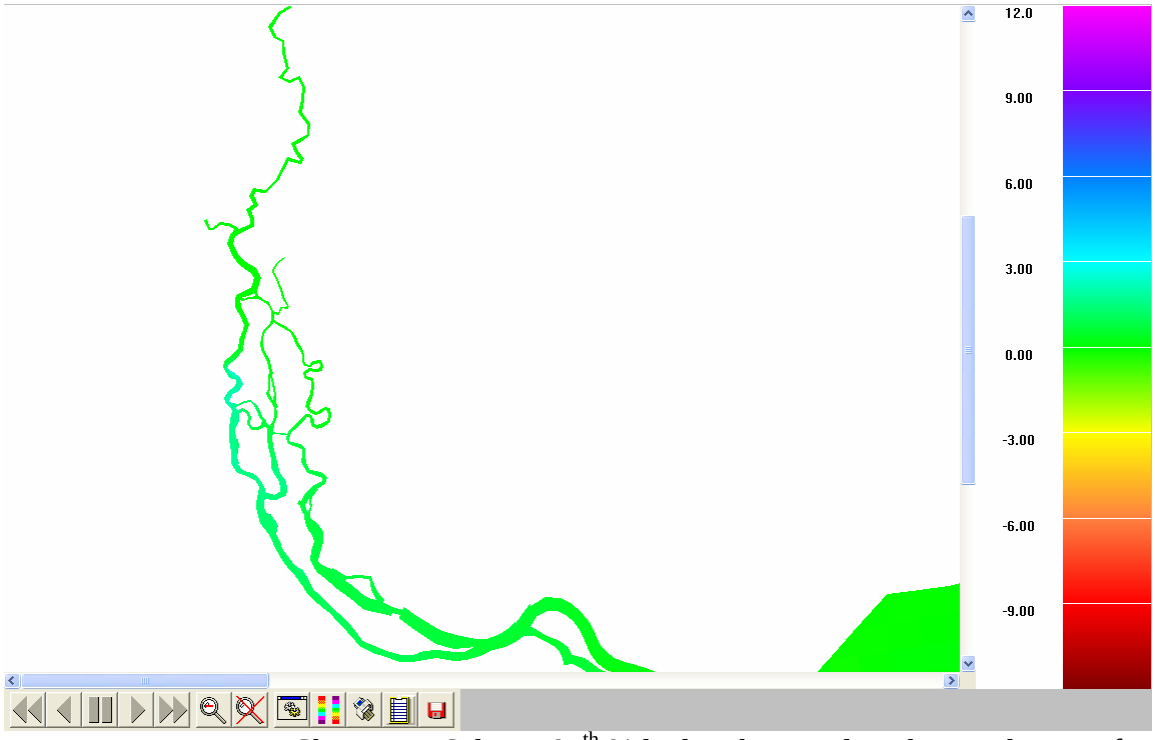
38. Figure B4.8. Changes in D.O. 95th %ile distribution along bottom layer: 2 ft deepening



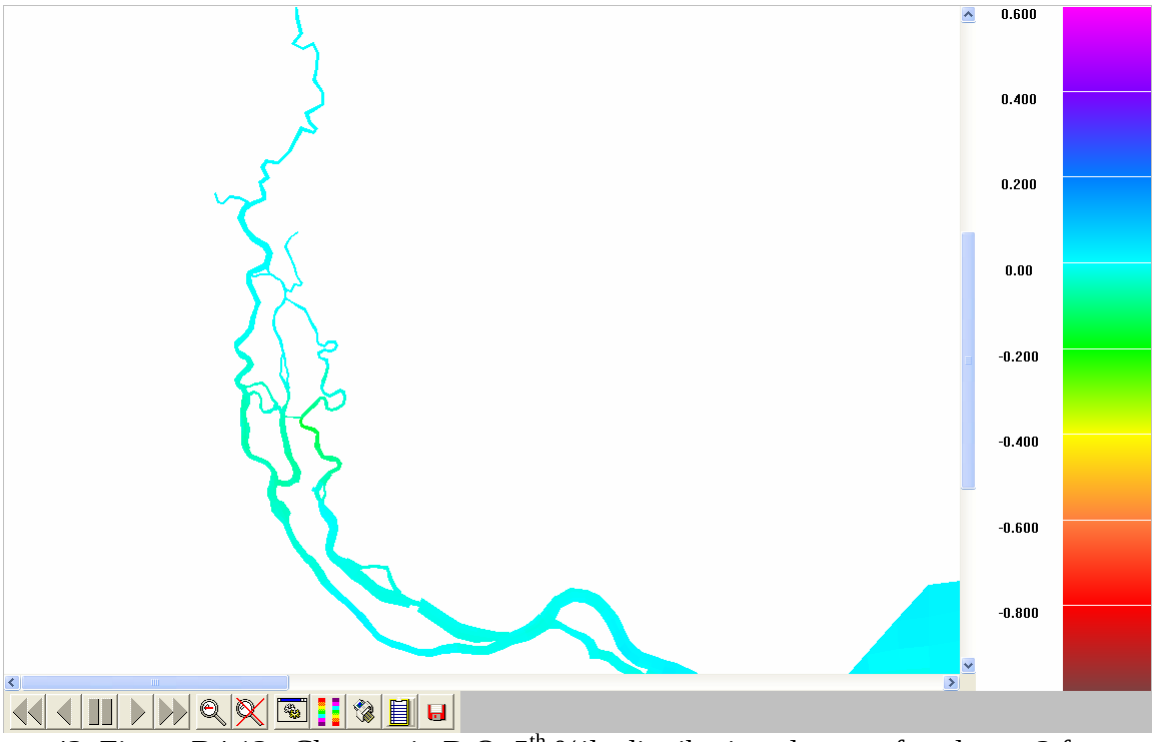
39. Figure B4.9. Changes in Salinity 5th %ile distribution along bottom layer: 2 ft deepening



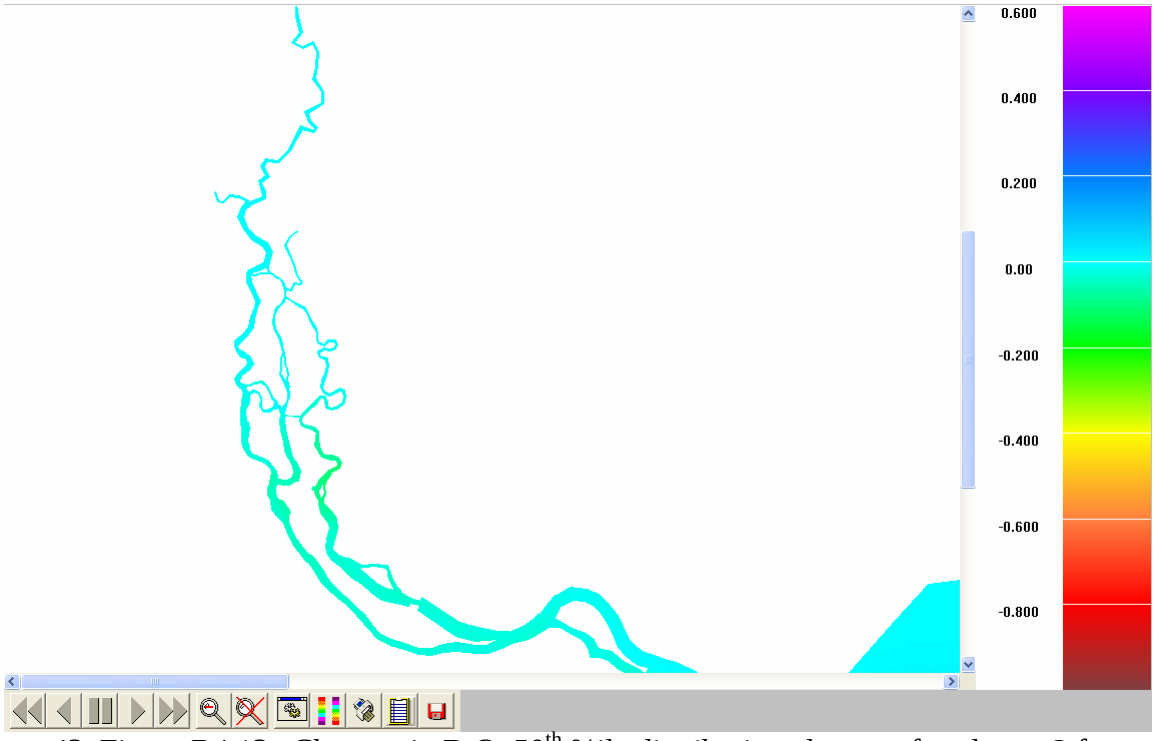
40. Figure B4.10. Changes in Salinity 50th %ile distribution along bottom layer: 2 ft deepening



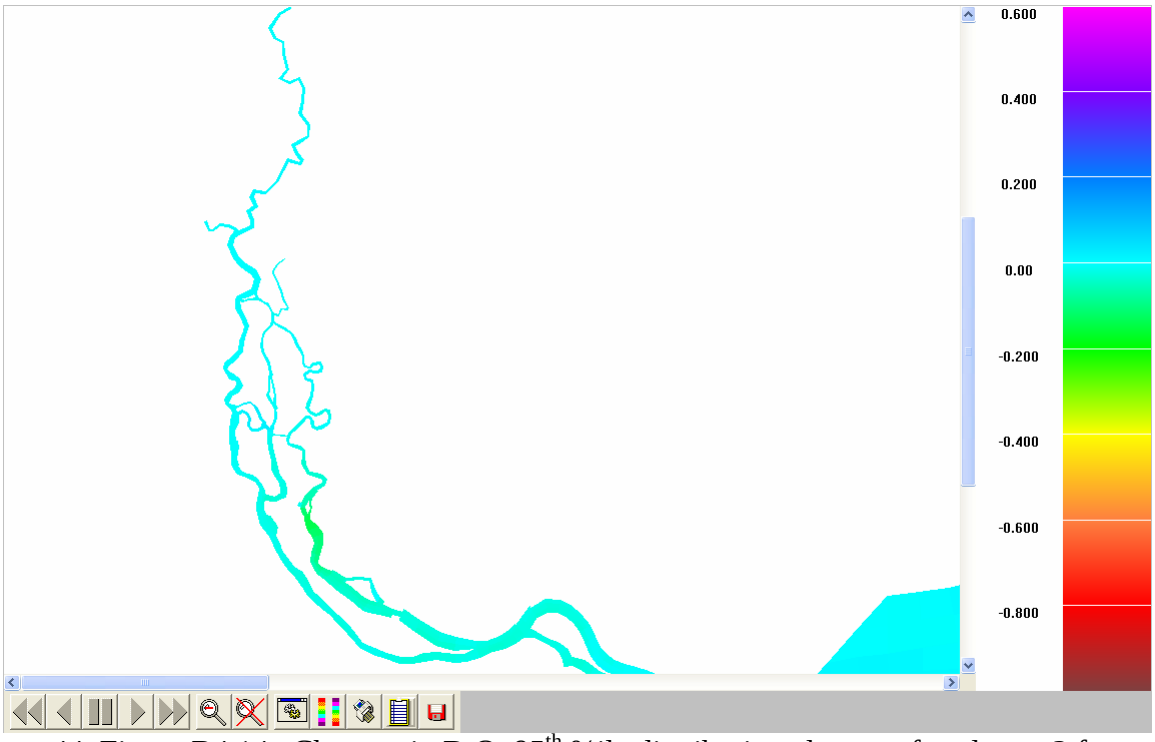
41. Figure B4.11. Changes in Salinity 95th %ile distribution along bottom layer: 2 ft deepening



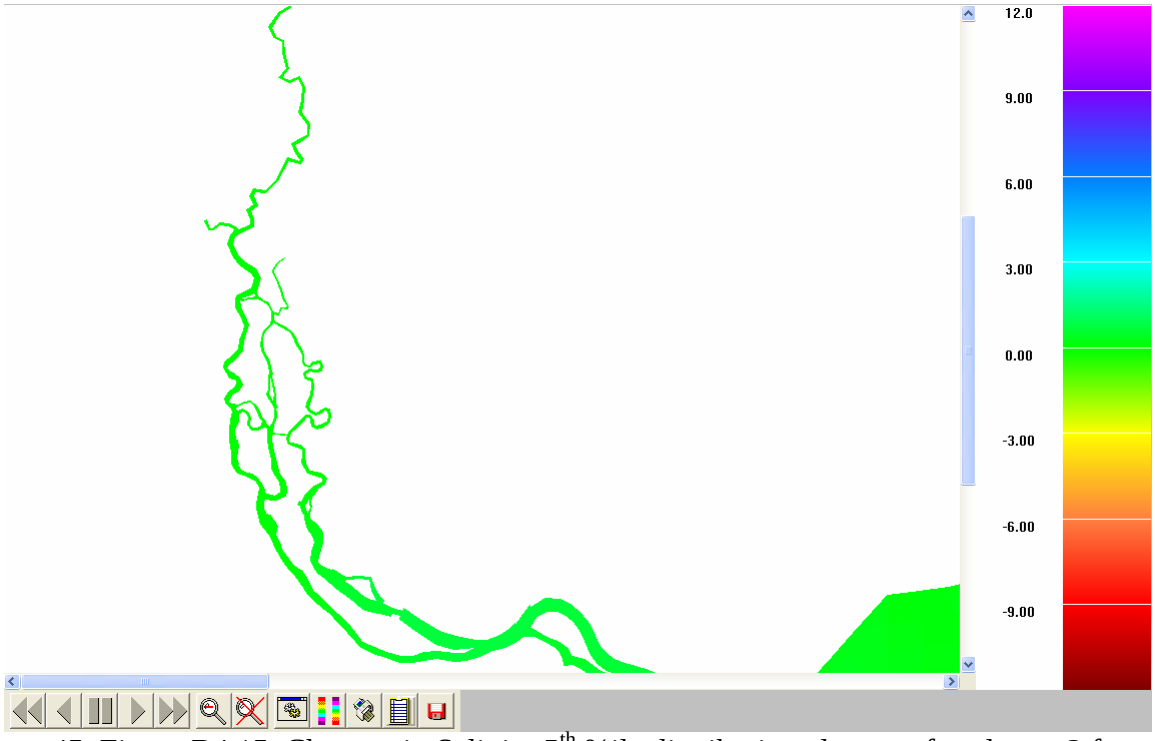
42. Figure B4.12. Changes in D.O. 5th %ile distribution along surface layer: 2 ft deepening



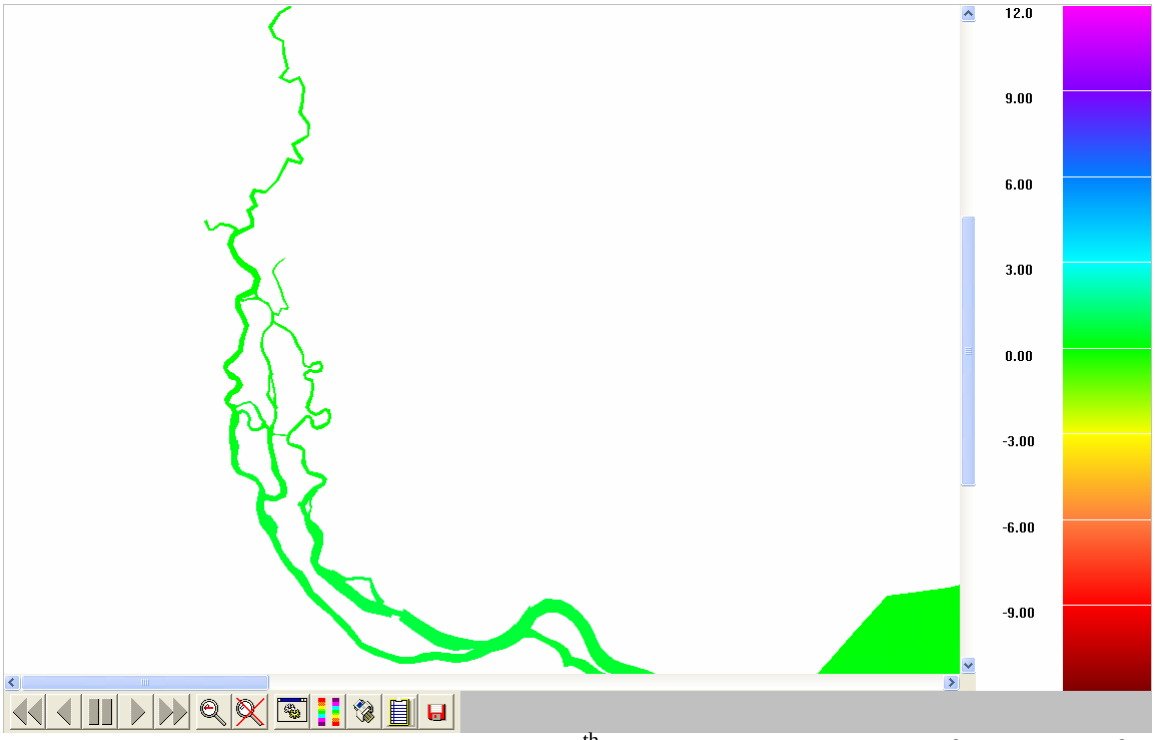
43. Figure B4.13. Changes in D.O. 50th %ile distribution along surface layer: 2 ft deepening



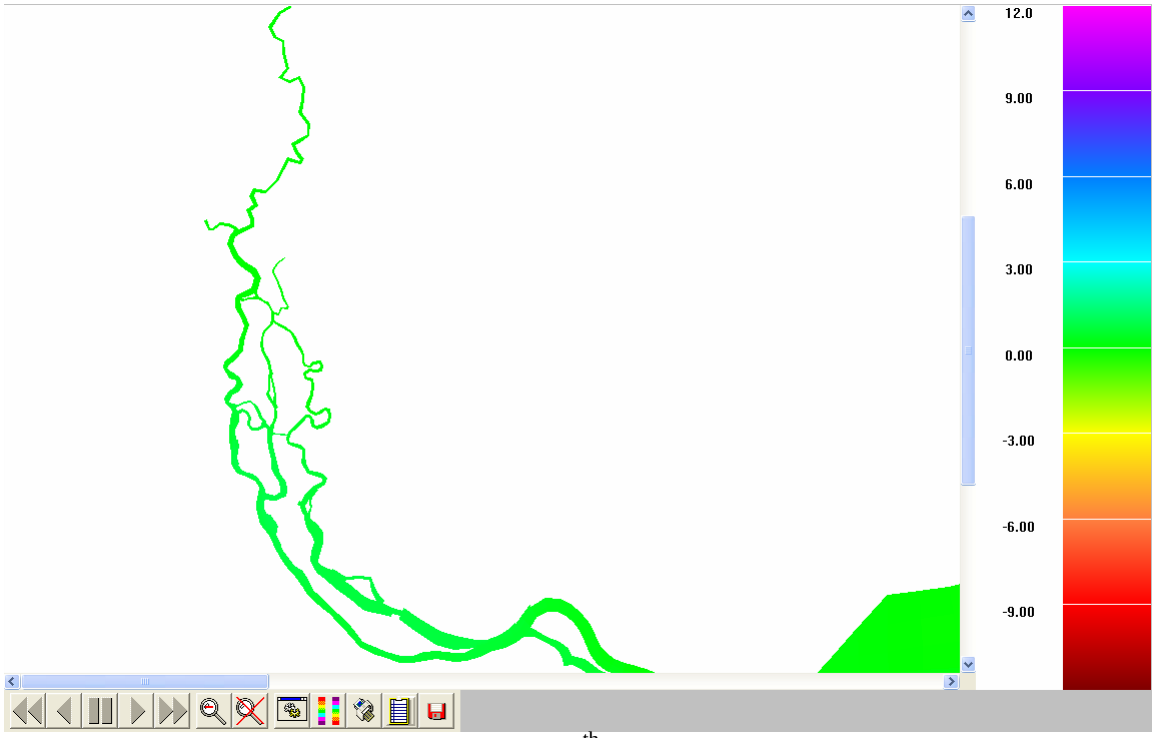
44. Figure B4.14. Changes in D.O. 95th %ile distribution along surface layer: 2 ft deepening



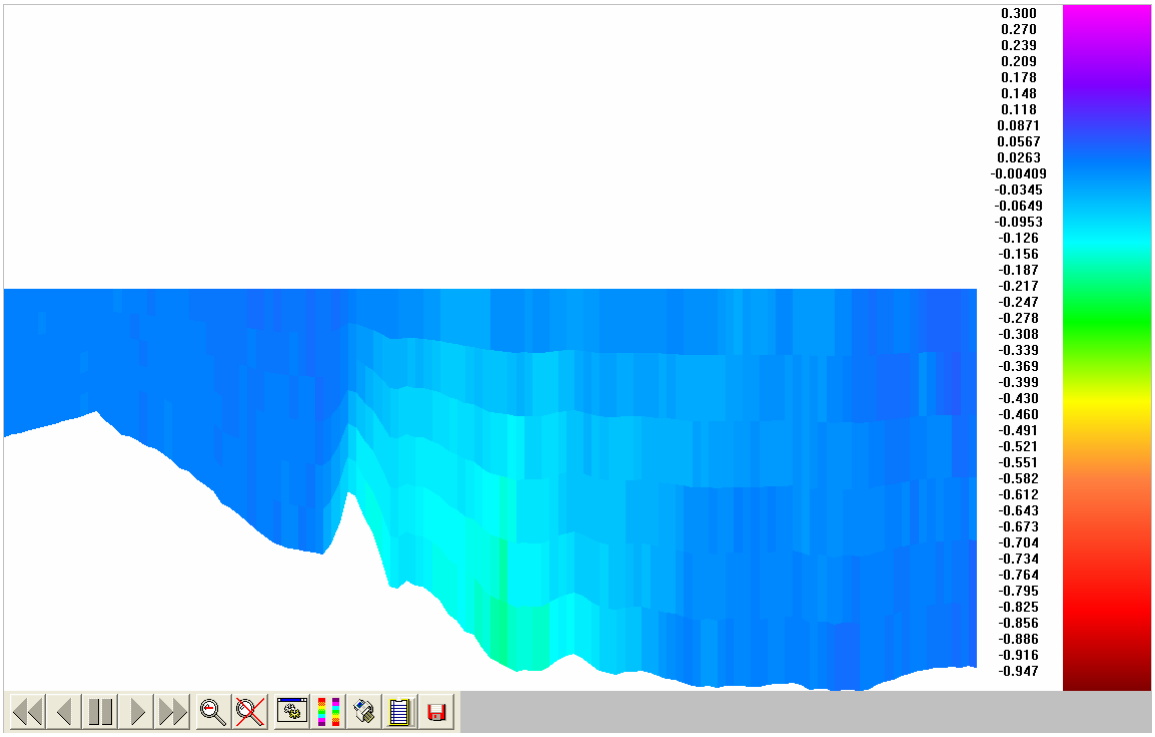
45. Figure B4.15. Changes in Salinity 5th %ile distribution along surface layer: 2 ft deepening



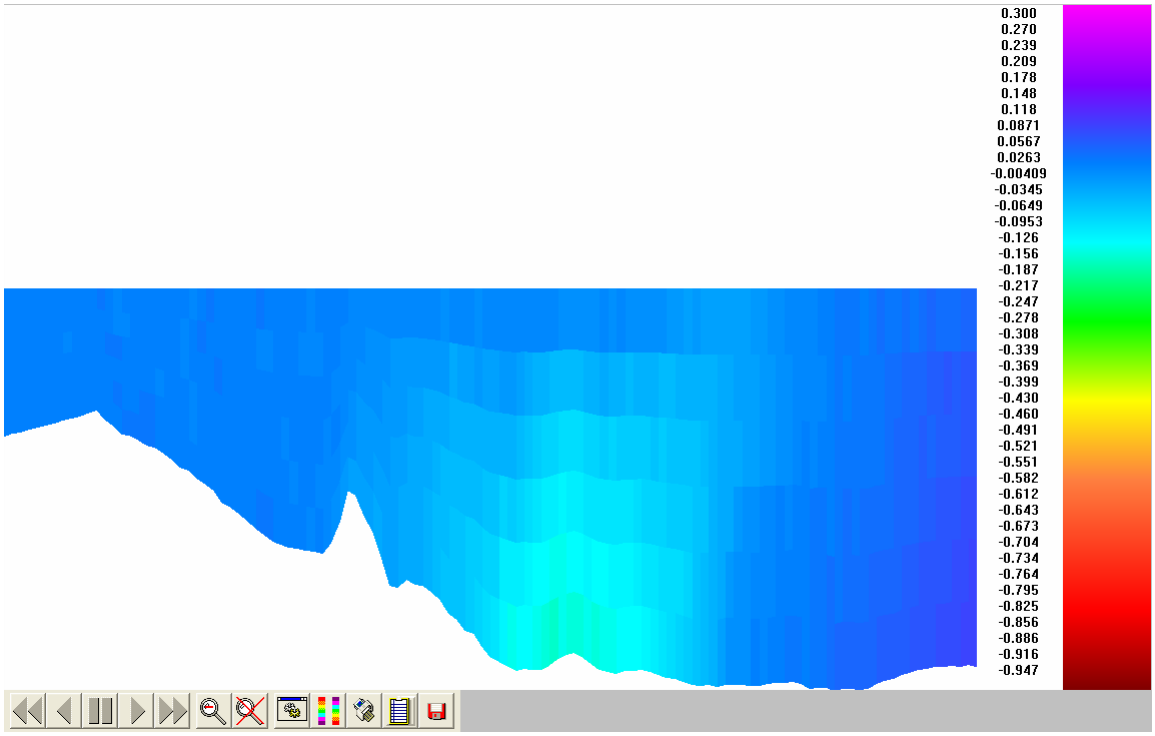
46. Figure B4.16. Changes in Salinity 50th %ile distribution along surface layer: 2 ft deepening



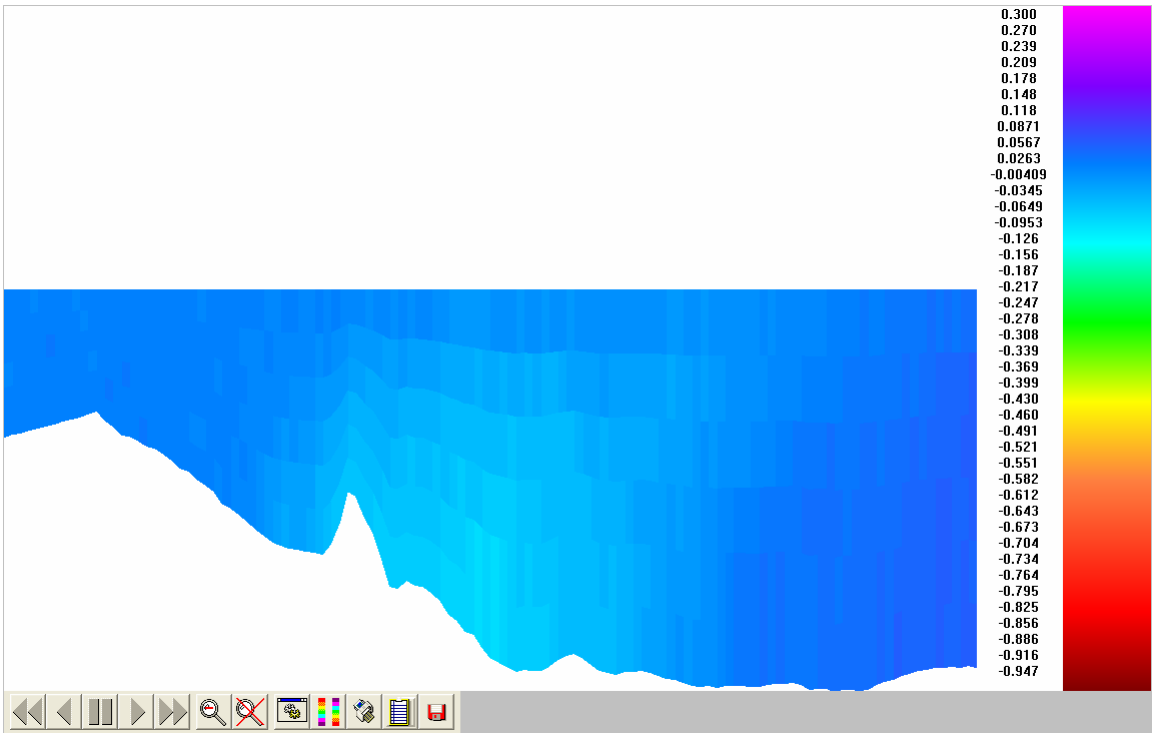
47. Figure B4.17. Changes in Salinity 95th %ile distribution along surface layer: 2 ft deepening



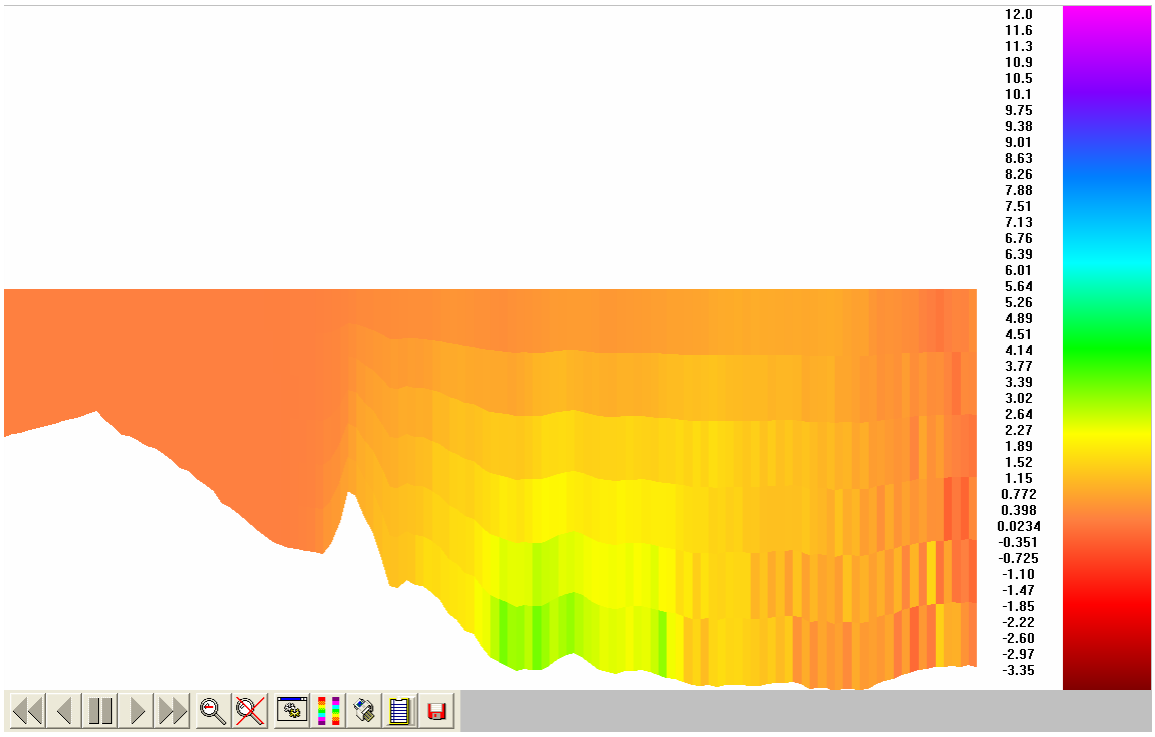
48. Figure B4.18. Snapshot of changes in 1-day averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 2 ft deepening



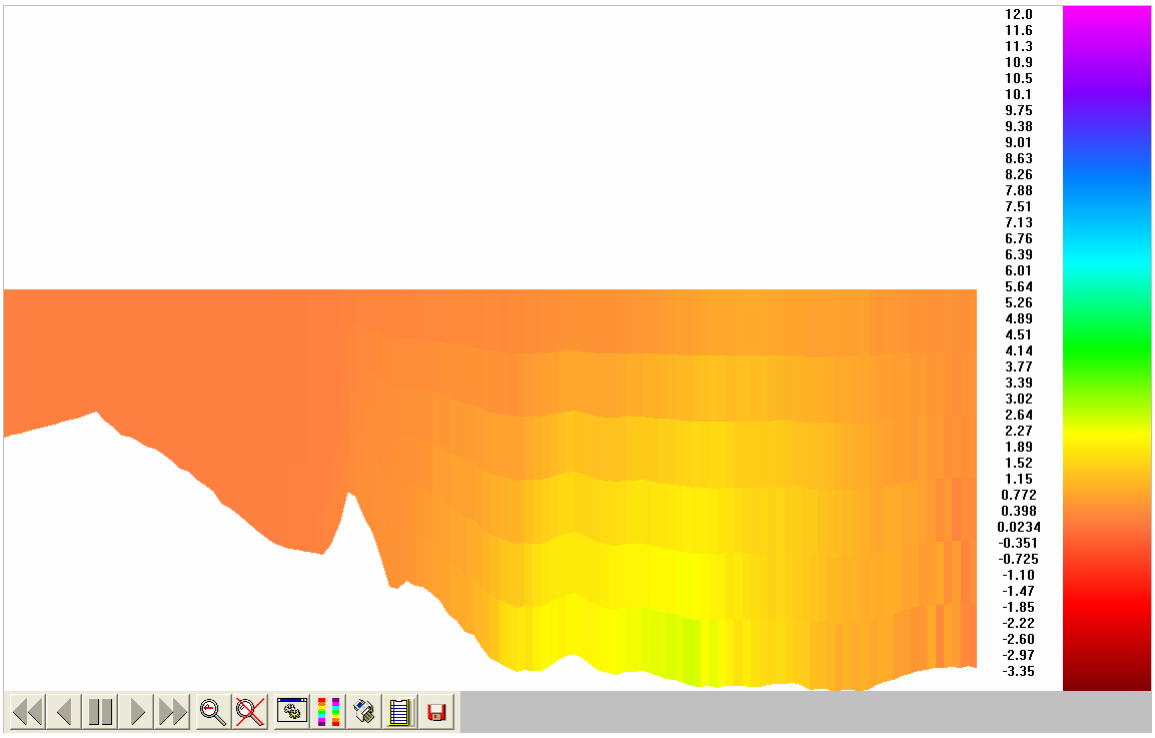
49. Figure B4.19. Snapshot of changes in 7-day averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 2 ft deepening



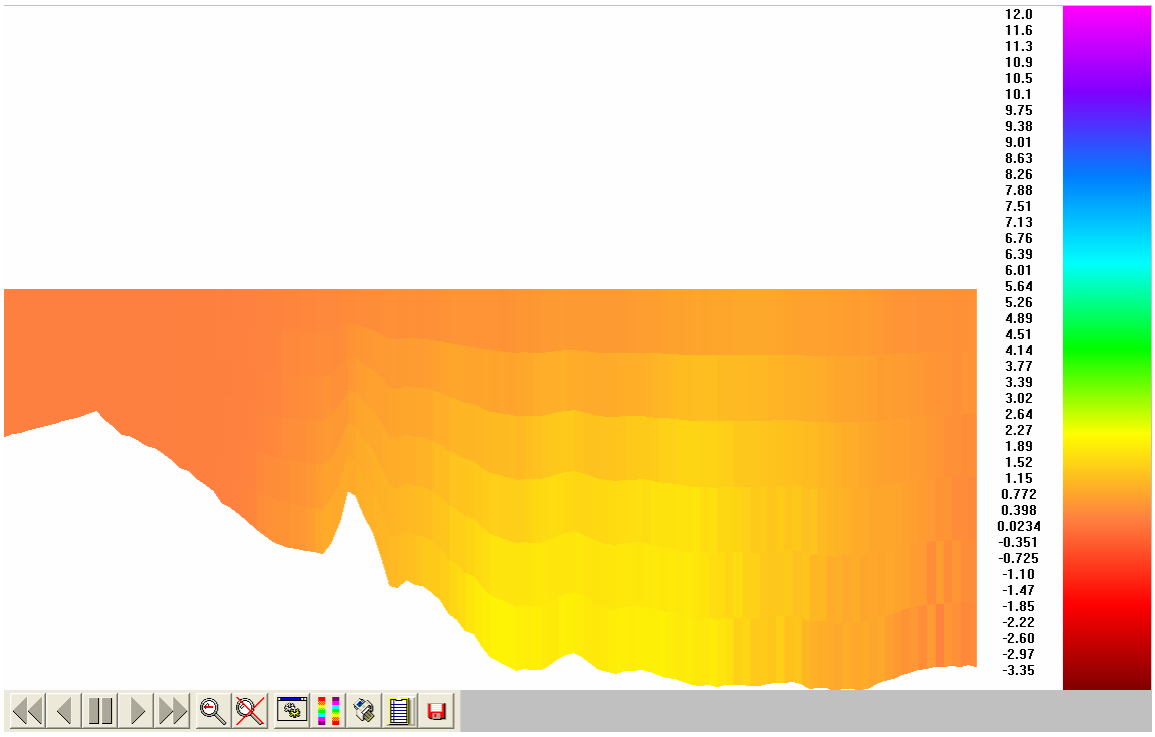
50. Figure B4.20. Snapshot of changes in 30-days averaged D.O. Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 2 ft deepening



51. Figure B4.21. Snapshot of changes in 1-day averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 2 ft deepening



52. Figure B4.22. Snapshot of changes in 7-days averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 2 ft deepening



53. Figure B4.23. Snapshot of changes in 30-days averaged Salinity Dynamics (August 10, 1997) in vertical plane of Upper Harbor: 2 ft deepening

Appendix C

SENSITIVITY ANALYSIS #2A: EXISTING BATHYMETRY, 1999 POINT SOURCES LOADS, 1999 HYDROLOGICAL AND METEOROLOGICAL CONDITIONS

May 1 – October 30, 1999 Simulation Period

Water Quality Review Group

1. Table C.1. Dissolved oxygen percentiles distribution in Critical cells

Zone	D.O. Percentile (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.53	3.7	3.81	4.02	4.37	4.79	5.05	5.27	5.64
FR2	2.93	3.12	3.25	3.53	3.87	4.29	4.62	4.78	5.1
FR3	2.64	2.87	2.97	3.19	3.65	4.06	4.38	4.54	4.84
FR4	2.72	2.92	3.02	3.25	3.68	4.07	4.39	4.54	4.84
FR5	2.69	2.87	2.97	3.29	3.69	4.06	4.38	4.58	4.76
FR6	2.76	2.92	3.01	3.33	3.7	4.08	4.45	4.65	4.83
FR7	3.31	3.57	3.75	4.1	4.54	4.96	5.28	5.52	6.05
FR8	3.4	3.71	3.88	4.23	4.64	5	5.28	5.45	5.78
FR9	3.55	3.79	3.99	4.36	4.82	5.25	5.5	5.65	5.91
FR10	2.29	3.13	3.38	3.92	4.59	5.24	5.65	5.82	6.04
FR11	2.17	2.78	3.15	3.63	4.22	4.85	5.4	5.62	5.95
MR1	2.67	3.11	3.31	3.68	4.05	4.38	4.69	4.88	5.09
MR2	2.26	2.62	2.96	3.46	3.92	4.32	4.63	4.86	5.1
MR3	2.12	2.5	2.8	3.35	3.82	4.27	4.59	4.82	5.07
MR4	2.09	2.47	2.66	3.08	3.51	3.88	4.23	4.39	4.74
MR5	0.45	0.99	1.39	2.21	3.63	5.13	5.57	5.73	5.97
MR6	1.05	1.66	2.11	3.03	4.42	5.3	5.71	5.9	6.17
LBR1	2.68	3.3	3.51	3.97	4.32	4.61	4.93	5.1	5.43
LBR2	2.11	2.34	2.52	2.99	3.34	3.65	3.95	4.14	4.43
LBR3	1.37	1.79	2.08	2.6	3.2	3.7	4.05	4.26	4.61
BR1	2.16	2.39	2.57	2.93	3.36	3.78	4.15	4.35	4.61
BR2	1.52	1.88	2.16	2.6	3.1	3.53	3.92	4.17	4.5
BR3	1.83	2.17	2.36	2.69	3.2	3.61	3.94	4.15	4.5
SCH1	1.4	1.76	2.05	2.61	3.4	4.16	4.71	5.02	5.34
SCH2	3.21	3.44	3.57	3.81	4.15	4.55	4.87	5.05	5.35
SR	2.24	2.52	2.96	3.6	3.86	4.2	4.5	4.64	4.91

2. Table C.2. Delta of Dissolved Oxygen percentiles distribution in Critical cells: 1999 (Project) and 2004 (Baseline) point sources loading scenarios

Zone	Delta D.O. Percentile																	
	1%		5%		10%		25%		50%		75%		90%		95%		99	
	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%
FR1	0.1	2.9	0.09	2.5	0.09	2.4	0.07	1.8	0.08	1.9	0.07	1.5	0.05	1.0	0.07	1.3	0.07	1.3
FR2	0.19	6.9	0.13	4.3	0.14	4.5	0.14	4.1	0.13	3.5	0.13	3.1	0.1	2.2	0.11	2.4	0.13	2.6
FR3	0.19	7.8	0.18	6.7	0.16	5.7	0.14	4.6	0.15	4.3	0.15	3.8	0.12	2.8	0.13	2.9	0.13	2.8
FR4	0.21	8.4	0.18	6.6	0.17	6.0	0.15	4.8	0.16	4.5	0.16	4.1	0.14	3.3	0.11	2.5	0.13	2.8
FR5	0.19	7.6	0.18	6.7	0.19	6.8	0.19	6.1	0.19	5.4	0.19	4.9	0.15	3.5	0.17	3.9	0.14	3.0
FR6	0.22	8.7	0.18	6.6	0.2	7.1	0.18	5.7	0.19	5.4	0.19	4.9	0.15	3.5	0.17	3.8	0.14	3.0
FR7	0.18	5.8	0.16	4.7	0.16	4.5	0.15	3.8	0.12	2.7	0.09	1.8	0.07	1.3	0.07	1.3	0.02	0.3
FR8	0.2	6.2	0.19	5.4	0.19	5.1	0.12	2.9	-0.05	-1.1	-0.11	-2.2	-0.14	-2.6	-0.16	-2.9	-0.12	-2.0
FR9	0.16	4.7	0.15	4.1	0.15	3.9	0.13	3.1	0.08	1.7	0.05	1.0	0.04	0.7	0.04	0.7	0.03	0.5
FR10	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.01	0.2
FR11	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.01	0.2
MR1	0.09	3.5	0.12	4.0	0.13	4.1	0.13	3.7	0.12	3.1	0.13	3.1	0.11	2.4	0.13	2.7	0.11	2.2
MR2	0.06	2.7	0.06	2.3	0.05	1.7	0.09	2.7	0.1	2.6	0.11	2.6	0.1	2.2	0.12	2.5	0.1	2.0
MR3	0.04	1.9	0.05	2.0	0.04	1.4	0.07	2.1	0.08	2.1	0.1	2.4	0.09	2.0	0.09	1.9	0.1	2.0
MR4	0.04	2.0	0.03	1.2	0.03	1.1	0.03	1.0	0.03	0.9	0.05	1.3	0.05	1.2	0.03	0.7	0.06	1.3
MR5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.01	0.2	0	0.0	0	0.0	0	0.0
MR6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.01	0.2	0	0.0
LBR1	0.01	0.4	0.01	0.3	0.01	0.3	0.01	0.3	0.01	0.2	0.01	0.2	0.01	0.2	0	0.0	0	0.0
LBR2	0.01	0.5	0.01	0.4	0.01	0.4	0.01	0.3	0.01	0.3	0.01	0.3	0.01	0.3	0.01	0.2	0	0.0
LBR3	0.03	2.2	0.04	2.3	0.04	2.0	0.04	1.6	0.07	2.2	0.07	1.9	0.07	1.8	0.08	1.9	0.05	1.1
BR1	0.16	8.0	0.16	7.2	0.16	6.6	0.15	5.4	0.15	4.7	0.15	4.1	0.14	3.5	0.13	3.1	0.13	2.9
BR2	0.15	10.9	0.27	16.8	0.33	18.0	0.4	18.2	0.32	11.5	0.34	10.7	0.35	9.8	0.39	10.3	0.35	8.4
BR3	0.14	8.3	0.14	6.9	0.14	6.3	0.13	5.1	0.14	4.6	0.14	4.0	0.15	4.0	0.1	2.5	0.11	2.5
SCH1	0.11	8.5	0.11	6.7	0.13	6.8	0.12	4.8	0.09	2.7	0.06	1.5	0.05	1.1	0.04	0.8	0.02	0.4
SCH2	0.13	4.2	0.13	3.9	0.12	3.5	0.12	3.3	0.11	2.7	0.11	2.5	0.1	2.1	0.09	1.8	0.1	1.9
SR	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

3. Table C.3. Dissolved oxygen percentiles distribution in Zones of Savannah Estuary

Zone Name	D.O. Concentration Percentiles (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.86	4.00	4.08	4.29	4.64	5.05	5.30	5.51	5.84
FR2	3.37	3.55	3.65	3.87	4.20	4.62	4.91	5.06	5.38
FR3	2.91	3.10	3.19	3.44	3.82	4.22	4.55	4.70	4.99
FR4	2.70	2.90	2.99	3.22	3.67	4.03	4.39	4.52	4.80
FR5	2.75	2.92	3.02	3.28	3.68	4.06	4.41	4.57	4.77
FR6	2.89	3.06	3.14	3.46	3.83	4.18	4.53	4.72	4.90
FR7	3.20	3.43	3.63	3.99	4.44	4.92	5.20	5.38	5.67
FR8	3.49	3.77	3.95	4.33	4.77	5.14	5.39	5.56	5.81
FR9	4.05	4.34	4.53	4.88	5.24	5.52	5.78	5.92	6.15
FR10	4.01	4.51	4.71	5.00	5.29	5.57	5.81	5.93	6.16
FR11	2.63	3.18	3.56	3.96	4.30	4.63	4.94	5.12	5.37
MR1	2.92	3.20	3.36	3.71	4.06	4.38	4.69	4.87	5.05
MR2	2.43	2.84	3.15	3.56	3.98	4.34	4.62	4.86	5.07
MR3	2.13	2.39	2.70	3.18	3.65	4.10	4.45	4.66	5.00
MR4	2.77	2.96	3.17	3.57	3.92	4.23	4.53	4.70	4.87
MR5	1.07	1.47	1.87	2.73	4.13	5.08	5.50	5.66	5.92
MR6	1.10	1.68	2.13	3.10	4.46	5.28	5.66	5.85	6.11
LBR1	2.87	3.04	3.18	3.64	3.92	4.17	4.48	4.61	4.76
LBR2	2.04	2.27	2.50	2.92	3.30	3.61	3.90	4.10	4.30
LBR3	1.80	1.94	2.05	2.55	3.10	3.39	3.71	3.86	4.20
BR1	2.55	2.69	2.81	3.10	3.51	3.92	4.28	4.47	4.74
BR2	2.11	2.31	2.46	2.76	3.22	3.65	4.02	4.20	4.47
BR3	2.06	2.23	2.36	2.68	3.17	3.56	3.92	4.13	4.38
SCh1	2.71	2.97	3.09	3.35	3.73	4.20	4.51	4.65	4.90
SCh2	3.46	3.59	3.69	3.90	4.21	4.62	4.91	5.09	5.38
SR	2.62	2.79	3.29	3.88	4.12	4.44	4.71	4.85	5.11

4. Table C.4. Delta of Dissolved Oxygen percentiles distribution in Zones: 1999 (Project) and 2004 (Baseline) point sources loading scenarios

Zone	Project - Baseline Difference (mg/l)									Project - Baseline Relative Difference (%)								
Name	1%	5%	10%	25%	50%	75%	90%	95%	99%	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	0.06	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.03	1.4	1.1	0.9	0.9	0.9	0.9	0.5	0.7	0.5
FR2	0.14	0.11	0.10	0.10	0.10	0.11	0.09	0.09	0.08	4.4	3.3	2.9	2.7	2.5	2.3	1.8	1.9	1.5
FR3	0.17	0.15	0.15	0.13	0.14	0.14	0.13	0.11	0.11	6.2	5.1	4.9	4.0	3.9	3.5	2.9	2.4	2.2
FR4	0.20	0.18	0.18	0.15	0.17	0.16	0.15	0.13	0.13	8.0	6.5	6.5	4.9	4.9	4.1	3.4	2.9	2.9
FR5	0.20	0.17	0.19	0.19	0.17	0.18	0.15	0.16	0.13	7.8	6.2	6.6	6.0	4.8	4.7	3.4	3.7	2.9
FR6	0.22	0.19	0.19	0.19	0.18	0.18	0.15	0.17	0.15	8.2	6.4	6.4	5.9	5.1	4.4	3.3	3.6	3.2
FR7	0.18	0.16	0.18	0.16	0.13	0.10	0.07	0.06	0.05	5.9	5.0	5.2	4.0	3.1	2.0	1.3	1.2	0.9
FR8	0.17	0.15	0.14	0.13	0.10	0.06	0.05	0.04	0.04	5.1	4.3	3.8	3.0	2.1	1.1	0.9	0.8	0.7
FR9	0.13	0.11	0.09	0.07	0.04	0.03	0.02	0.02	0.01	3.3	2.6	2.1	1.4	0.8	0.5	0.4	0.4	0.2
FR10	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
FR11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MR1	0.13	0.15	0.15	0.14	0.13	0.14	0.12	0.12	0.11	4.7	5.0	4.7	4.0	3.4	3.2	2.6	2.6	2.2
MR2	0.07	0.06	0.09	0.10	0.12	0.14	0.10	0.12	0.11	3.1	2.0	3.1	3.0	3.0	3.2	2.2	2.5	2.3
MR3	0.04	0.04	0.04	0.05	0.07	0.08	0.08	0.08	0.09	1.8	1.6	1.4	1.7	2.0	1.9	1.8	1.6	1.8
MR4	0.04	0.03	0.01	0.01	0.02	0.02	0.02	0.02	0.01	1.4	0.9	0.4	0.3	0.4	0.5	0.4	0.4	0.2
MR5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1	0.3	0.1	0.1	0.0	0.0	0.0	0.1	0.1
MR6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0
LBR1	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.2	0.3	0.3	0.1	0.2	0.2	0.2	0.2	0.1
LBR2	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.4	0.3	0.5	0.2	0.3	0.3	0.3	0.2	0.1
LBR3	0.04	0.04	0.04	0.03	0.06	0.06	0.05	0.04	0.04	2.5	2.2	2.1	1.0	1.9	1.9	1.4	1.1	1.0
BR1	0.14	0.15	0.15	0.15	0.15	0.15	0.13	0.13	0.14	5.8	5.7	5.6	5.0	4.5	3.9	3.1	3.0	3.0
BR2	0.16	0.14	0.15	0.15	0.15	0.15	0.13	0.13	0.13	8.2	6.6	6.6	5.8	4.9	4.3	3.4	3.1	3.0
BR3	0.15	0.13	0.12	0.10	0.12	0.13	0.12	0.10	0.09	7.7	6.0	5.4	3.9	3.8	3.8	3.0	2.5	2.0
SCh1	0.10	0.09	0.08	0.08	0.09	0.09	0.07	0.07	0.06	3.9	3.0	2.7	2.6	2.5	2.1	1.7	1.5	1.3
SCh2	0.12	0.12	0.12	0.11	0.11	0.11	0.09	0.09	0.09	3.7	3.4	3.2	2.8	2.6	2.3	1.8	1.9	1.6
SR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

5. Table C.5. Percentage of the volume of waters with violation of Dissolved Oxygen standards for Zones of Savannah Estuary within the period of May 1 – October 30, 1999: 1999 (Project) and 2004 (Baseline) point sources loading scenarios

Zones	D.O. STANDARDS														
	1-Day Average			7-Day Average			30-Day Average			GA MINIMUM D.O.			SC MINIMUM D.O.		
	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B
FR1	0	0	0	0	0	0	0	0	0	0	0	0	7	4	-3
FR2	0	0	0	0	0	0	3	1	-2	0	0	0	31	23	-8
FR3	0	0	0	2	0	-2	19	11	-8	3	1	-2	N/A	N/A	N/A
FR4	0	0	0	5	2	-3	22	14	-8	6	2	-4	N/A	N/A	N/A
FR5	0	0	0	4	1	-3	19	11	-8	5	2	-3	N/A	N/A	N/A
FR6	0	0	0	2	0	-2	12	6	-6	4	1	-3	N/A	N/A	N/A
FR7	0	0	0	0	0	0	1	0	-1	0	0	0	N/A	N/A	N/A
FR8	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR9	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR10	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR11	0	0	0	0	0	0	2	2	0	1	1	0	6	6	0
MR1	0	0	0	0	0	0	5	3	-2	1	0	-1	N/A	N/A	N/A
MR2	0	0	0	1	0	-1	6	5	-1	1	1	0	N/A	N/A	N/A
MR3	0	0	0	3	3	0	10	9	-1	3	3	0	N/A	N/A	N/A
MR4	0	0	0	1	1	0	5	4	-1	2	2	0	N/A	N/A	N/A
MR5	0	0	0	1	1	0	5	5	0	5	5	0	11	11	0
MR6	0	0	0	0	0	0	3	3	0	3	3	0	9	9	0
LBR1	0	0	0	1	1	0	6	6	0	1	1	0	18	18	0
LBR2	1	1	0	6	6	0	18	18	0	7	7	0	34	34	0
LBR3	3	3	0	13	12	-1	30	28	-2	14	13	-1	47	45	-2
BR1	0	0	0	10	6	-4	39	28	-11	12	7	-5	67	58	-9
BR2	2	0	-2	19	15	-4	49	42	-7	20	15	-5	75	68	-7
BR3	3	1	-2	21	17	-4	48	42	-6	22	18	-4	70	66	-4
SCh1	1	1	0	4	3	-1	8	7	-1	5	4	-1	N/A	N/A	N/A
SCh2	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
SR	0	0	0	1	1	0	3	3	0	1	1	0	6	6	0

6. Table C.6. Percentage of water volumes with salinity in %iles within the period of May 1 – October 30, 1999

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	19.6	5.2	4.4	4.8	4.4	4.3	4.5	3.8	88
10	23.6	9.1	8.8	9.1	8.9	8.7	9.1	8.4	88
25	35.8	20.7	22.4	22.3	22.8	22.1	26.1	21.6	88
50	57	43.1	46.6	46.5	47.1	46.1	47.1	43	88
75	79.7	69.8	72.8	72.8	73.1	72.8	74.2	69.7	88
90	91.1	87.5	89	89	89.2	89.2	89.3	87.5	89.3
95	95.6	93.6	94.4	94.5	94.6	94.6	94.1	93.7	95.3
Total Volume 100*km3:	31414.5	659.1	4809.2	22.6	39.2	136.3	10	9.5	43.6

7. Table C.7. Percentage of water volumes with D.O. in %iles within the period of May 1 – October 30, 1999

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	5.3	4.7	4.8	5.7	5.3	4.8	5.3	5.3	5.8
10	10.5	9.5	9.7	11.2	10.4	9.7	10.2	10.5	10.9
25	26.2	24.1	24.7	27.4	25.9	24.4	25.3	25.4	26.5
50	52.2	48.8	49.7	53.5	51.3	49.2	50.7	50.9	51.4
75	77.4	74.1	75	77.7	76.1	74.5	75.4	75.7	75.6
90	90.7	89.5	90	91.3	90.5	89.8	90.3	90.1	90.4
95	95.4	94.8	95	95.7	95.3	94.8	95.2	95.2	95.2
Total Volume 100*km3:	31414.5	659.1	4809.2	22.6	39.2	136.3	10	9.5	43.6

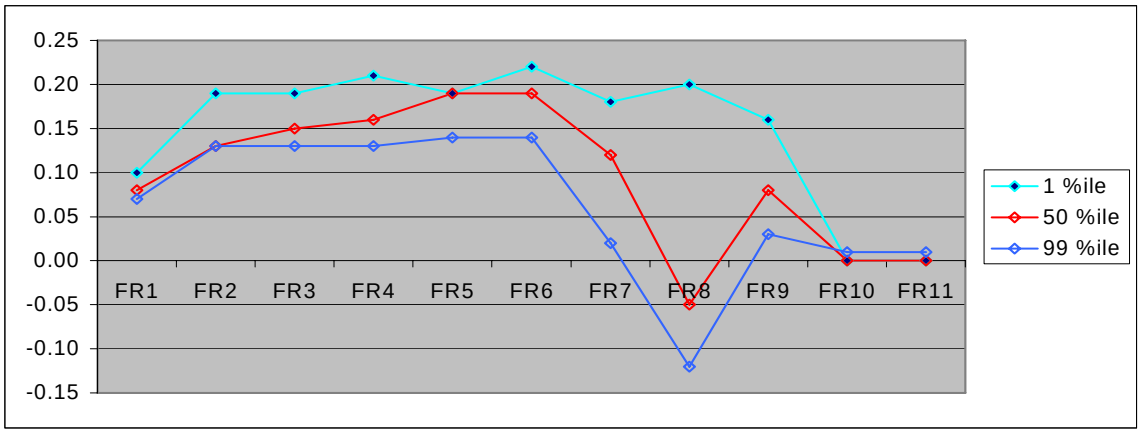
8. Table C.8. Water volumes in Upper Harbor in increments of 1^{o} C of water temperature within the period of May 1 – October 30, 1999

Temperature C^{o}	Total Volume %
19	0.01
20	0.7
21	3.71
22	8.89
23	14.26
24	22.76
25	33.67
26	48.48
27	59.67
28	68.63
29	77.56
30	85.3
31	89.56
32	96.42
33	99.99
34	100

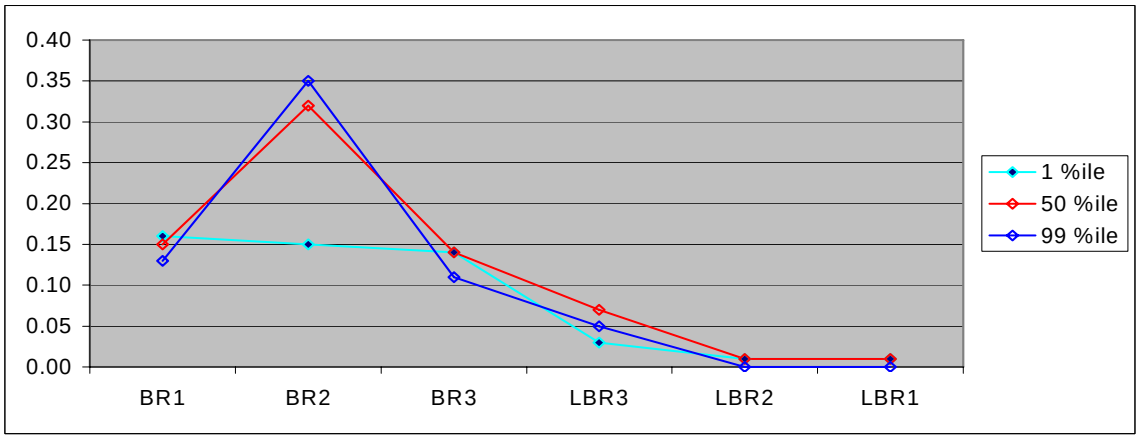
9. Table C.9. Water volumes in Upper Harbor in increments of 0.1 mg/l of D.O. within the period of May 1 – October 30, 1999
   (See file: Postprocessor Output\99-S2E\99-S2E_DO Increment Volume)

10. Table C.10. Percentage of water volumes corresponding to 1-, 7-, and 30-days averages of D.O. depth-averaged concentrations in Upper Harbor within the period of May 1 – October 30, 1999
    (See file: Postprocessor Output99-\S2E\99-S2E_volume DO in averages)

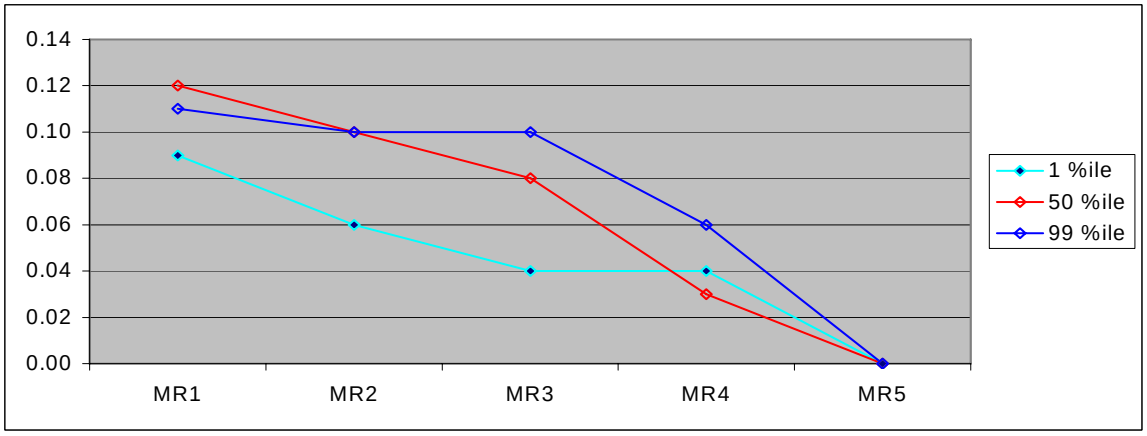
Front River



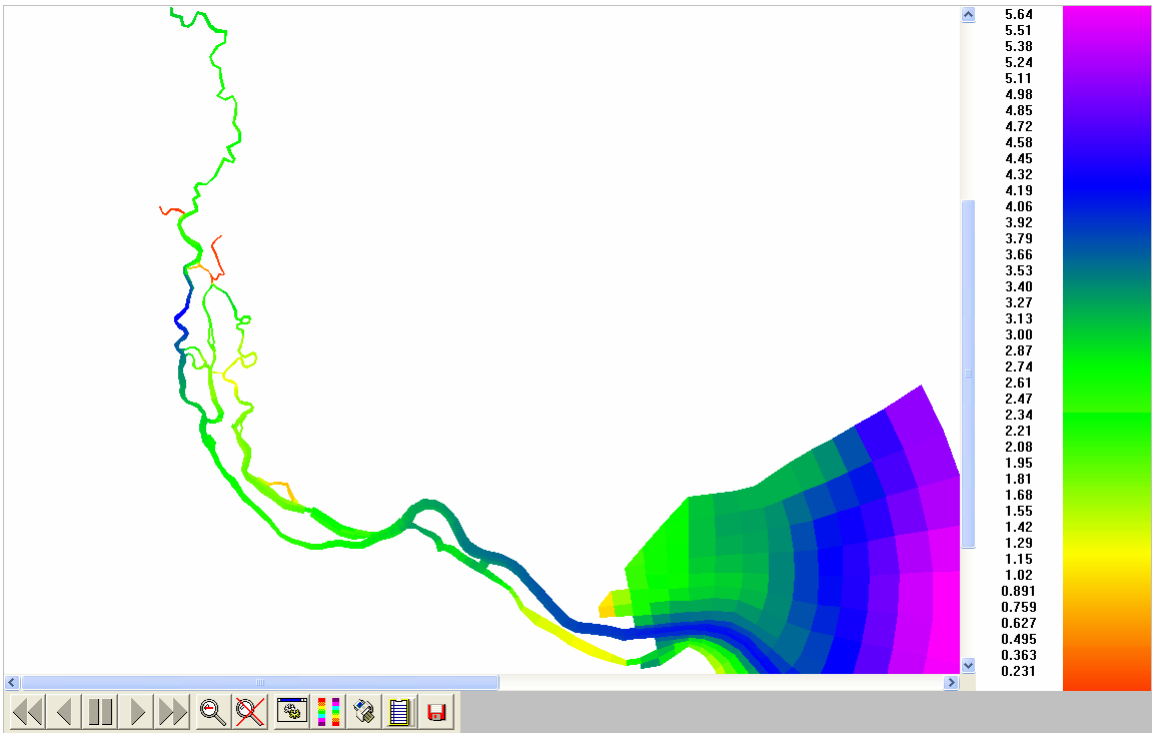
Back and Little Back Rivers



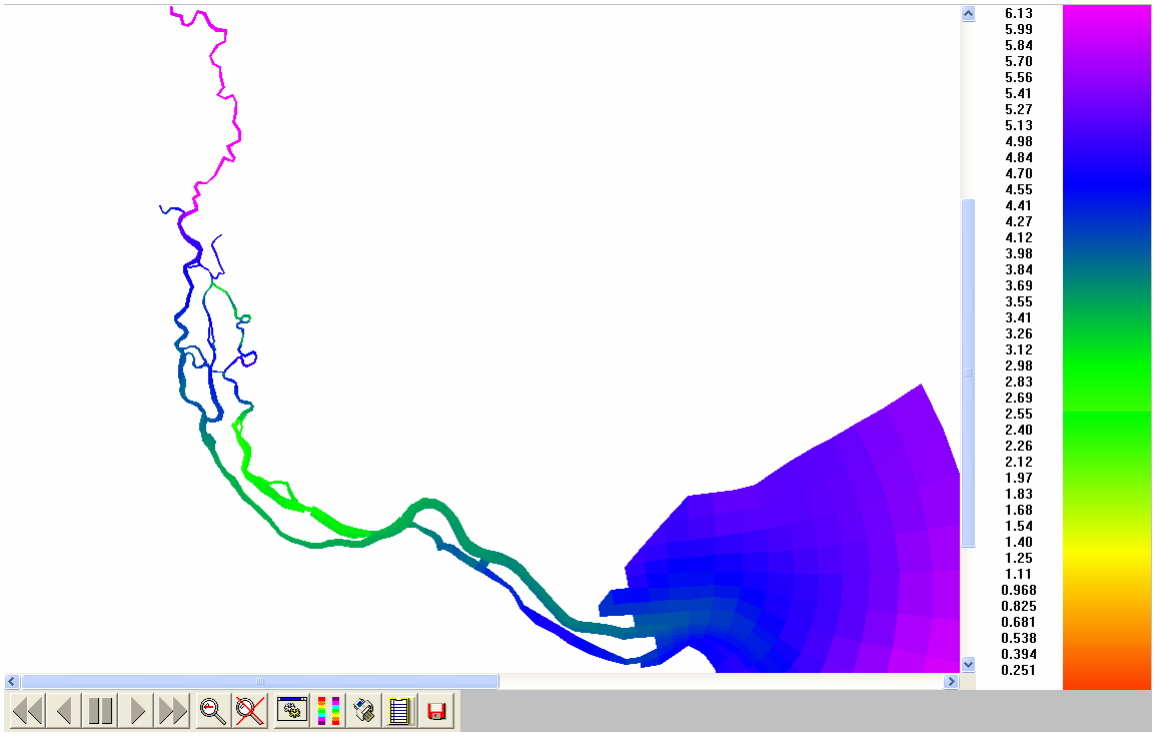
Middle River



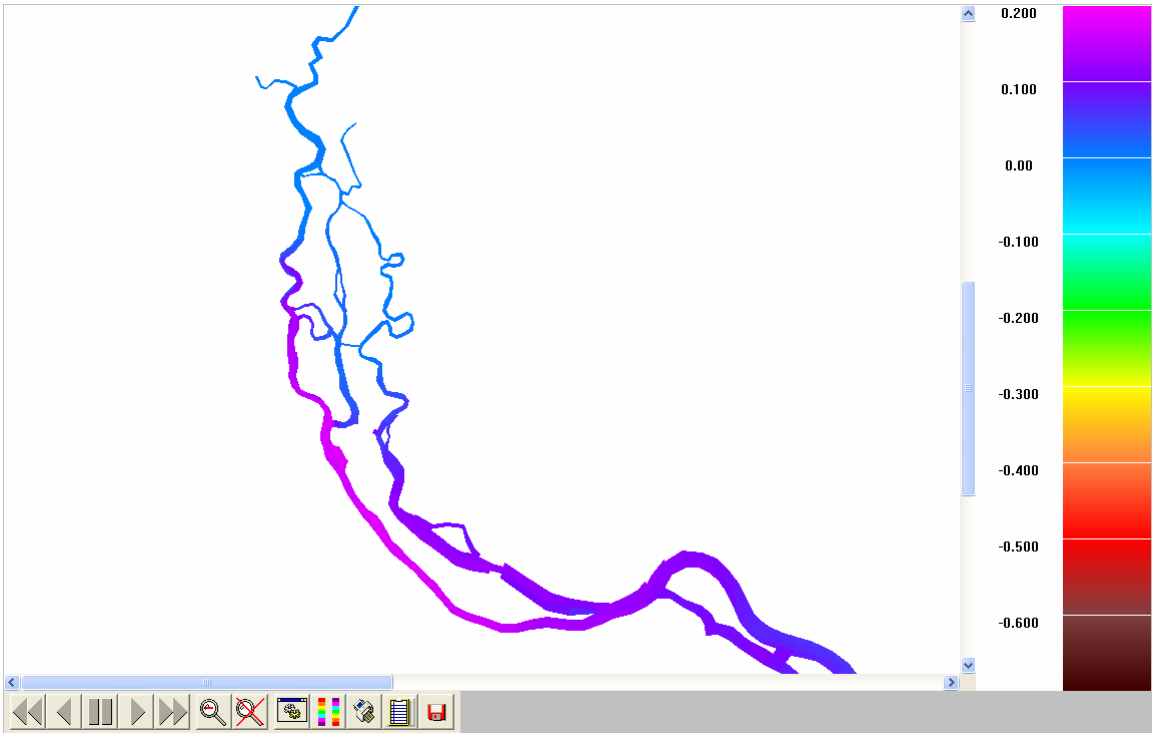
11. Figure C.1. Longitudinal profile of Dissolved Oxygen (mg/l) distribution along Critical cells of Savannah Estuary: Existing bathymetry



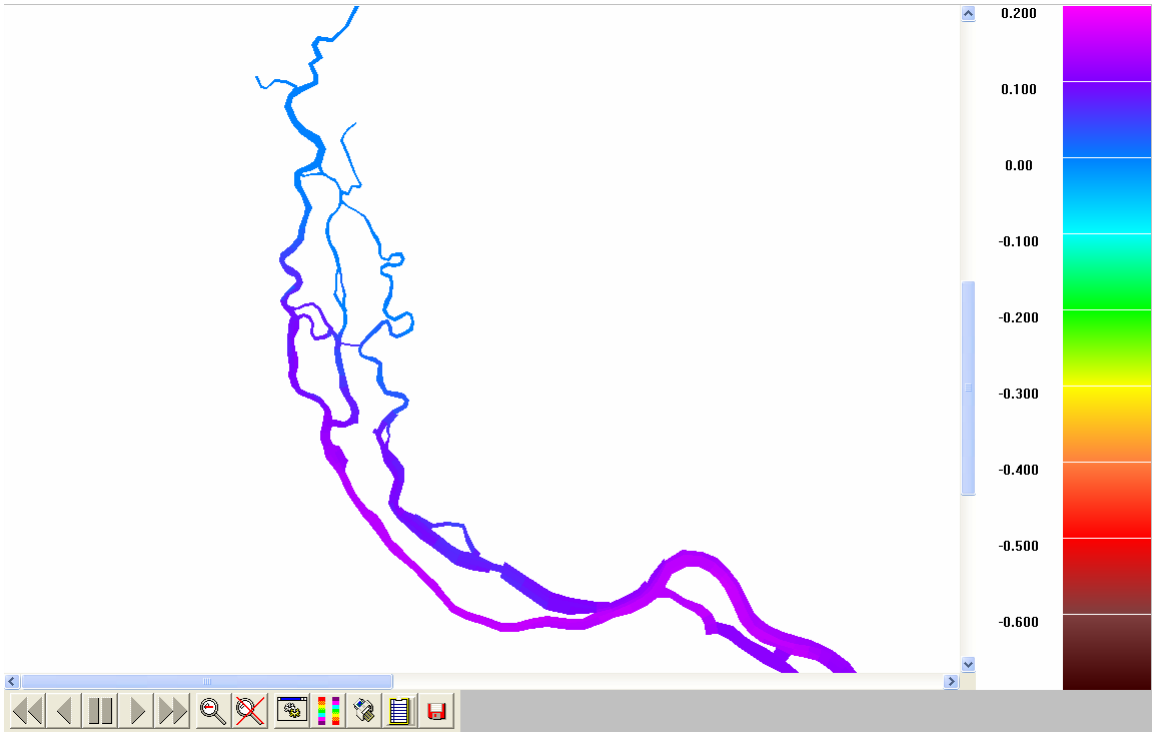
12. Figure C.2. Minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1999: Existing bathymetry



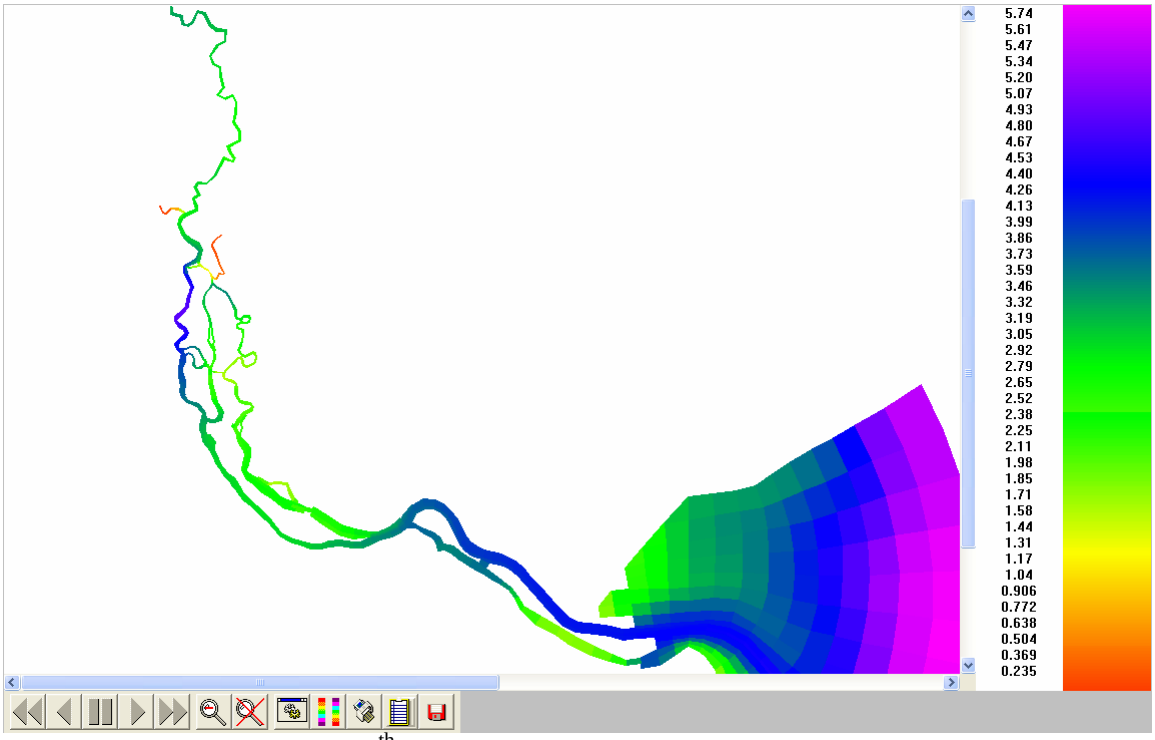
13. Figure C.3. Minimum D.O. distribution along surface layer within the analyzed period of May 1 - October 30, 1999: Existing bathymetry



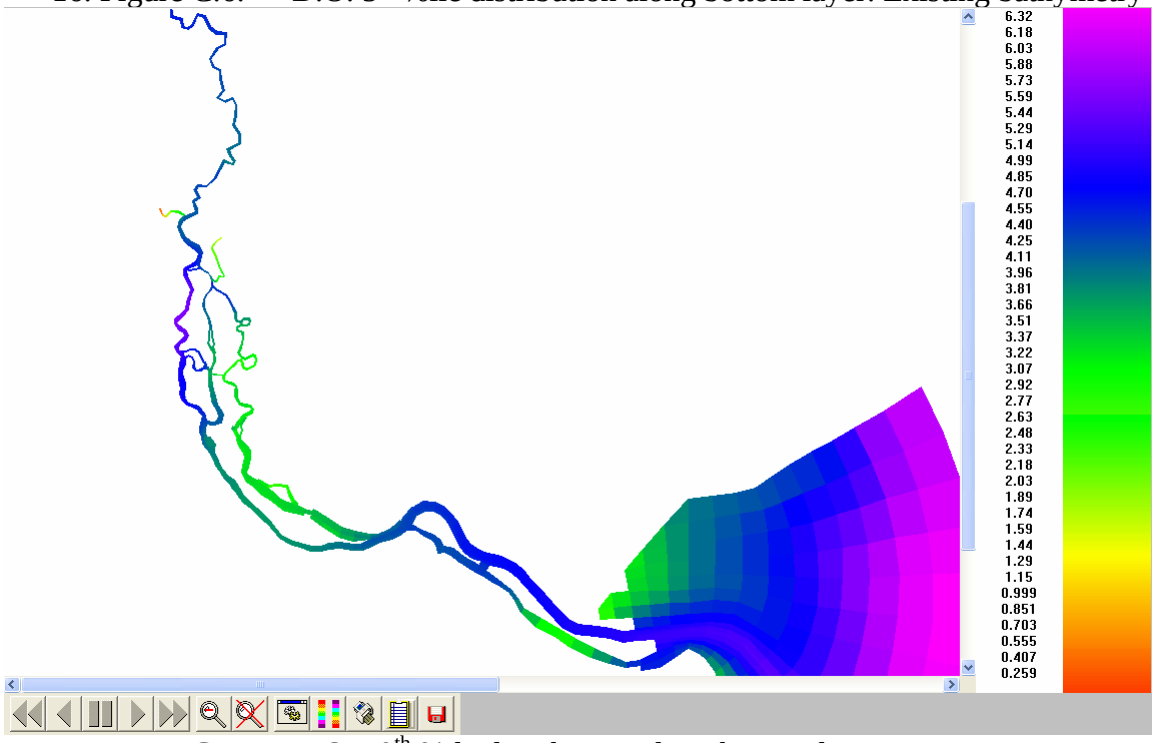
14. Figure C.4. Delta of Minimum D.O. distribution along bottom layer: 1999 minus 2004 loading scenarios



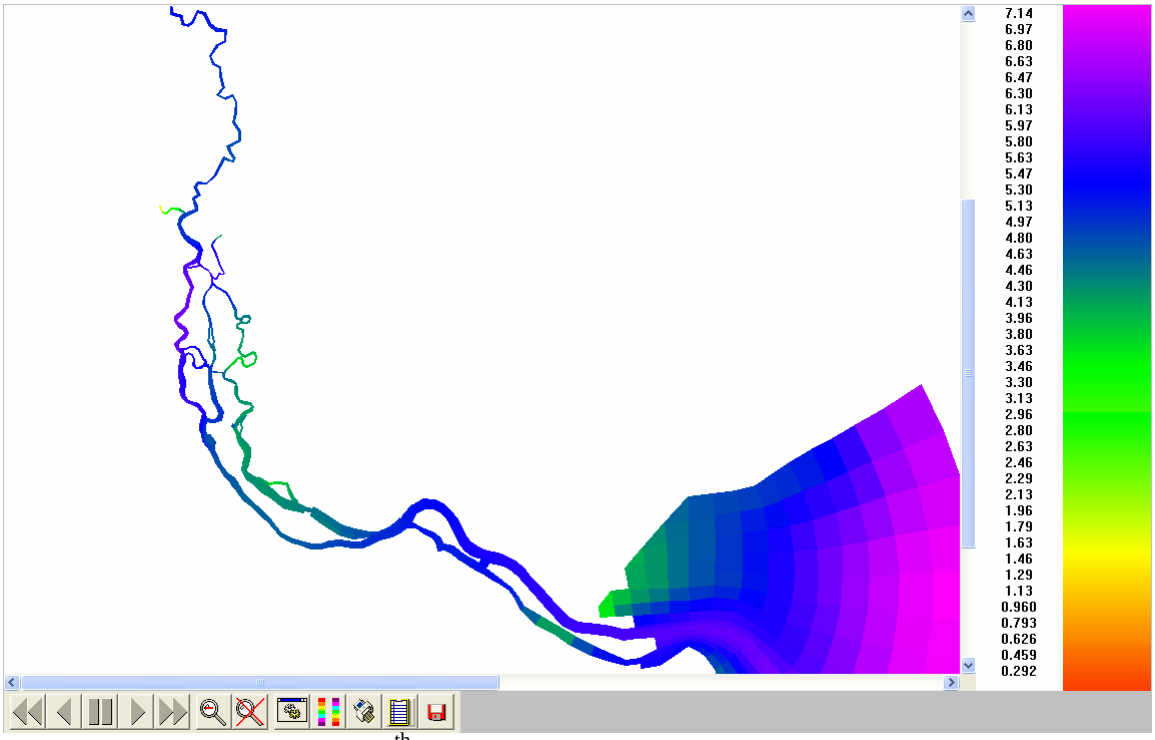
15. Figure C.5. Delta of Minimum D.O. distribution along surface layer: 1999 minus 2004 loading scenarios



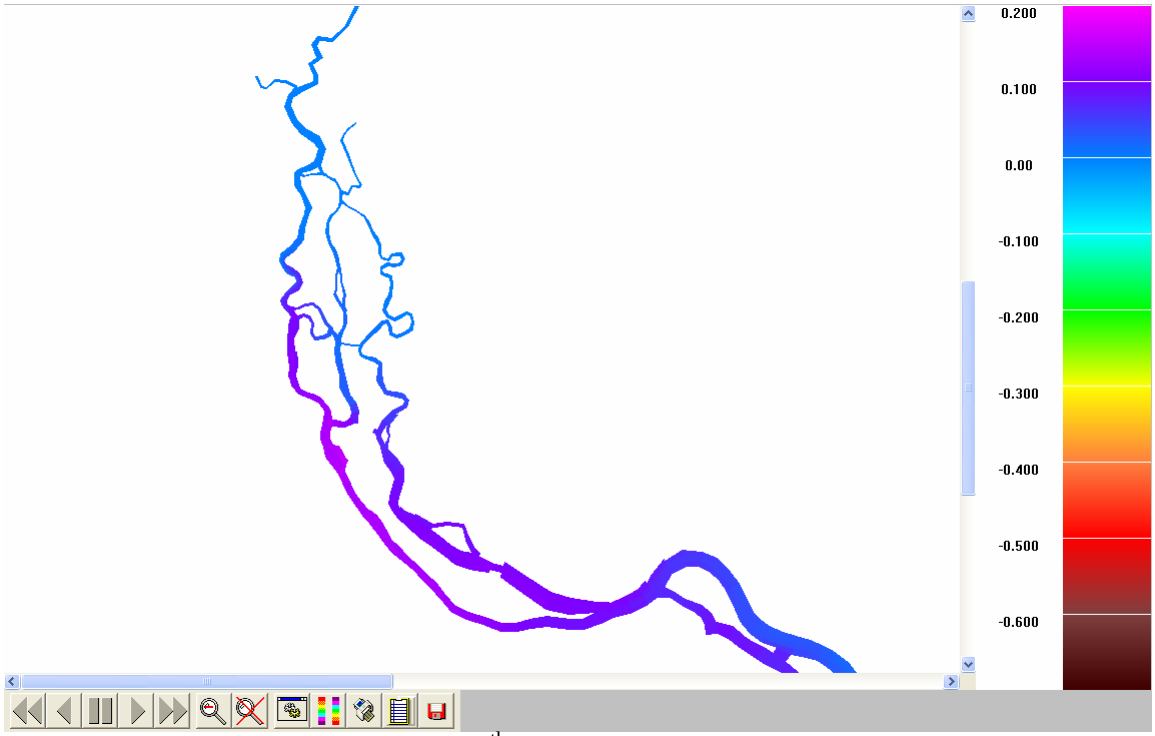
16. Figure C.6. D.O. 5th %ile distribution along bottom layer: Existing bathymetry



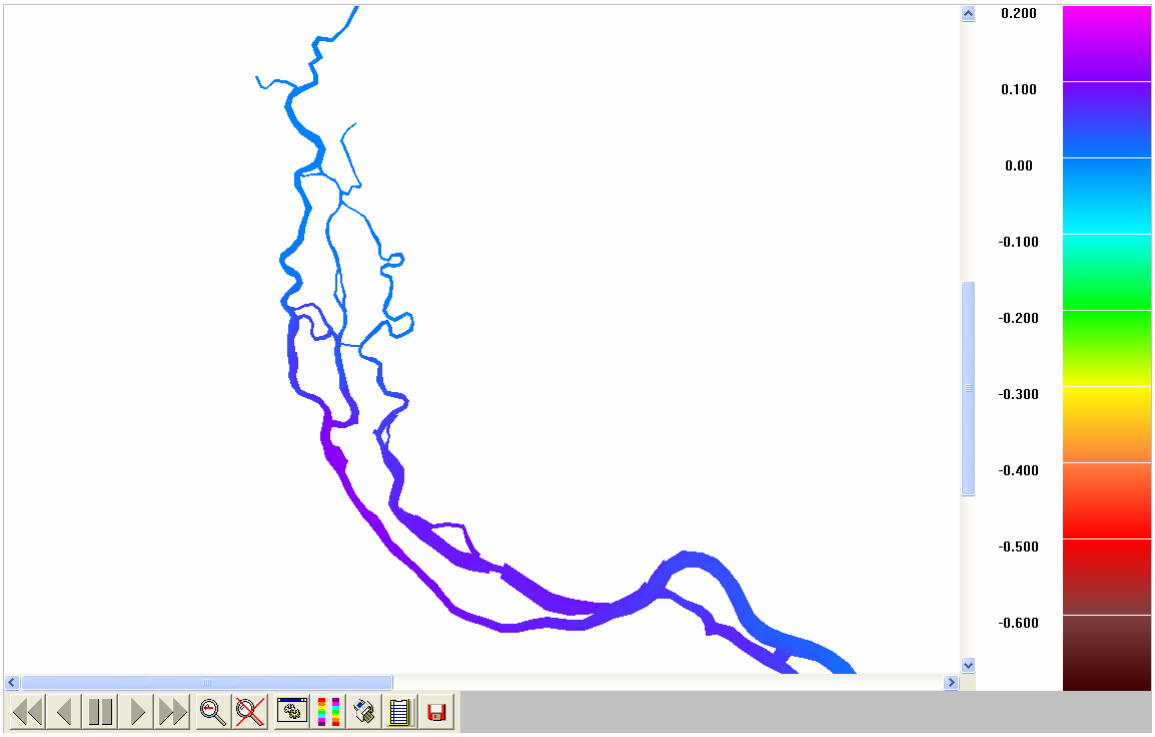
17. Figure C.7. D.O. 50th %ile distribution along bottom layer: Existing bathymetry



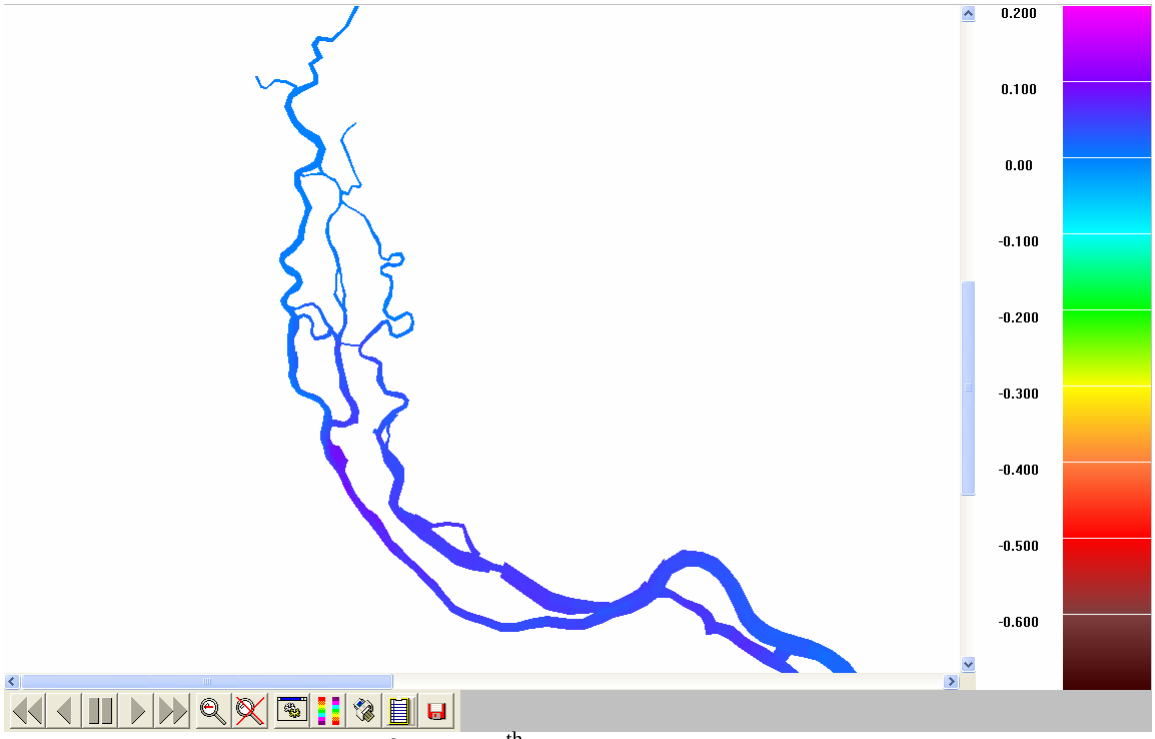
18. Figure C.8. D.O. 95th %ile distribution along bottom layer: Existing bathymetry



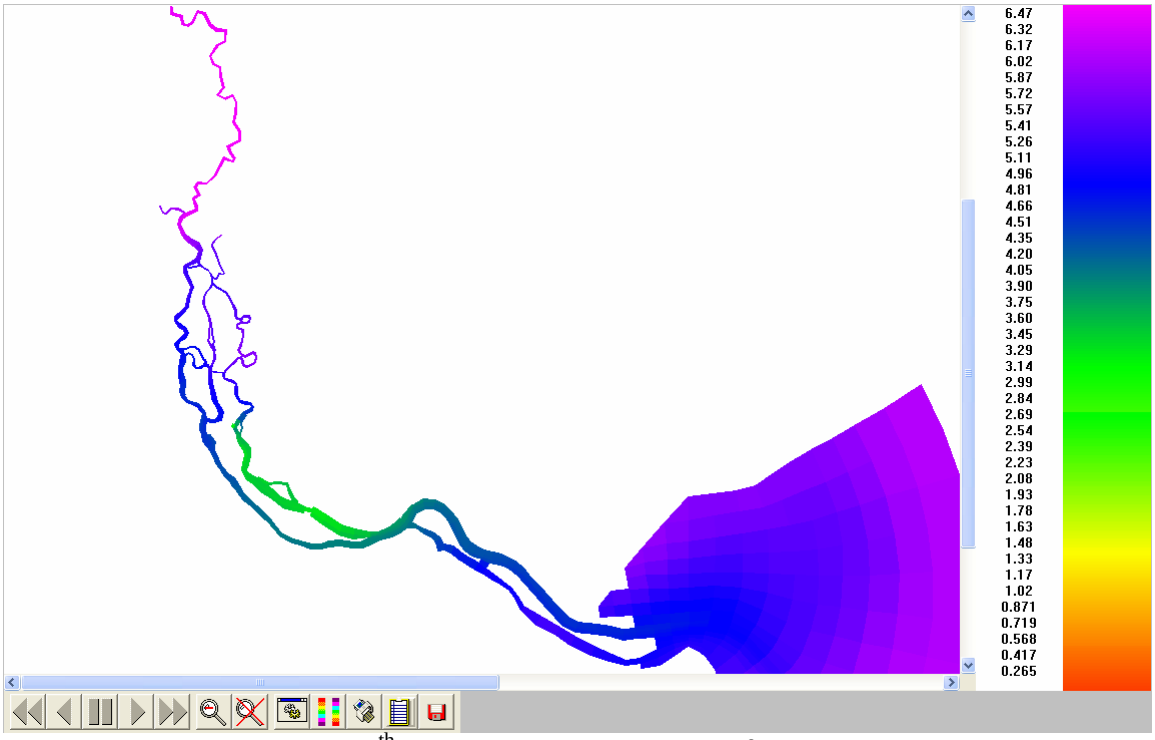
19. Figure C.9. Delta of D.O. 5th %ile distribution along bottom layer: 1999 minus 2004 loading scenarios



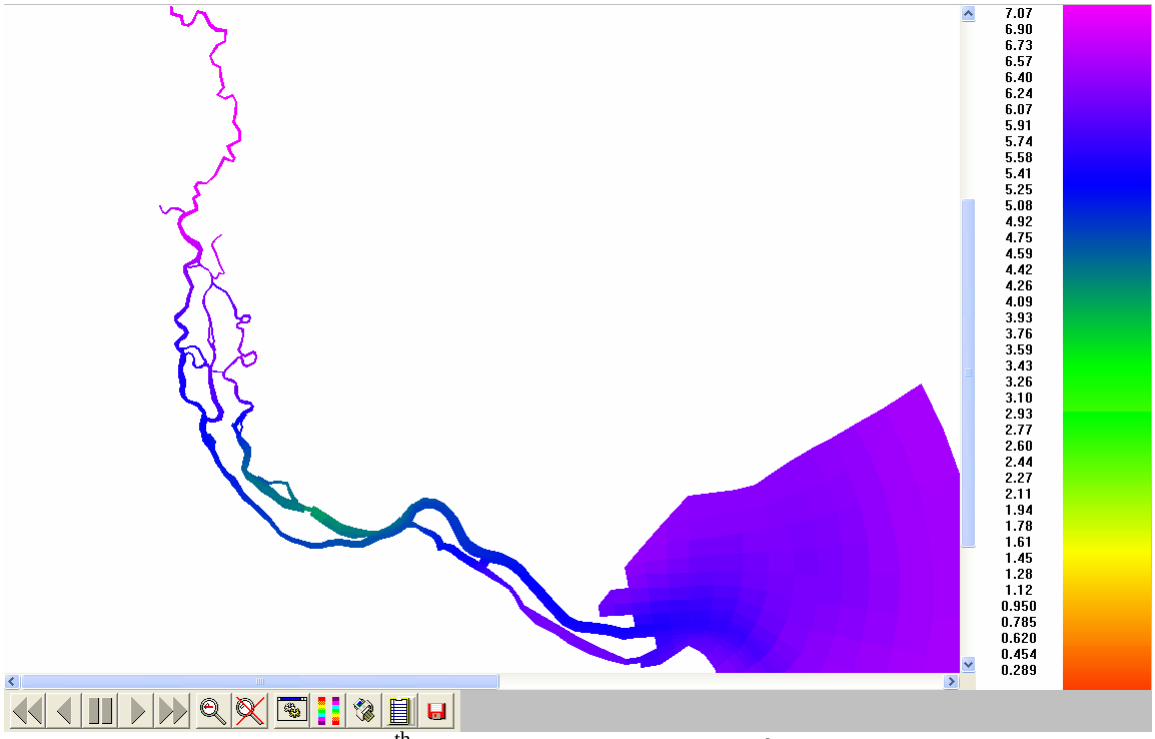
20. Figure C.10. Delta of D.O. 50th %ile distribution along bottom layer: 1999 minus 2004 loading scenarios



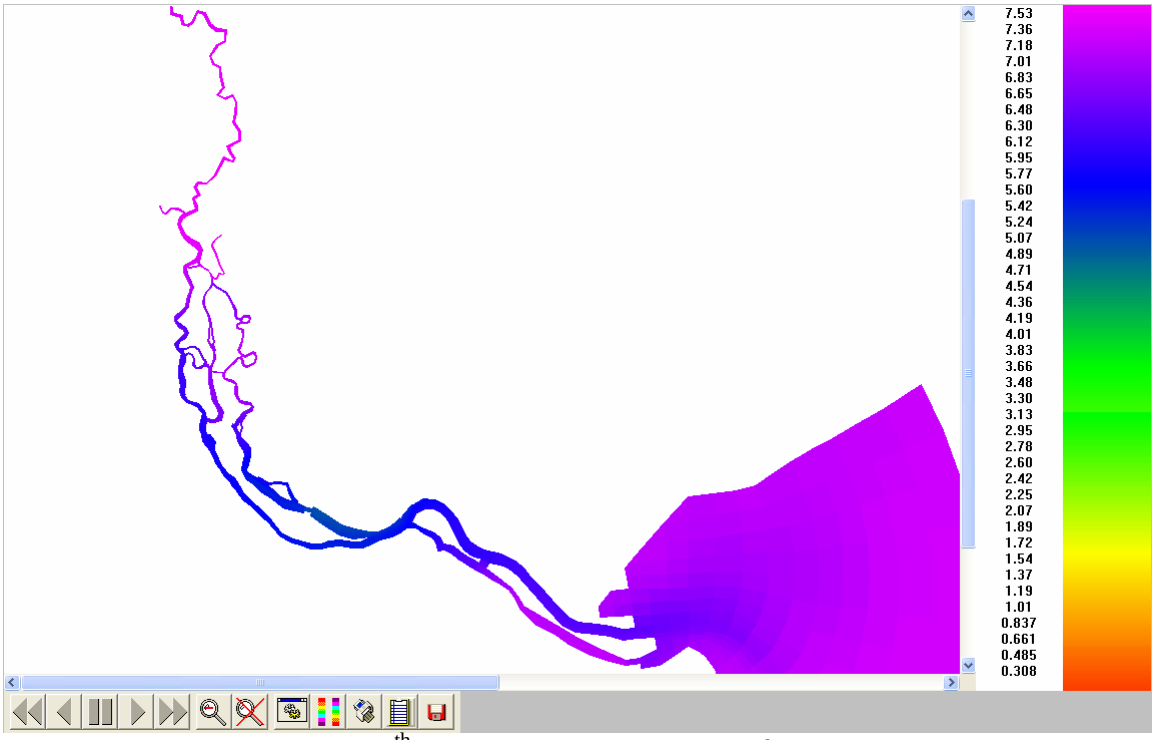
21. Figure C.11. Delta of D.O. 95th %ile distribution along bottom layer: 1999 minus 2004 loading scenarios



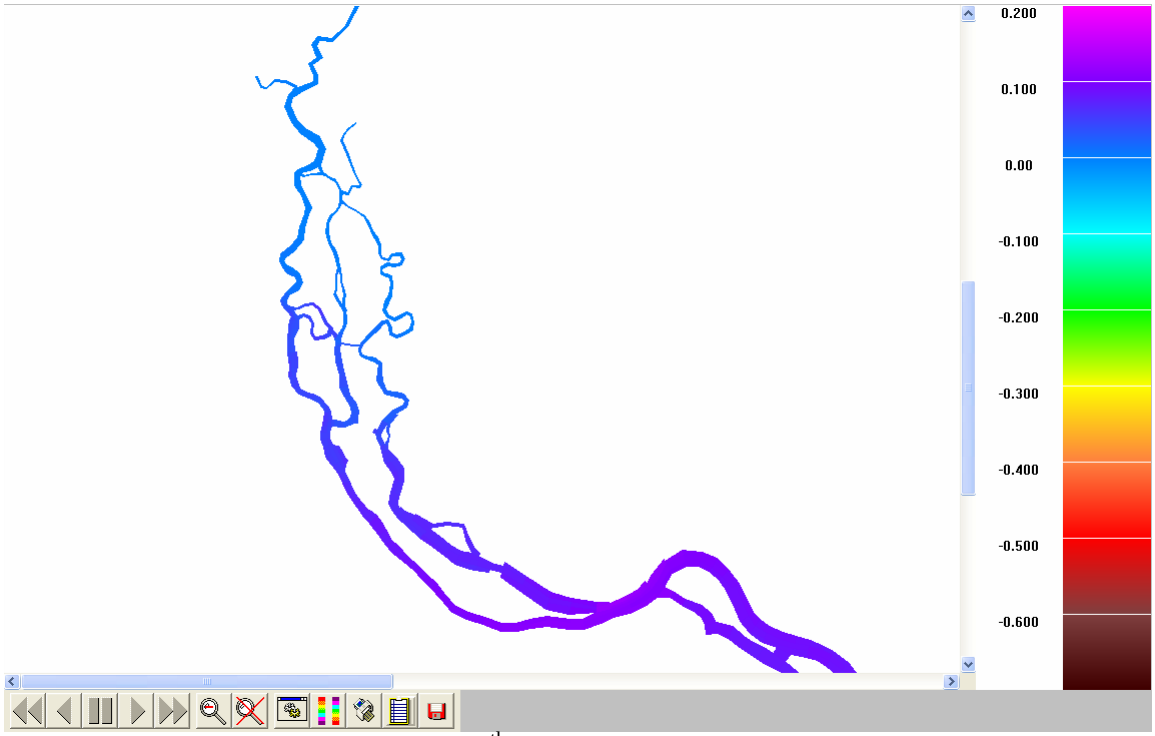
22. Figure C.12. D.O. 5th %ile distribution along surface layer: Existing bathymetry



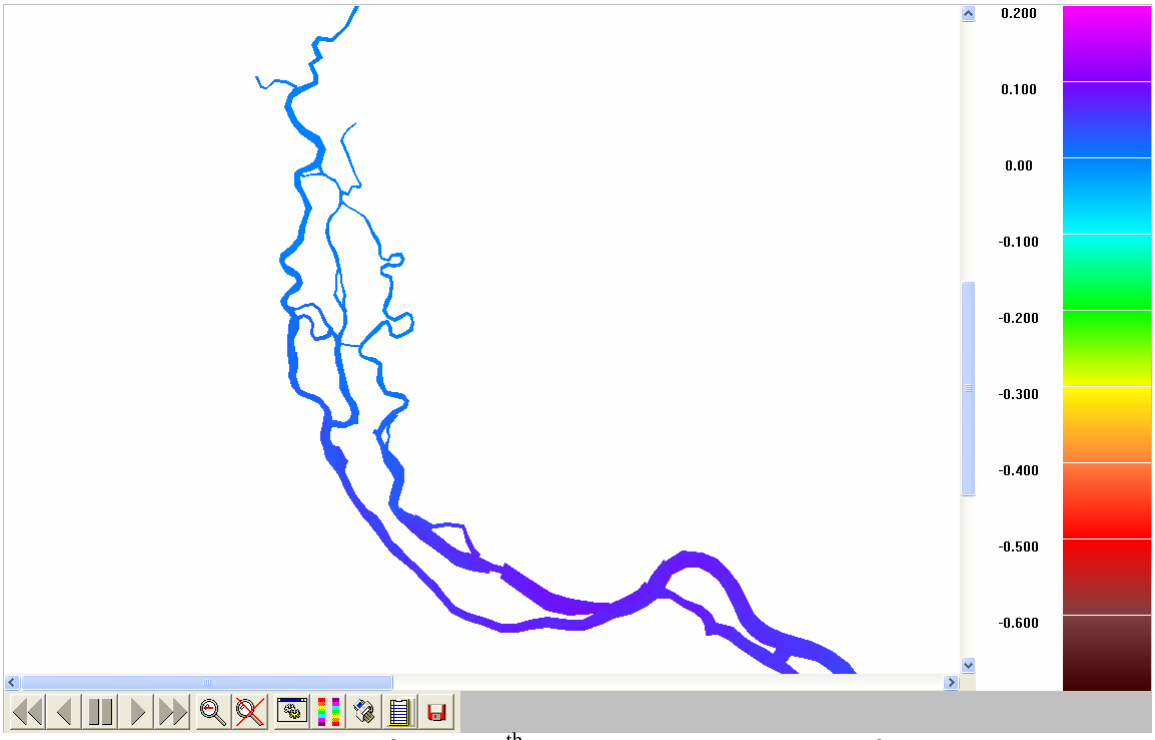
23. Figure C.13. D.O. 50th %ile distribution along surface layer: Existing bathymetry



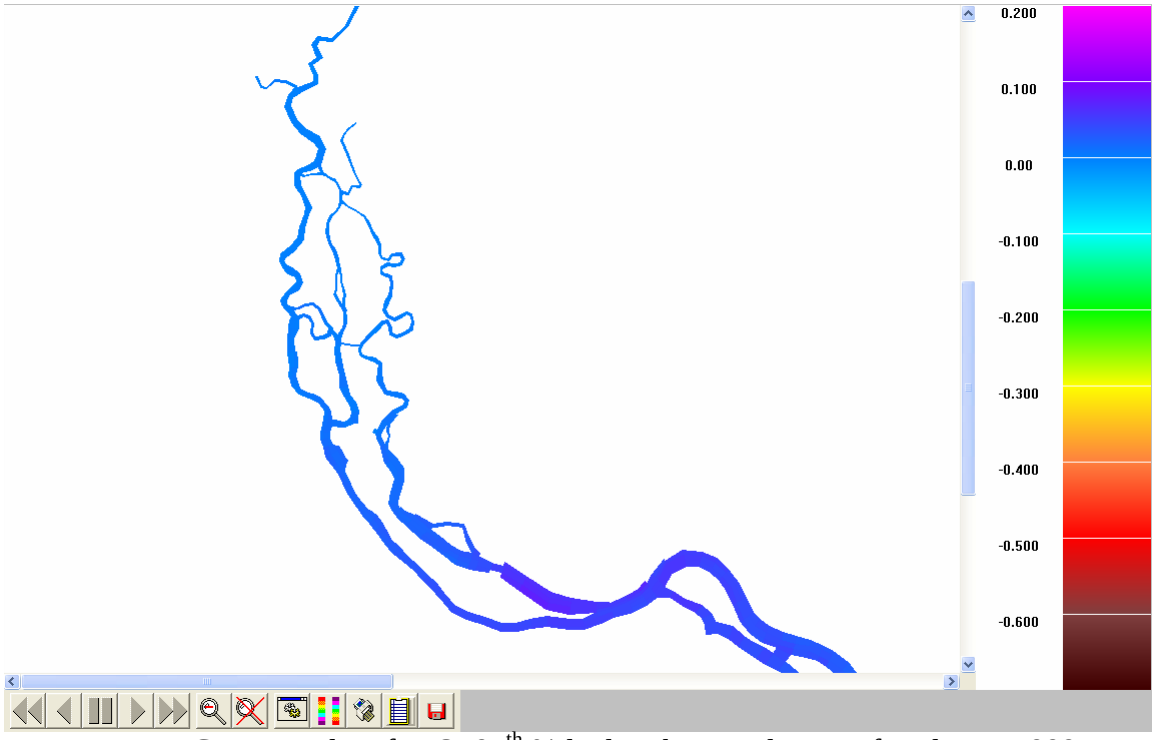
24. Figure C.14. D.O. 95th %ile distribution along surface layer: Existing bathymetry



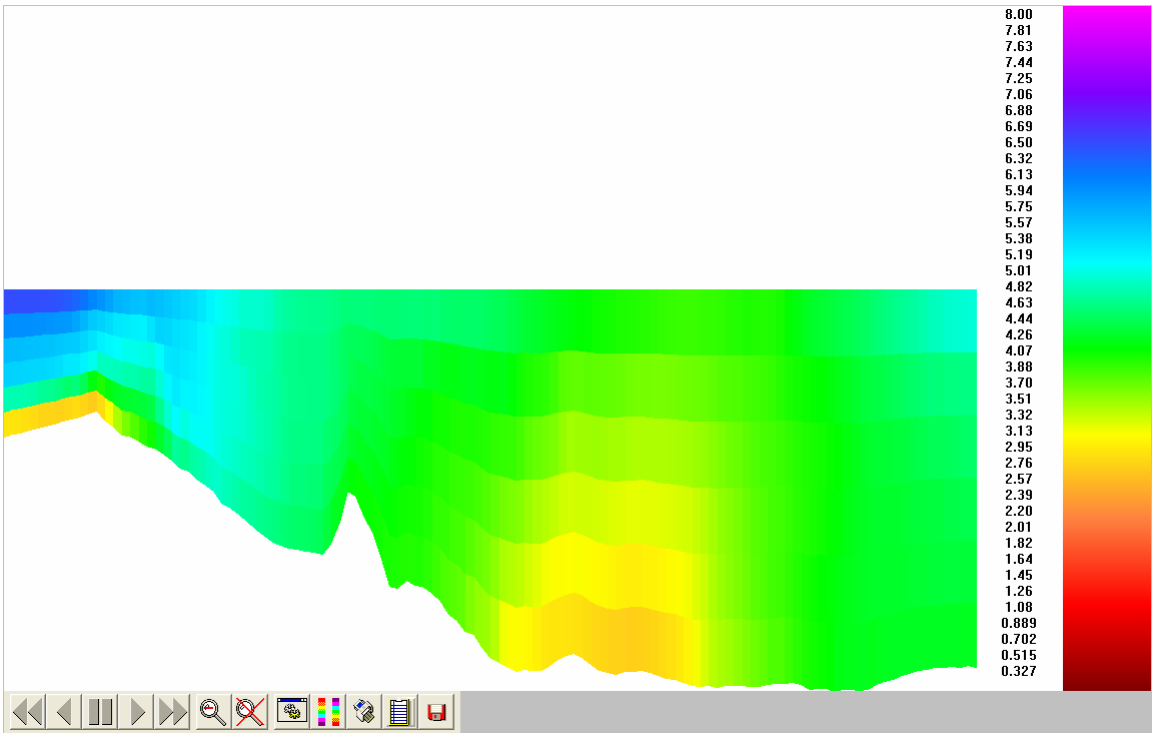
25. Figure C.15. Delta of D.O. 5th %ile distribution along surface layer: 1999 minus 2004 loading scenarios



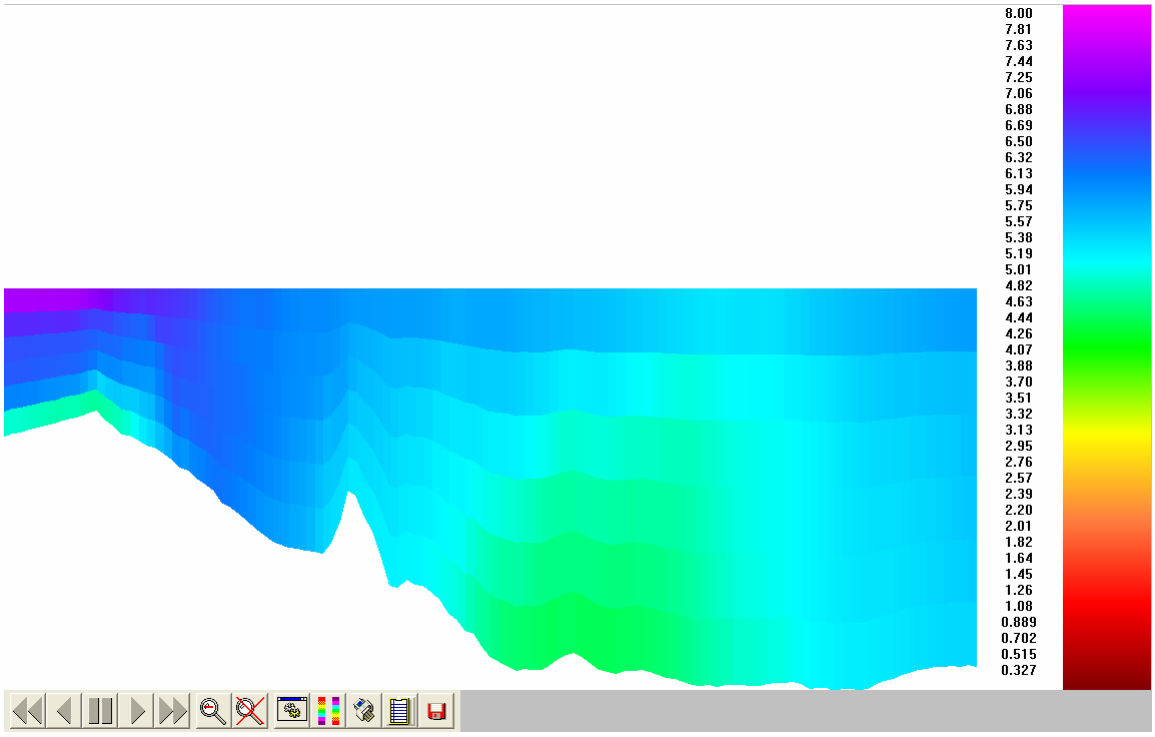
26. Figure C.16. Delta of D.O. 50th %ile distribution along surface layer: 1999 minus 2004 loading scenarios



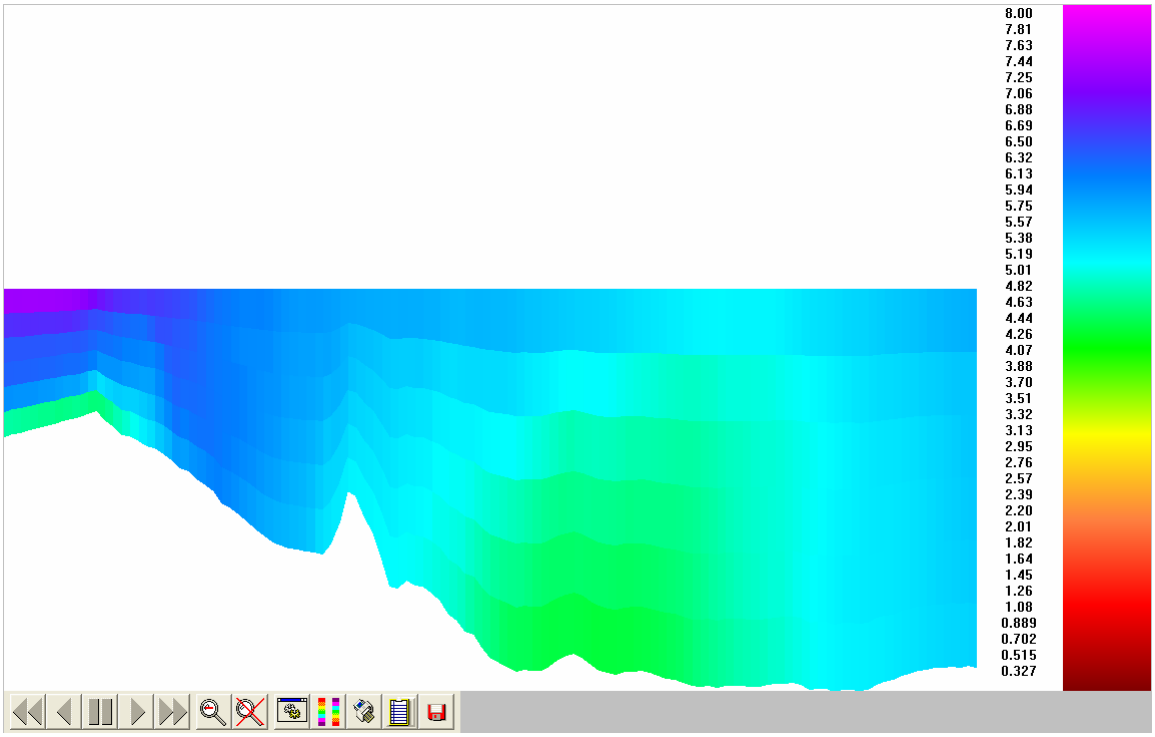
27. Figure C.17. Delta of D.O. 95th %ile distribution along surface layer: 1999 minus 2004 loading scenarios



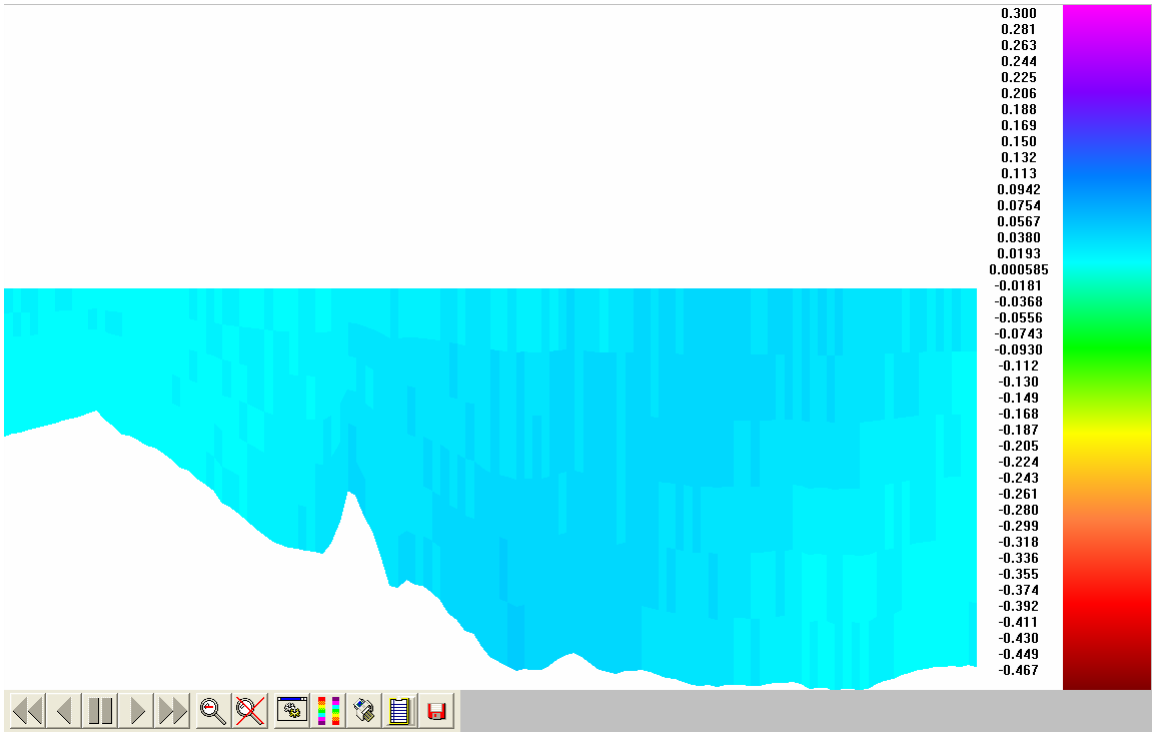
28. Figure C.18. Snapshot of 1-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Existing bathymetry



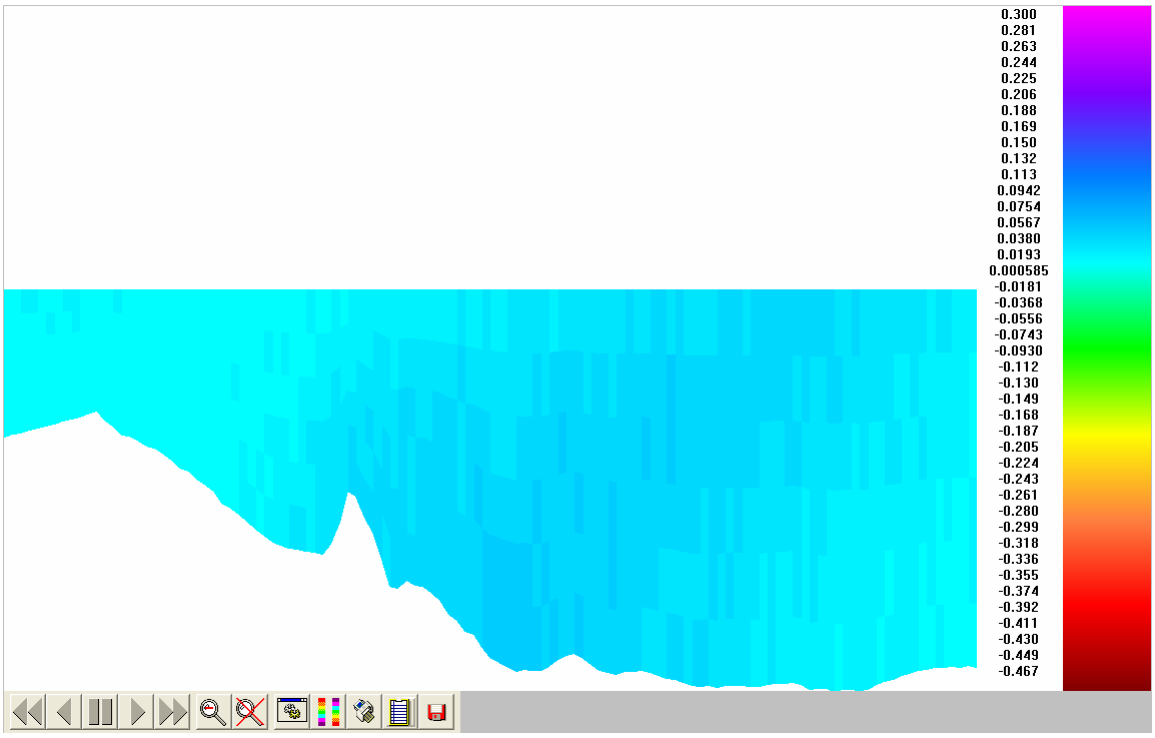
29. Figure C.19. Snapshot of 7-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Existing bathymetry



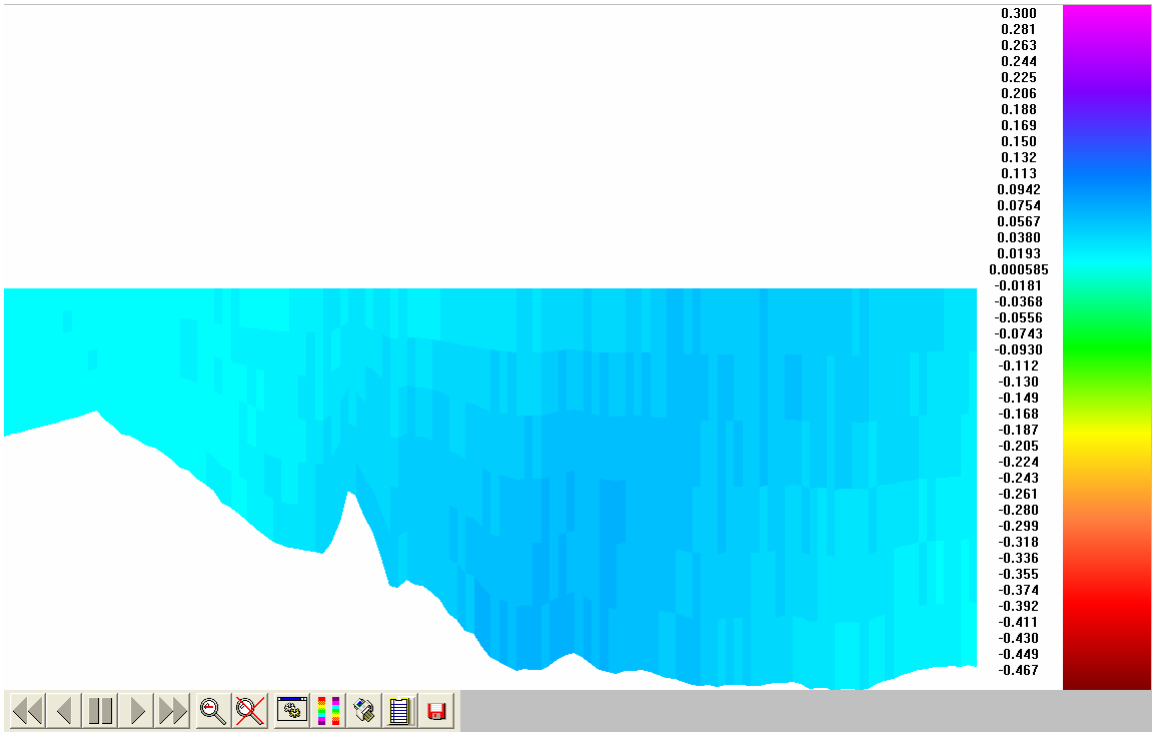
30. Figure C.20. Snapshot of 30-days averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Existing bathymetry



31. Figure C.21. Snapshot of Delta of 1-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 1999 minus 2004 loading scenarios



32. Figure C.22. Snapshot of Delta of 7-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 1999 minus 2004 loading scenarios



33. Figure C.23. Snapshot of Delta of 30-days averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: 1999 minus 2004 loading scenarios

Appendix D

SENSITIVITY ANALYSIS #2B: EXISTING BATHYMETRY, 1999 POINT SOURCES LOADS, 1999 HYDROLOGICAL AND METEOROLOGICAL CONDITIONS

May 1 – October 30, 1999 Simulation Period

Water Quality Review Group

1. Table D.1. Dissolved oxygen percentiles distribution in Critical cells

Zone	D.O. Percentile (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.16	3.41	3.53	3.76	4.12	4.55	4.86	5.04	5.37
FR2	2.27	2.64	2.77	3.07	3.42	3.84	4.25	4.41	4.73
FR3	1.99	2.26	2.42	2.72	3.13	3.56	3.95	4.16	4.51
FR4	2.01	2.29	2.45	2.75	3.11	3.54	3.92	4.14	4.47
FR5	2.01	2.26	2.37	2.73	3.1	3.5	3.93	4.08	4.38
FR6	2.03	2.24	2.36	2.68	3.07	3.47	3.93	4.07	4.36
FR7	2.35	2.64	2.85	3.27	3.82	4.48	4.96	5.13	5.45
FR8	2.76	3.12	3.29	3.76	4.44	4.89	5.27	5.47	5.77
FR9	2.97	3.25	3.45	3.88	4.47	5.01	5.32	5.47	5.73
FR10	2.28	3.12	3.37	3.91	4.57	5.19	5.57	5.73	5.96
FR11	2.14	2.77	3.14	3.62	4.22	4.82	5.35	5.55	5.88
MR1	2.24	2.61	2.83	3.17	3.57	3.91	4.27	4.45	4.72
MR2	1.91	2.34	2.64	3.07	3.5	3.9	4.25	4.45	4.74
MR3	1.8	2.21	2.53	2.99	3.43	3.88	4.23	4.45	4.71
MR4	1.8	2.2	2.42	2.88	3.26	3.6	3.96	4.18	4.47
MR5	0.43	0.96	1.34	2.17	3.58	5.08	5.49	5.66	5.9
MR6	1.03	1.61	2.06	2.98	4.37	5.24	5.62	5.81	6.1
LBR1	2.58	3.12	3.36	3.86	4.19	4.47	4.81	4.99	5.34
LBR2	1.87	2.14	2.33	2.84	3.17	3.45	3.78	3.98	4.27
LBR3	1.1	1.49	1.81	2.32	2.85	3.34	3.7	3.91	4.34
BR1	1.57	1.85	2.03	2.4	2.83	3.27	3.68	3.91	4.23
BR2	0.94	1.25	1.46	1.83	2.4	2.83	3.22	3.49	3.9
BR3	1.28	1.65	1.87	2.22	2.69	3.12	3.45	3.76	4.15
SCH1	1.01	1.39	1.63	2.22	3.08	3.96	4.53	4.87	5.21
SCH2	2.76	2.99	3.13	3.4	3.75	4.16	4.55	4.72	5.01
SR	2.24	2.52	2.96	3.6	3.86	4.2	4.5	4.64	4.91

2. Table D.2. Delta of Dissolved Oxygen percentiles distribution in Critical cells: Permitted (Project) and 2004 (Baseline) point sources loading scenarios

Zone	Delta D.O. Percentile																	
	1%		5%		10%		25%		50%		75%		90%		95%		99	
	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%	mg/l	%
FR1	-0.27	-7.9	-0.2	-5.5	-0.19	-5.1	-0.19	-4.8	-0.17	-4.0	-0.17	-3.6	-0.14	-2.8	-0.16	-3.1	-0.2	-3.6
FR2	-0.47	-17.2	-0.35	-11.7	-0.34	-10.9	-0.32	-9.4	-0.32	-8.6	-0.32	-7.7	-0.27	-6.0	-0.26	-5.6	-0.24	-4.8
FR3	-0.46	-18.8	-0.43	-16.0	-0.39	-13.9	-0.33	-10.8	-0.37	-10.6	-0.35	-9.0	-0.31	-7.3	-0.25	-5.7	-0.2	-4.2
FR4	-0.5	-19.9	-0.45	-16.4	-0.4	-14.0	-0.35	-11.3	-0.41	-11.6	-0.37	-9.5	-0.33	-7.8	-0.29	-6.5	-0.24	-5.1
FR5	-0.49	-19.6	-0.43	-16.0	-0.41	-14.7	-0.37	-11.9	-0.4	-11.4	-0.37	-9.6	-0.3	-7.1	-0.33	-7.5	-0.24	-5.2
FR6	-0.51	-20.1	-0.5	-18.2	-0.45	-16.0	-0.47	-14.9	-0.44	-12.5	-0.42	-10.8	-0.37	-8.6	-0.41	-9.2	-0.33	-7.0
FR7	-0.78	-24.9	-0.77	-22.6	-0.74	-20.6	-0.68	-17.2	-0.6	-13.6	-0.39	-8.0	-0.25	-4.8	-0.32	-5.9	-0.58	-9.6
FR8	-0.44	-13.8	-0.4	-11.4	-0.4	-10.8	-0.35	-8.5	-0.25	-5.3	-0.22	-4.3	-0.15	-2.8	-0.14	-2.5	-0.13	-2.2
FR9	-0.42	-12.4	-0.39	-10.7	-0.39	-10.2	-0.35	-8.3	-0.27	-5.7	-0.19	-3.7	-0.14	-2.6	-0.14	-2.5	-0.15	-2.6
FR10	-0.01	-0.4	-0.01	-0.3	-0.01	-0.3	-0.01	-0.3	-0.02	-0.4	-0.05	-1.0	-0.08	-1.4	-0.09	-1.5	-0.07	-1.2
FR11	-0.03	-1.4	-0.01	-0.4	-0.01	-0.3	-0.01	-0.3	0	0.0	-0.03	-0.6	-0.05	-0.9	-0.07	-1.2	-0.06	-1.0
MR1	-0.34	-13.2	-0.38	-12.7	-0.35	-11.0	-0.38	-10.7	-0.36	-9.2	-0.34	-8.0	-0.31	-6.8	-0.3	-6.3	-0.26	-5.2
MR2	-0.29	-13.2	-0.22	-8.6	-0.27	-9.3	-0.3	-8.9	-0.32	-8.4	-0.31	-7.4	-0.28	-6.2	-0.29	-6.1	-0.26	-5.2
MR3	-0.28	-13.5	-0.24	-9.8	-0.23	-8.3	-0.29	-8.8	-0.31	-8.3	-0.29	-7.0	-0.27	-6.0	-0.28	-5.9	-0.26	-5.2
MR4	-0.25	-12.2	-0.24	-9.8	-0.21	-8.0	-0.17	-5.6	-0.22	-6.3	-0.23	-6.0	-0.22	-5.3	-0.18	-4.1	-0.21	-4.5
MR5	-0.02	-4.4	-0.03	-3.0	-0.05	-3.6	-0.04	-1.8	-0.05	-1.4	-0.04	-0.8	-0.08	-1.4	-0.07	-1.2	-0.07	-1.2
MR6	-0.02	-1.9	-0.05	-3.0	-0.05	-2.4	-0.05	-1.7	-0.05	-1.1	-0.06	-1.1	-0.09	-1.6	-0.08	-1.4	-0.07	-1.1
LBR1	-0.09	-3.4	-0.17	-5.2	-0.14	-4.0	-0.1	-2.5	-0.12	-2.8	-0.13	-2.8	-0.11	-2.2	-0.11	-2.2	-0.09	-1.7
LBR2	-0.23	-11.0	-0.19	-8.2	-0.18	-7.2	-0.14	-4.7	-0.16	-4.8	-0.19	-5.2	-0.16	-4.1	-0.15	-3.6	-0.16	-3.6
LBR3	-0.24	-17.9	-0.26	-14.9	-0.23	-11.3	-0.24	-9.4	-0.28	-8.9	-0.29	-8.0	-0.28	-7.0	-0.27	-6.5	-0.22	-4.8
BR1	-0.43	-21.5	-0.38	-17.0	-0.38	-15.8	-0.38	-13.7	-0.38	-11.8	-0.36	-9.9	-0.33	-8.2	-0.31	-7.3	-0.25	-5.6
BR2	-0.43	-31.4	-0.36	-22.4	-0.37	-20.2	-0.37	-16.8	-0.38	-13.7	-0.36	-11.3	-0.35	-9.8	-0.29	-7.7	-0.25	-6.0
BR3	-0.41	-24.3	-0.38	-18.7	-0.35	-15.8	-0.34	-13.3	-0.37	-12.1	-0.35	-10.1	-0.34	-9.0	-0.29	-7.2	-0.24	-5.5
SCH1	-0.28	-21.7	-0.26	-15.8	-0.29	-15.1	-0.27	-10.8	-0.23	-6.9	-0.14	-3.4	-0.13	-2.8	-0.11	-2.2	-0.11	-2.1
SCH2	-0.32	-10.4	-0.32	-9.7	-0.32	-9.3	-0.29	-7.9	-0.29	-7.2	-0.28	-6.3	-0.22	-4.6	-0.24	-4.8	-0.24	-4.6
SR	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

3. Table D.3. Dissolved oxygen percentiles distribution in Zones of Savannah Estuary

Zone Name	D.O. Concentration Percentiles (mg/l)								
	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	3.68	3.85	3.94	4.16	4.50	4.91	5.21	5.39	5.72
FR2	2.86	3.16	3.29	3.52	3.87	4.28	4.63	4.78	5.10
FR3	2.26	2.58	2.70	2.99	3.33	3.75	4.14	4.32	4.62
FR4	2.00	2.27	2.38	2.69	3.07	3.50	3.90	4.08	4.43
FR5	2.05	2.27	2.39	2.67	3.08	3.46	3.91	4.06	4.38
FR6	2.17	2.41	2.51	2.81	3.20	3.60	4.03	4.21	4.44
FR7	2.53	2.84	3.01	3.43	3.99	4.56	4.94	5.12	5.43
FR8	2.91	3.24	3.43	3.86	4.42	4.88	5.18	5.35	5.62
FR9	3.57	3.93	4.15	4.59	5.04	5.37	5.63	5.78	6.03
FR10	3.98	4.45	4.65	4.95	5.22	5.48	5.71	5.85	6.09
FR11	2.64	3.18	3.56	3.96	4.30	4.62	4.92	5.11	5.34
MR1	2.34	2.64	2.83	3.18	3.56	3.91	4.25	4.45	4.68
MR2	2.05	2.50	2.74	3.13	3.53	3.88	4.24	4.44	4.69
MR3	1.82	2.12	2.48	2.88	3.32	3.76	4.11	4.32	4.67
MR4	2.49	2.75	3.00	3.43	3.76	4.05	4.34	4.54	4.75
MR5	1.04	1.41	1.83	2.67	4.10	5.03	5.43	5.59	5.85
MR6	1.08	1.63	2.09	3.04	4.43	5.22	5.58	5.77	6.04
LBR1	2.67	2.84	3.02	3.53	3.75	4.00	4.33	4.47	4.64
LBR2	1.78	2.06	2.29	2.76	3.12	3.41	3.72	3.94	4.15
LBR3	1.45	1.59	1.78	2.33	2.77	3.05	3.43	3.60	3.96
BR1	2.01	2.19	2.31	2.60	3.01	3.42	3.85	4.03	4.31
BR2	1.51	1.79	1.93	2.24	2.69	3.13	3.54	3.76	4.08
BR3	1.51	1.74	1.92	2.29	2.72	3.08	3.51	3.75	4.07
SCh1	2.35	2.66	2.79	3.05	3.43	3.90	4.26	4.42	4.71
SCh2	3.02	3.19	3.29	3.54	3.85	4.27	4.63	4.78	5.08
SR	2.62	2.79	3.29	3.88	4.12	4.44	4.71	4.85	5.11

4. Table D.4. Delta of Dissolved Oxygen percentiles distribution in Zones: Permitted (Project) and 2004 (Baseline) point sources loading scenarios

Zone	Project - Baseline Difference (mg/l)									Project - Baseline Relative Difference (%)								
Name	1%	5%	10%	25%	50%	75%	90%	95%	99%	1%	5%	10%	25%	50%	75%	90%	95%	99%
FR1	-0.13	-0.11	-0.10	-0.09	-0.09	-0.09	-0.07	-0.09	-0.09	-3.4	-2.8	-2.4	-2.2	-2.1	-1.9	-1.3	-1.6	-1.6
FR2	-0.36	-0.28	-0.27	-0.25	-0.24	-0.24	-0.19	-0.18	-0.20	-11.2	-8.1	-7.5	-6.5	-5.8	-5.3	-4.0	-3.7	-3.8
FR3	-0.48	-0.37	-0.35	-0.32	-0.35	-0.33	-0.28	-0.26	-0.26	-17.5	-12.7	-11.4	-9.7	-9.5	-8.0	-6.3	-5.7	-5.3
FR4	-0.50	-0.46	-0.43	-0.38	-0.42	-0.37	-0.34	-0.31	-0.24	-20.0	-16.9	-15.2	-12.2	-12.1	-9.6	-8.1	-7.1	-5.1
FR5	-0.50	-0.47	-0.44	-0.43	-0.44	-0.42	-0.36	-0.35	-0.25	-19.6	-17.2	-15.6	-13.7	-12.4	-10.7	-8.4	-7.9	-5.4
FR6	-0.50	-0.46	-0.44	-0.46	-0.44	-0.41	-0.35	-0.35	-0.30	-18.8	-16.1	-15.0	-14.0	-12.1	-10.1	-8.0	-7.7	-6.4
FR7	-0.49	-0.43	-0.44	-0.41	-0.32	-0.26	-0.20	-0.19	-0.19	-16.3	-13.1	-12.8	-10.7	-7.5	-5.5	-3.8	-3.6	-3.4
FR8	-0.41	-0.38	-0.37	-0.35	-0.26	-0.20	-0.17	-0.17	-0.16	-12.3	-10.4	-9.7	-8.3	-5.5	-4.0	-3.1	-3.1	-2.7
FR9	-0.35	-0.30	-0.29	-0.23	-0.16	-0.13	-0.13	-0.12	-0.10	-9.0	-7.1	-6.4	-4.8	-3.1	-2.4	-2.2	-2.0	-1.7
FR10	-0.03	-0.05	-0.06	-0.05	-0.06	-0.08	-0.09	-0.08	-0.07	-0.7	-1.2	-1.3	-1.0	-1.2	-1.5	-1.6	-1.3	-1.1
FR11	0.01	0.00	0.00	0.00	0.00	-0.01	-0.02	-0.02	-0.03	0.3	0.0	0.0	-0.1	0.0	-0.2	-0.4	-0.4	-0.5
MR1	-0.45	-0.41	-0.39	-0.38	-0.38	-0.33	-0.32	-0.30	-0.26	-16.2	-13.4	-12.0	-10.7	-9.5	-7.8	-7.0	-6.3	-5.2
MR2	-0.31	-0.29	-0.31	-0.33	-0.34	-0.32	-0.29	-0.30	-0.26	-13.1	-10.2	-10.1	-9.4	-8.8	-7.7	-6.3	-6.4	-5.3
MR3	-0.27	-0.23	-0.19	-0.25	-0.27	-0.27	-0.26	-0.26	-0.25	-12.8	-10.0	-7.1	-8.1	-7.4	-6.7	-6.0	-5.7	-5.0
MR4	-0.25	-0.18	-0.16	-0.14	-0.14	-0.15	-0.17	-0.14	-0.10	-9.1	-6.2	-4.9	-3.8	-3.7	-3.7	-3.7	-3.0	-2.1
MR5	-0.03	-0.05	-0.05	-0.06	-0.03	-0.05	-0.07	-0.07	-0.07	-2.9	-3.6	-2.4	-2.1	-0.7	-0.9	-1.3	-1.2	-1.2
MR6	-0.03	-0.05	-0.04	-0.06	-0.03	-0.06	-0.08	-0.07	-0.07	-2.5	-3.2	-1.7	-2.0	-0.8	-1.1	-1.4	-1.2	-1.1
LBR1	-0.19	-0.19	-0.16	-0.10	-0.16	-0.16	-0.14	-0.14	-0.11	-6.6	-6.2	-4.9	-2.9	-4.1	-3.8	-3.1	-3.0	-2.4
LBR2	-0.25	-0.20	-0.20	-0.16	-0.17	-0.19	-0.17	-0.15	-0.14	-12.4	-8.8	-7.9	-5.4	-5.3	-5.1	-4.4	-3.8	-3.2
LBR3	-0.31	-0.31	-0.23	-0.19	-0.28	-0.28	-0.24	-0.21	-0.20	-17.8	-16.4	-11.3	-7.6	-9.1	-8.3	-6.4	-5.6	-4.9
BR1	-0.40	-0.35	-0.35	-0.35	-0.35	-0.35	-0.30	-0.31	-0.29	-16.7	-13.9	-13.1	-11.8	-10.5	-9.4	-7.3	-7.2	-6.3
BR2	-0.44	-0.37	-0.38	-0.37	-0.38	-0.37	-0.34	-0.32	-0.26	-22.6	-17.3	-16.4	-14.0	-12.2	-10.6	-8.8	-7.8	-5.9
BR3	-0.41	-0.36	-0.32	-0.29	-0.34	-0.36	-0.30	-0.28	-0.23	-21.4	-17.3	-14.4	-11.4	-11.2	-10.3	-7.9	-6.8	-5.2
SCh1	-0.26	-0.22	-0.21	-0.22	-0.21	-0.21	-0.18	-0.16	-0.13	-9.9	-7.7	-7.1	-6.6	-5.8	-5.2	-4.0	-3.5	-2.7
SCh2	-0.32	-0.29	-0.28	-0.25	-0.25	-0.25	-0.20	-0.22	-0.21	-9.5	-8.2	-7.9	-6.7	-6.1	-5.6	-4.2	-4.4	-3.9
SR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

5. Table D.5. Percentage of the volume of waters with violation of Dissolved Oxygen standards for Zones of Savannah Estuary within the period of May 1 – October 30, 1999: Permitted (Project) and 2004 (Baseline) point sources loading scenarios

Zones	D.O. STANDARDS														
	1-Day Average			7-Day Average			30-Day Average			GA MINIMUM D.O.			SC MINIMUM D.O.		
	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B)	Project(P)	Delta=P-B	Baseline(B	Project(P)	Delta=P-B
FR1	0	0	0	0	0	0	0	0	0	0	0	0	7	16	9
FR2	0	0	0	0	1	1	3	17	14	0	4	4	31	52	21
FR3	0	0	0	2	12	10	19	42	23	3	13	10	N/A	N/A	N/A
FR4	0	1	1	5	16	11	22	44	22	6	18	12	N/A	N/A	N/A
FR5	0	1	1	4	15	11	19	39	20	5	17	12	N/A	N/A	N/A
FR6	0	0	0	2	11	9	12	30	18	4	14	10	N/A	N/A	N/A
FR7	0	0	0	0	1	1	1	4	3	0	4	4	N/A	N/A	N/A
FR8	0	0	0	0	0	0	0	0	0	0	1	1	N/A	N/A	N/A
FR9	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR10	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A
FR11	0	0	0	0	0	0	2	2	0	1	1	0	6	6	0
MR1	0	0	0	0	4	4	5	14	9	1	5	4	N/A	N/A	N/A
MR2	0	0	0	1	4	3	6	14	8	1	4	3	N/A	N/A	N/A
MR3	0	1	1	3	5	2	10	15	5	3	6	3	N/A	N/A	N/A
MR4	0	0	0	1	2	1	5	7	2	2	2	0	N/A	N/A	N/A
MR5	0	0	0	1	2	1	5	5	0	5	5	0	11	12	1
MR6	0	0	0	0	0	0	3	3	0	3	3	0	9	9	0
LBR1	0	0	0	1	2	1	6	9	3	1	2	1	18	23	5
LBR2	1	2	1	6	9	3	18	24	6	7	10	3	34	41	7
LBR3	3	5	2	13	20	7	30	37	7	14	21	7	47	54	7
BR1	0	2	2	10	25	15	39	64	25	12	26	14	67	84	17
BR2	2	9	7	19	37	18	49	65	16	20	38	18	75	86	11
BR3	3	10	7	21	36	15	48	59	11	22	38	16	70	79	9
SCh1	1	2	1	4	5	1	8	13	5	5	7	2	N/A	N/A	N/A
SCh2	0	0	0	0	0	0	0	4	4	0	1	1	N/A	N/A	N/A
SR	0	0	0	1	1	0	3	3	0	1	1	0	6	6	0

6. Table D.6. Percentage of water volumes with salinity in %iles within the period of May 1 – October 30, 1999

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	19.6	5.2	4.4	4.8	4.4	4.3	4.5	3.8	88
10	23.6	9.1	8.8	9.1	8.9	8.7	9.1	8.4	88
25	35.8	20.7	22.4	22.3	22.8	22.1	26.1	21.6	88
50	57	43.1	46.6	46.5	47.1	46.1	47.1	43	88
75	79.7	69.8	72.8	72.8	73.1	72.8	74.2	69.7	88
90	91.1	87.5	89	89	89.2	89.2	89.3	87.5	89.3
95	95.6	93.6	94.4	94.5	94.6	94.6	94.1	93.7	95.3
Total Volume 100*km3:	31414.5	659.1	4809.2	22.6	39.2	136.3	10	9.5	43.6

7. Table D.7. Percentage of water volumes with D.O. in %iles within the period of May 1 – October 30, 1999

Percen-tile	Harbor / River			Stations					
	Upper Hrb %	Middle Rvr %	Back Rvr %	Houlih Brg %	Broad Str %	Pulaski Frt %	Lucknow Cnl %	USF&W Dck %	I-95 Brg %
5	5.2	5	4.9	5.7	5.2	4.7	5.3	5.4	5.7
10	10.4	10	9.9	11.3	10.5	9.3	10.2	10.6	11.1
25	26	25.1	24.9	27.7	25.9	23.9	25.5	25.7	26.6
50	52	49.8	50	53.6	51.3	48.8	51.1	51.1	51.4
75	77.4	74.6	75.3	77.8	76	74.3	75.6	76	75.9
90	90.6	89.8	90.2	91.2	90.5	89.7	90.2	90.4	90.5
95	95.4	94.9	95.1	95.7	95.3	94.7	95.2	95.3	95.3
Total Volume 100*km3:	31414.5	659.1	4809.2	22.6	39.2	136.3	10	9.5	43.6

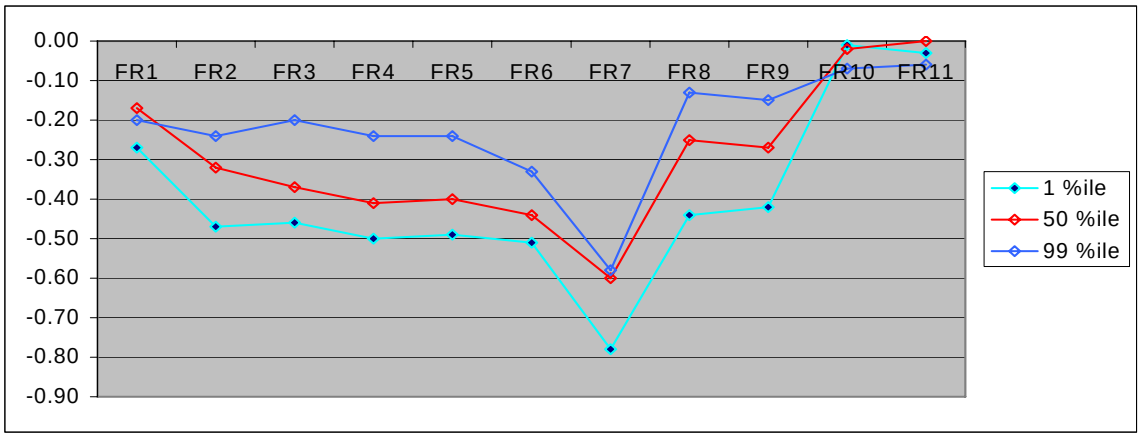
8. Table D.8. Water volumes in Upper Harbor in increments of 1^{o} C of water temperature within the period of May 1 – October 30, 1999

Temperature C^{o}	Total Volume %
19	0.01
20	0.7
21	3.71
22	8.89
23	14.26
24	22.76
25	33.67
26	48.48
27	59.67
28	68.63
29	77.56
30	85.3
31	89.56
32	96.42
33	99.99
34	100

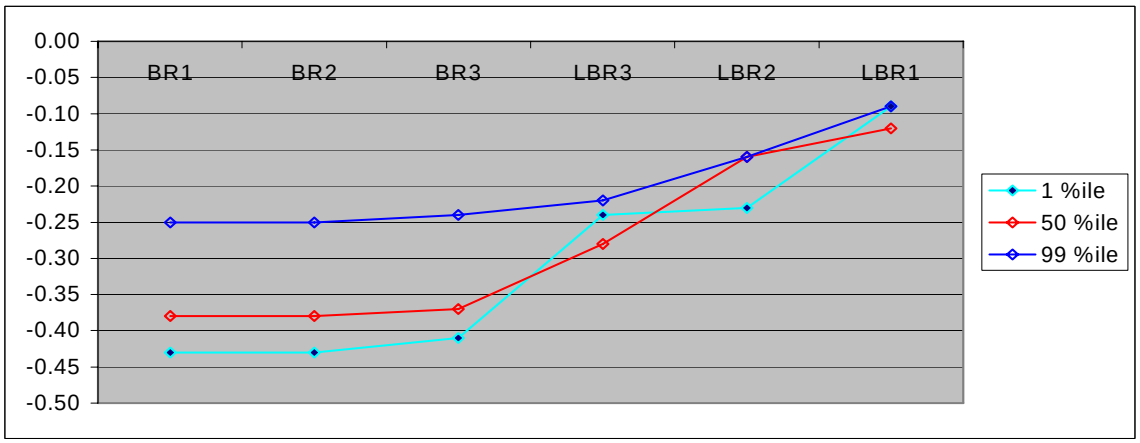
9. Table D.9. Water volumes in Upper Harbor in increments of 0.1 mg/l of D.O. within the period of May 1 – October 30, 1999
   (See file: Postprocessor Output\99-S3E\99-S3E_DO Increment Volume)

10. Table D.10. Percentage of water volumes corresponding to 1-, 7-, and 30-days averages of D.O. depth-averaged concentrations in Upper Harbor within the period of May 1 – October 30, 1999
    (See file: Postprocessor Output\99-S3E\99-S3E_volume DO in averages)

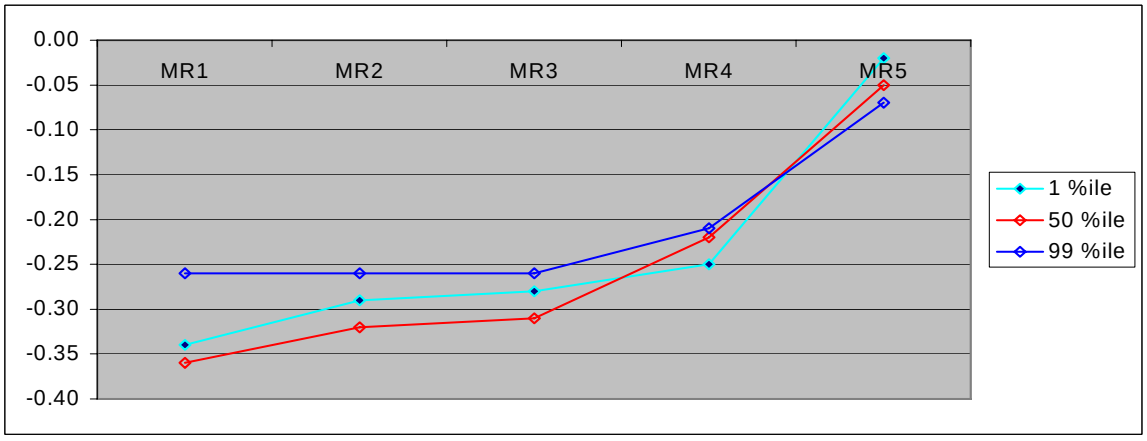
Front River



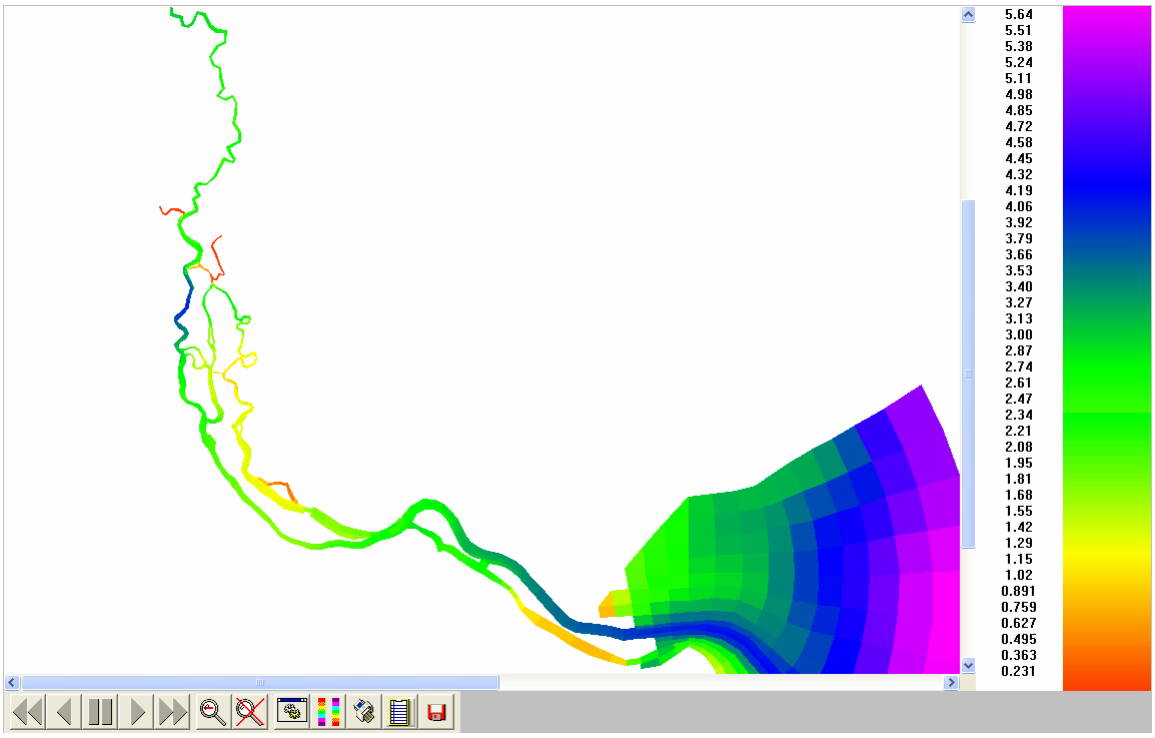
Back and Little Back Rivers



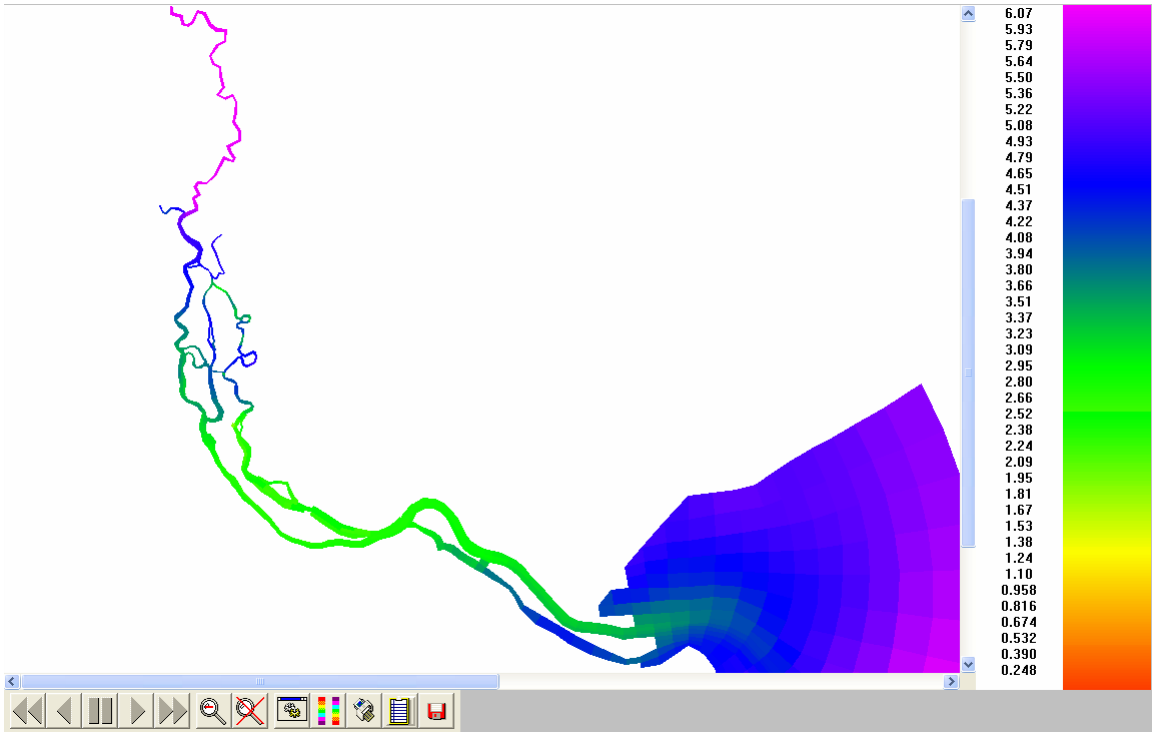
Middle River



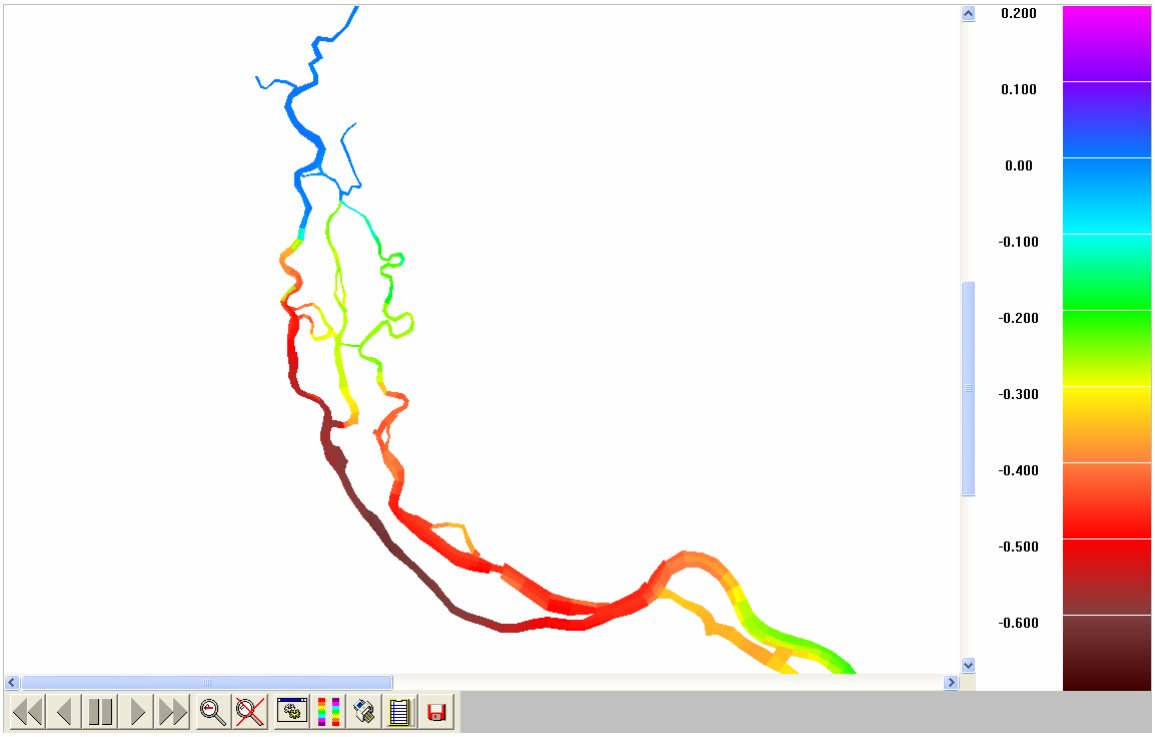
11. Figure D.1. Longitudinal profile of Dissolved Oxygen (mg/l) distribution along Critical cells of Savannah Estuary: Existing bathymetry



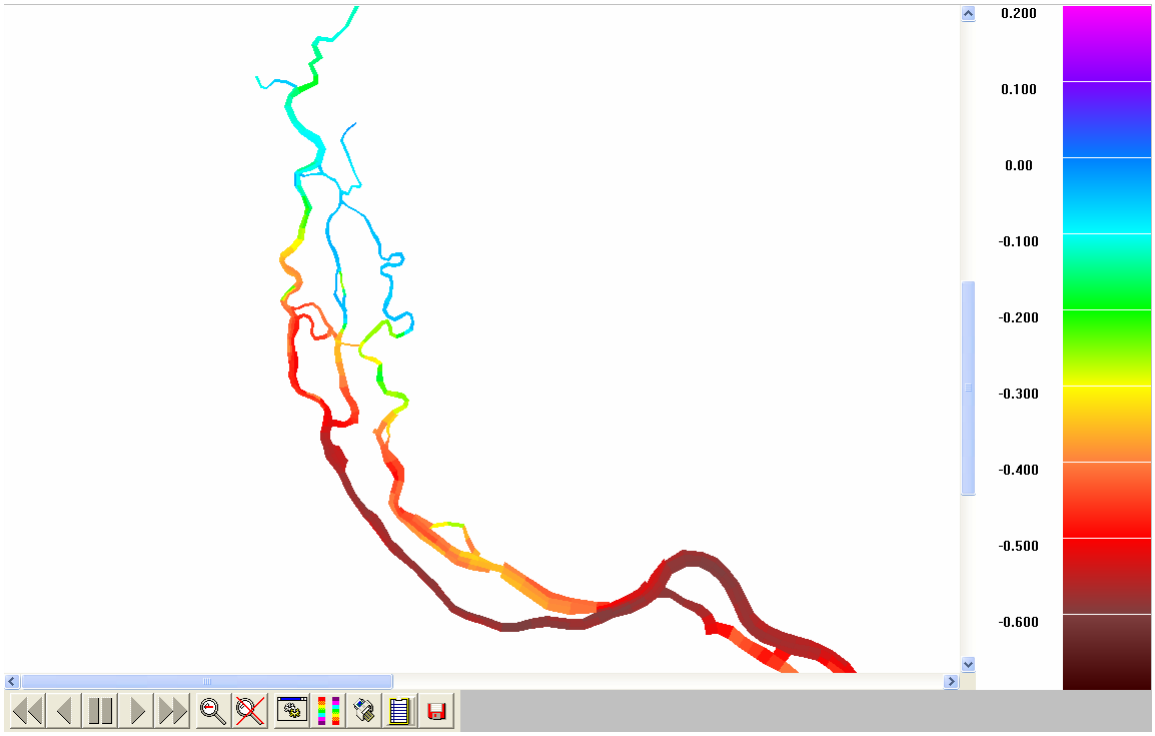
12. Figure D.2. Minimum D.O. distribution along bottom layer within the analyzed period of May 1 - October 30, 1999: Existing bathymetry



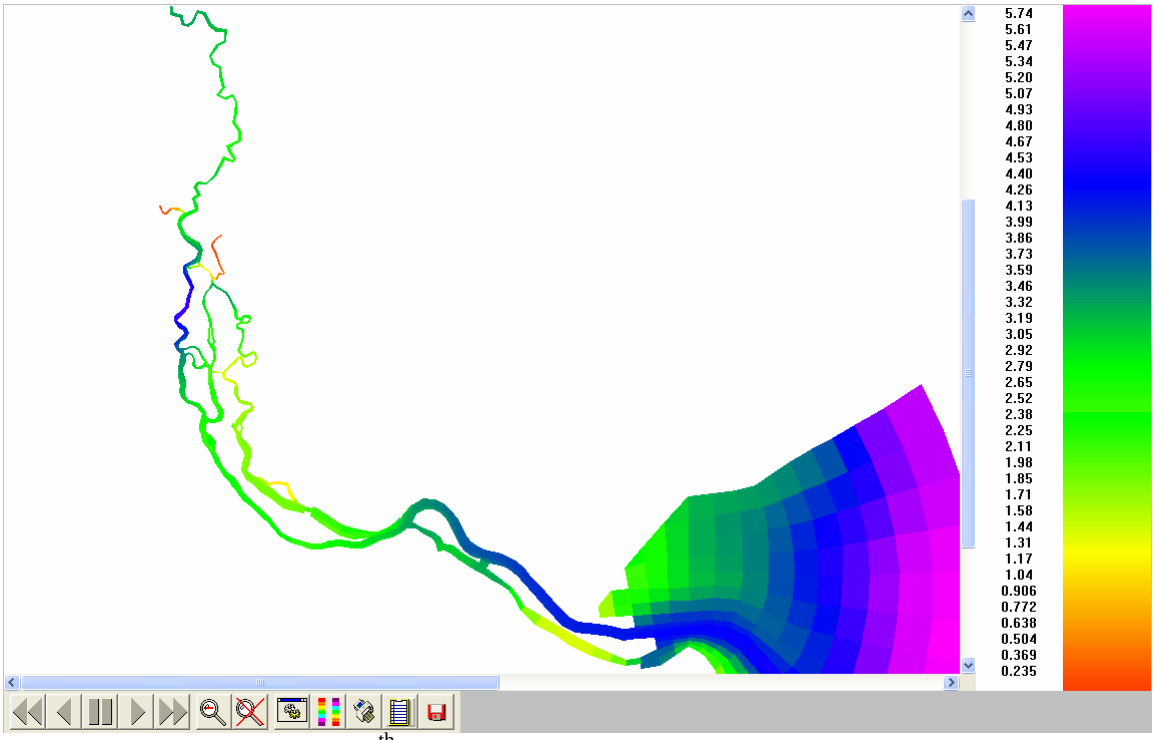
13. Figure D.3. Minimum D.O. distribution along surface layer within the analyzed period of May 1 - October 30, 1999: Existing bathymetry



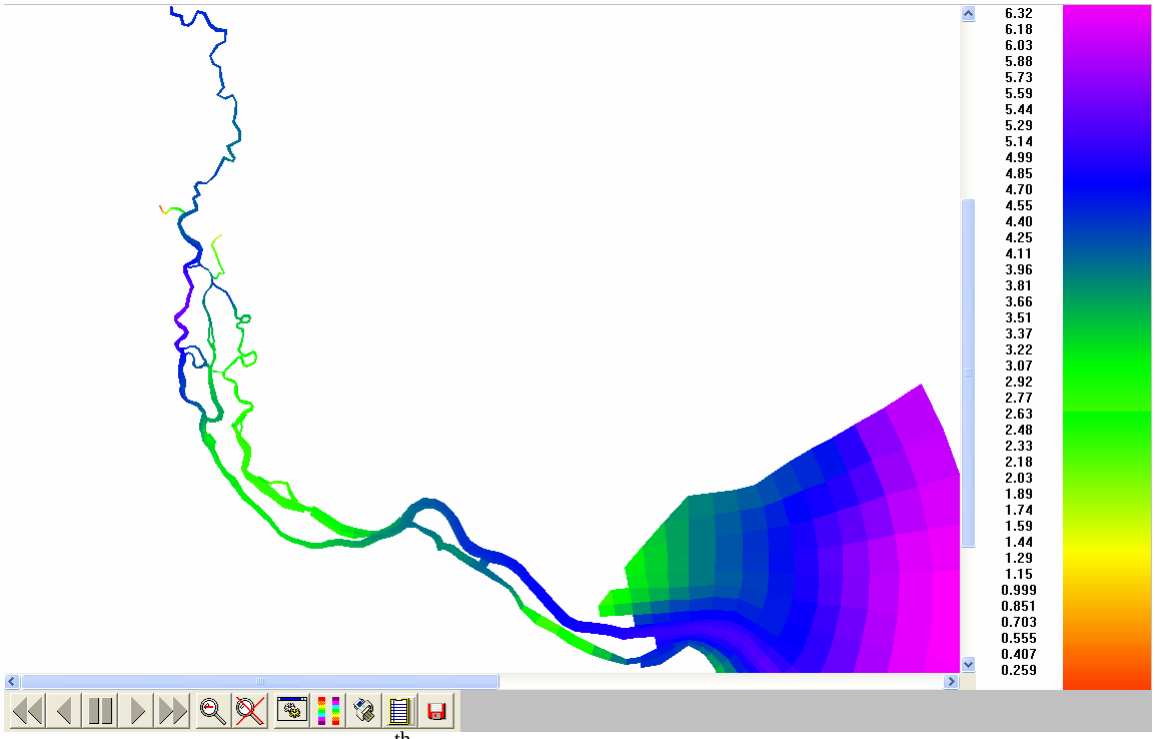
14. Figure D.4. Delta of Minimum D.O. distribution along bottom layer: Permitted minus 2004 loading scenarios



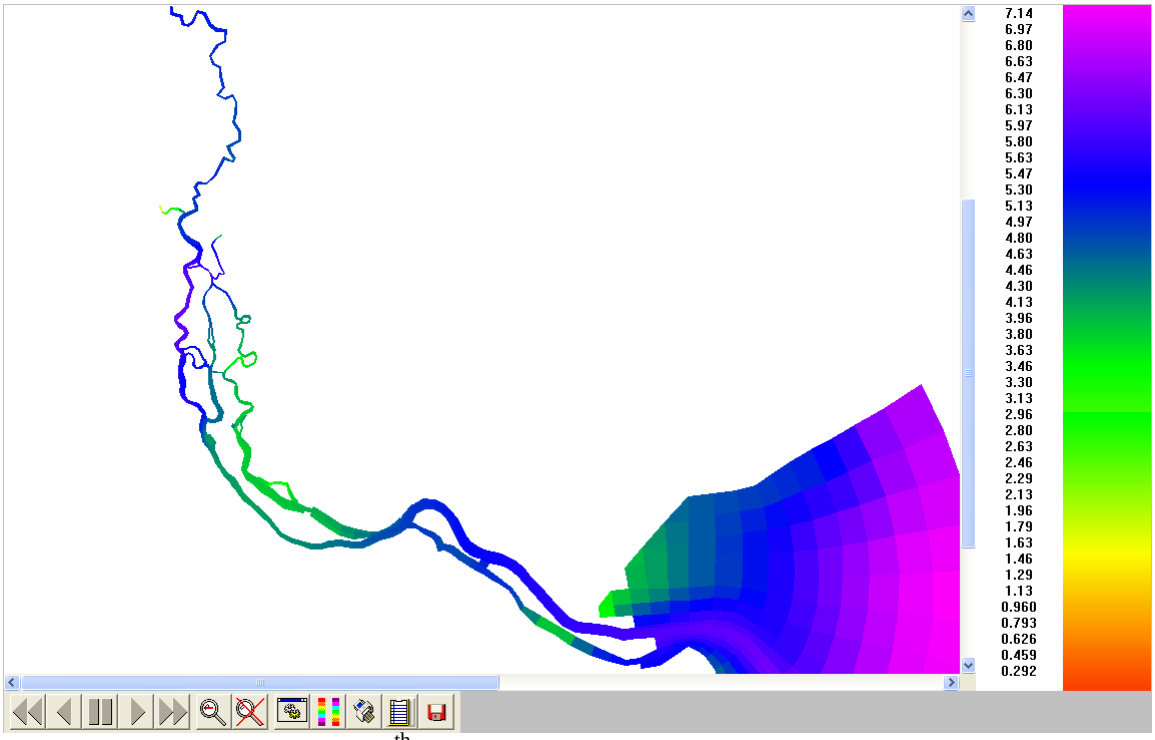
15. Figure D.5. Delta of Minimum D.O. distribution along Surface layer: Permitted minus 2004 loading scenarios



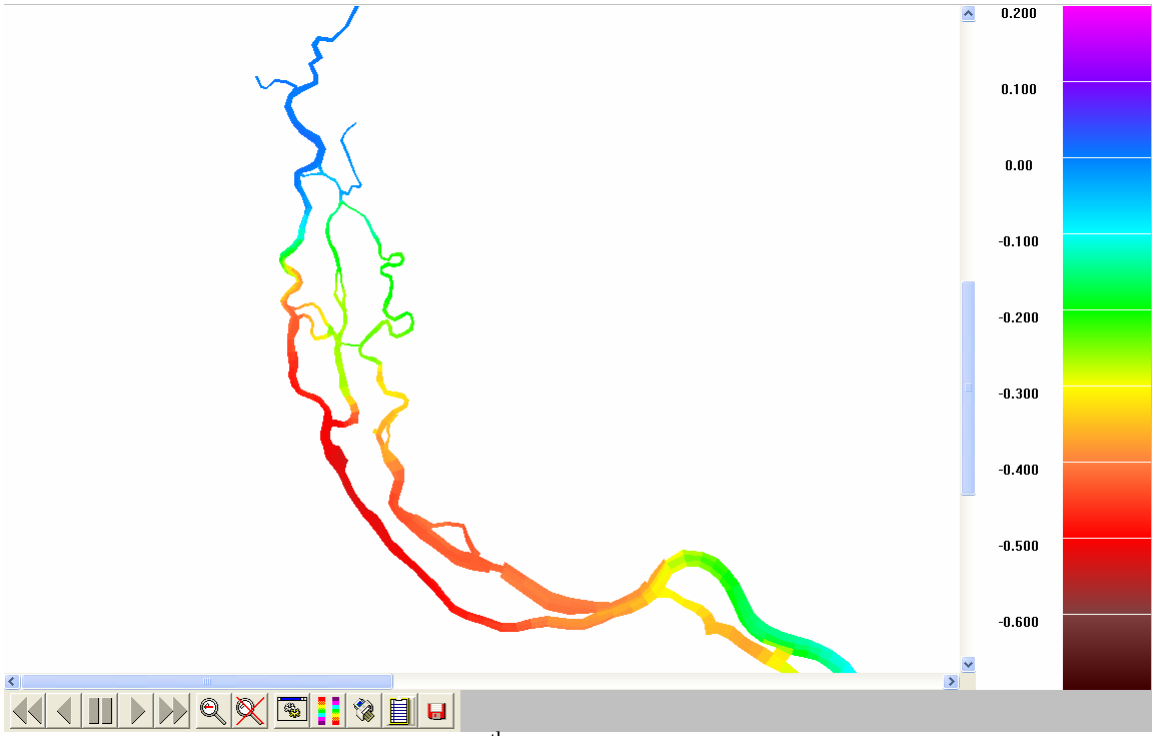
16. Figure D.6. D.O. 5th %ile distribution along bottom layer: Existing bathymetry



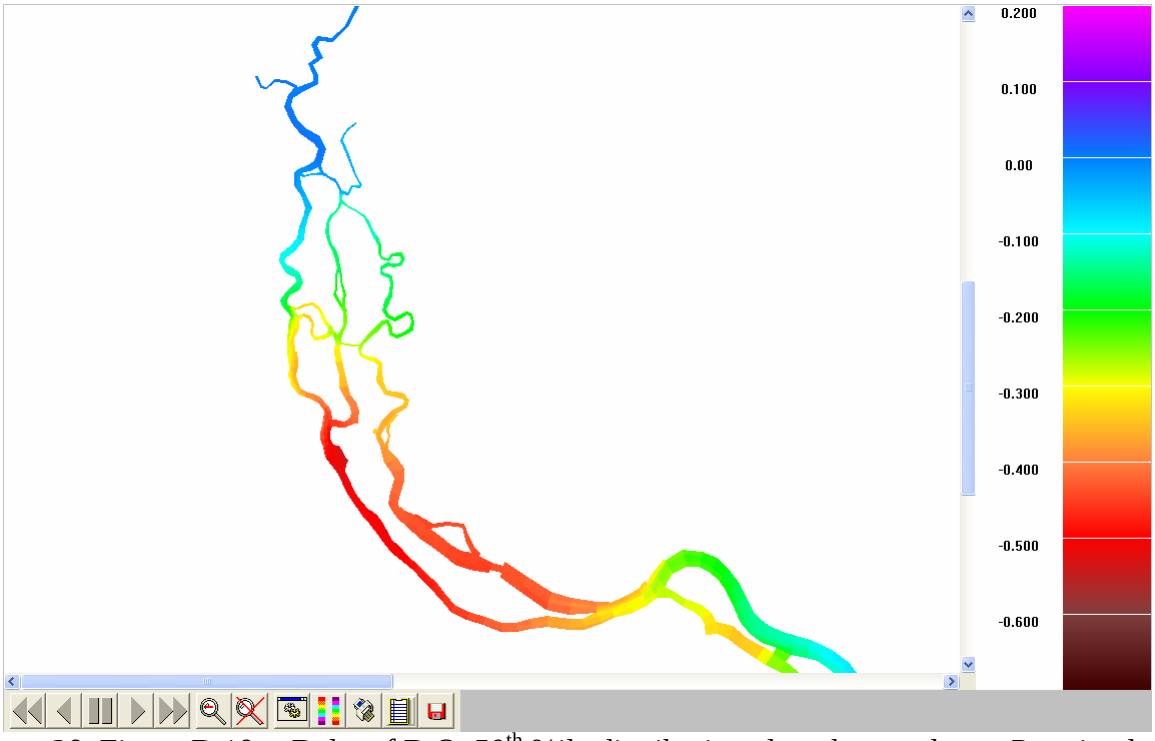
17. Figure D.7. D.O. 50th %ile distribution along bottom layer: Existing bathymetry



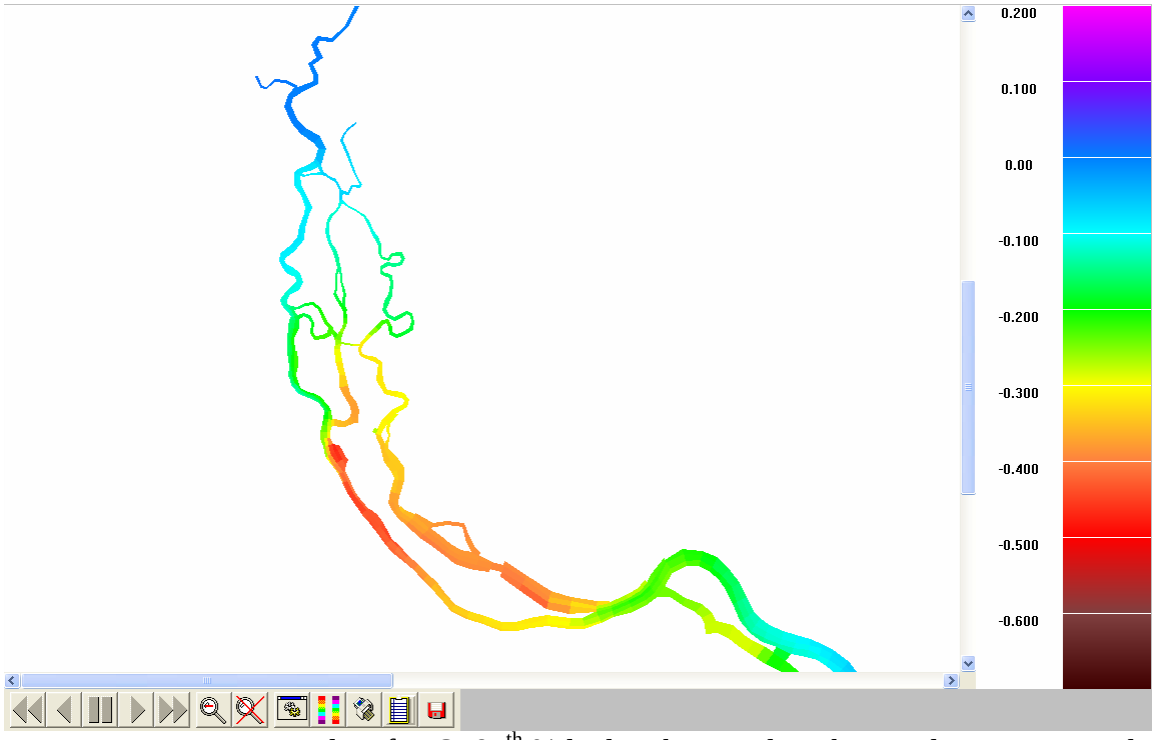
18. Figure D.8. D.O. 95th %ile distribution along bottom layer: Existing bathymetry



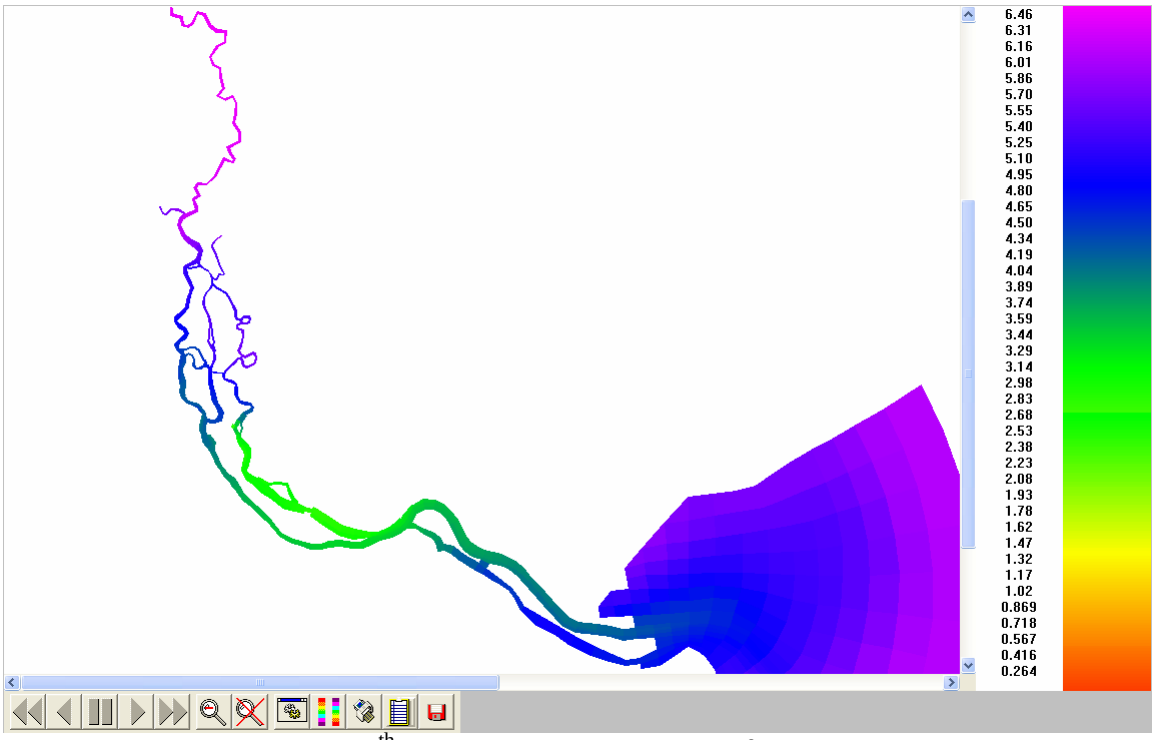
19. Figure D.9. Delta of D.O. 5th %ile distribution along bottom layer: Permitted minus 2004 loading scenarios



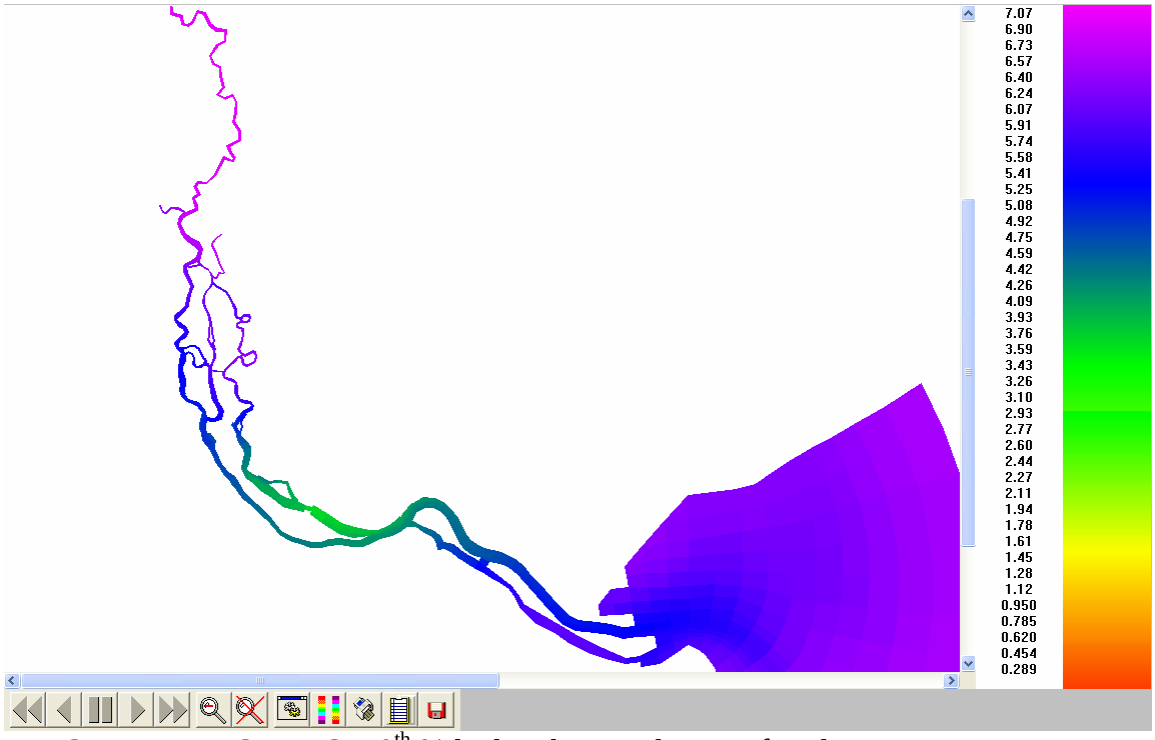
20. Figure D.10. Delta of D.O. 50th %ile distribution along bottom layer: Permitted minus 2004 loading scenarios



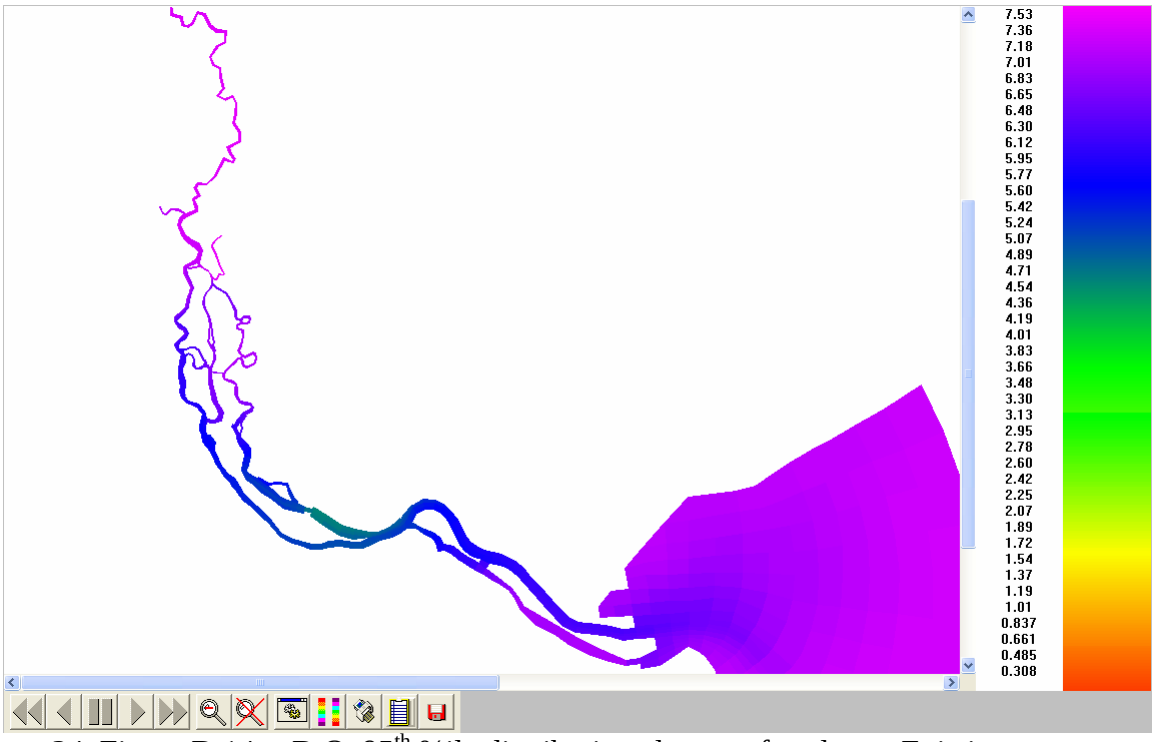
21. Figure D.11. Delta of D.O. 95th %ile distribution along bottom layer: Permitted minus 2004 loading scenarios



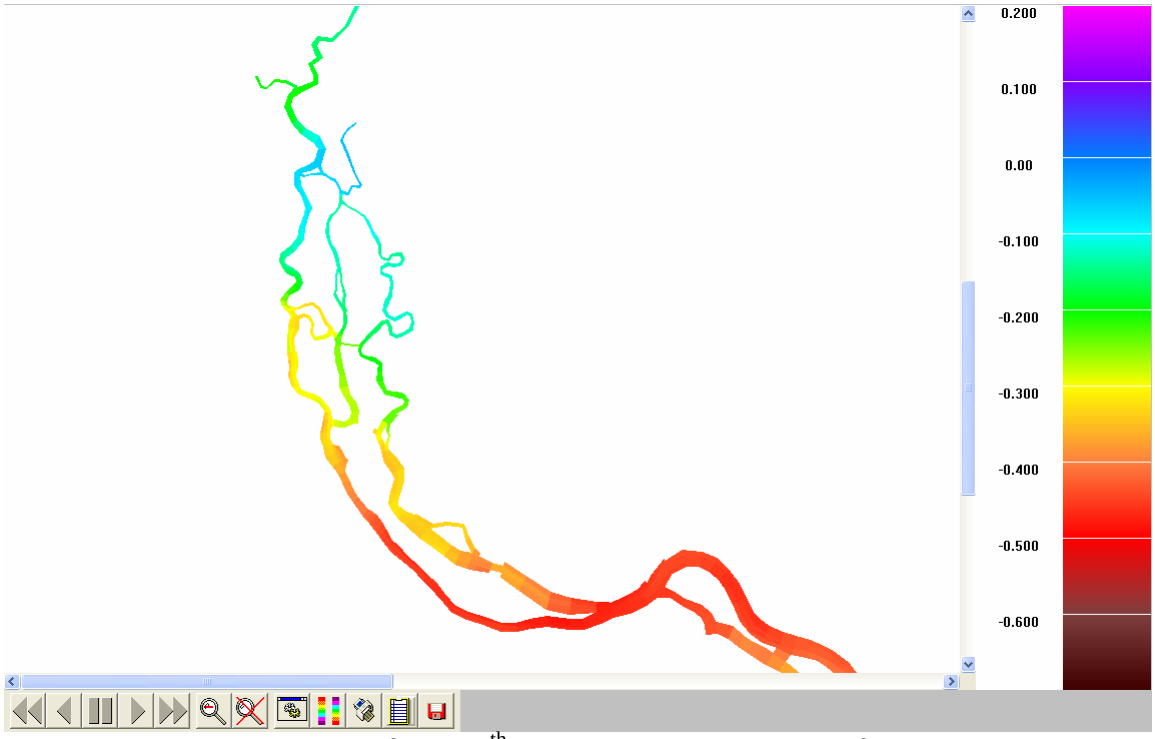
22. Figure D.12. D.O. 5th %ile distribution along surface layer: Existing bathymetry



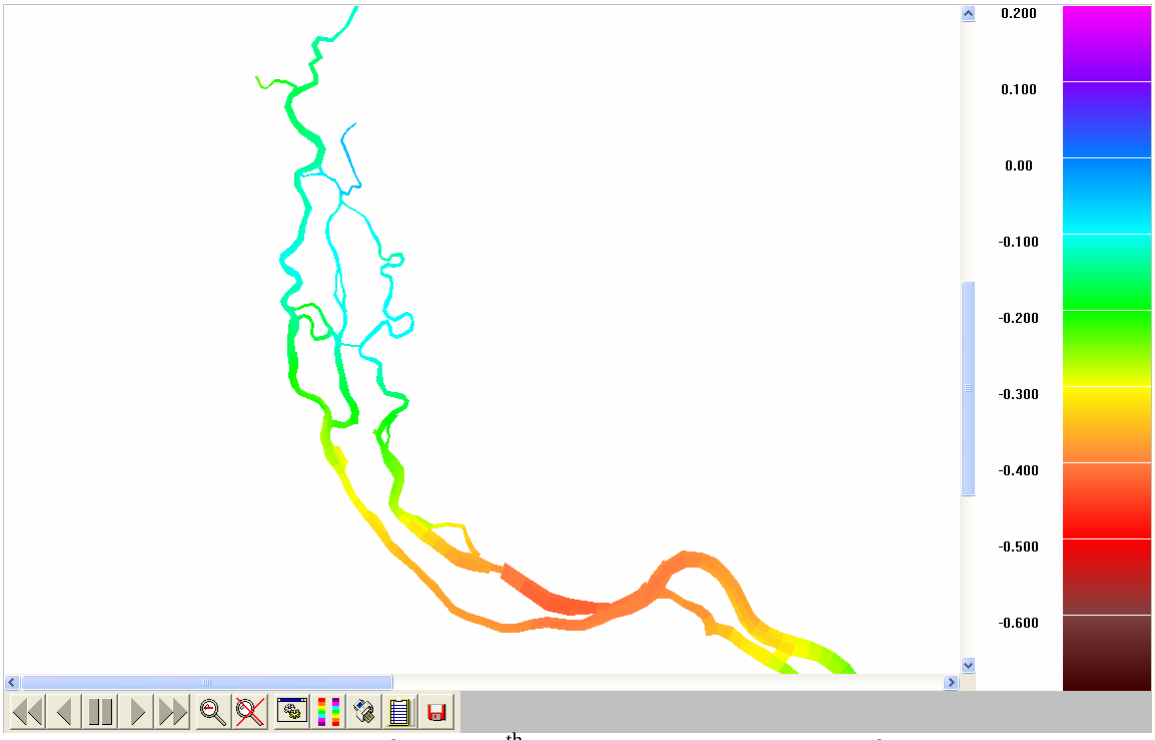
23. Figure D.13. D.O. 50th %ile distribution along surface layer: Existing bathymetry



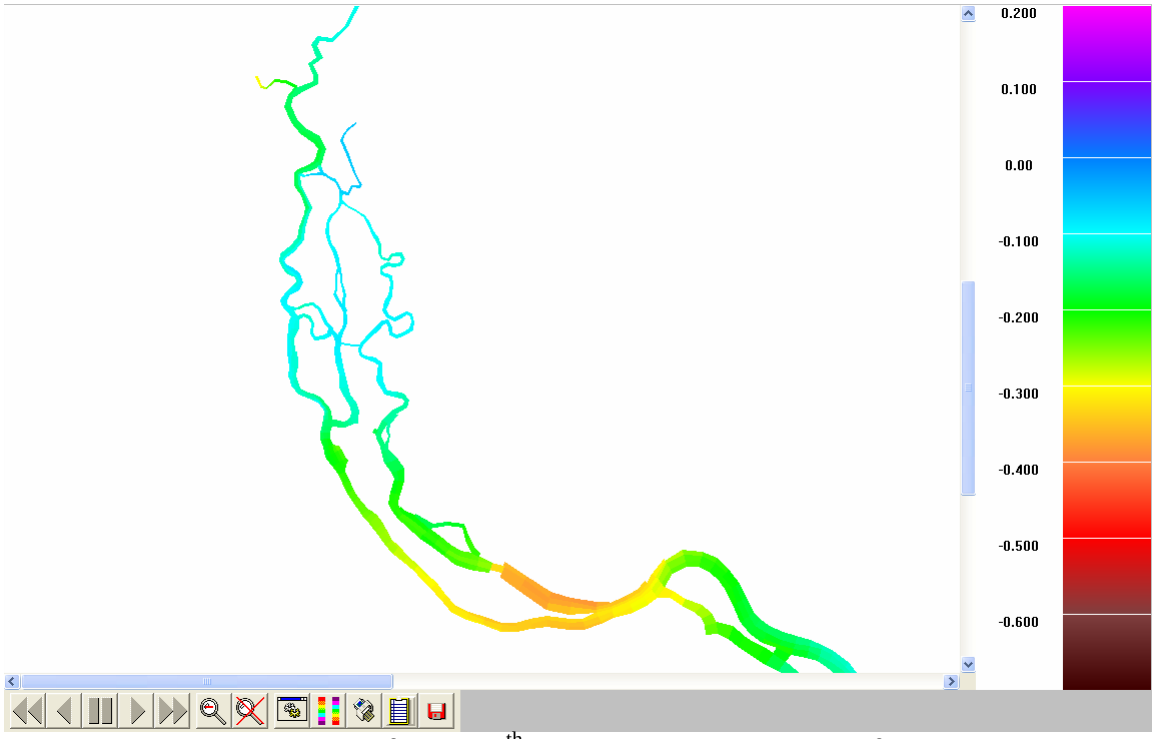
24. Figure D.14. D.O. 95th %ile distribution along surface layer: Existing bathymetry



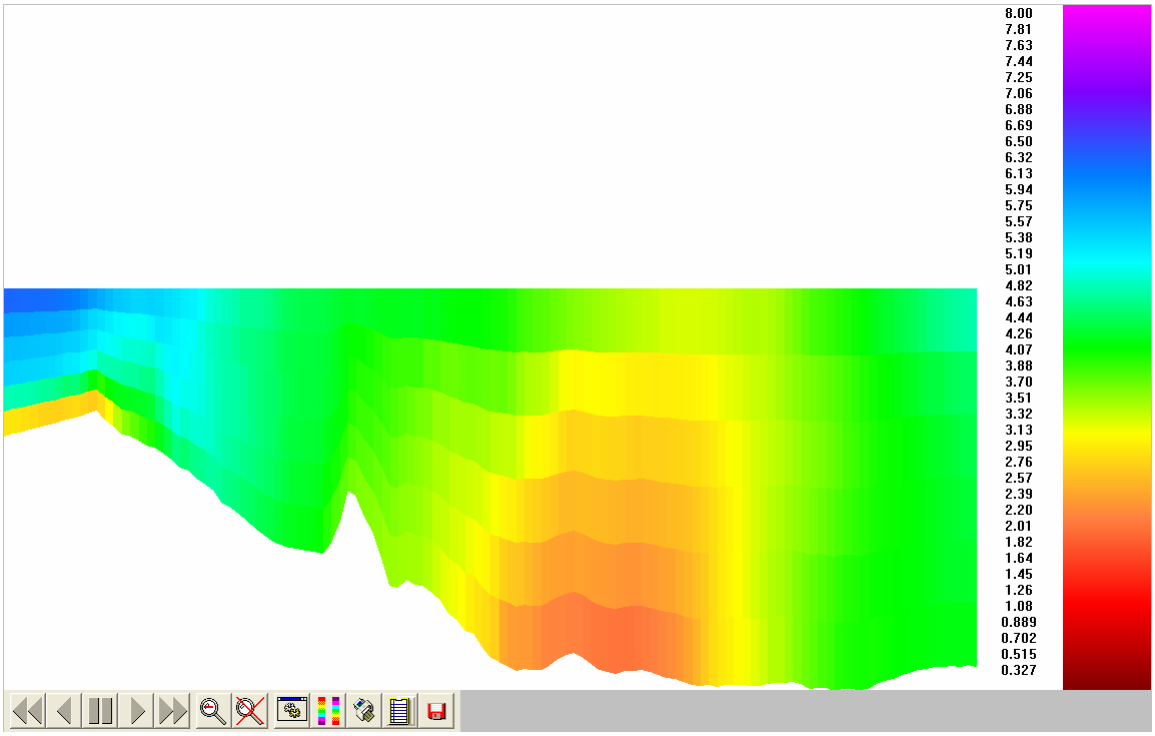
25. Figure D.15. Delta of D.O. 5th %ile distribution along surface layer: Permitted minus 2004 loading scenarios



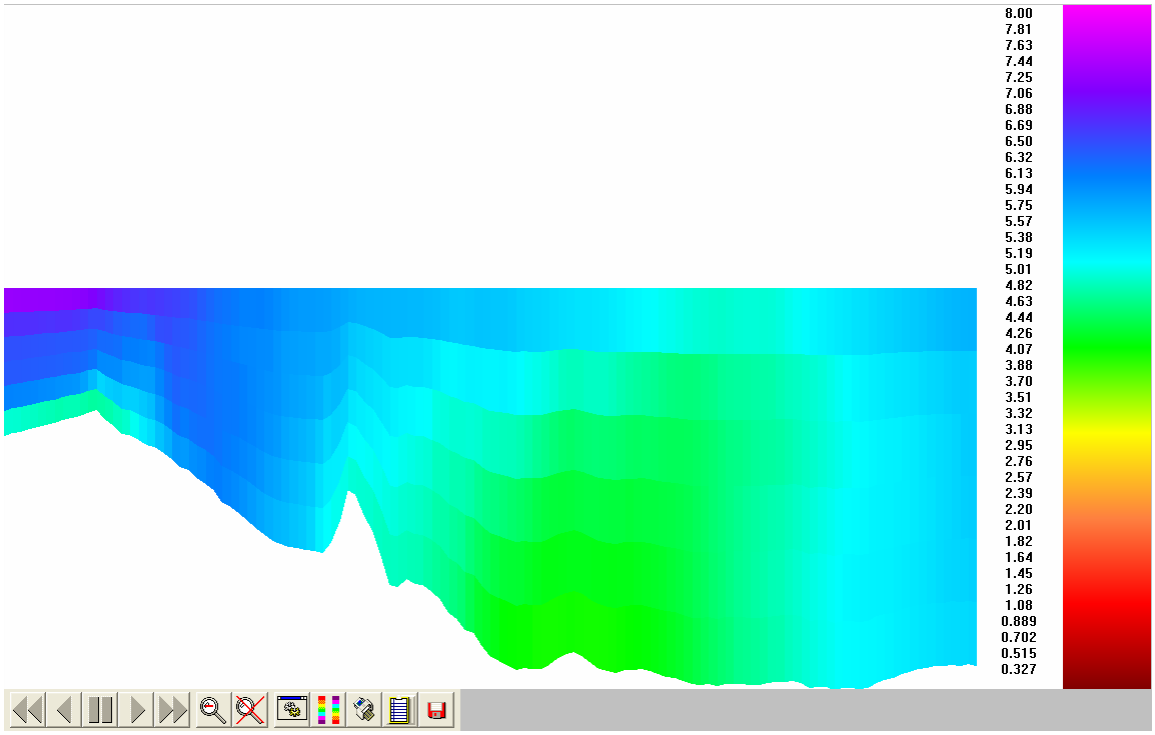
26. Figure D.16. Delta of D.O. 50th %ile distribution along surface layer: Permitted minus 2004 loading scenarios



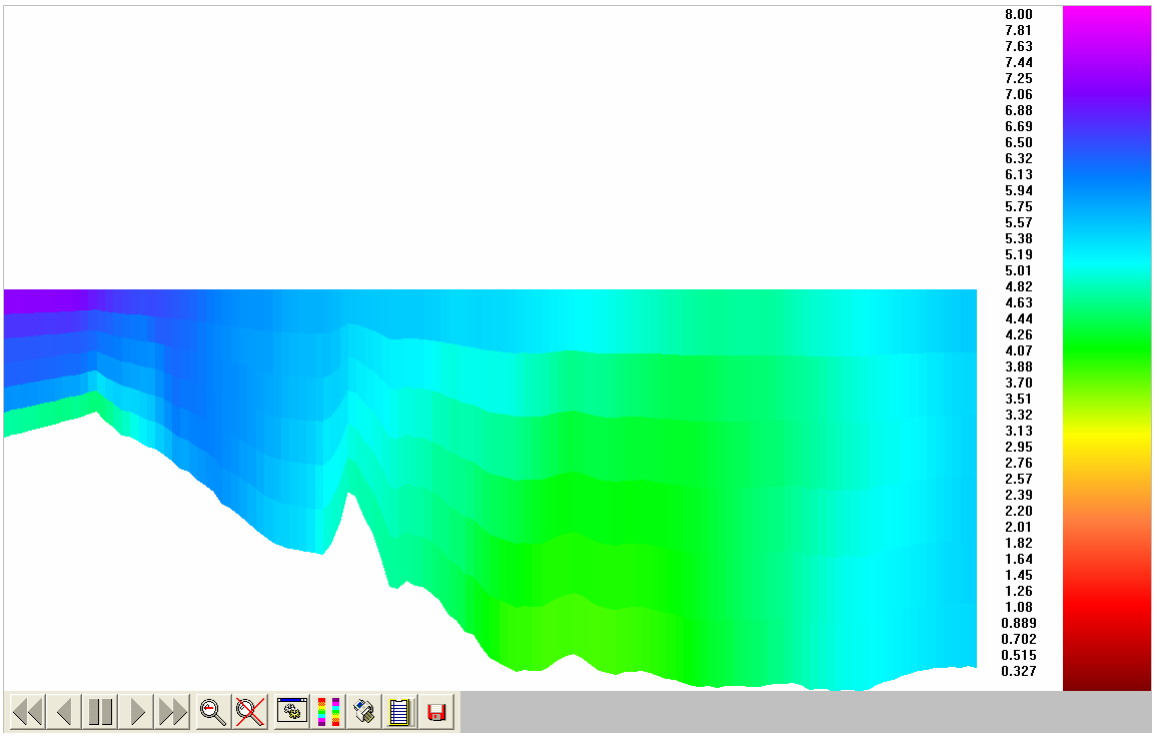
27. Figure D.17. Delta of D.O. 95th %ile distribution along surface layer: Permitted minus 2004 loading scenarios



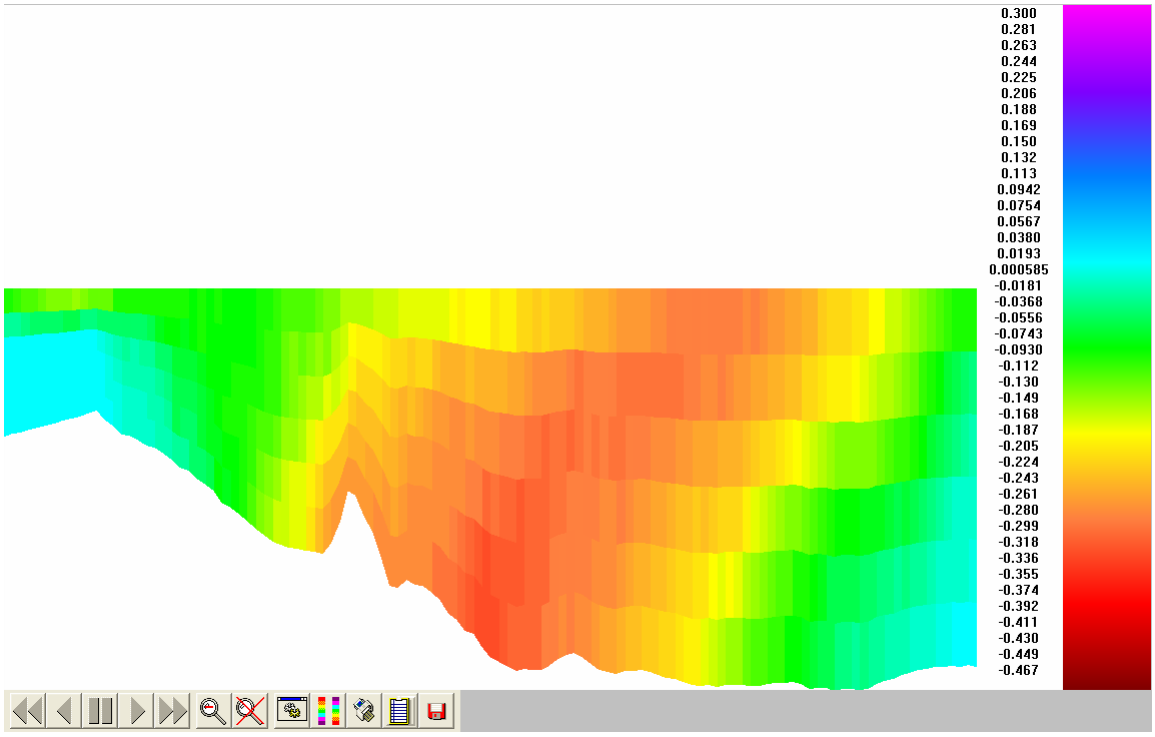
28. Figure D.18. Snapshot of 1-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Existing bathymetry



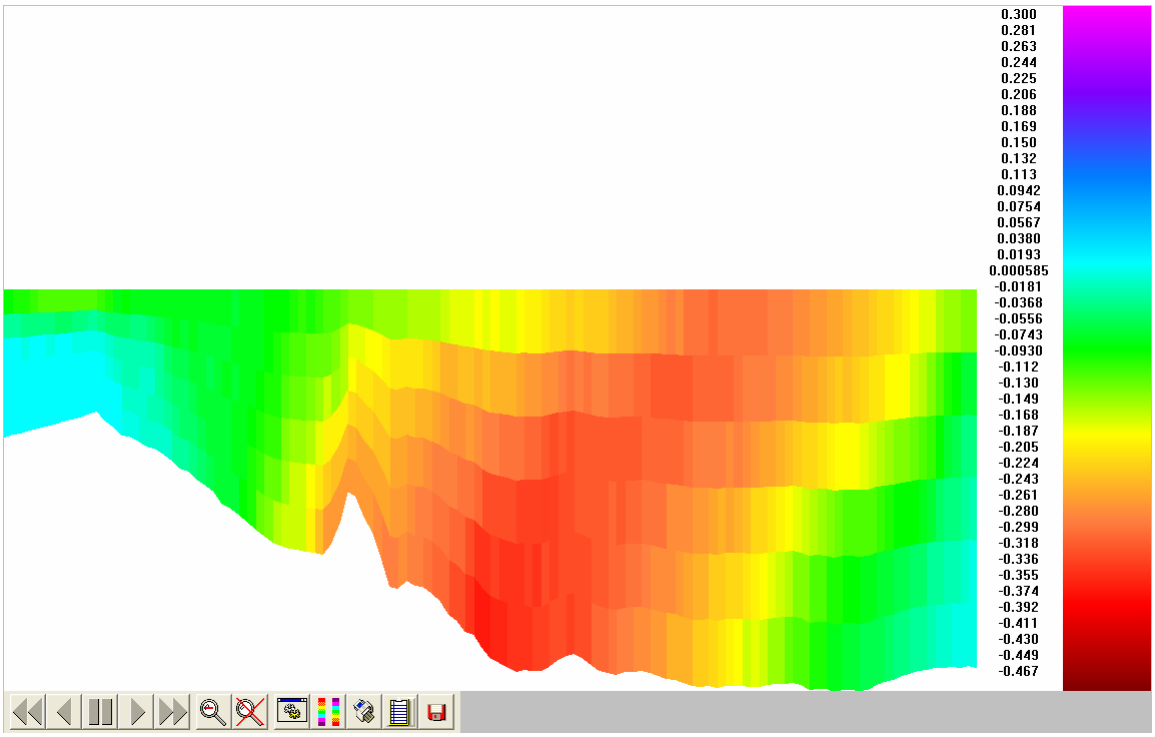
29. Figure D.19. Snapshot of 7-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Existing bathymetry



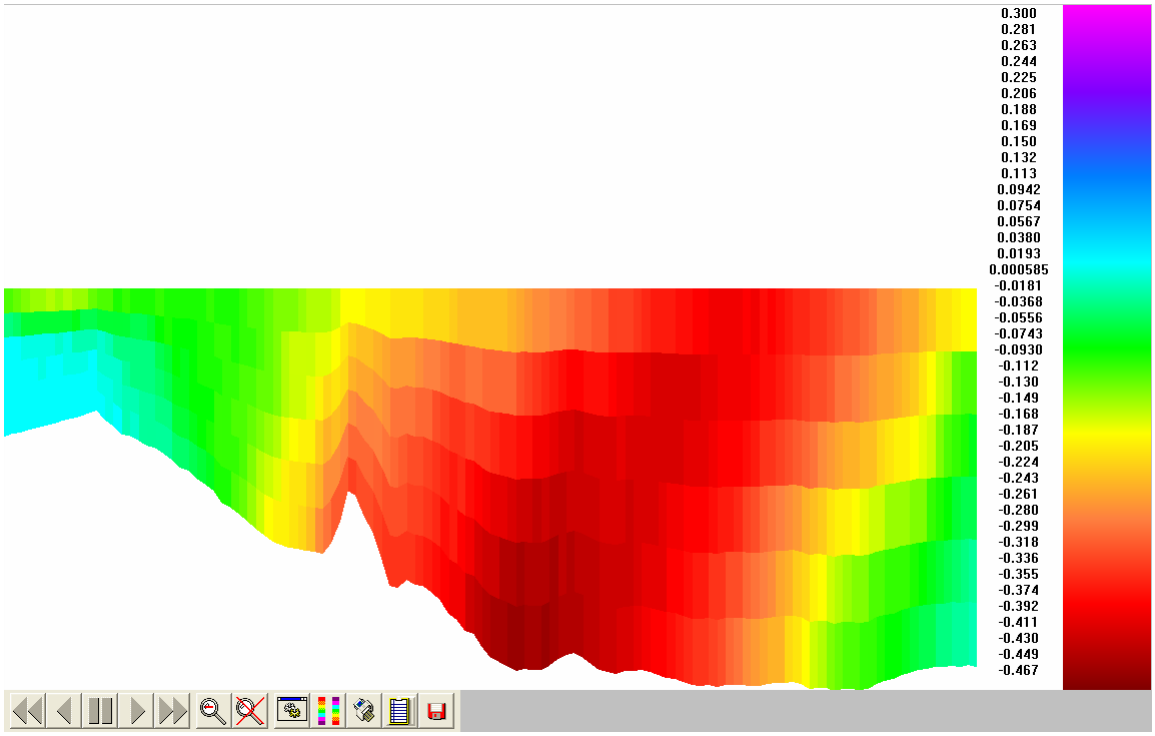
30. Figure D.20. Snapshot of 30-days averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Existing bathymetry



31. Figure D.21. Snapshot of Delta of 1-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Permitted minus 2004 loading scenarios



32. Figure D.22. Snapshot of Delta of 7-day averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Permitted minus 2004 loading scenarios



33. Figure D.23. Snapshot of Delta of 30-days averaged D.O. Dynamics (August 10, 1999) in vertical plane of Upper Harbor: Permitted minus 2004 loading scenarios