Technical Memorandum

To: U.S. EPA, Region 10   **From:**   John Hamrick

                                            Date: Final Revision 10/23/2012

Re: Results from Chukchi/Beaufort Seas Permit Dilution Modeling Scenarios

1.0   Introduction

This memorandum documents the simulation of mixing and dispersion of pollutant discharges authorized by the Beaufort and Chukchi general permits. The primary discharge type of interest is drilling fluid (mud) with dispersal in the water column and deposits on the sea bed producing smothering impacts and potentially exposing water column and benthic organisms to contaminants in the drilling fluid. The evaluation considered a range of expected discharge rates and physical configurations for the range of ambient environmental conditions including water depth, stratification and tidal and non-tidal currents characterizing the areas.

Mixing, dispersion, and deposition are simulated using version 2.5 of the Offshore Operators Committee Mud and Produced Water Discharge Model (OOC Model) [1-2, 4-6]. The model has two components, one to simulate the water column transport and bed deposition drilling models, and the second to simulate water column mixing and dispersion for a generic water discharge containing dilute dissolved material. The second component is most often used to simulate produced water. It is, however, generic enough to simulate the water column transport and dilution of a wide range of discharges including deck drainage, sanitary and domestic wastewater, and cooling water each of which can be characterized by a flow rate, temperature, salinity, and unit concentration. Since the model application in this study considers only discharges during exploratory drilling operations, produced water discharges have not been considered. Use of both components of the OOC model allows efficient use of the range of ambient environmental conditions in evaluating both drilling fluid and a range of water discharges. In addition, an Excel based interface to the OOC model was developed allowing model scenarios to be defined in tabular form with the model input files automatically created, the model executed in batch mode, and the model results automatically processed into tabular and graphical form.

Note, while the model evaluated the solids deposition and plume dilution at a 2 meter depth, the Beaufort general permit expressly prohibits all discharges in areas where the water depth is less than 5 meters from mean lower low water. Since all waters at the Chukchi lease locations are deeper than 5 meters, the Chukchi general permit does not include the same requirement.

2.0   Drilling Fluid Dispersion

Drilling fluid dilution and deposition in the Chukchi and Beaufort seas have been previously analyzed using an older version of the OOC as described in Tetra Tech 1993 [7]. The general approach followed in that study was used here. The range of discharge and ambient conditions parameters used in that study were reviewed and updated in relation to more recent information on ambient

conditions and drilling practices in the area of interest, including information received in the notices of intent (NOIs) submitted by Shell for drilling in the Beaufort and Chukchi seas in 2010. The set of constant model parameters used in that study were adopted for this study since reviewed information did not provide a basis for changes. The model constant model parameters are summarized in Table 1. However, the combination of ambient and discharge conditions considered in Tetra Tech (1993) [7] was revised primarily to include greater ambient water depths estimated from reviews of drilling NOIs.

Unlike previous analyses, discharge duration was also varied to reflect actual, anticipated discharge conditions. Tables 2 and 3 summarize the parameters varied in the 55 simulation cases considered in US and metric units, respectively. The modeling included simulation of open water discharges (OWDs) as well as simulations for shunted discharges (at depth). Under-ice modeling was performed to test the effects of omitting water action from the simulations. However, the under-ice results were not different from the open water conditions and, therefore, are not presented separately.

Example graphical results for the simulations are shown in Figures 1 through 7. Figure 1 shows the water column plume trajectory of the plume in the direction of the ambient current. Trajectory plots for all 55 cases are shown in Appendix A. Figure 2 shows the water column plume dilution factor in the direction of the ambient current. The dilution factor translates end of pipe concentrations to local concentration by simple division. Dilution factor plots for all 55 cases are shown in Appendix B. Figure 5 shows the deposition pattern of particulate material in the drilling fluid in plan view down current from the discharge. Figure 7 shows the depositional thickness in plan view down-current from the discharge.

Drill cuttings (discussed below) are not included in the modeling of the drilling fluid discharges and are assumed to deposit on the seabed within 100 meters of the platform. Resuspension of drilling fluid solids and cuttings is not considered, although any resuspension of particulate material would generally lower the model predicted deposition. Table 4 summarizes the maximum mass deposition of the solids contained in drilling fluids on the bed and the corresponding thickness of the deposited layer. The thicknesses were estimated using a drilling fluid density of 3.959 gm/cm^3 and a porosity of 0.4. Appendices C and D include deposition mass thickness contour plots for all 55 cases. The drilling fluid deposition thickness calculation is linear with respect to the total volume discharged when ambient conditions (water depth, discharge depth, and current speed) and the discharge rate are constant. For example, the deposition associated with 2000 bbl discharge in two hours would be twice that of 1000 bbl discharged in one hour.

Model predictions for plume dilution factors for drilling fluid discharges are provided in the last two columns in Table 4. The plume dilution module of the OOC model terminates the simulation when there is no particulate matter remaining in the plume. This is an inherent limitation of the model code. In this application, termination occurred for numerous cases before the plume reached the distance (100 m) of interest. The next to last column shows the dilution factor at the termination distance, and the last column shows the estimated dilution factor at a distance of 100 m from the outfall. When the model terminated at a distance less than 100 m, linear extrapolation was used for to estimate the dilution factor at a distance of 100 m from the outfall. The lowest simulated and extrapolated dilution factor at 100 m for all limited-mixing cases was 600:1. A plot of the dilution factor with distance for the critical scenario (case 33) is shown in Figure 3.

In numerous cases, the dilution factor curve slope was extremely high at the point of model termination, indicating high mixing with distance and an extrapolation that would yield dilution factors much higher than the minimum dilution case. Figures 4 and 5 show cases where the model terminates at less than 100 m distance. The first is an example where the dilution factor at 100 m was extrapolated using linear interpolation, and the second is an example of a case where the dilution factor with distance relationship has a high enough slope to run out this case as a worst-case scenario. Dilution factor versus distance plots are included in Appendix B for all 55 cases.

3.0   Cuttings Deposition

The deposition of drill cutting can be estimated using simple model based on the two-dimensional advection diffusion equation

$$U\frac{\partial C}{\partial x} = K_y \frac{\partial^2 C}{\partial y^2} - \frac{W_{set}}{h}C$$

Where C is the depth average concentration, x is the current direction and y the normal direction, U is the depth current speed, W_{set} is the cutting settling velocity, and h the water depth. The lateral turbulent diffusion coefficient, K_y is approximately:

$$K_y = 0.1H_{eff}U_* \cong 0.005H_{eff}U$$

where the shear velocity, U_* is approximately 5 percent of the velocity. The effective depth is equal to the total depth under non-stratified conditions. The solution of the advection diffusion equation is

$$C = \frac{(Q_cC_o)}{h^2U\sqrt{4\pi\dfrac{K_y}{Uh}\dfrac{x}{h}}}\exp\left(-\frac{W_{set}}{h}\frac{x}{h} - \frac{y^2}{4\dfrac{K_yx}{U}}\right)$$

Where Q_cC_o is the cuttings mass discharge rate. The solution is singular at the discharge x=y=0, but noting that the depth average concentration should not exceed the discharge concentration the distance at which the solution becomes valid is

$$\frac{L}{h} + \left(\sqrt{4\pi0.005}\frac{h^2U}{Q_c}\frac{U}{W_{set}}\right)\sqrt{\frac{L}{h}} - \left(\frac{U}{W_{set}}\right) = 0$$

The mass per unit area of bed cutting deposited over the discharge period T, is

$$m_b = \frac{M}{h^2\sqrt{4\pi\dfrac{K_y}{Uh}\dfrac{x}{h}}}\left(\frac{W_{set}}{U}\right)\exp\left(-\frac{W_{set}}{U}\frac{x}{h} - \frac{y^2}{4\dfrac{K_yx}{U}}\right)$$

$$M = \int_0^T (Q_cC_o)\,dt$$

Where M is the mass of cuttings discharged. The thickness of the deposited cutting layer will be maximum along the centerline and given by

$$B = \frac{m_b}{(1-n)\rho_s} = \frac{1}{(1-n)}\frac{M}{\rho_sh^2}\left(\frac{W_{set}}{U}\right)\frac{\exp\left(-\dfrac{W_{set}}{U}\dfrac{x}{h}\right)}{\sqrt{4\pi\dfrac{K_y}{hU}\dfrac{x}{h}}}$$

To determine the critical conditions for evaluation of cuttings deposition thickness, the distance that discrete drill cuttings particles will deposit beyond its discharge point can be estimated by the simple formula:

$$L_d = \frac{Uh}{W_{set}}$$

where L_d is the horizontal distance from the discharge location. For a given mass of cuttings discharged shallower depths and slower currents combined with higher settling velocities will result in thicker deposits over a smaller area.

Drill cuttings discharges are reported in volume units of barrel. To determine the mass of cuttings in a barrel, a conservative solids content of 50 per cent by volume and a solids specific gravity of 2.65 was assumed. Using these values gives 210658 kilograms of cuttings per 1000 barrels discharged with the thickness given by

$$B = 634 \frac{1}{h^2} \left(\frac{W_{set}}{U} \right) \frac{\exp\left(-\frac{W_{set}}{U} \frac{x}{h} \right)}{\sqrt{\frac{x}{h}}}$$

for a deposited porosity of 0.5. Cuttings discharges ranging from 1000 to 10000 barrels per well are typical for the wells anticipated. Table 5a through 5e summarizes cuttings deposition thickness for 1000 barrel discharges of cuttings particles having diameters of 62.5, 125, 250, 500, and 1,000 micrometers at distances of 1, 3.2, 10, 32, and 100 meters from the discharge. If the cuttings particle size distribution is known, a mean diameter could be used to select the most appropriate table. Since the equation for cuttings deposition thickness is linear, the results in the table can be readily scaled for other discharge volumes. For example, the results would be increased by a factor of 10 for a 10000 barrel discharge.

It is noted that some of the results in these tables are not physically realizable in that the depth of cuttings deposition exceeds the water depth, particularly at distances of 1 and 3.2 meters from the discharge. This is a mathematical artifact of the solution singularity at the point of discharge. In such cases the cuttings would not accumulate to these thicknesses due to slope instability and bed load transport. When the slope of the cuttings pile exceeds the angle of repose of the cuttings particles, the slope will fail resulting in a wider, less steep pile. Also, as the height of the cuttings pile increases, flow over the pile may accelerate and near-surface particles will be transported away by bed load sediment transport. Slope stability and bed load sediment transport are complex processes requiring exact cuttings particle shape and size distributions and are beyond to scope of this analysis. However, it is important to note that deposition thicknesses at larger distances, greater than 10 m to 32 m, are accurate and unaffected by the solution singularity and that any localized flattening of the cuttings pile deposition near the source will not extend to these distances.

Non-Drilling Fluid Discharges

Information for simulating non-drilling fluid discharges is a much less detailed and simpler analysis as neglecting discharge momentum and buoyancy is appropriate. In such cases, only the discharge flow rate, ambient depth, and current speed are needed. The reduction in discharge concentration, C_o, along the direction of the ambient current (centerline of discharge plume in horizontal plane) is given by:

$$\frac{C}{C_o} = \frac{1}{D} = \frac{Q}{H_{eff} U \sqrt{\dfrac{4\pi K_y x}{U}}}$$

[3], where C is the depth average concentration over the effective depth, H_{eff}, D is the dilution factor, Q is the discharge rate, U is the ambient current speed, and x is the along current centerline coordinate. For a well-mixed water column, the effective depth is the entire depth of the water column. For a stratified water column, the effective depth is either the fraction of the depth above or below the pycnocline for discharges above or below the pycnocline. The lateral turbulent diffusion coefficient, K_y is approximately:

$$K_y = 0.1 H_{eff} U_* \cong 0.005 H_{eff} U$$

where the shear velocity, U_* is approximately 5 percent of the velocity. Combining these equations, the dilution factor is given by:

$$D = \frac{H_{eff} U \sqrt{0.02\pi H_{eff} x}}{Q}$$

The historical estimated range of flow rates of these discharges is 10,000 to 200,000 gallons per day (about 200 to 4,500 barrels per day) and a number of flow rates in this range were considered, as well as a much higher flow rate of 45,000 bbl per day for the cooling water flow rate provided in Shell's NOIs. Table 6 summarizes dilution factors for flows of 200, 2250, 4500, 45,000, and 113,000 barrels per day for the range of ambient depths and current speeds considered for the drilling fluid discharges, at current distances of 10, 100, and 1,000 meters from the discharge. For specific contaminant concentrations in the discharge, Co, the dilution factor can be readily used to determine resulting concentrations at a specific distance from the discharge point. A number of combinations with high discharge rates yielded dilution factors less than 1, identified by na in the Table 6. This indicates that the combination of parameters entering the calculation produce an unrealizable result as well as indicating that the assumptions of the ambient mixing model are not appropriate. Actual discharges having these high flows likely has significant jet induced mixing and should be analyzed using discharge specific parameters including discharge port diameter, orientation, and depth of discharge.

4.0   Temperature

The Alaska Water Quality Standard for temperature for marine water uses (Water Supply, Aquaculture) state that the discharge "may not cause the weekly average temperature to increase more than 1° C. The maximum rate of change may not exceed 0.5° C per hour normal daily temperature cycles may not be altered in amplitude or frequency." The modeling for temperature effects was based on simple ambient dispersion modeling and assumed a temperature differential of 1.5° C (based on information provided by the applicants).

Temperature impacts can readily be evaluated in a conservative manner using the dilution factors defined in the previous section and tabulated in Table 6. The initial concentration Co is now the temperature access or discharge temperature less the ambient temperature. The temperature rise at 100 m is then the initial divided by the dilution factor. For some of the high flow cases very small dilution factors are predicted at 100 m. For these cases jet induced mixing and the physical characteristics of the discharge should be considered as discussed in the preceding section.

Table 1. OOC Model Input Parameters Held Constant

Discharge Conditions	
Angle of Pipe (degrees downward from horizontal)	90.0
Depth of Pipe Mouth (m)	0.3
Pipe Radius	0.1
Rig Type	generic
Rig Length (m)	70.1
Rig Width (m)	61.0
Rig Wake Effect	Included
Drilling Mud Characteristics	
Bulk Density (g/cm^3)	2.085
Initial Solids Concentration in Whole Mud (mg/L)	1,441,000

Mud Particle Distribution				
		Volume Fraction in	Settling Velocity	
Class Number	Density (g/cm^3)	Whole Mud (cm^3/cm^3)	(cm/sec)	(ft/sec)
1	3.959	0.0364	0.658	0.021600
2	3.959	0.0364	0.208	0.006820
3	3.959	0.0437	0.085	0.002780
4	3.959	0.0728	0.044	0.001430
5	3.959	0.1383	0.023	0.000758
6	3.959	0.0364	0.013	0.000427

Receiving Water Characteristics	
Significant Wave Height (m)[a]	0.6
Significant Wave Period (sec)[a]	12.0
Surface Water Density (σ_t)	22.0
Density Gradient ($\Delta\sigma_t$/m)	+0.1

[a] All under-ice model runs omitted the effect of waves in the model.

Table 2. OOC Model Input Parameters Varied

| Case ID | Ambient | | Discharge | | | Intended Simulation |
	Water Depth (ft)	Current Speed (ft/sec)	Depth (ft)	Rate (bbl/hr)	Discharge Duration (sec)	
CASE-1	6.56	0.07	0.98	250	8280	OWD
CASE-2	6.56	0.33	0.98	250	3600	OWD
CASE-3	6.56	0.98	0.98	250	3600	OWD
CASE-4	6.56	1.31	0.98	250	3600	OWD
CASE-5	16.4	0.07	0.98	250	8280	OWD
CASE-6	16.4	0.33	0.98	250	3600	OWD
CASE-7	16.4	0.98	0.98	250	3600	OWD
CASE-8	16.4	1.31	0.98	250	3600	OWD
CASE-9	65.6	0.07	0.98	250	8280	OWD
CASE-10	131.2	0.07	0.98	250	8280	OWD
CASE-11	164	0.07	0.98	250	8280	OWD
CASE-12	131.2	0.33	115.78	250	3600	OWD, S
CASE-13	131.2	0.33	125.62	250	3600	OWD, S
CASE-14	164	0.33	115.78	250	3600	OWD, S
CASE-15	164	0.33	125.62	250	3600	OWD, S
CASE-16	16.4	0.07	0.98	500	8280	OWD
CASE-17	16.4	0.33	0.98	500	3600	OWD
CASE-18	16.4	0.98	0.98	500	3600	OWD
CASE-19	16.4	1.31	0.98	500	3600	OWD
CASE-20	65.6	0.07	0.98	500	8280	OWD
CASE-21	65.6	0.33	0.98	500	3600	OWD
CASE-22	65.6	0.98	0.98	500	3600	OWD
CASE-23	65.6	1.31	0.98	500	3600	OWD
CASE-24	131.2	0.07	0.98	500	8280	OWD
CASE-25	131.2	0.33	115.78	500	3600	OWD, S
CASE-26	131.2	0.98	66.58	500	3600	OWD, S
CASE-27	131.2	1.31	66.58	500	3600	OWD, S
CASE-28	164	0.07	0.98	500	8280	OWD
CASE-29	164	0.33	115.78	500	3600	OWD, S
CASE-30	164	0.98	66.58	500	3600	OWD, S

Table 2 (continued). OOC Model Input Parameters Varied

| Case ID | Ambient | | Discharge | | | Intended Simulation |
	Water Depth (ft)	Current Speed (ft/sec)	Depth (ft)	Rate (bbl/hr)	Discharge Duration (sec)	
CASE-31	164	1.31	66.58	500	3600	OWD, S
CASE-32	65.6	0.07	0.98	750	8280	OWD
CASE-33	65.6	0.33	0.98	750	3600	OWD
CASE-34	65.6	0.98	0.98	750	3600	OWD
CASE-35	65.6	1.31	0.98	750	3600	OWD
CASE-36	131.2	0.07	0.98	750	8280	OWD
CASE-37	131.2	0.33	0.98	750	3600	OWD
CASE-38	131.2	0.98	0.98	750	3600	OWD
CASE-39	131.2	1.31	0.98	750	3600	OWD
CASE-40	131.2	0.33	66.58	750	3600	OWD, S
CASE-41	164	0.07	0.98	750	8280	OWD
CASE-42	164	0.33	0.98	750	3600	OWD
CASE-43	164	0.98	0.98	750	3600	OWD
CASE-44	164	1.31	0.98	750	3600	OWD
CASE-45	164	0.33	66.58	750	3600	OWD, S
CASE-46	131.2	0.07	0.98	1000	8280	OWD
CASE-47	131.2	0.33	0.98	1000	3600	OWD
CASE-48	131.2	0.98	0.98	1000	3600	OWD
CASE-49	131.2	1.31	0.98	1000	3600	OWD
CASE-50	131.2	0.33	66.58	1000	3600	OWD, S
CASE-51	164	0.07	0.98	1000	8280	OWD
CASE-52	164	0.33	0.98	1000	3600	OWD
CASE-53	164	0.98	0.98	1000	3600	OWD
CASE-54	164	1.31	0.98	1000	3600	OWD
CASE-55	164	0.33	66.58	1000	3600	OWD, S

Table 3. OOC Model Input Parameters Varied (metric)

| Case ID | Ambient | | Discharge | | | Intended Simulation |
	Water Depth (m)	Current Speed (m/sec)	Depth (m)	Rate (bbl/hr)	Discharge Duration (sec)	
CASE-1	2.0	0.20	0.3	250	OWD	2
CASE-2	2.0	0.10	0.3	250	OWD	2
CASE-3	2.0	0.30	0.3	250	OWD	2
CASE-4	2.0	0.40	0.3	250	OWD	2
CASE-5	5.0	0.02	0.3	250	8280	OWD
CASE-6	5.0	0.10	0.3	250	3600	OWD
CASE-7	5.0	0.30	0.3	250	3600	OWD
CASE-8	5.0	0.40	0.3	250	3600	OWD
CASE-9	20.0	0.02	0.3	250	8280	OWD
CASE-10	40.0	0.02	0.3	250	8280	OWD
CASE-11	50.0	0.02	0.3	250	8280	OWD
CASE-12	40.0	0.10	35.3	250	3600	OWD, S
CASE-13	40.0	0.10	38.3	250	3600	OWD, S
CASE-14	50.0	0.10	35.3	250	3600	OWD, S
CASE-15	50.0	0.10	38.3	250	3600	OWD, S
CASE-16	5.0	0.02	0.3	500	8280	OWD
CASE-17	5.0	0.10	0.3	500	3600	OWD
CASE-18	5.0	0.30	0.3	500	3600	OWD
CASE-19	5.0	0.40	0.3	500	3600	OWD
CASE-20	20.0	0.02	0.3	500	8280	OWD
CASE-21	20.0	0.10	0.3	500	3600	OWD
CASE-22	20.0	0.30	0.3	500	3600	OWD
CASE-23	20.0	0.40	0.3	500	3600	OWD
CASE-24	40.0	0.02	0.3	500	8280	OWD
CASE-25	40.0	0.10	35.3	500	3600	OWD, S
CASE-26	40.0	0.30	20.3	500	3600	OWD, S
CASE-27	40.0	0.40	20.3	500	3600	OWD, S
CASE-28	50.0	0.02	0.3	500	8280	OWD
CASE-29	50.0	0.10	35.3	500	3600	OWD, S
CASE-30	50.0	0.30	20.3	500	3600	OWD, S
CASE-31	50.0	0.40	20.3	500	3600	OWD, S

Table 3 (continued). OOC Model Input Parameters Varied (metric)

Case ID	Ambient		Discharge			Intended Simulation
	Water Depth (m)	Current Speed (m/sec)	Depth (m)	Rate (bbl/hr)	Discharge Duration (sec)	
CASE-32	20.0	0.02	0.3	750	8280	OWD
CASE-33	20.0	0.10	0.3	750	3600	OWD
CASE-34	20.0	0.30	0.3	750	3600	OWD
CASE-35	20.0	0.40	0.3	750	3600	OWD
CASE-36	40.0	0.02	0.3	750	8280	OWD
CASE-37	40.0	0.10	0.3	750	3600	OWD
CASE-38	40.0	0.30	0.3	750	3600	OWD
CASE-39	40.0	0.40	0.3	750	3600	OWD
CASE-40	40.0	0.10	20.3	750	3600	OWD, S
CASE-41	50.0	0.02	0.3	750	8280	OWD
CASE-42	50.0	0.10	0.3	750	3600	OWD
CASE-43	50.0	0.30	0.3	750	3600	OWD
CASE-44	50.0	0.40	0.3	750	3600	OWD
CASE-45	50.0	0.10	20.3	750	3600	OWD, S
CASE-46	40.0	0.02	0.3	1000	8280	OWD
CASE-47	40.0	0.10	0.3	1000	3600	OWD
CASE-48	40.0	0.30	0.3	1000	3600	OWD
CASE-49	40.0	0.40	0.3	1000	3600	OWD
CASE-50	40.0	0.10	20.3	1000	3600	OWD, S
CASE-51	50.0	0.02	0.3	1000	8280	OWD
CASE-52	50.0	0.10	0.3	1000	3600	OWD
CASE-53	50.0	0.30	0.3	1000	3600	OWD
CASE-54	50.0	0.40	0.3	1000	3600	OWD
CASE-55	50.0	0.10	20.3	1000	3600	OWD, S

Table 4. Predicted Solids Deposition and Plume Dilution for Drilling Fluid Discharge

Case ID	Ambient		Discharge			Deposit Thick. cm	Center-line Dilution Factor at model termination (distance in m)	Center-line Dilution Factor at 100 m
	Water Depth (m)	Current Speed (m/sec)	Depth (m)	Rate (bbl/hr)	Duration (sec)			
CASE-1	2.0	0.20	0.3	250	2.0	na	30 (1)	3000
CASE-2	2.0	0.10	0.3	250	2.0	0.118	27 (2)	1350
CASE-3	2.0	0.30	0.3	250	2.0	0.077	120 (5)	2400
CASE-4	2.0	0.40	0.3	250	2.0	0.067	145 (8)	1810
CASE-5	5.0	0.02	0.3	250	8280	0.242	125 (2)	6250
CASE-6	5.0	0.10	0.3	250	3600	0.070	100 (2)	5000
CASE-7	5.0	0.30	0.3	250	3600	0.050	420 (15)	2800
CASE-8	5.0	0.40	0.3	250	3600	0.041	510 (30)	1700
CASE-9	20.0	0.02	0.3	250	8280	0.051	840 (7)	1800
CASE-10	40.0	0.02	0.3	250	8280	0.016	860 (7)	1650
CASE-11	50.0	0.02	0.3	250	8280	0.011	860 (7)	1650
CASE-12	40.0	0.10	35.3	250	3600	0.042	100 (2)	5000
CASE-13	40.0	0.10	38.3	250	3600	0.058	26 (2)	1300
CASE-14	50.0	0.10	35.3	250	3600	0.026	950 (13)	7300
CASE-15	50.0	0.10	38.3	250	3600	0.028	760 (10)	7600
CASE-16	5.0	0.02	0.3	500	8280	0.400	82 (2)	4100
CASE-17	5.0	0.10	0.3	500	3600	0.121	56 (2)	2300
CASE-18	5.0	0.30	0.3	500	3600	0.076	375 (13)	2900
CASE-19	5.0	0.40	0.3	500	3600	0.069	410 (21)	1950
CASE-20	20.0	0.02	0.3	500	8280	0.119	380 (2)	19000
CASE-21	20.0	0.10	0.3	500	3600	0.031	900 (30)	900
CASE-22	20.0	0.30	0.3	500	3600	0.015	1020 (70)	1100
CASE-23	20.0	0.40	0.3	500	3600	0.012	1010 (78)	1050
CASE-24	40.0	0.02	0.3	500	8280	0.029	760 (8)	1650
CASE-25	40.0	0.10	35.3	500	3600	0.062	56 (2)	2800
CASE-26	40.0	0.30	20.3	500	3600	0.018	2400 (85)	2500
CASE-27	40.0	0.40	20.3	500	3600	0.011	3200 (100)	3200
CASE-28	50.0	0.02	0.3	500	8280	0.020	760 (8)	1650

Table 4 (continued). Predicted Solids Deposition and Plume Dilution for Drilling Fluid Discharge

Case ID	Ambient		Discharge			Deposit Thick. cm	Center-line Dilution Factor at model termination (distance in m)	Center-line Dilution Factor at 100 m
	Water Depth (m)	Current Speed (m/sec)	Depth (m)	Rate (bbl/hr)	Duration (sec)			
CASE-29	50.0	0.10	35.3	500	3600	0.042	700 (13)	5400
CASE-30	50.0	0.30	20.3	500	3600	0.010	4400 (100)	4400
CASE-31	50.0	0.40	20.3	500	3600	0.007	3500 (100)	3500
CASE-32	20.0	0.02	0.3	750	8280	0.145	310 (2)	15500
CASE-33	20.0	0.10	0.3	750	3600	0.044	550 (38)	600
CASE-34	20.0	0.30	0.3	750	3600	0.023	980 (76)	1000
CASE-35	20.0	0.40	0.3	750	3600	0.017	1000 (95)	1000
CASE-36	40.0	0.02	0.3	750	8280	0.038	720(9)	5250
CASE-37	40.0	0.10	0.3	750	3600	0.020	870 (33)	1350
CASE-38	40.0	0.30	0.3	750	3600	0.010	980 (75)	1000
CASE-39	40.0	0.40	0.3	750	3600	0.008	1000 (95)	1000
CASE-40	40.0	0.10	20.3	750	3600	0.046	580 (8)	7250
CASE-41	50.0	0.02	0.3	750	8280	0.027	720(9)	5250
CASE-42	50.0	0.10	0.3	750	3600	0.013	870 (33)	1350
CASE-43	50.0	0.30	0.3	750	3600	0.006	980 (75)	1000
CASE-44	50.0	0.40	0.3	750	3600	na	1000 (95)	1000
CASE-45	50.0	0.10	20.3	750	3600	0.037	1320 (22)	7320
CASE-46	40.0	0.02	0.3	1000	8280	0.069	350 (2)	17500
CASE-47	40.0	0.10	0.3	1000	3600	0.024	870 (35)	1350
CASE-48	40.0	0.30	0.3	1000	3600	0.013	920 (80)	980
CASE-49	40.0	0.40	0.3	1000	3600	0.011	950 (100)	950
CASE-50	40.0	0.10	20.3	1000	3600	0.056	425 (6)	7100
CASE-51	50.0	0.02	0.3	1000	8280	0.037	650 (8)	1350
CASE-52	50.0	0.10	0.3	1000	3600	0.017	870 (35)	1500
CASE-53	50.0	0.30	0.3	1000	3600	0.008	950 (80)	975
CASE-54	50.0	0.40	0.3	1000	3600	0.006	950 (100)	950
CASE-55	50.0	0.10	20.3	1000	3600	0.041	1050 (16)	6550

Table 5a. Predicted Drill Cutting Deposition Thickness for 1000 Barrel Discharge

Case ID	Discharge Height Above Bottom Depth (m)	Current Speed (m/sec)	Deposition Thickness 63 um Cutting At 1, 3.2, 10, 32, and 100 meters (meters)				
			1 m	3.2 m	10 m	32 m	100 m
CASE-101	2.0	0.02	20.307	10.309	4.188	0.844	0.018
CASE-102	2.0	0.10	4.219	2.325	1.225	0.561	0.165
CASE-103	2.0	0.30	1.415	0.791	0.435	0.228	0.103
CASE-104	2.0	0.40	1.062	0.594	0.329	0.176	0.084
CASE-105	5.0	0.02	5.286	2.854	1.409	0.526	0.081
CASE-106	5.0	0.10	1.073	0.599	0.328	0.170	0.074
CASE-107	5.0	0.30	0.359	0.201	0.112	0.061	0.032
CASE-108	5.0	0.40	0.269	0.151	0.084	0.047	0.024
CASE-109	20.0	0.02	0.670	0.373	0.203	0.103	0.042
CASE-110	20.0	0.10	0.135	0.076	0.042	0.023	0.012
CASE-111	20.0	0.30	0.045	0.025	0.014	0.008	0.004
CASE-112	20.0	0.40	0.034	0.019	0.011	0.006	0.003
CASE-113	40.0	0.02	0.238	0.133	0.074	0.039	0.019
CASE-114	40.0	0.10	0.048	0.027	0.015	0.008	0.005
CASE-115	40.0	0.30	0.016	0.009	0.005	0.003	0.002
CASE-116	40.0	0.40	0.012	0.007	0.004	0.002	0.001
CASE-117	50.0	0.02	0.170	0.095	0.053	0.029	0.014
CASE-118	50.0	0.10	0.034	0.019	0.011	0.006	0.003
CASE-119	50.0	0.30	0.011	0.006	0.004	0.002	0.001
CASE-120	50.0	0.40	0.009	0.005	0.003	0.002	0.001

Table 5b. Predicted Drill Cutting Deposition Thickness for 1000 Barrel Discharge

Case ID	Discharge Height Above Bottom Depth (m)	Current Speed (m/sec)	Deposition Thickness 125 um Cutting At 1, 3.2, 10, 32, and 100 meters (meters)				
			1 m	3.2 m	10 m	32 m	100 m
CASE-101	2.0	0.02	69.686	26.146	4.076	0.040	0.000
CASE-102	2.0	0.10	16.193	8.400	3.654	0.914	0.040
CASE-103	2.0	0.30	5.534	3.030	1.564	0.672	0.161
CASE-104	2.0	0.40	4.164	2.295	1.210	0.556	0.165
CASE-105	5.0	0.02	19.728	9.438	3.176	0.354	0.001
CASE-106	5.0	0.10	4.190	2.282	1.158	0.471	0.095
CASE-107	5.0	0.30	1.411	0.785	0.426	0.215	0.086
CASE-108	5.0	0.40	1.059	0.591	0.324	0.168	0.073
CASE-109	20.0	0.02	2.609	1.409	0.697	0.261	0.041
CASE-110	20.0	0.10	0.530	0.296	0.162	0.084	0.037
CASE-111	20.0	0.30	0.177	0.099	0.055	0.030	0.016
CASE-112	20.0	0.40	0.133	0.075	0.042	0.023	0.012
CASE-113	40.0	0.02	0.931	0.513	0.271	0.124	0.037
CASE-114	40.0	0.10	0.188	0.105	0.058	0.032	0.016
CASE-115	40.0	0.30	0.063	0.035	0.020	0.011	0.006
CASE-116	40.0	0.40	0.047	0.026	0.015	0.008	0.004
CASE-117	50.0	0.02	0.667	0.369	0.197	0.094	0.032
CASE-118	50.0	0.10	0.134	0.075	0.042	0.023	0.012
CASE-119	50.0	0.30	0.045	0.025	0.014	0.008	0.004
CASE-120	50.0	0.40	0.034	0.019	0.011	0.006	0.003

Table 5c. Predicted Drill Cutting Deposition Thickness for 1000 Barrel Discharge

Case ID	Discharge Height Above Bottom Depth (m)	Current Speed (m/sec)	Deposition Thickness 250 um Cutting At 1, 3.2, 10, 32, and 100 meters (meters)				
			1 m	3.2 m	10 m	32 m	100 m
CASE-101	2.0	0.02	158.823	17.681	0.059	0.000	0.000
CASE-102	2.0	0.10	57.879	23.549	4.745	0.105	0.000
CASE-103	2.0	0.30	21.322	10.767	4.299	0.821	0.015
CASE-104	2.0	0.40	16.193	8.400	3.654	0.914	0.040
CASE-105	5.0	0.02	63.014	18.543	1.339	0.001	0.000
CASE-106	5.0	0.10	16.021	7.917	2.952	0.454	0.004
CASE-107	5.0	0.30	5.558	2.995	1.468	0.536	0.077
CASE-108	5.0	0.40	4.190	2.282	1.158	0.471	0.095
CASE-109	20.0	0.02	9.864	4.719	1.588	0.177	0.001
CASE-110	20.0	0.10	2.095	1.141	0.579	0.235	0.047
CASE-111	20.0	0.30	0.705	0.393	0.213	0.108	0.043
CASE-112	20.0	0.40	0.530	0.296	0.162	0.084	0.037
CASE-113	40.0	0.02	3.621	1.878	0.817	0.204	0.009
CASE-114	40.0	0.10	0.746	0.413	0.221	0.106	0.036
CASE-115	40.0	0.30	0.250	0.140	0.077	0.041	0.020
CASE-116	40.0	0.40	0.188	0.105	0.058	0.032	0.016
CASE-117	50.0	0.02	2.610	1.376	0.630	0.185	0.013
CASE-118	50.0	0.10	0.535	0.297	0.160	0.079	0.030
CASE-119	50.0	0.30	0.179	0.100	0.056	0.030	0.015
CASE-120	50.0	0.40	0.134	0.075	0.042	0.023	0.012

Table 5d. Predicted Drill Cutting Deposition Thickness for 1000 Barrel Discharge

Case ID	Discharge Height Above Bottom Depth (m)	Current Speed (m/sec)	Deposition Thickness 500 um Cutting At 1, 3.2, 10, 32, and 100 meters (meters)				
			1 m	3.2 m	10 m	32 m	100 m
CASE-101	2.0	0.02	66.959	0.058	0.000	0.000	0.000
CASE-102	2.0	0.10	147.621	22.723	0.211	0.000	0.000
CASE-103	2.0	0.30	73.408	26.809	3.837	0.029	0.000
CASE-104	2.0	0.40	57.879	23.549	4.745	0.105	0.000
CASE-105	5.0	0.02	102.478	4.316	0.001	0.000	0.000
CASE-106	5.0	0.10	53.528	17.931	1.952	0.006	0.000
CASE-107	5.0	0.30	20.939	9.910	3.223	0.322	0.001
CASE-108	5.0	0.40	16.021	7.917	2.952	0.454	0.004
CASE-109	20.0	0.02	31.507	9.271	0.670	0.001	0.000
CASE-110	20.0	0.10	8.011	3.959	1.476	0.227	0.002
CASE-111	20.0	0.30	2.779	1.497	0.734	0.268	0.038
CASE-112	20.0	0.40	2.095	1.141	0.579	0.235	0.047
CASE-113	40.0	0.02	12.942	5.266	1.061	0.023	0.000
CASE-114	40.0	0.10	2.918	1.539	0.705	0.207	0.015
CASE-115	40.0	0.30	0.992	0.546	0.287	0.130	0.037
CASE-116	40.0	0.40	0.746	0.413	0.221	0.106	0.036
CASE-117	50.0	0.02	9.543	4.142	1.025	0.043	0.000
CASE-118	50.0	0.10	2.101	1.122	0.535	0.179	0.020
CASE-119	50.0	0.30	0.712	0.393	0.209	0.099	0.032
CASE-120	50.0	0.40	0.535	0.297	0.160	0.079	0.030

Table 5e. Predicted Drill Cutting Deposition Thickness for 1000 Barrel Discharge

Case ID	Discharge Height Above Bottom Depth (m)	Current Speed (m/sec)	Deposition Thickness 1000 um Cutting At 1, 3.2, 10, 32, and 100 meters (meters)				
			1 m	3.2 m	10 m	32 m	100 m
CASE-101	2.0	0.02	0.021	0.000	0.000	0.000	0.000
CASE-102	2.0	0.10	91.998	0.234	0.000	0.000	0.000
CASE-103	2.0	0.30	162.361	15.098	0.028	0.000	0.000
CASE-104	2.0	0.40	149.975	21.872	0.171	0.000	0.000
CASE-105	5.0	0.02	9.552	0.000	0.000	0.000	0.000
CASE-106	5.0	0.10	104.306	6.767	0.004	0.000	0.000
CASE-107	5.0	0.30	67.720	18.543	1.066	0.000	0.000
CASE-108	5.0	0.40	55.204	18.097	1.840	0.005	0.000
CASE-109	20.0	0.02	50.771	1.919	0.000	0.000	0.000
CASE-110	20.0	0.10	27.602	9.049	0.920	0.002	0.000
CASE-111	20.0	0.30	10.869	5.107	1.624	0.151	0.000
CASE-112	20.0	0.40	8.324	4.091	1.500	0.219	0.002
CASE-113	40.0	0.02	33.536	4.891	0.038	0.000	0.000
CASE-114	40.0	0.10	11.058	4.749	1.135	0.043	0.000
CASE-115	40.0	0.30	4.006	2.060	0.871	0.199	0.006
CASE-116	40.0	0.40	3.036	1.597	0.725	0.208	0.014
CASE-117	50.0	0.02	27.191	5.195	0.096	0.000	0.000
CASE-118	50.0	0.10	8.113	3.677	1.043	0.068	0.000
CASE-119	50.0	0.30	2.891	1.513	0.677	0.185	0.011
CASE-120	50.0	0.40	2.186	1.165	0.552	0.181	0.018

Table 6. Predicted Dilution for Non-Drilling Fluid Discharges

Case ID	Effective Water Depth (m)	Current Speed (m/sec)	Discharge Rate (bbl/day)	Discharge Rate (cms)	Dilution Factor at 10 m	Dilution Factor at 100 m	Dilution Factor at 1000 m
101	2	0.02	200	0.00037	121.8	385.3	1218.0
102	2	0.02	2250	0.00414	10.8	34.3	108.3
103	2	0.02	4500	0.00828	5.4	17.1	54.2
104	2	0.02	45000	0.08280	na	1.7	5.4
105	2	0.02	113000	0.20790	na	na	2.2
106	2	0.10	200	0.00037	609.2	1927.0	6092.0
107	2	0.10	2250	0.00414	54.2	171.3	541.5
108	2	0.10	4500	0.00828	27.1	85.6	270.8
109	2	0.10	45000	0.08280	2.7	8.6	27.1
110	2	0.10	113000	0.20790	1.1	3.4	10.8
111	2	0.30	200	0.00037	1828.0	5780.0	18280.0
112	2	0.30	2250	0.00414	162.5	513.8	1625.0
113	2	0.30	4500	0.00828	81.2	256.9	812.3
114	2	0.30	45000	0.08280	8.1	25.7	81.2
115	2	0.30	113000	0.20790	3.2	10.2	32.3
116	2	0.40	200	0.00037	2437.0	7706.0	24370.0
117	2	0.40	2250	0.00414	216.6	685.0	2166.0
118	2	0.40	4500	0.00828	108.3	342.5	1083.0
119	2	0.40	45000	0.08280	10.8	34.3	108.3
120	2	0.40	113000	0.20790	4.3	13.6	43.1
121	5	0.02	200	0.00037	481.6	1523.0	4816.0
122	5	0.02	2250	0.00414	42.8	135.4	428.1
123	5	0.02	4500	0.00828	21.4	67.7	214.1
124	5	0.02	45000	0.08280	2.1	6.8	21.4
125	5	0.02	113000	0.20790	na	2.7	8.5

Table 6. Non-Drilling Fluid Water Discharge Cases (continued)

Case ID	Effective Water Depth (m)	Current Speed (m/sec)	Discharge Rate (bbl/day)	Discharge Rate (cms)	Dilution at 10 m	Dilution at 100 m	Dilution at 1000 m
126	5	0.10	200	0.00037	2408.0	7615.0	24080.0
127	5	0.10	2250	0.00414	214.1	676.9	2141.0
128	5	0.10	4500	0.00828	107.0	338.5	1070.0
129	5	0.10	45000	0.08280	10.7	33.8	107.0
130	5	0.10	113000	0.20790	4.3	13.5	42.6
131	5	0.30	200	0.00037	7225.0	22850.0	72250.0
132	5	0.30	2250	0.00414	642.2	2031.0	6422.0
133	5	0.30	4500	0.00828	321.1	1015.0	3211.0
134	5	0.30	45000	0.08280	32.1	101.5	321.1
135	5	0.30	113000	0.20790	12.8	40.4	127.9
136	5	0.40	200	0.00037	9633.0	30460.0	96330.0
137	5	0.40	2250	0.00414	856.3	2708.0	8563.0
138	5	0.40	4500	0.00828	428.1	1354.0	4281.0
139	5	0.40	45000	0.08280	42.8	135.4	428.1
140	5	0.40	113000	0.20790	17.0	53.9	170.5
141	20	0.02	200	0.00037	3853.0	12180.0	38530.0
142	20	0.02	2250	0.00414	342.5	1083.0	3425.0
143	20	0.02	4500	0.00828	171.3	541.5	1713.0
144	20	0.02	45000	0.08280	17.1	54.2	171.3
145	20	0.02	113000	0.20790	6.8	21.6	68.2
146	20	0.10	200	0.00037	19270.0	60920.0	192700.0
147	20	0.10	2250	0.00414	1713.0	5415.0	17130.0
148	20	0.10	4500	0.00828	856.3	2708.0	8563.0
149	20	0.10	45000	0.08280	85.6	270.8	856.3
150	20	0.10	113000	0.20790	34.1	107.8	341.0

Table 6. Non-Drilling Fluid Water Discharge Cases (continued)

Case ID	Effective Water Depth (m)	Current Speed (m/sec)	Discharge Rate (bbl/day)	Discharge Rate (cms)	Dilution at 10 m	Dilution at 100 m	Dilution at 1000 m
151	20	0.30	200	0.00037	57800.0	182800.0	578000.0
152	20	0.30	2250	0.00414	5138.0	16250.0	51380.0
153	20	0.30	4500	0.00828	2569.0	8123.0	25690.0
154	20	0.30	45000	0.08280	256.9	812.3	2569.0
155	20	0.30	113000	0.20790	102.3	323.5	1023.0
156	20	0.40	200	0.00037	77060.0	243700.0	770600.0
157	20	0.40	2250	0.00414	6850.0	21660.0	68500.0
158	20	0.40	4500	0.00828	3425.0	10830.0	34250.0
159	20	0.40	45000	0.08280	342.5	1083.0	3425.0
160	20	0.40	113000	0.20790	136.4	431.3	1364.0
161	40	0.02	200	0.00037	10900.0	34460.0	109000.0
162	40	0.02	2250	0.00414	968.7	3063.0	9687.0
163	40	0.02	4500	0.00828	484.4	1532.0	4844.0
164	40	0.02	45000	0.08280	48.4	153.2	484.4
165	40	0.02	113000	0.20790	19.3	61.0	192.9
166	40	0.10	200	0.00037	54490.0	172300.0	544900.0
167	40	0.10	2250	0.00414	4844.0	15320.0	48440.0
168	40	0.10	4500	0.00828	2422.0	7659.0	24220.0
169	40	0.10	45000	0.08280	242.2	765.9	2422.0
170	40	0.10	113000	0.20790	96.4	305.0	964.5
171	40	0.30	200	0.00037	163500.0	517000.0	1635000.0
172	40	0.30	2250	0.00414	14530.0	45950.0	145300.0
173	40	0.30	4500	0.00828	7266.0	22980.0	72660.0
174	40	0.30	45000	0.08280	726.6	2298.0	7266.0
175	40	0.30	113000	0.20790	289.3	915.0	2893.0

Table 6. Non-Drilling Fluid Water Discharge Cases (continued)

Case ID	Effective Water Depth (m)	Current Speed (m/sec)	Discharge Rate (bbl/day)	Discharge Rate (cms)	Dilution at 10 m	Dilution at 100 m	Dilution at 1000 m
176	40	0.40	200	0.00037	218000.0	689300.0	2180000.0
177	40	0.40	2250	0.00414	19370.0	61270.0	193700.0
178	40	0.40	4500	0.00828	9687.0	30630.0	96870.0
179	40	0.40	45000	0.08280	968.7	3063.0	9687.0
180	40	0.40	113000	0.20790	385.8	1220.0	3858.0
181	50	0.02	200	0.00037	15230.0	48160.0	152300.0
182	50	0.02	2250	0.00414	1354.0	4281.0	13540.0
183	50	0.02	4500	0.00828	676.9	2141.0	6769.0
184	50	0.02	45000	0.08280	67.7	214.1	676.9
185	50	0.02	113000	0.20790	27.0	85.3	269.6
186	50	0.10	200	0.00037	76150.0	240800.0	761500.0
187	50	0.10	2250	0.00414	6769.0	21410.0	67690.0
188	50	0.10	4500	0.00828	3385.0	10700.0	33850.0
189	50	0.10	45000	0.08280	338.5	1070.0	3385.0
190	50	0.10	113000	0.20790	134.8	426.2	1348.0
191	50	0.30	200	0.00037	228500.0	722500.0	2285000.0
192	50	0.30	2250	0.00414	20310.0	64220.0	203100.0
193	50	0.30	4500	0.00828	10150.0	32110.0	101500.0
194	50	0.30	45000	0.08280	1015.0	3211.0	10150.0
195	50	0.30	113000	0.20790	404.4	1279.0	4044.0
196	50	0.40	200	0.00037	304600.0	963300.0	3046000.0
197	50	0.40	2250	0.00414	27080.0	85630.0	270800.0
198	50	0.40	4500	0.00828	13540.0	42810.0	135400.0
199	50	0.40	45000	0.08280	1354.0	4281.0	13540.0
200	50	0.40	113000	0.20790	539.1	1705.0	5391.0

Figure 1. Example of Water Column Plume Trajectory in Direction Current Case 21.
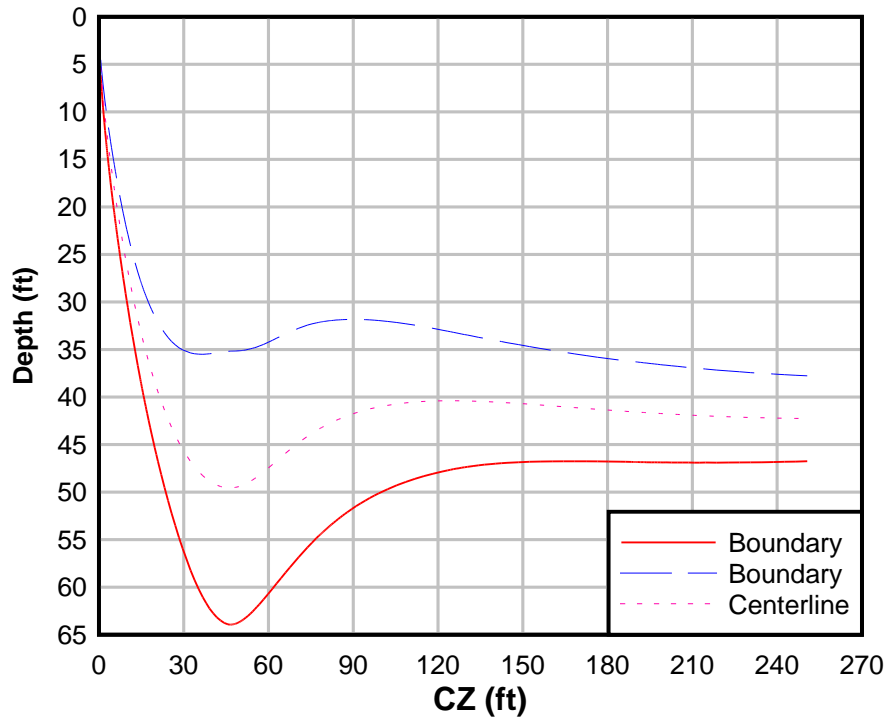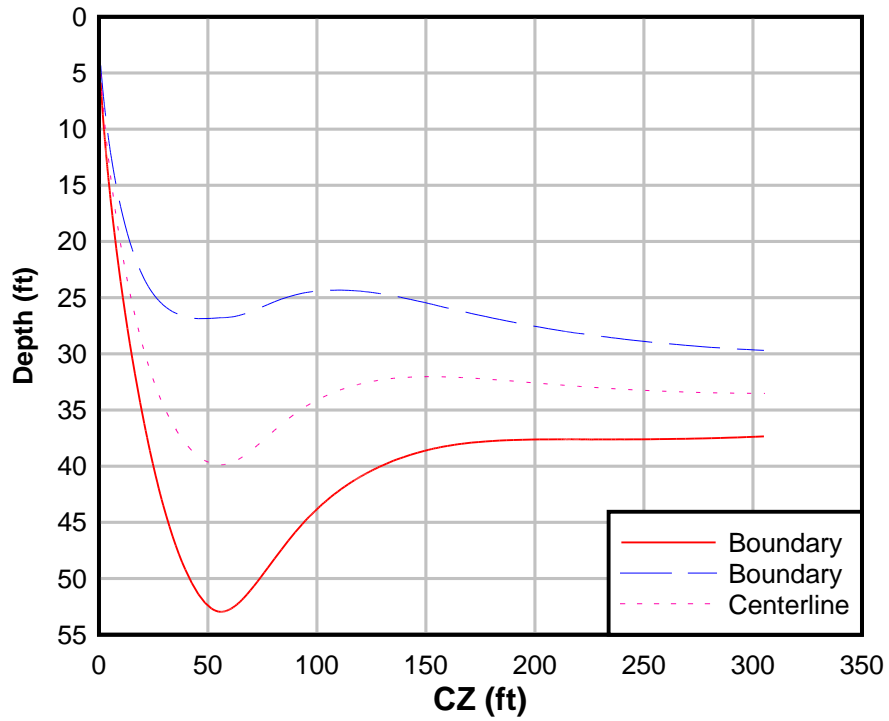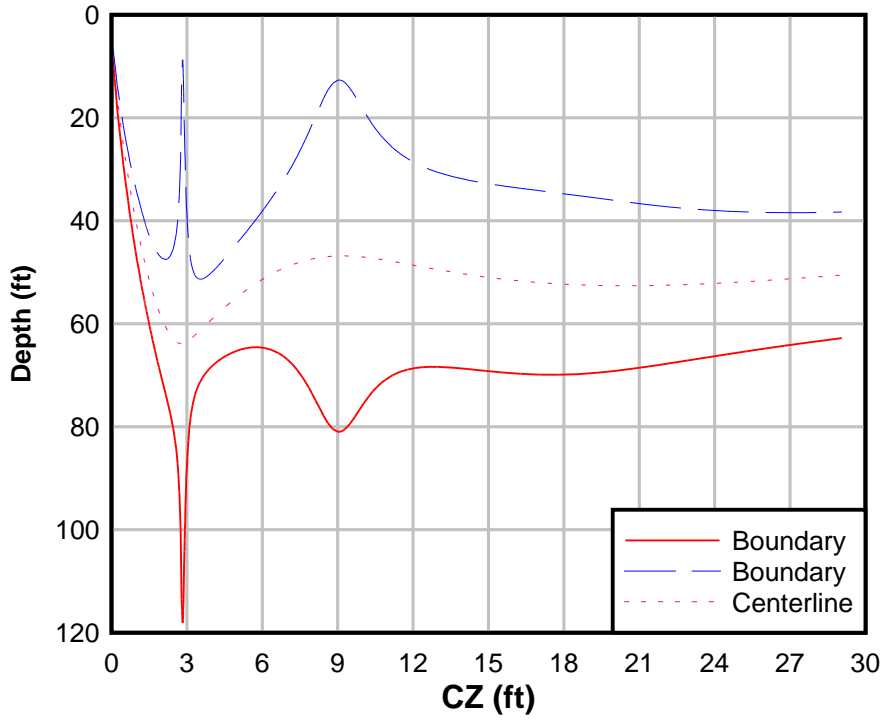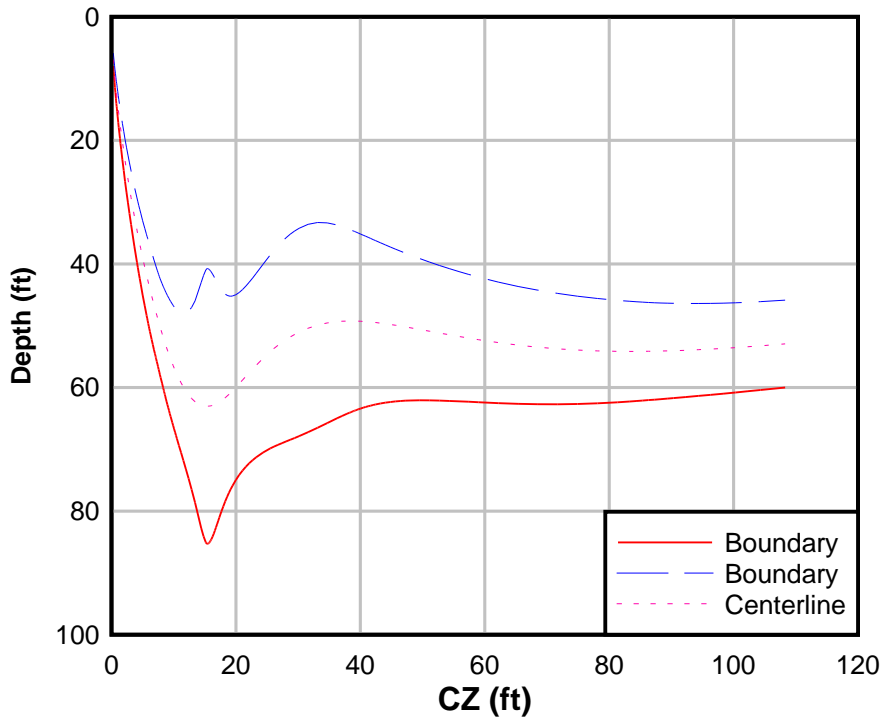

OOCPC Model-Chukchi and Beaufort Seas
CASE-21 Plume Trajectory
Ambient (Water Depth= 20 m, Current Speed= 10 cm/sec)
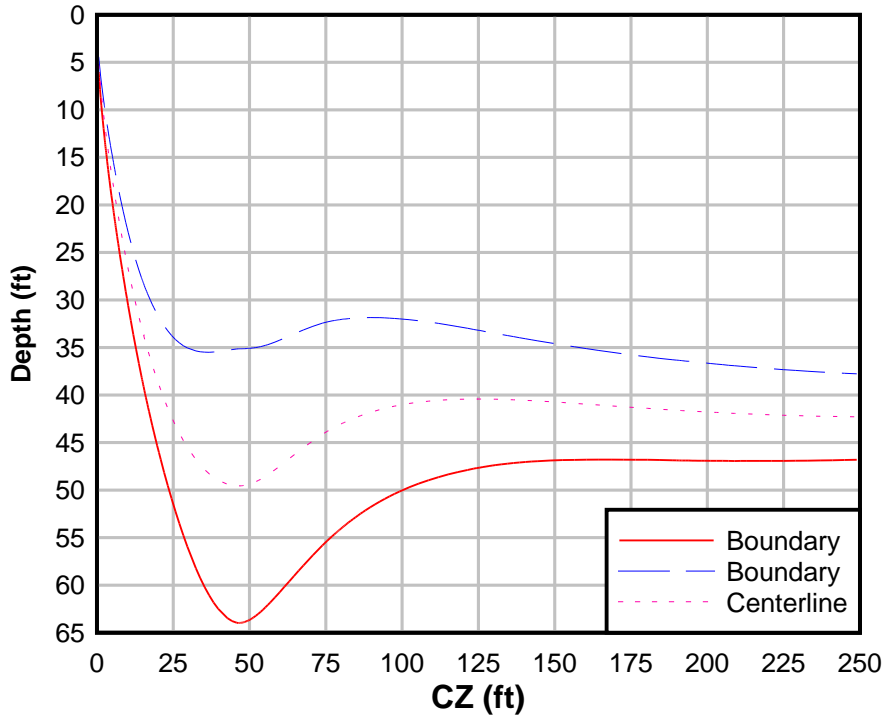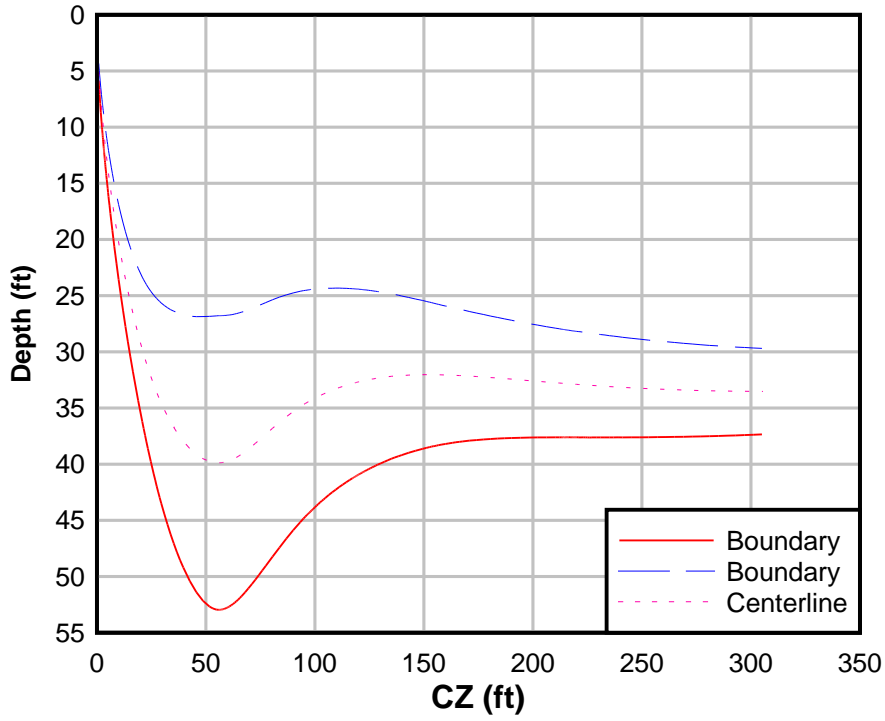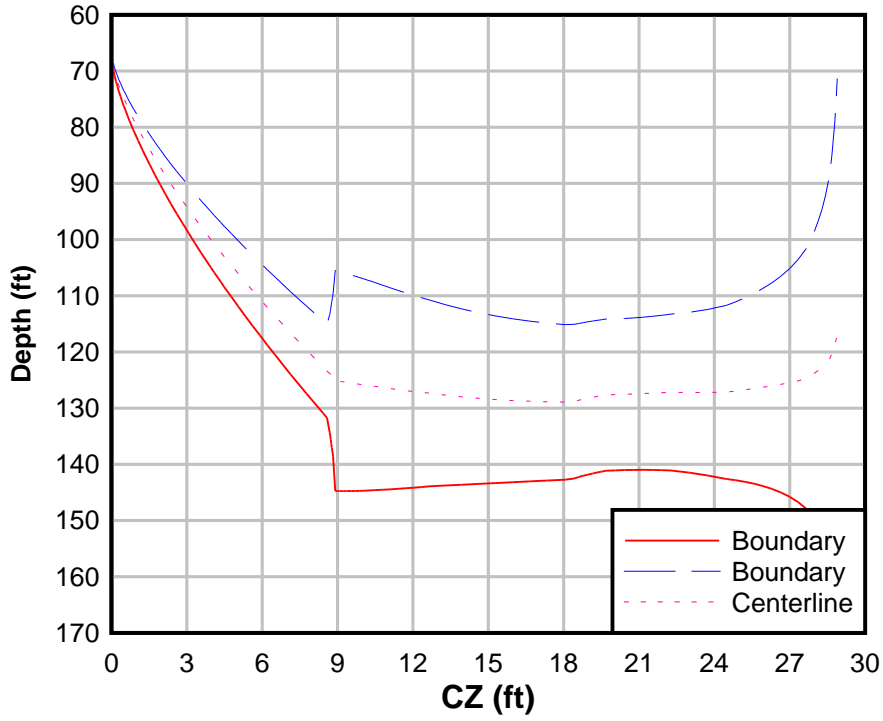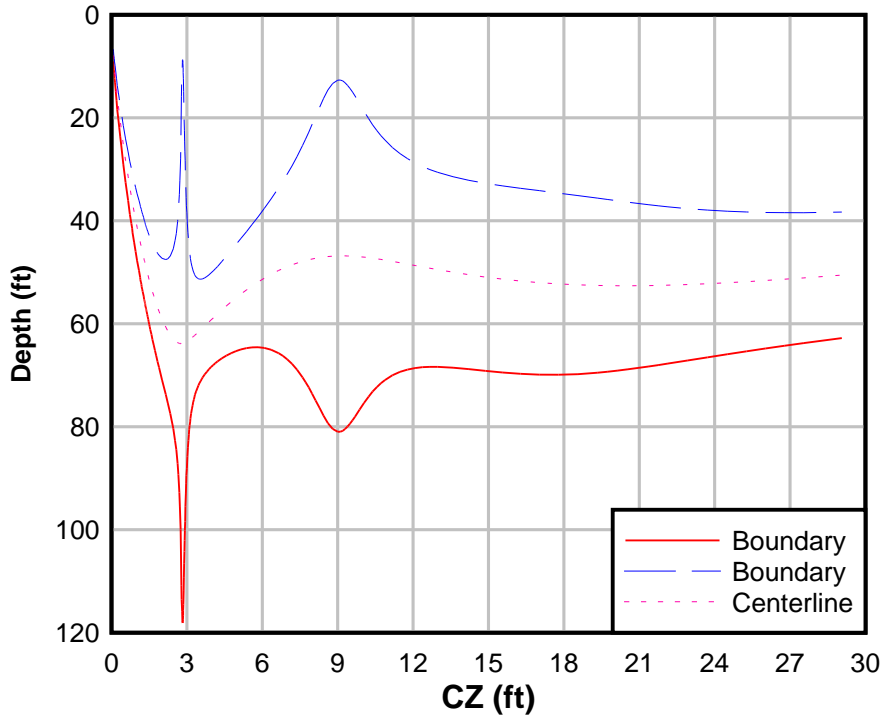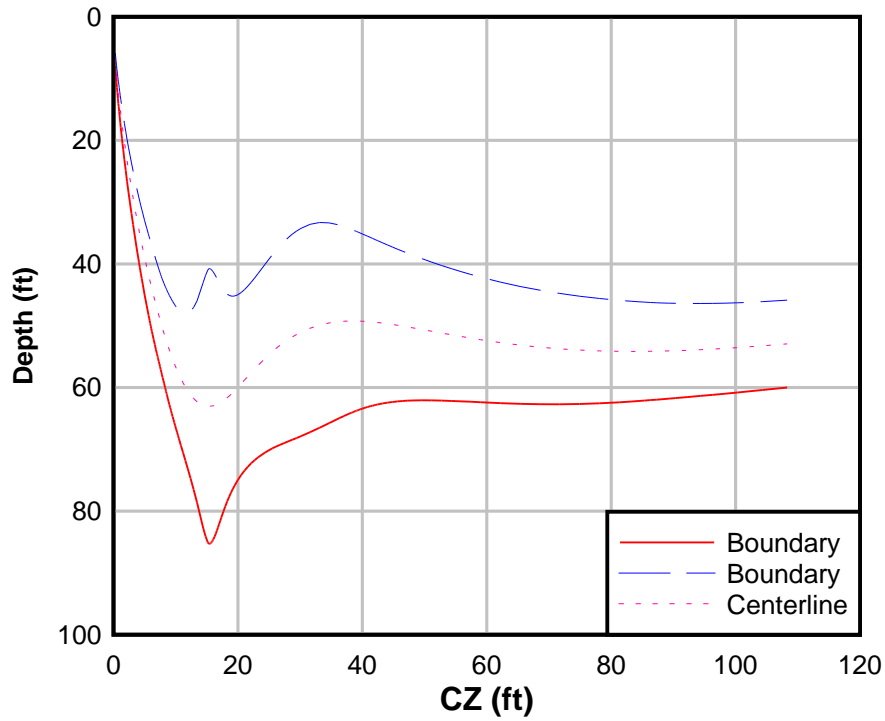Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
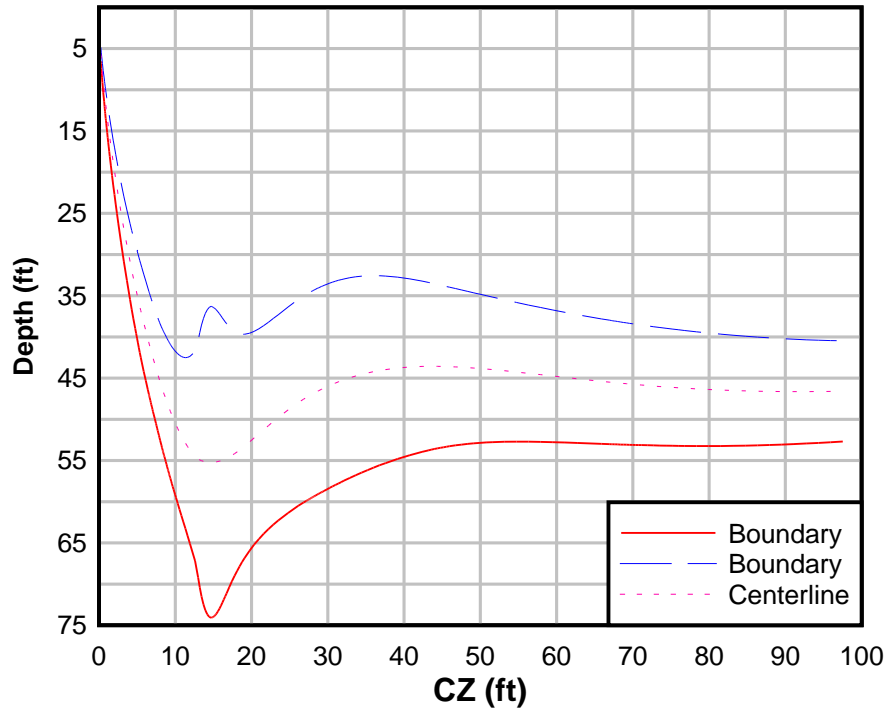
## Figure 2. Example of Water Column Plume Dilution in Direction of Current for Case 21.

OOCPC Model-Chukchi and Beaufort Seas
CASE-21 Dilution Factor
Ambient (Water Depth= 20 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
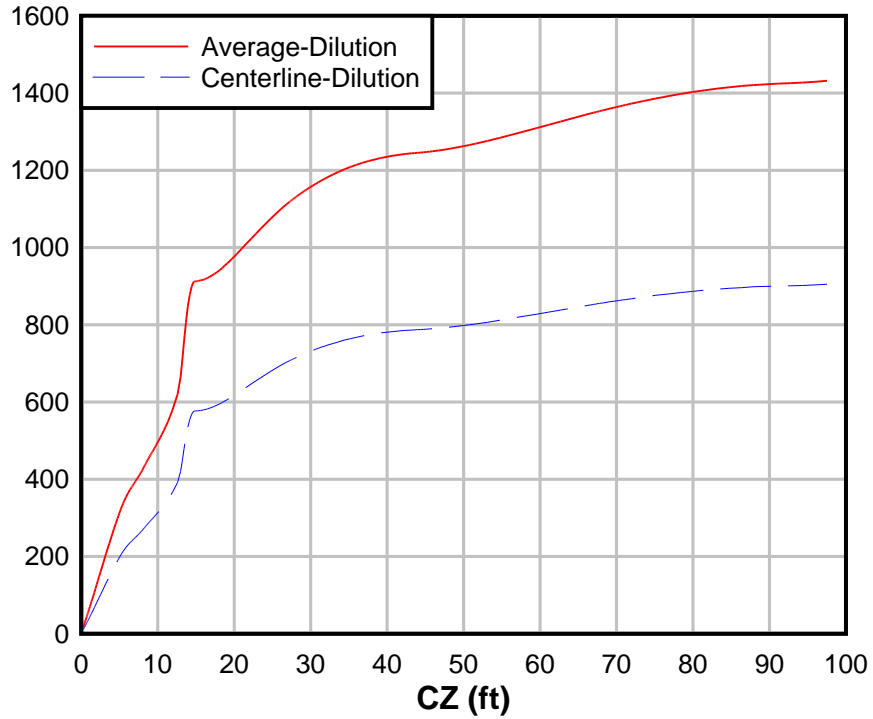
Figure 3. Water Column Plume Dilution in Direction of Current for Case 33.

OOCPC Model-Chukchi and Beaufort Seas
CASE-33 Dilution Factor
Ambient (Water Depth= 20 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)
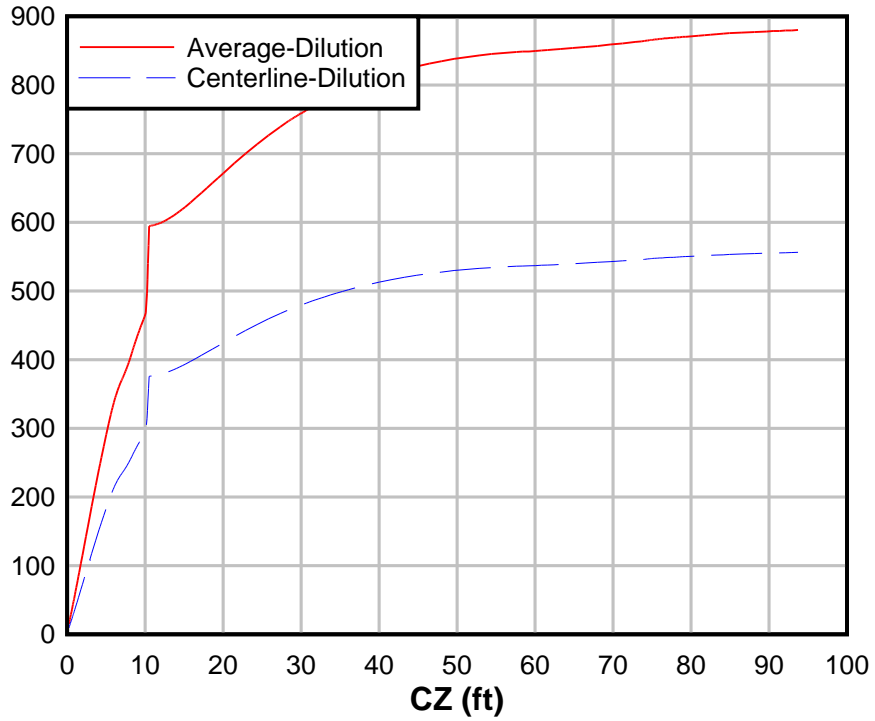
Figure 4. Water Column Plume Dilution in Direction of Current for Case 1.

OOCPC Model-Chukchi and Beaufort Seas
CASE-1 Dilution Factor
Ambient (Water Depth= 2 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)
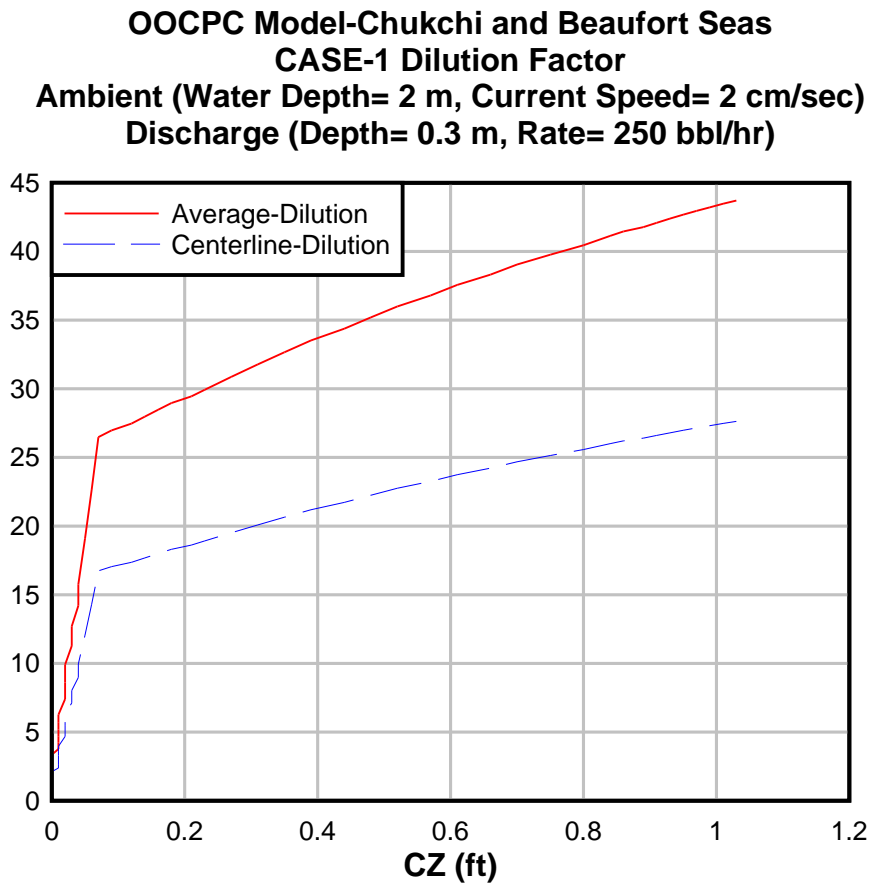
Figure 5. Example of Water Column Plume Dilution in Direction of Current for Case 55.

OOCPC Model-Chukchi and Beaufort Seas
CASE-55 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 20.3 m, Rate= 1000 bbl/hr)
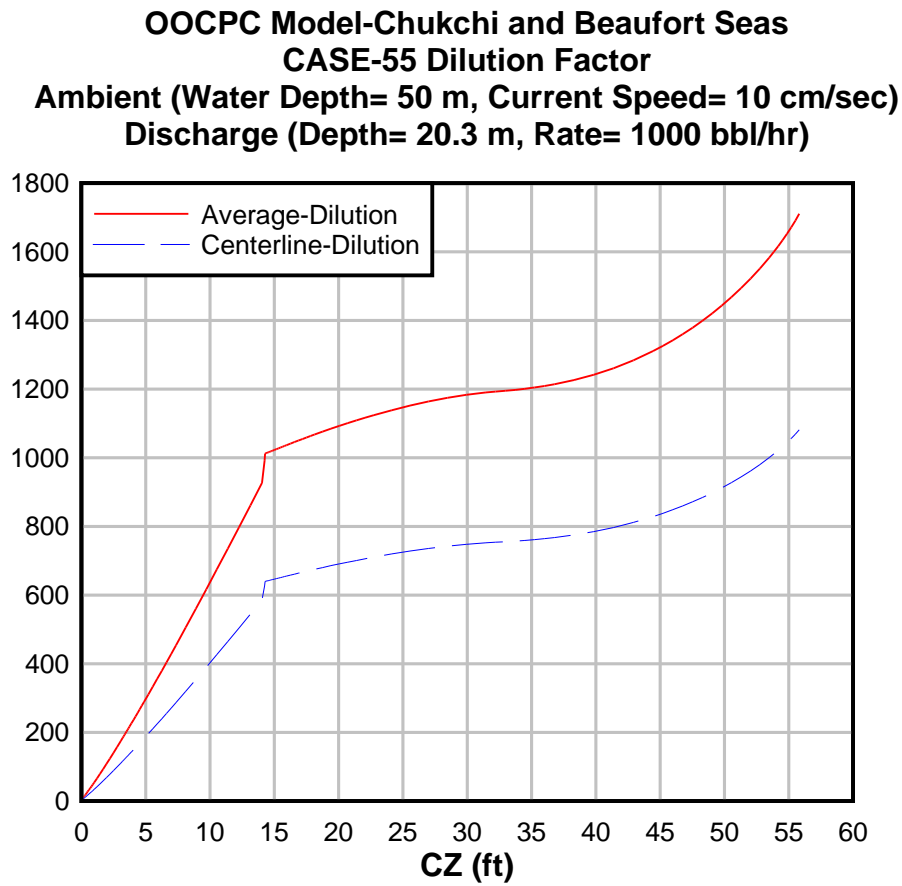
Figure 6. Example of Bed Deposition for Case 21.

CASE-21 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
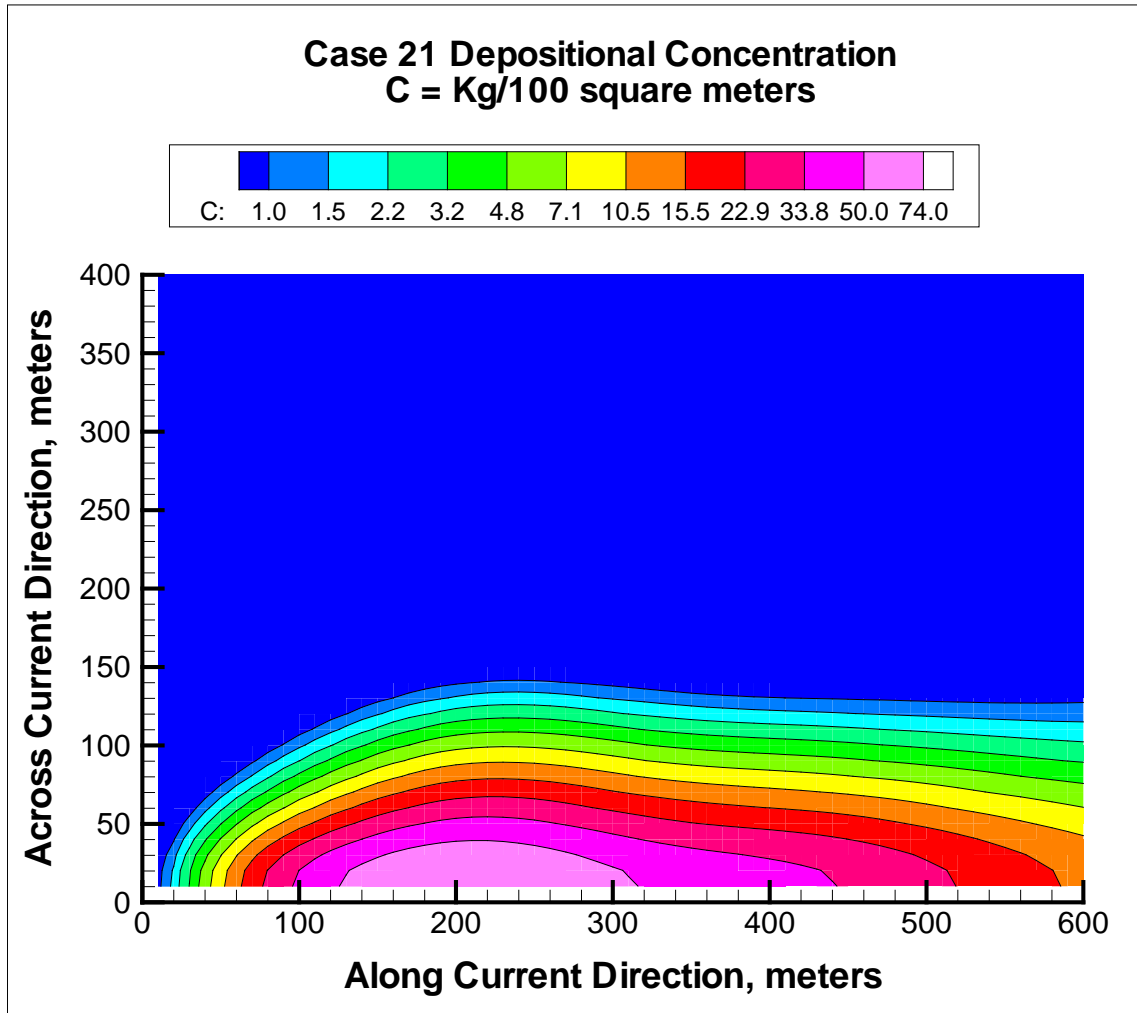
Figure 7. Example of Deposition Thickness for Case 21.

CASE-21 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
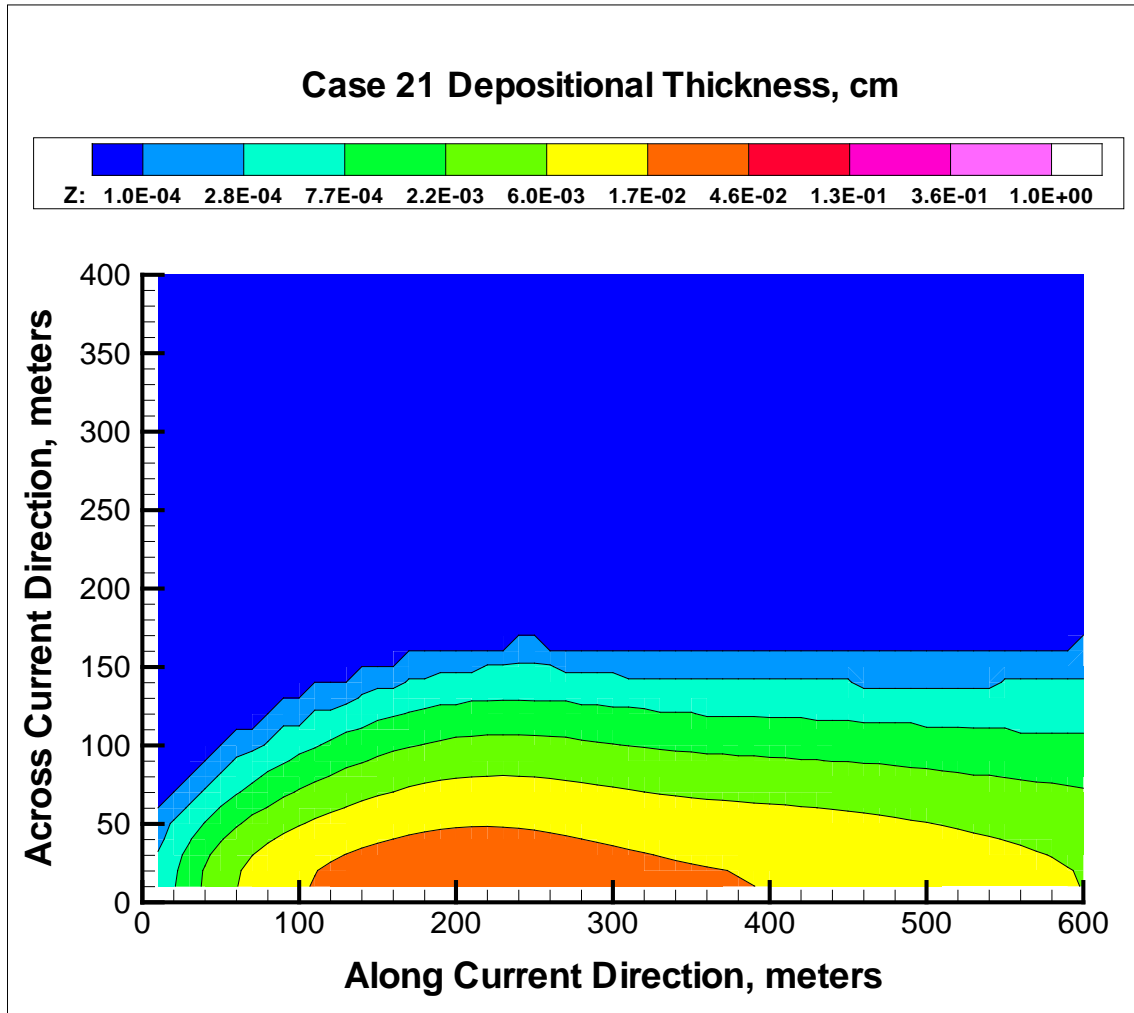
References

[1] Brandsma, M. G., 2004. Automatic validation of the Offshore Operators Committee Discharge Model and application to predicting drilling solids accumulation on the sea floor, Environmental Modelling & Software 19, 617-628.

[2] Brandsma, M. G., and J. P. Smith, 1999. Offshore Operators Committee Mud and Produced Water Discharge Model - Report and User Guide. Exxon Production Research Company, EPR.29PR.99, 166pp.

[3] Fischer, H. B., E.J. List, H. C. Y. Koh, J. Imbeger, and N. A. Brooks. 1979**.** Mixing in Inland and Coastal Waters. 483 pp.

[4] Nedwed, T. J., J. P. Smith, and M. G. Brandsma, Verification of the OOC Mud and Produced Water Discharge Model using lab-scale plume behavior experiments, Environmental Modelling & Software, 19, 655-670.

[5] Pivel, M.A.G., C.M.D.S. Freitas, and J.L.D. Comba, 2009. Modeling the discharge of cuttings and drilling fluids in a deep-water environment, Deep Sea Research Part II: 56, 12-21.

[6] Smith, J. P., M. G. Brandsma, and T. J. Nedwed, 2004. Field verification of the Offshore Operators Committee (OOC) Mud and Produced Water Discharge Model, Environmental Modelling & Software, 19, 739-749.

[7] Tetra Tech, Inc., 1993. Technical Support Document for the Revises Offshore Operator's Committee Model: Regulating Dilution and Deposition of Drilling Muds on the Outer Continental Shelf. Prepared for US EPA, Region 10, EPA Contract 68-C8-001, Draft Report TC 6516-13.

Appendix A – Water Column Plume Trajectories in the Direction of the Ambient Current

Appendix B – Water Column Plume Dilution in the Direction of the Ambient Current

Appendix C – Solids Deposition to Bed at End of Simulations (Kilograms/100 M²)

Appendix D – Solids Deposition to Bed at End of Simulations (in Centimeters)
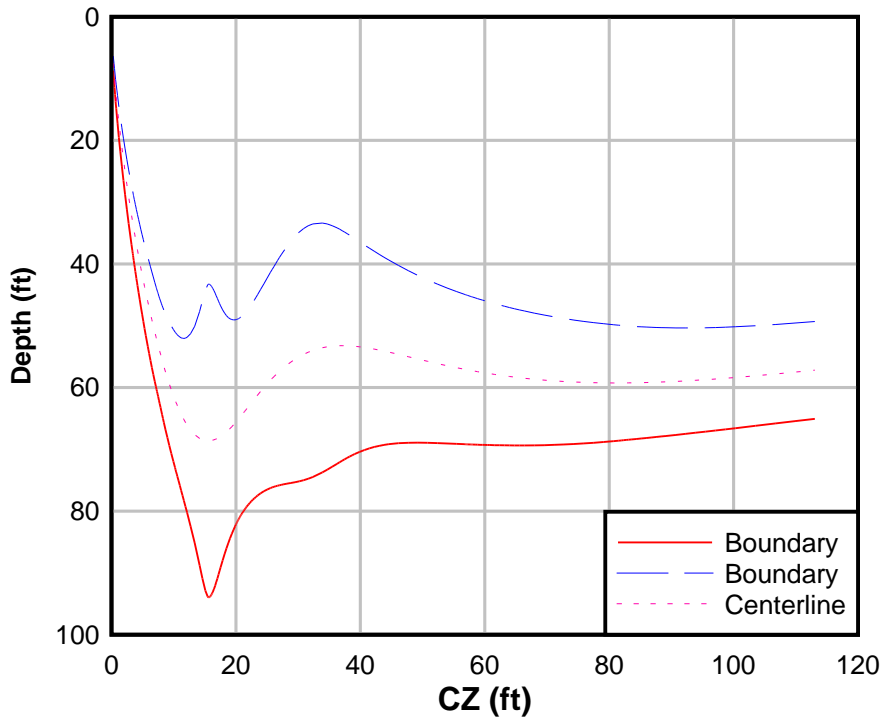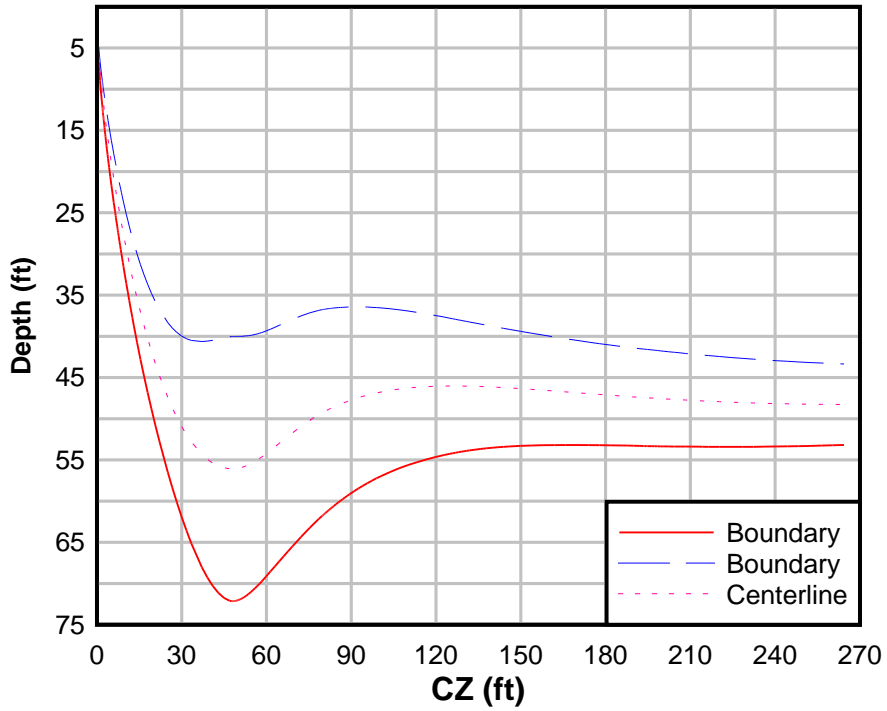
OOCPC Model-Chukchi and Beaufort Seas
CASE-1 Plume Trajectory
Ambient (Water Depth= 2 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Legend:
- Boundary
- Boundary
- Centerline
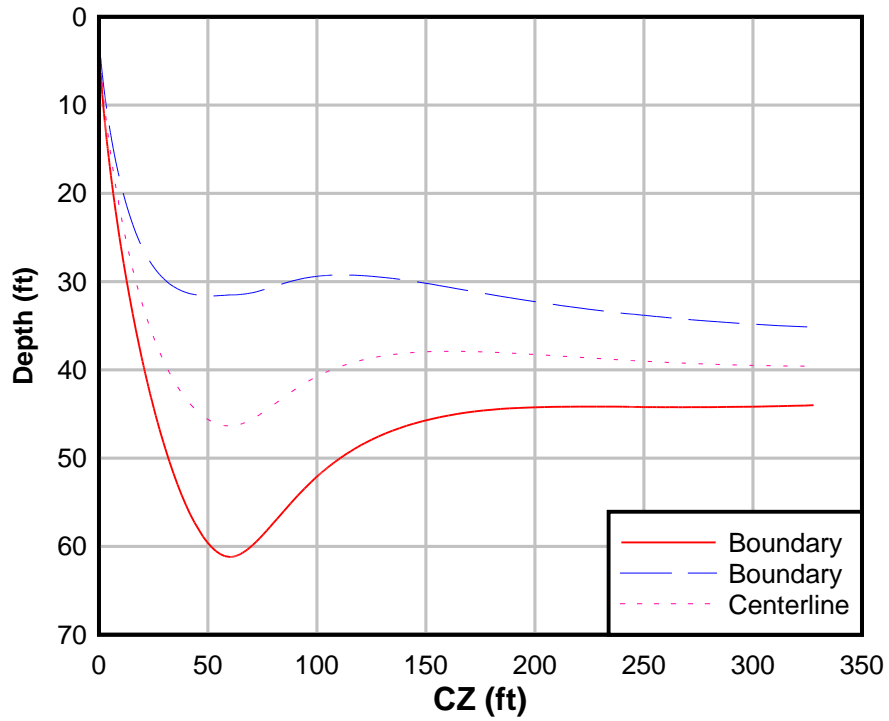
X-axis: CZ (ft)
Y-axis: Depth (ft)
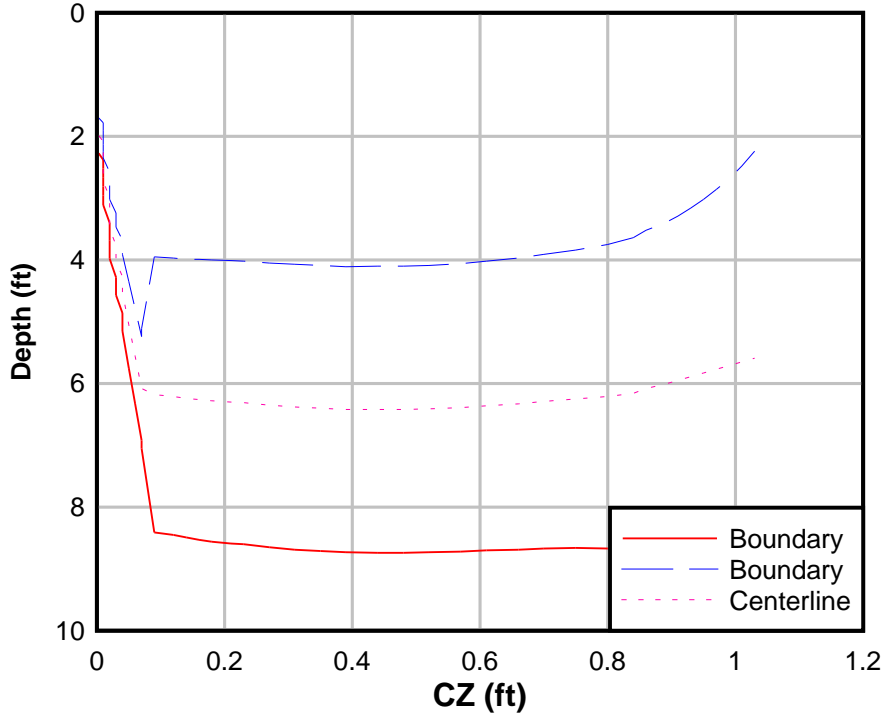
OOCPC Model-Chukchi and Beaufort Seas
CASE-2 Plume Trajectory
Ambient (Water Depth= 2 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)
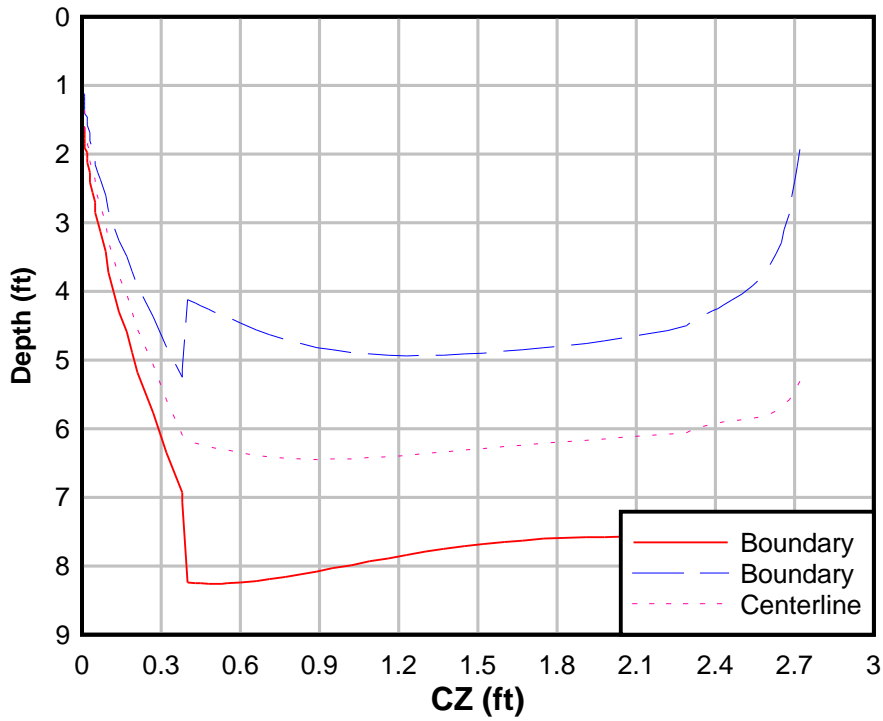
OOCPC Model-Chukchi and Beaufort Seas
CASE-3 Plume Trajectory
Ambient (Water Depth= 2 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)
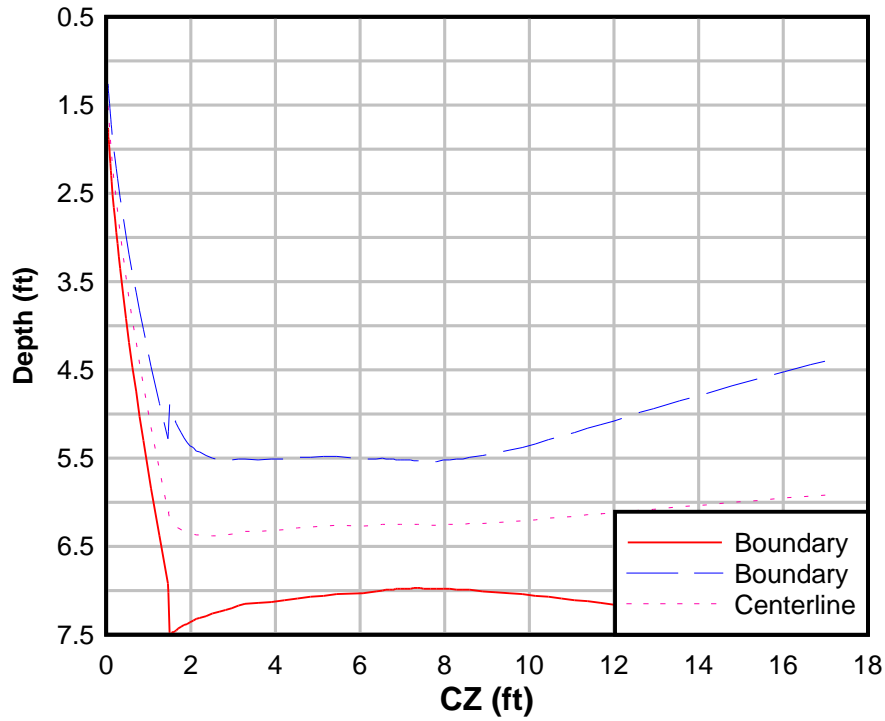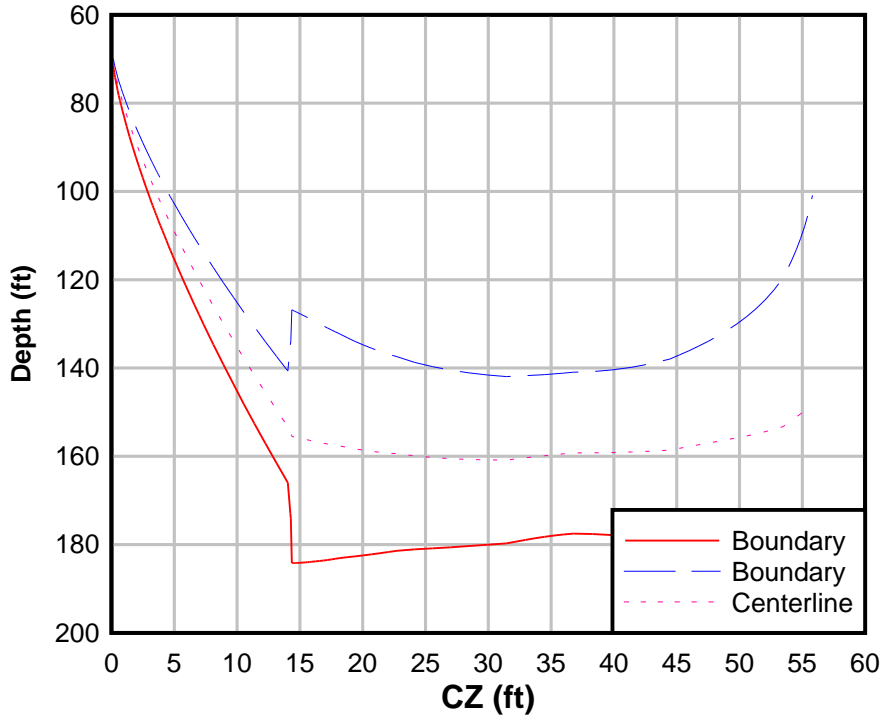
OOCPC Model-Chukchi and Beaufort Seas
CASE-4 Plume Trajectory
Ambient (Water Depth= 2 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Legend:
- Boundary (red solid)
- Boundary (blue dashed)
- Centerline (pink dotted)

X-axis: CZ (ft)
Y-axis: Depth (ft)
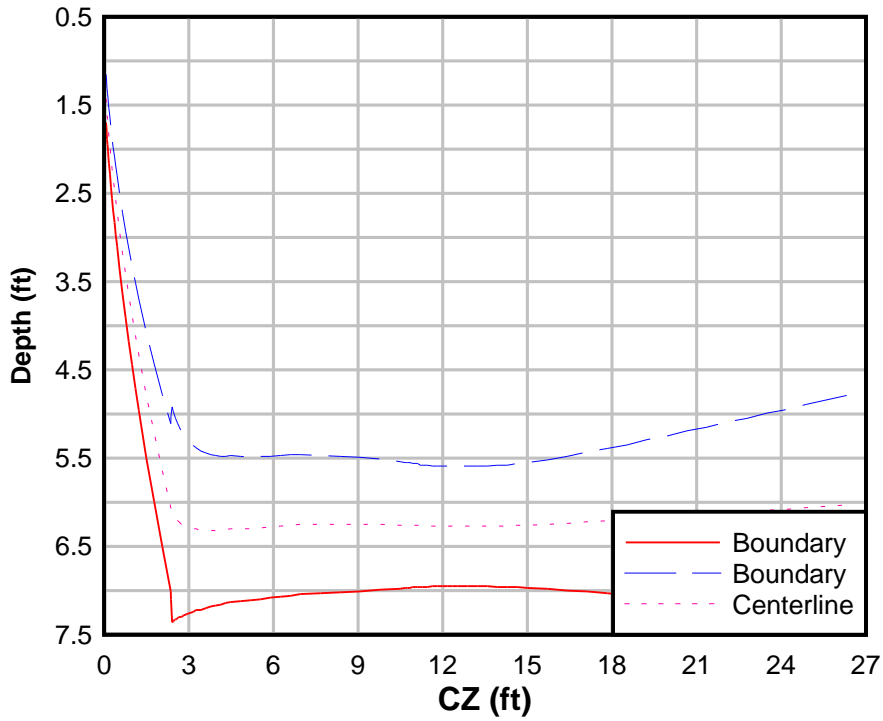
OOCPC Model-Chukchi and Beaufort Seas
CASE-5 Plume Trajectory
Ambient (Water Depth= 5 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)
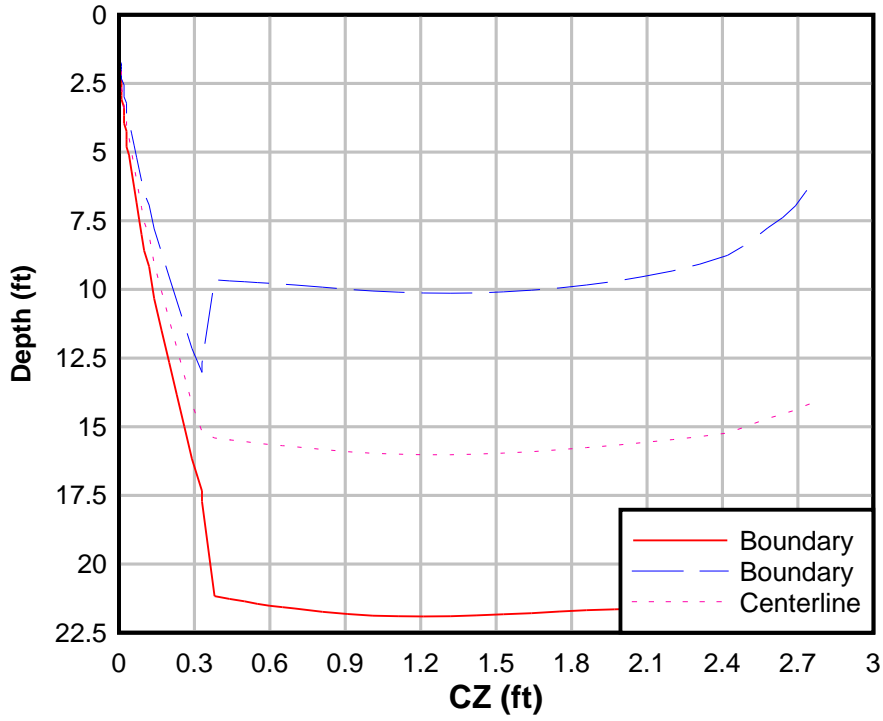
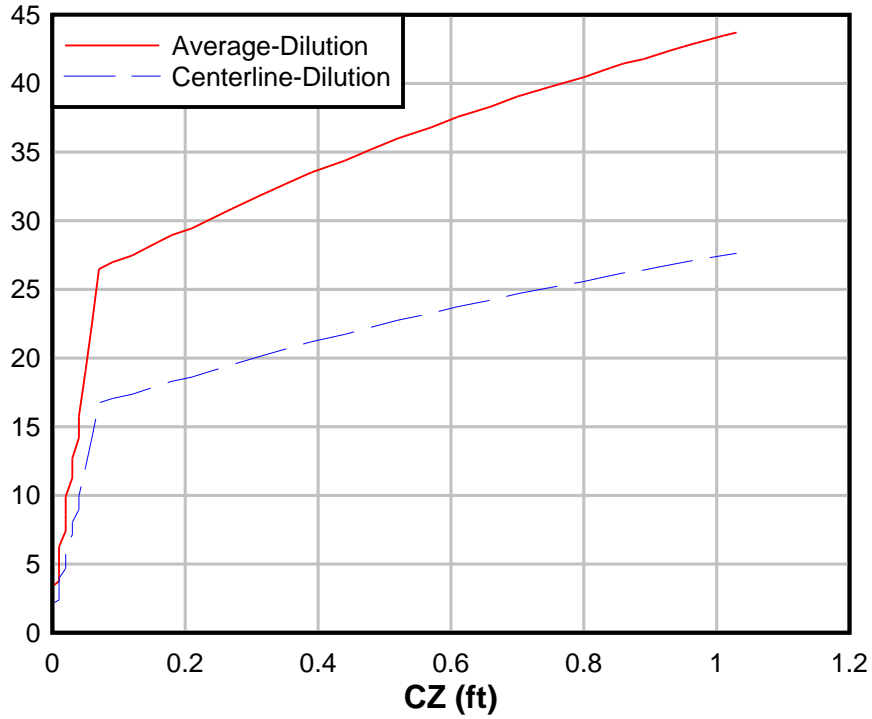**OOCPC Model-Chukchi and Beaufort Seas**
CASE-6 Plume Trajectory
Ambient (Water Depth= 5 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)
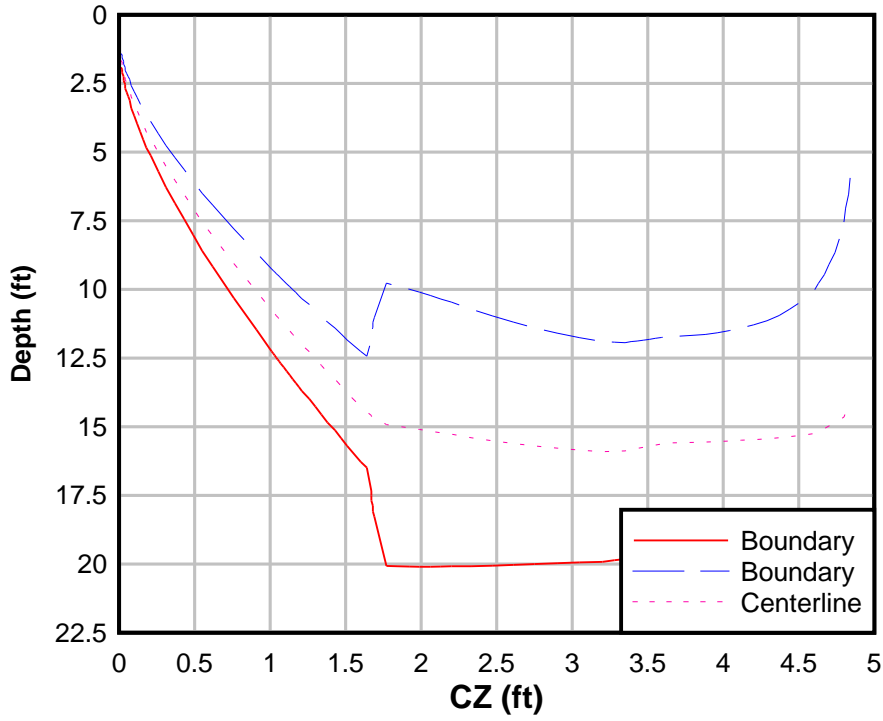
OOCPC Model-Chukchi and Beaufort Seas
CASE-7 Plume Trajectory
Ambient (Water Depth= 5 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)
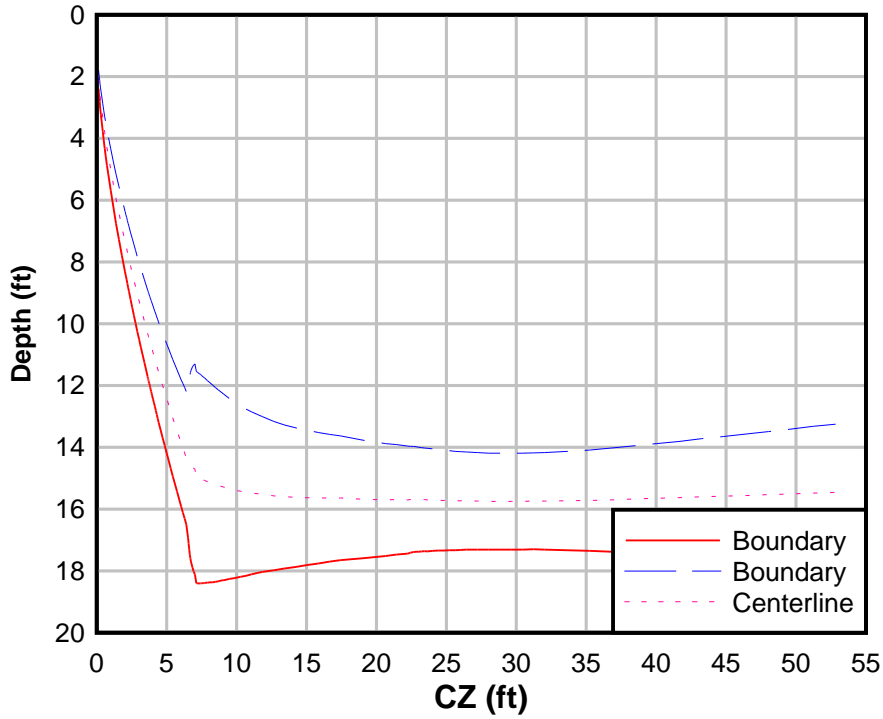
OOCPC Model-Chukchi and Beaufort Seas
CASE-8 Plume Trajectory
Ambient (Water Depth= 5 m, Current Speed= 40 cm/sec)
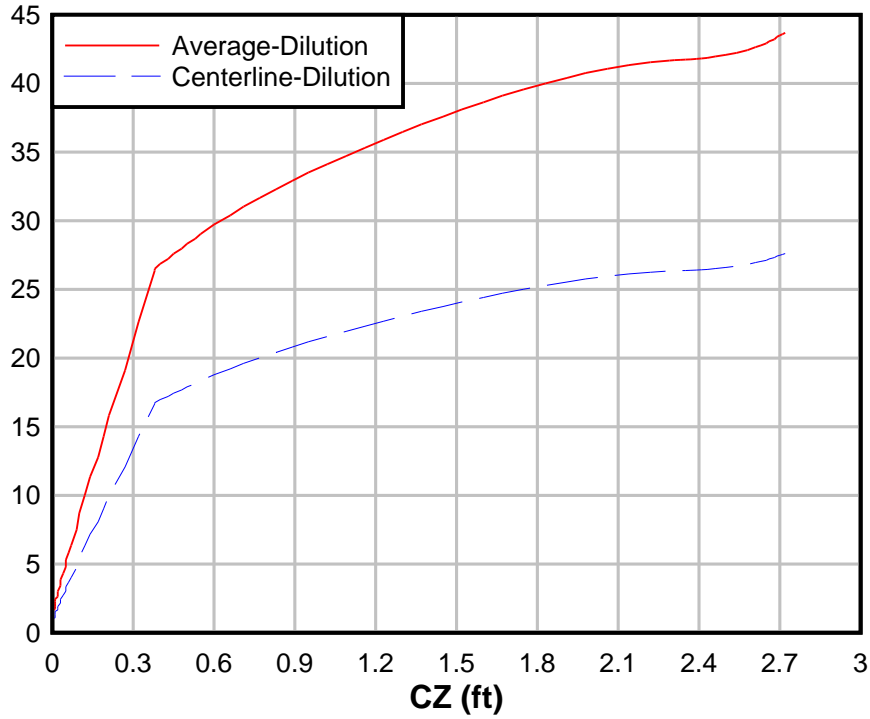**Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)**
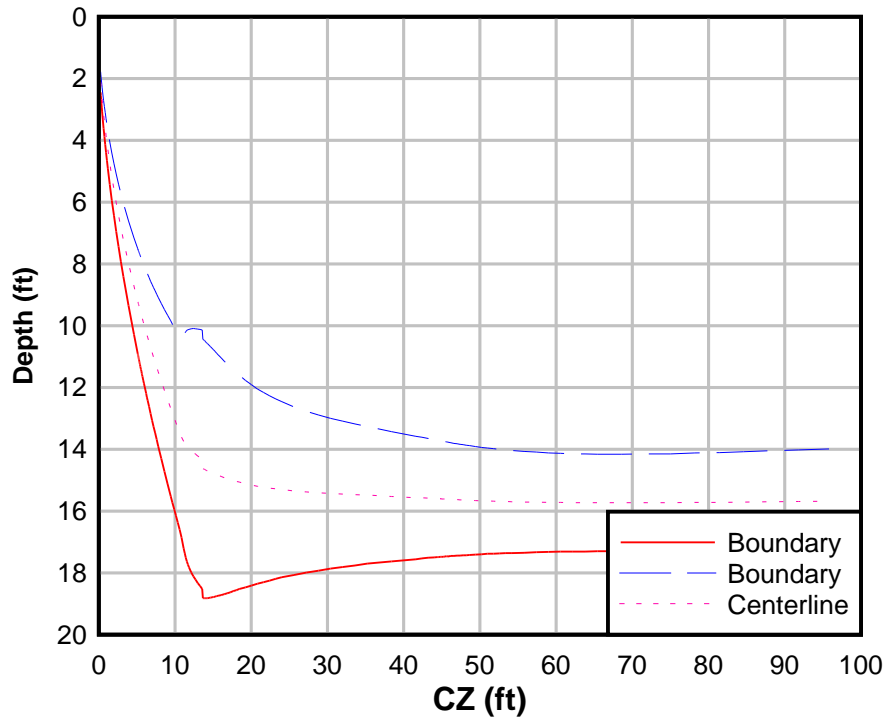
OOCPC Model-Chukchi and Beaufort Seas
CASE-9 Plume Trajectory
Ambient (Water Depth= 20 m, Current Speed= 2 cm/sec)
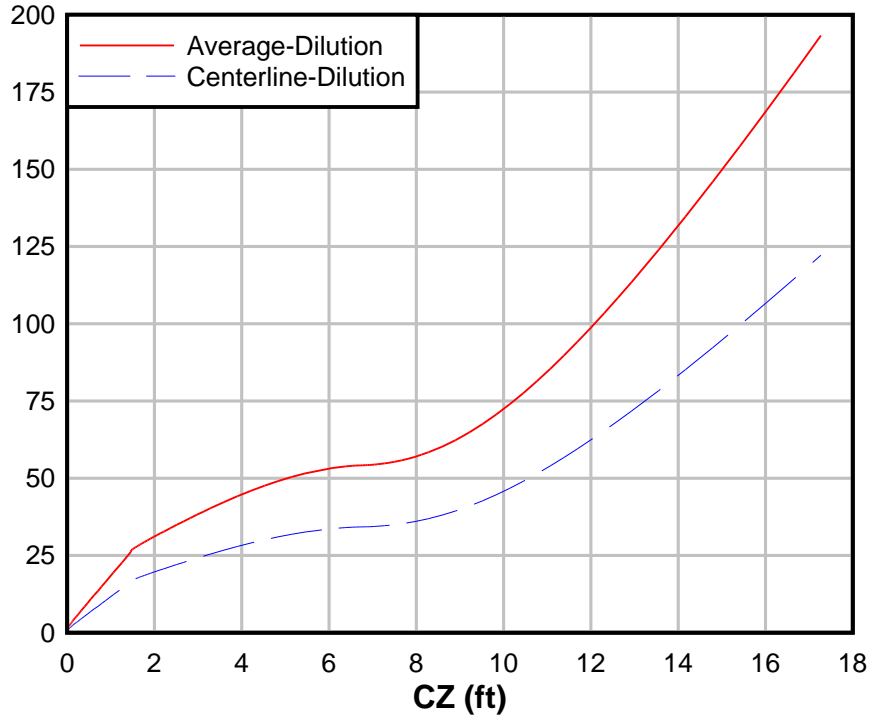**Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)**

Depth (ft) vs CZ (ft)

Legend:
— Boundary
– – Boundary
···· Centerline
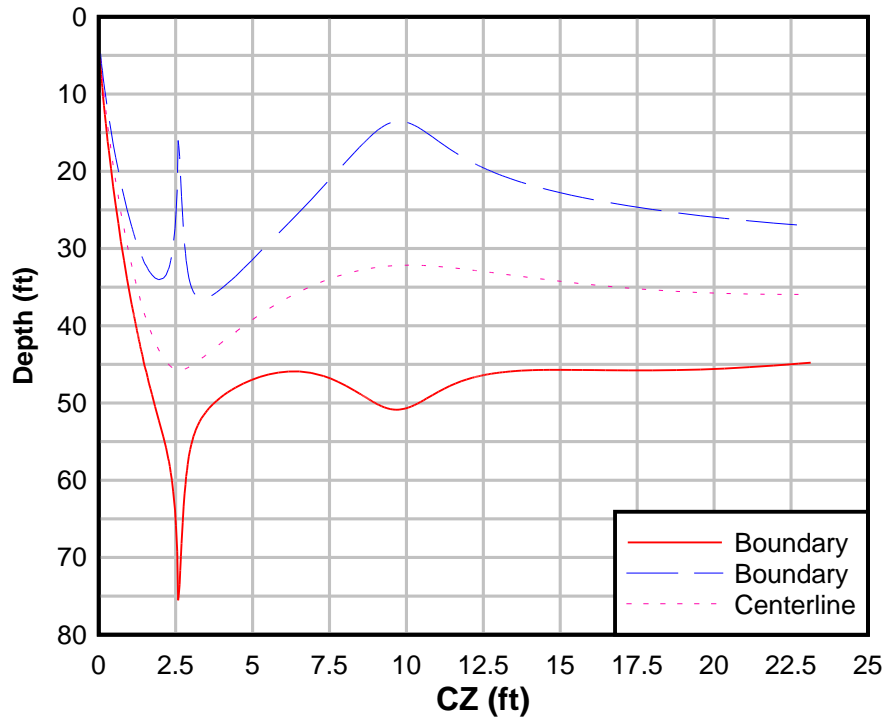
OOCPC Model-Chukchi and Beaufort Seas
CASE-10 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
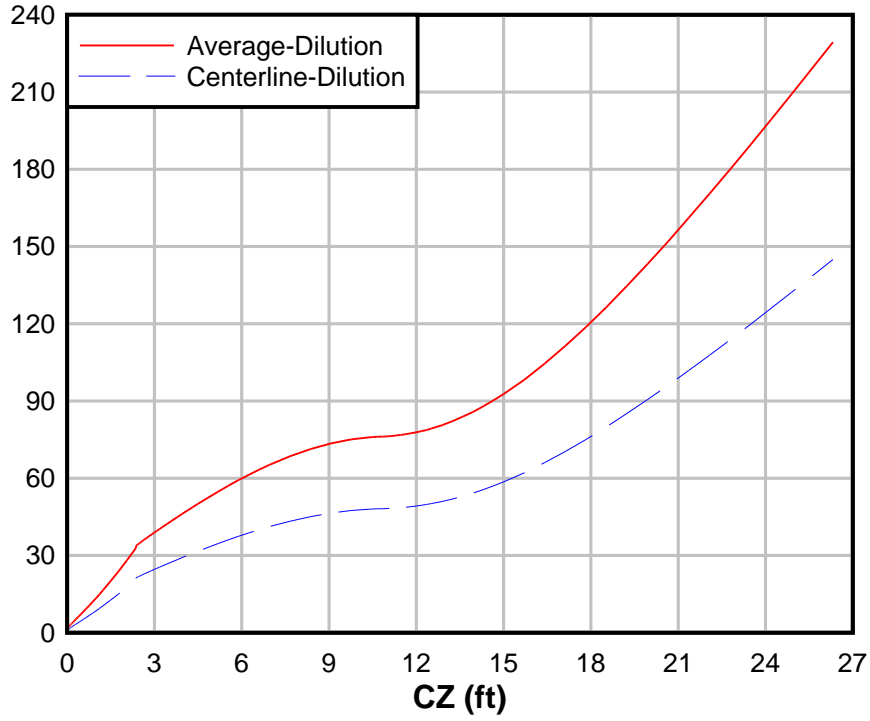### Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)
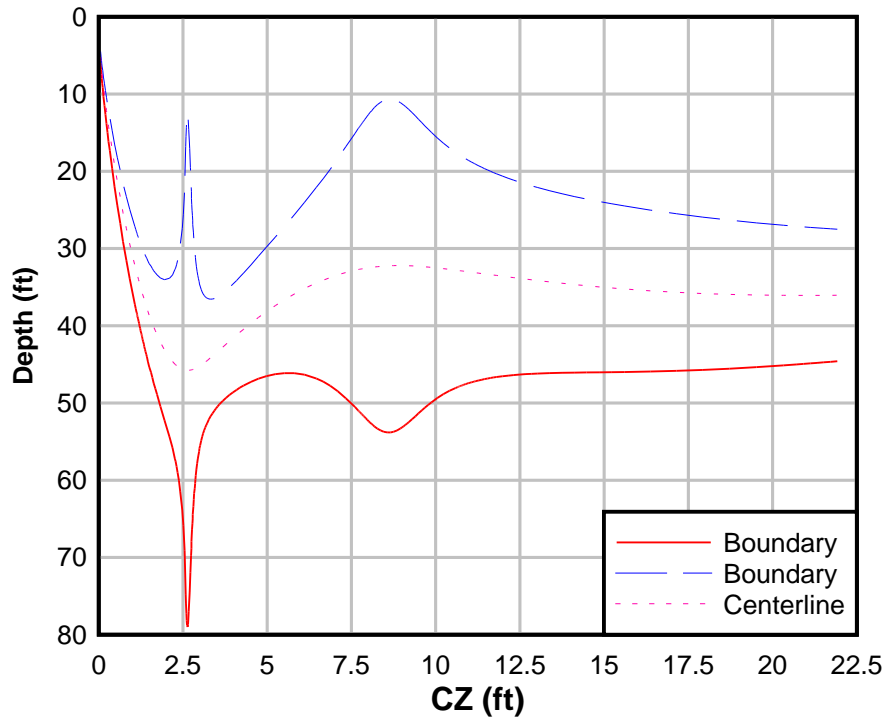
OOCPC Model-Chukchi and Beaufort Seas
CASE-11 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)
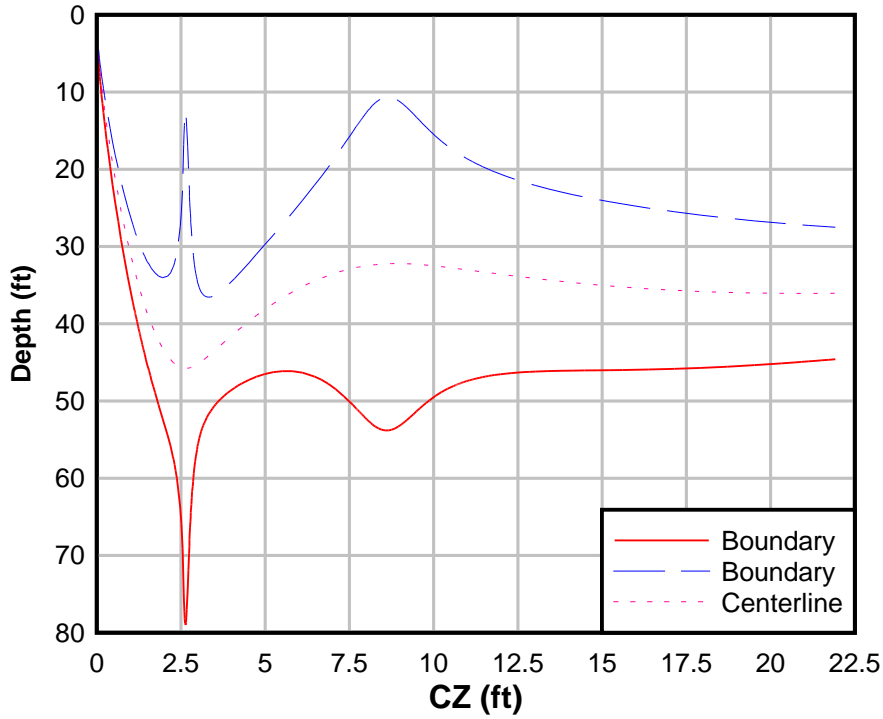
OOCPC Model-Chukchi and Beaufort Seas
CASE-12 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 250 bbl/hr)
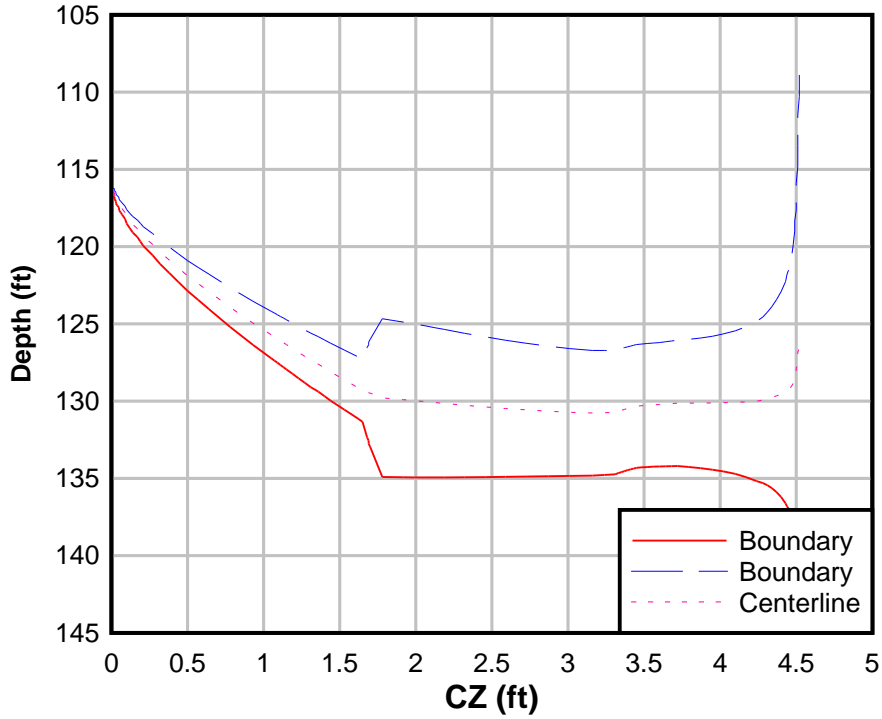
OOCPC Model-Chukchi and Beaufort Seas
CASE-13 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 38.3 m, Rate= 250 bbl/hr)
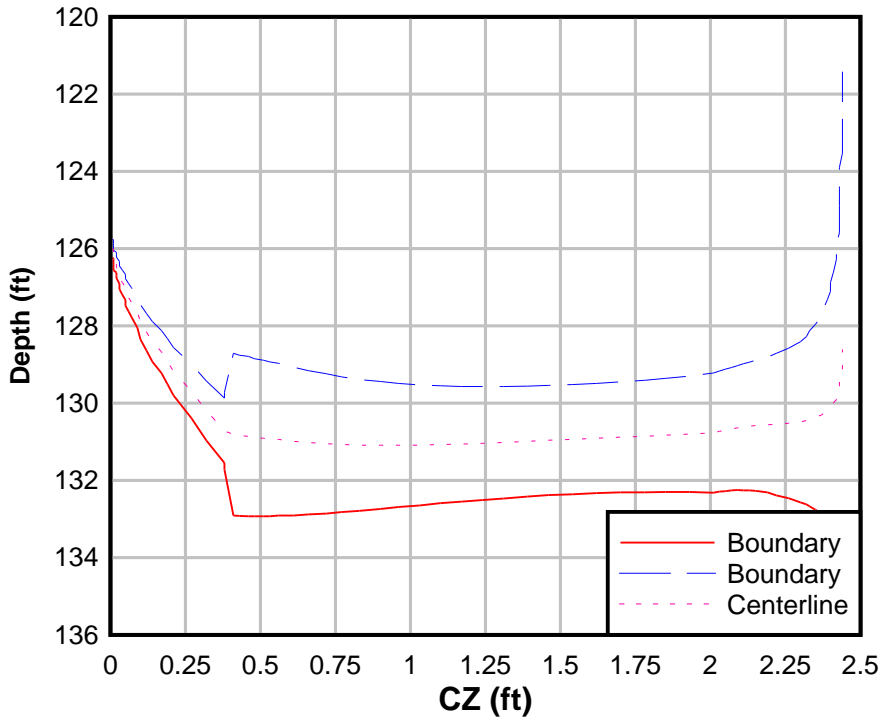
OOCPC Model-Chukchi and Beaufort Seas
CASE-14 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 250 bbl/hr)
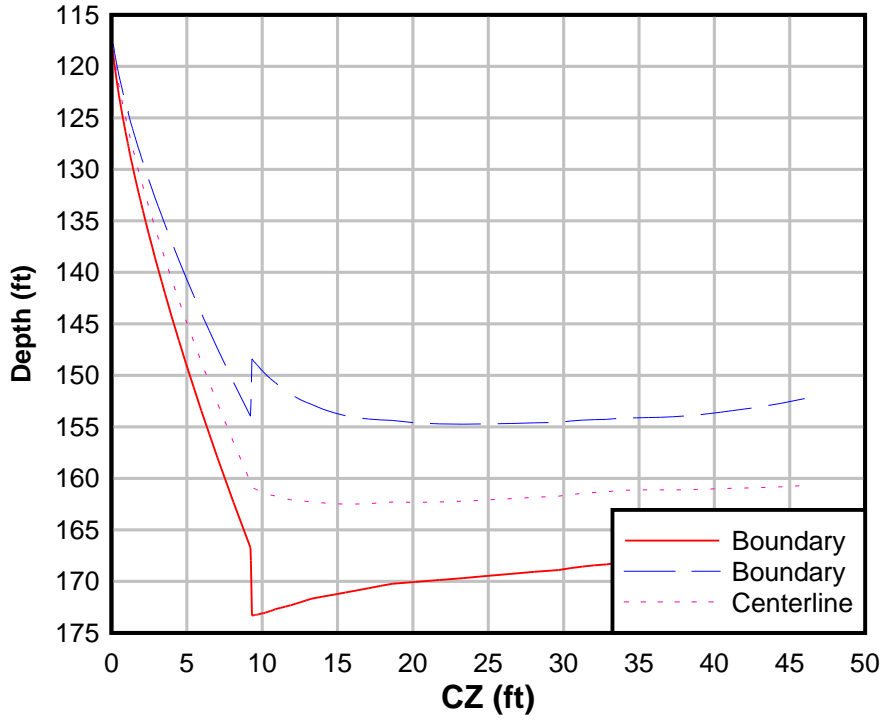
OOCPC Model-Chukchi and Beaufort Seas
CASE-15 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
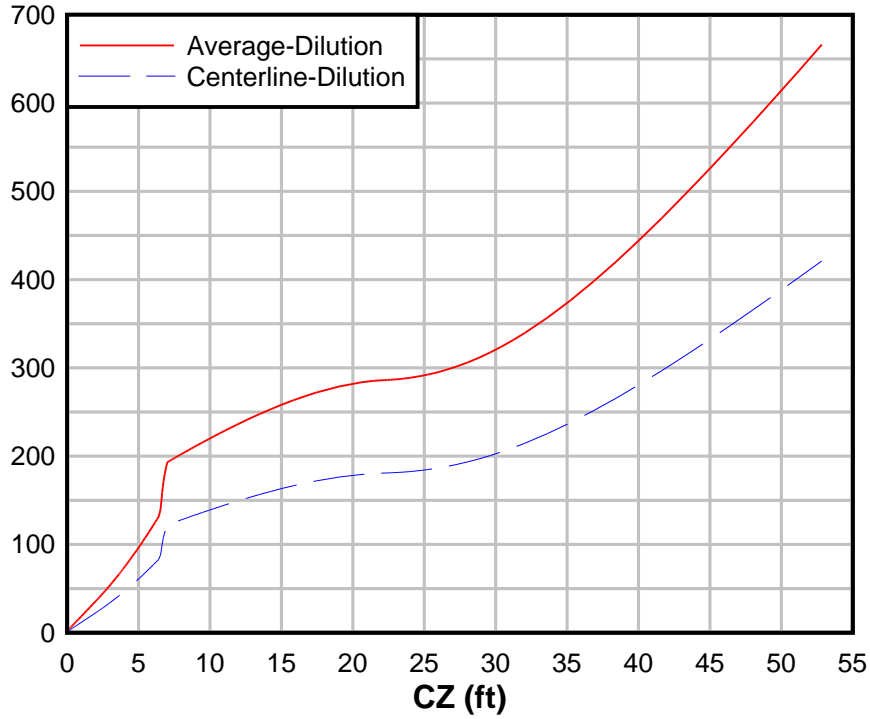### Discharge (Depth= 38.3 m, Rate= 250 bbl/hr)
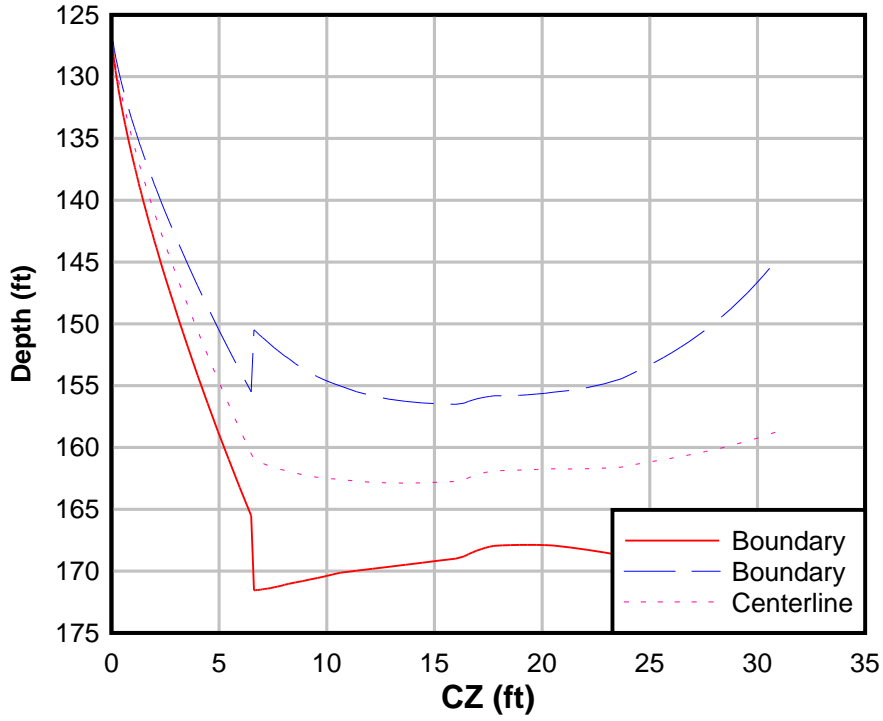
OOCPC Model-Chukchi and Beaufort Seas
CASE-16 Plume Trajectory
Ambient (Water Depth= 5 m, Current Speed= 2 cm/sec)
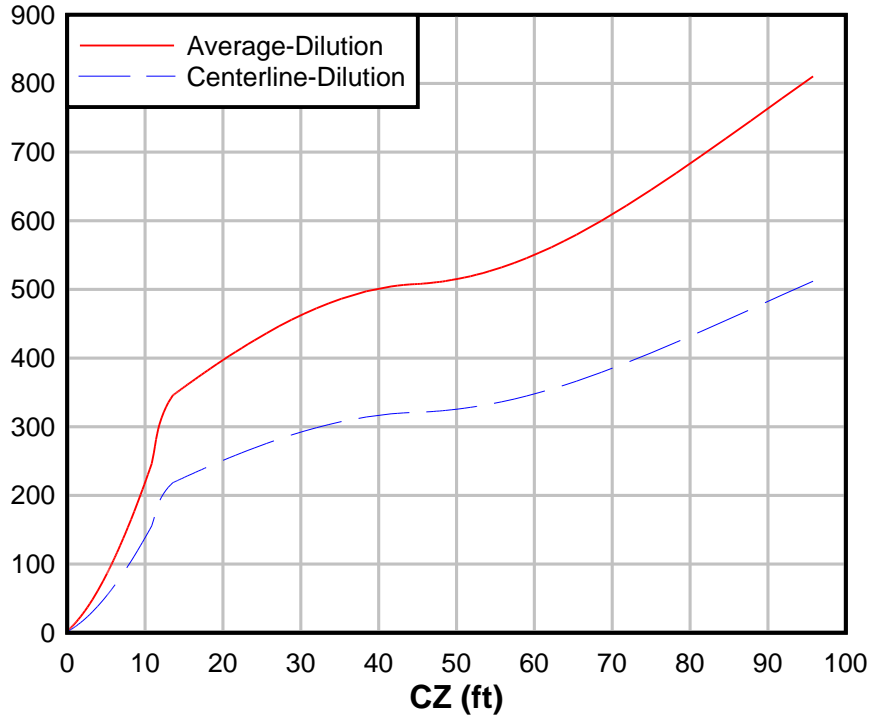**Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)**
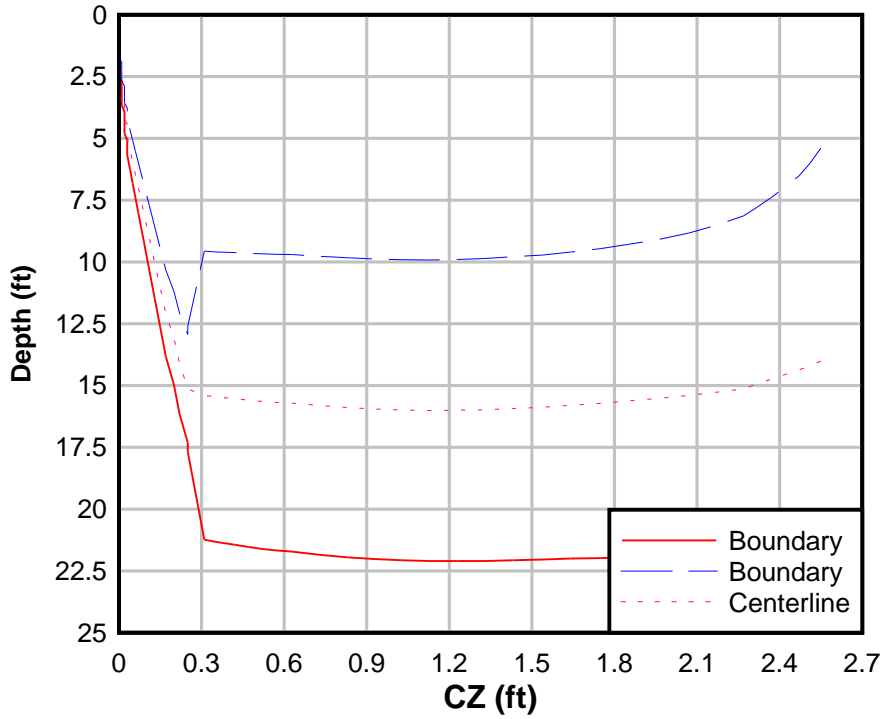
OOCPC Model-Chukchi and Beaufort Seas
CASE-17 Plume Trajectory
Ambient (Water Depth= 5 m, Current Speed= 10 cm/sec)
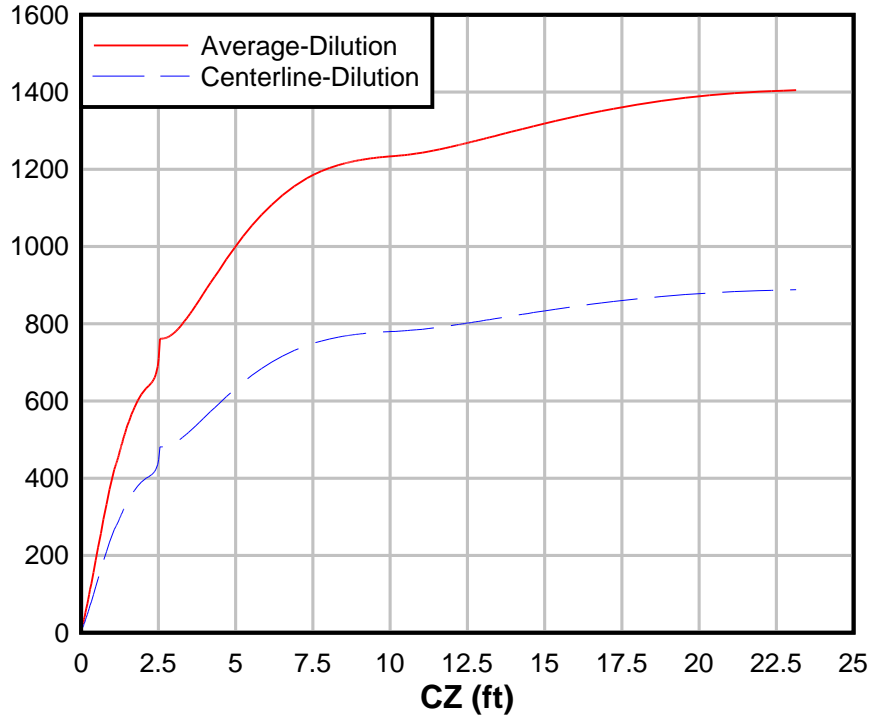**Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)**
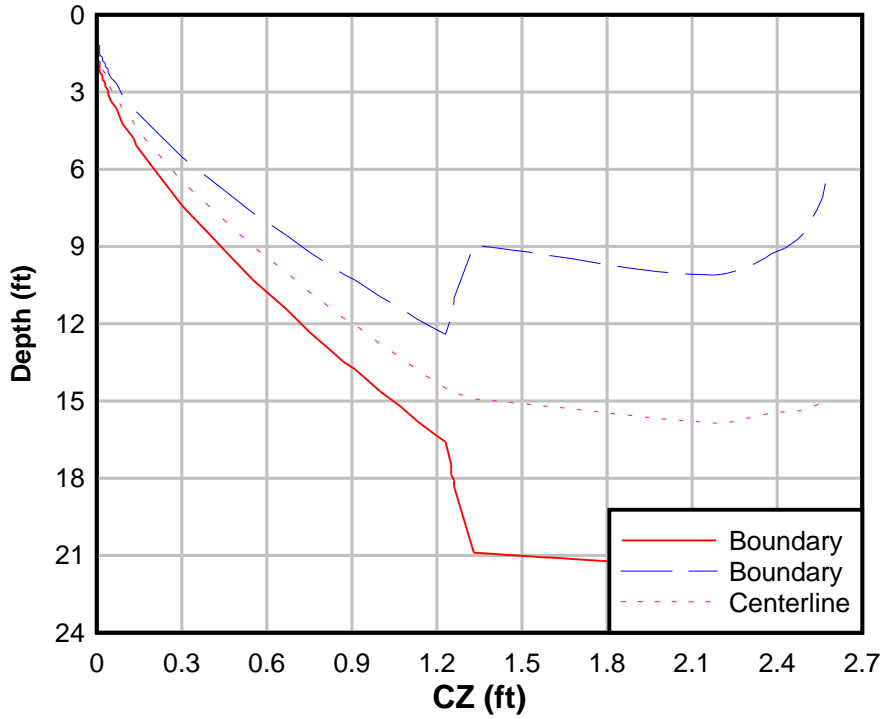
OOCPC Model-Chukchi and Beaufort Seas
CASE-18 Plume Trajectory
Ambient (Water Depth= 5 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

Legend:
- Boundary (red solid line)
- Boundary (blue dashed line)
- Centerline (pink dotted line)

X-axis: CZ (ft), range 0 to 50
Y-axis: Depth (ft), range 0 to 20
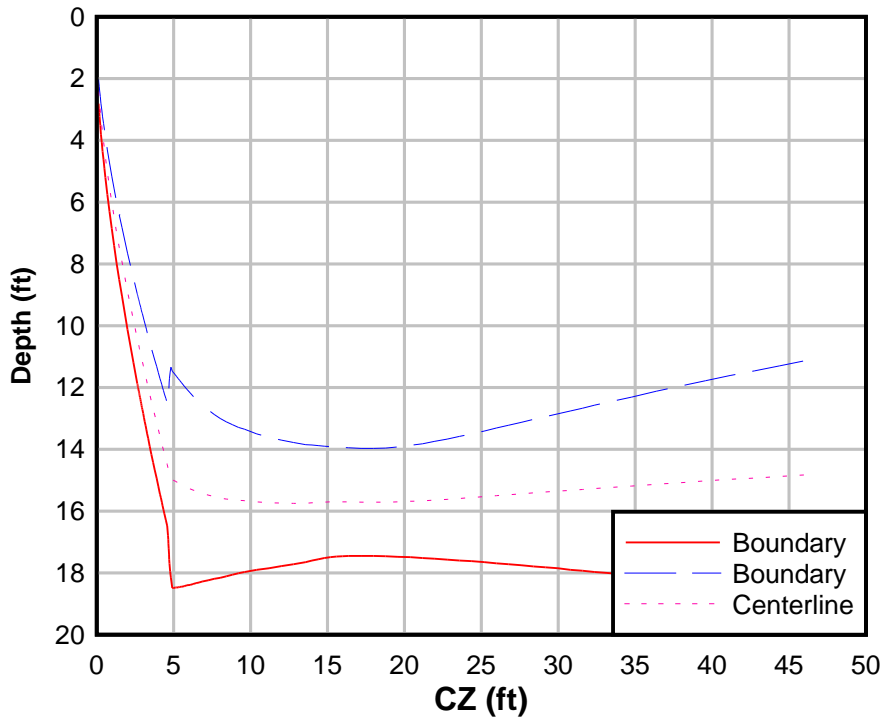
OOCPC Model-Chukchi and Beaufort Seas
CASE-19 Plume Trajectory
Ambient (Water Depth= 5 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
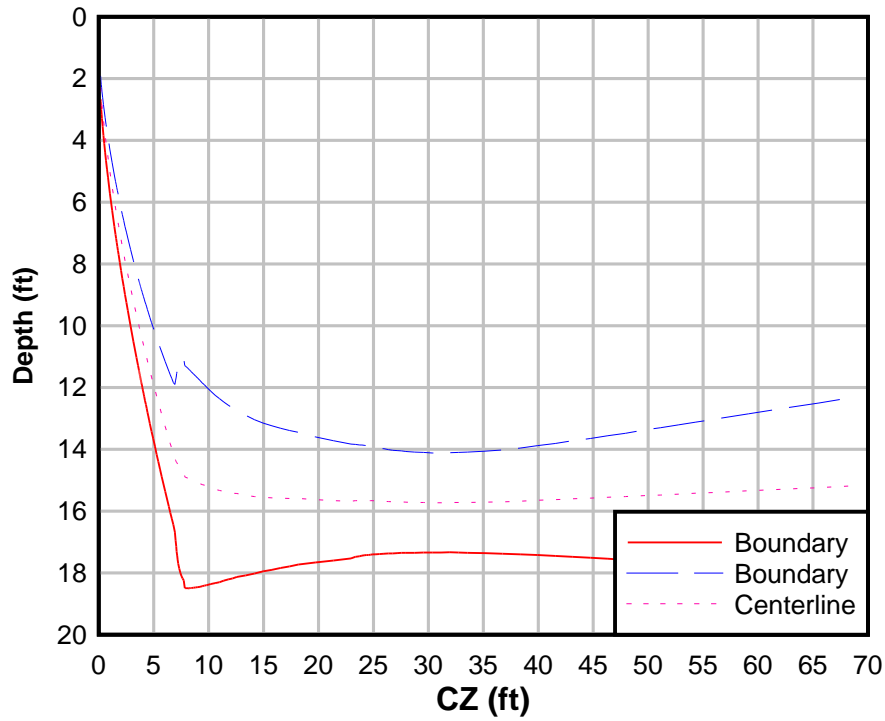
OOCPC Model-Chukchi and Beaufort Seas
CASE-20 Plume Trajectory
Ambient (Water Depth= 20 m, Current Speed= 2 cm/sec)
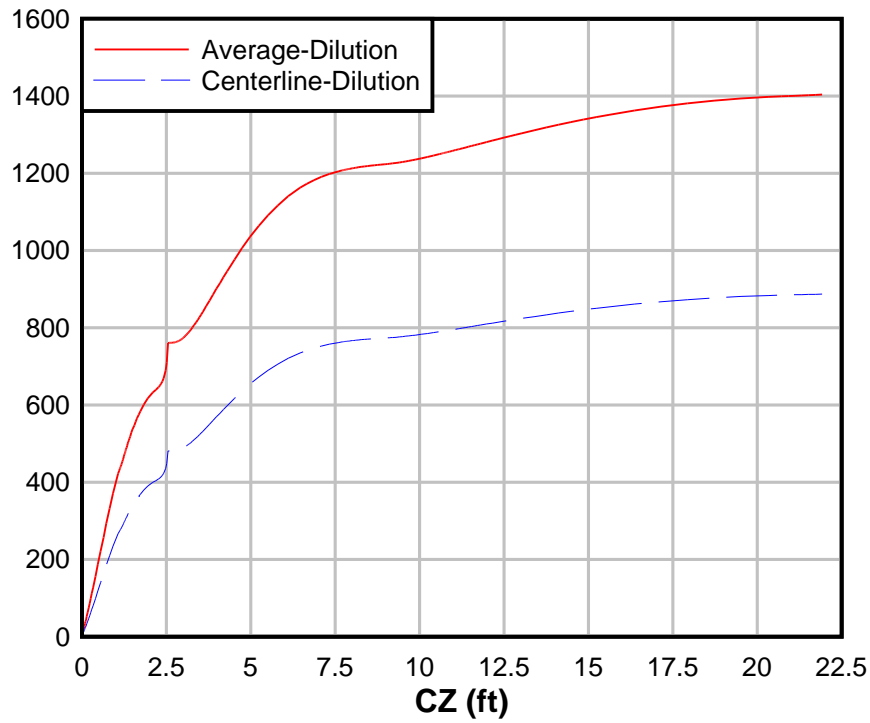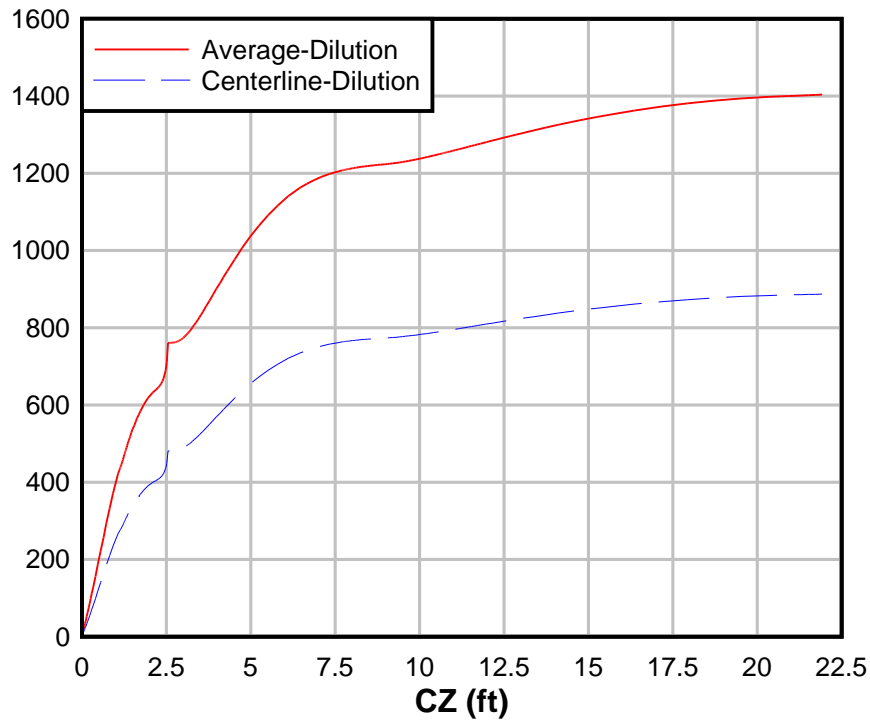**Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)**
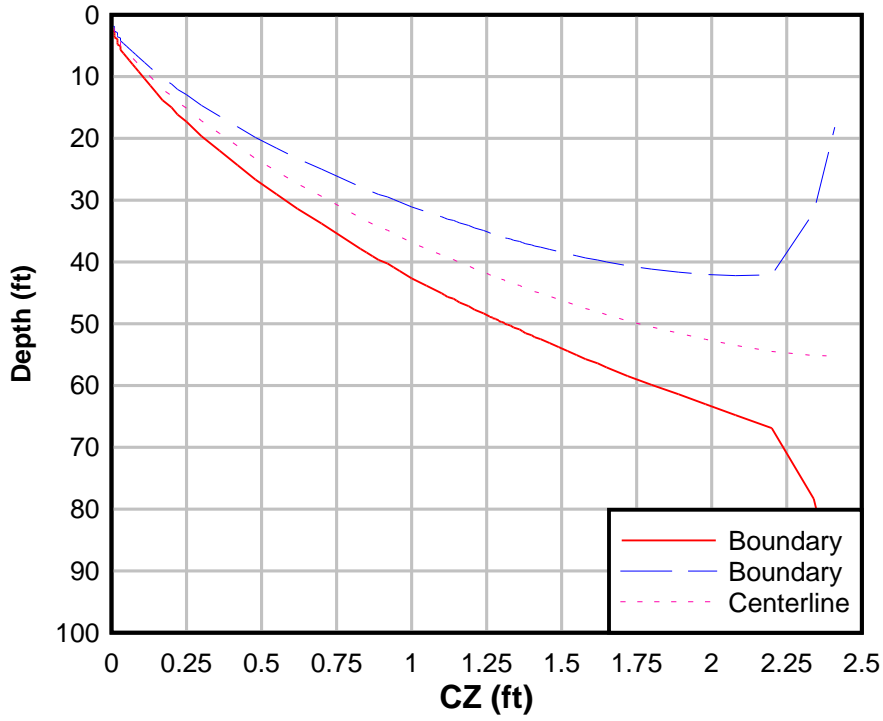
OOCPC Model-Chukchi and Beaufort Seas
CASE-21 Plume Trajectory
Ambient (Water Depth= 20 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
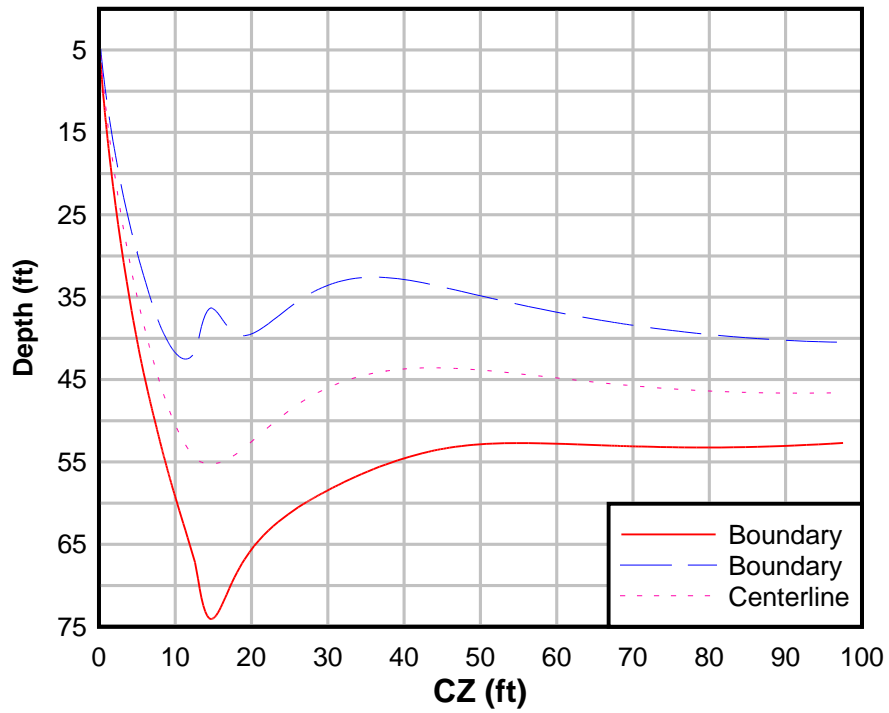
OOCPC Model-Chukchi and Beaufort Seas
CASE-22 Plume Trajectory
Ambient (Water Depth= 20 m, Current Speed= 30 cm/sec)
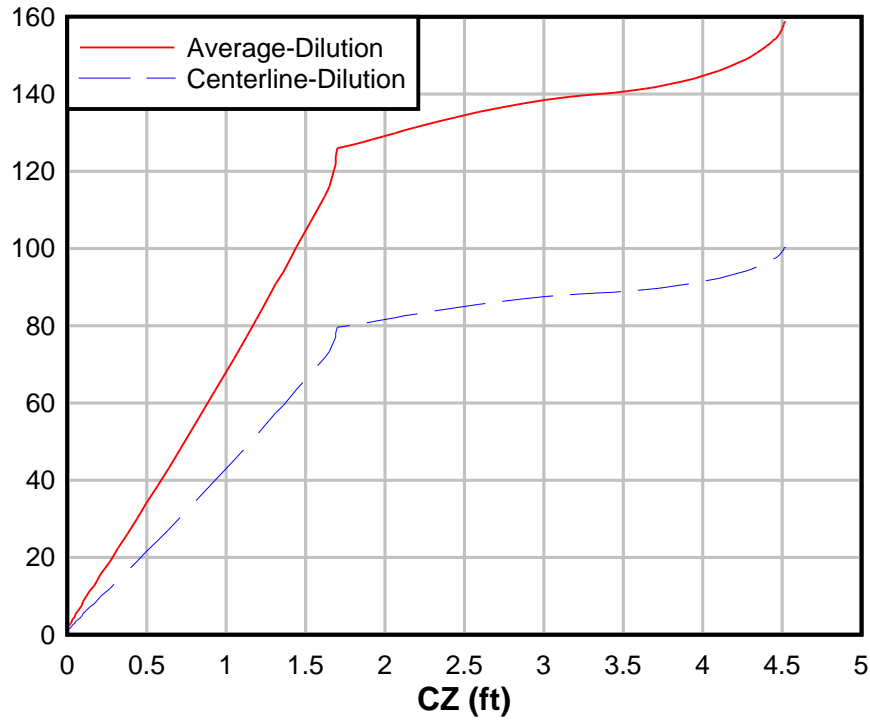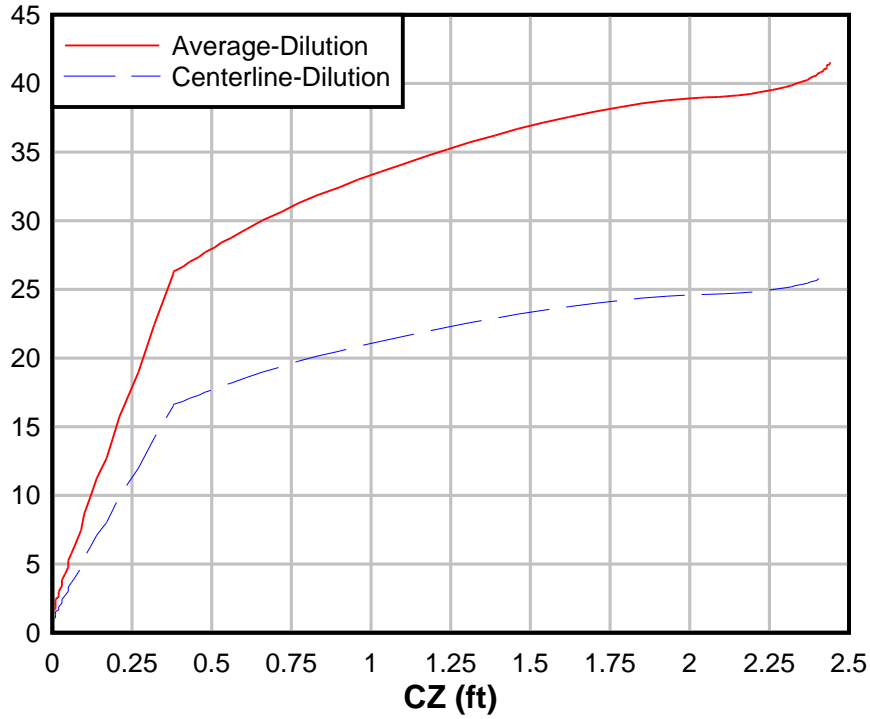### Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
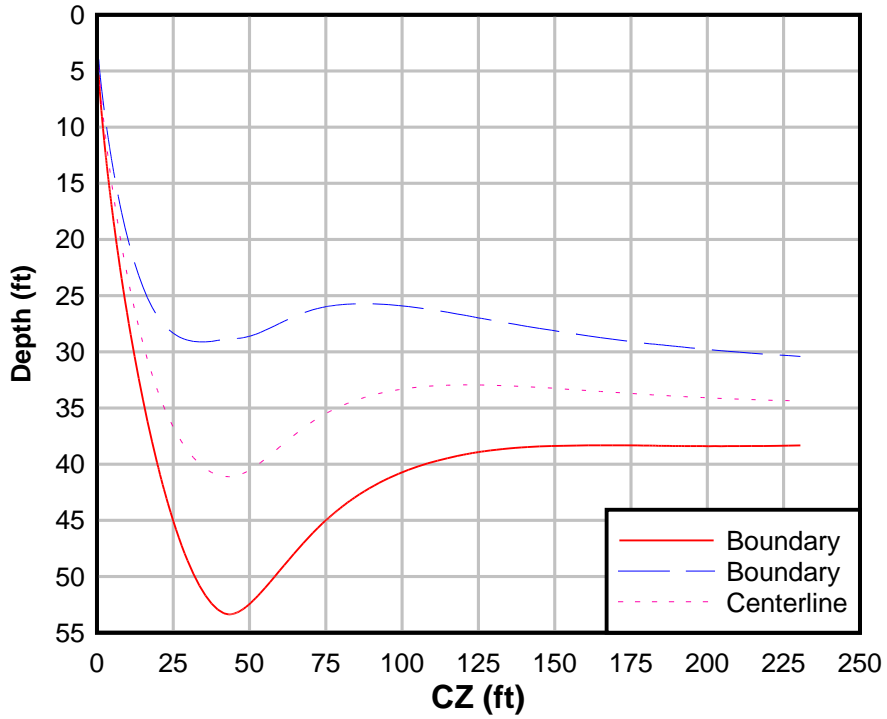
OOCPC Model-Chukchi and Beaufort Seas
CASE-23 Plume Trajectory
Ambient (Water Depth= 20 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
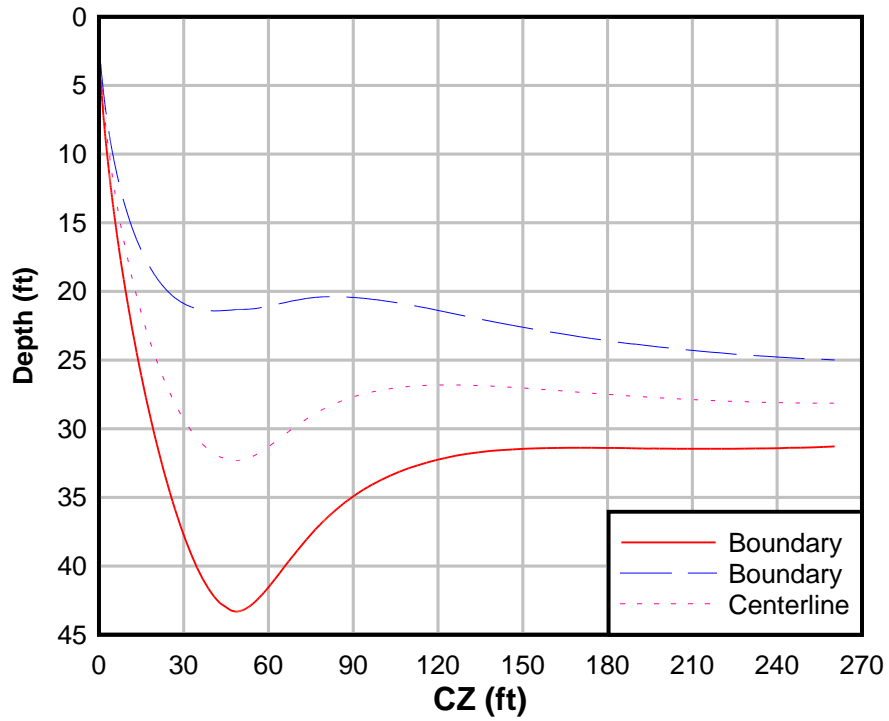
OOCPC Model-Chukchi and Beaufort Seas
CASE-24 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
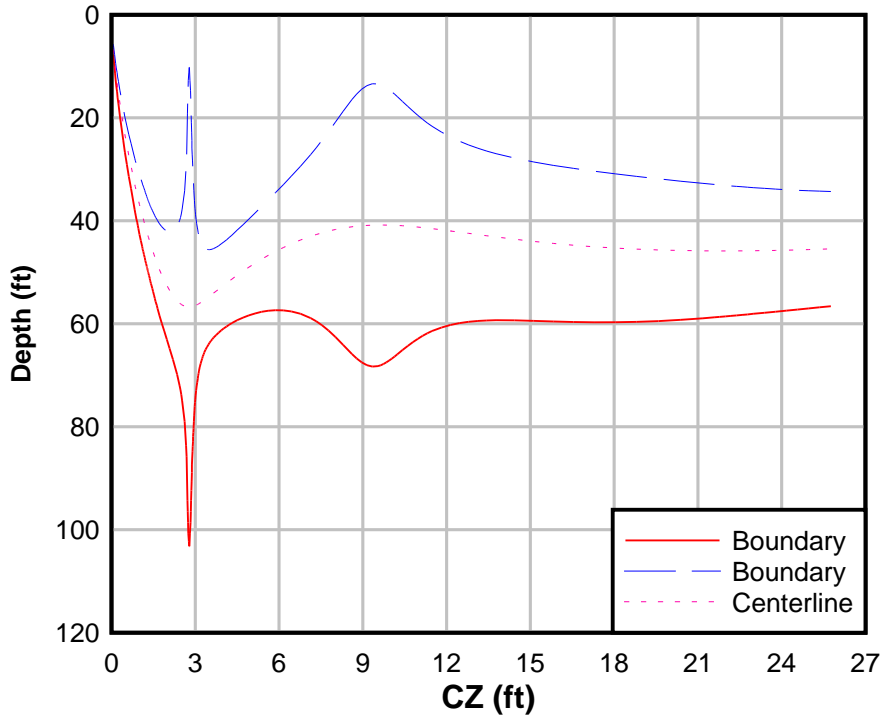
OOCPC Model-Chukchi and Beaufort Seas
CASE-25 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 500 bbl/hr)
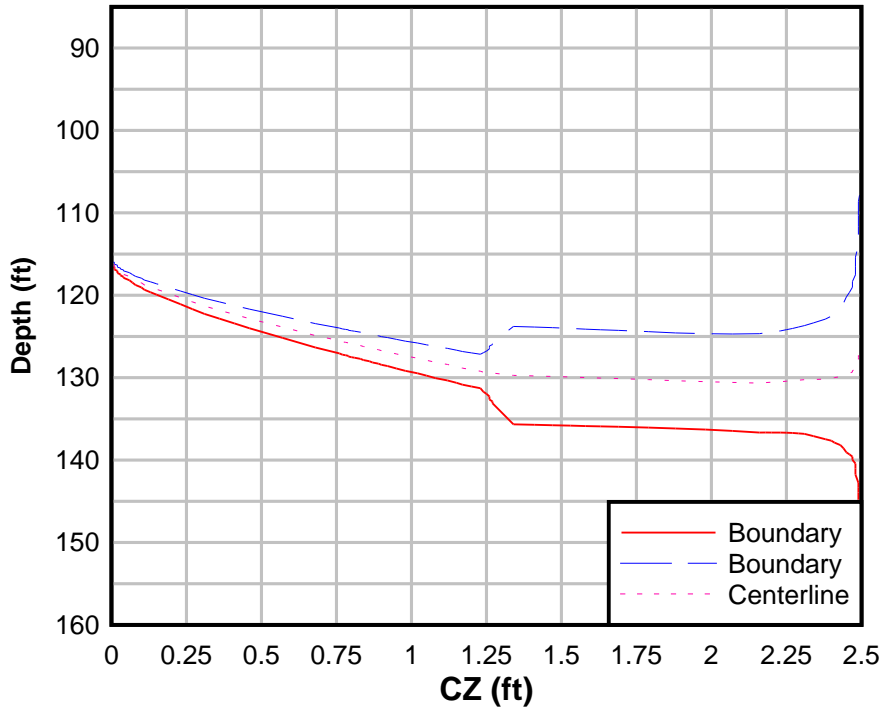
OOCPC Model-Chukchi and Beaufort Seas
CASE-26 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 30 cm/sec)
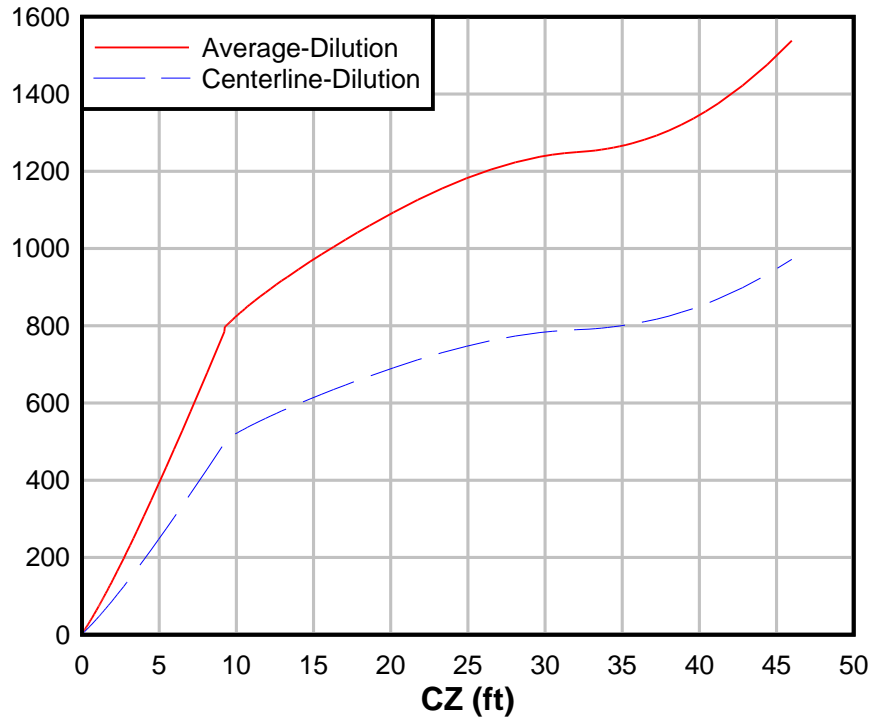**Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)**
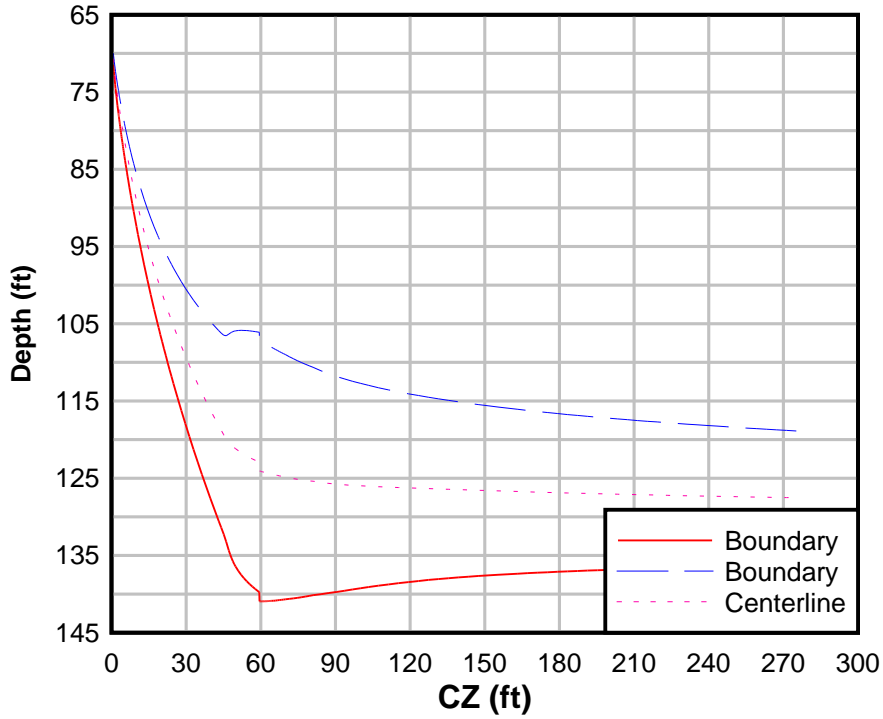
OOCPC Model-Chukchi and Beaufort Seas
CASE-27 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 40 cm/sec)
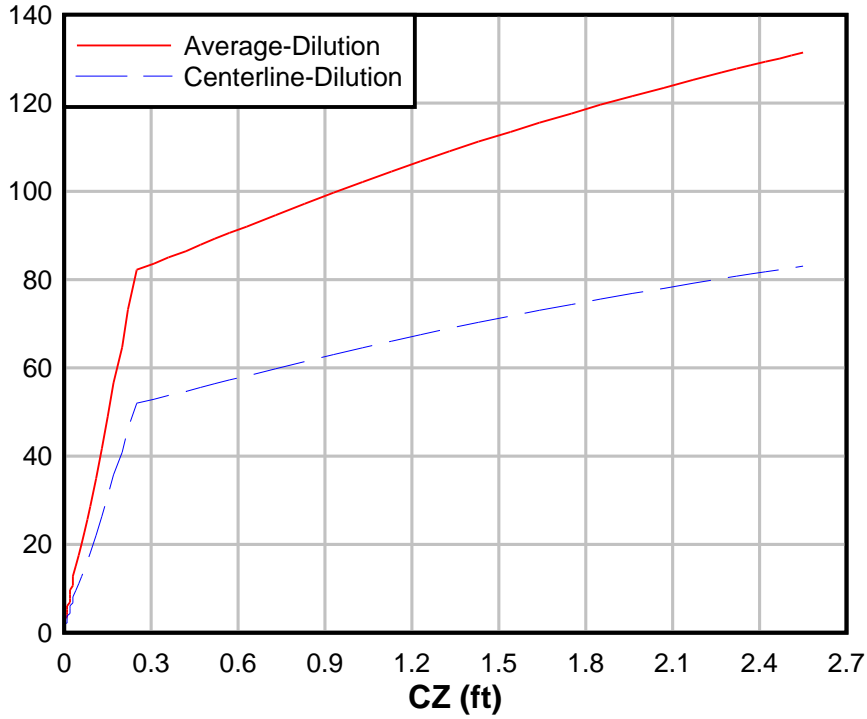**Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)**
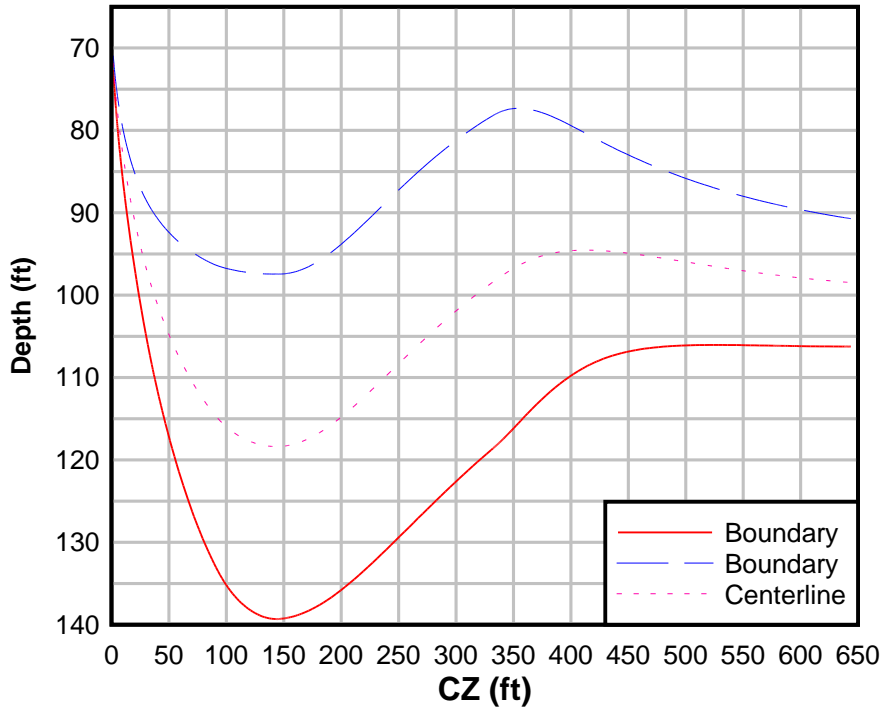
OOCPC Model-Chukchi and Beaufort Seas
CASE-28 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
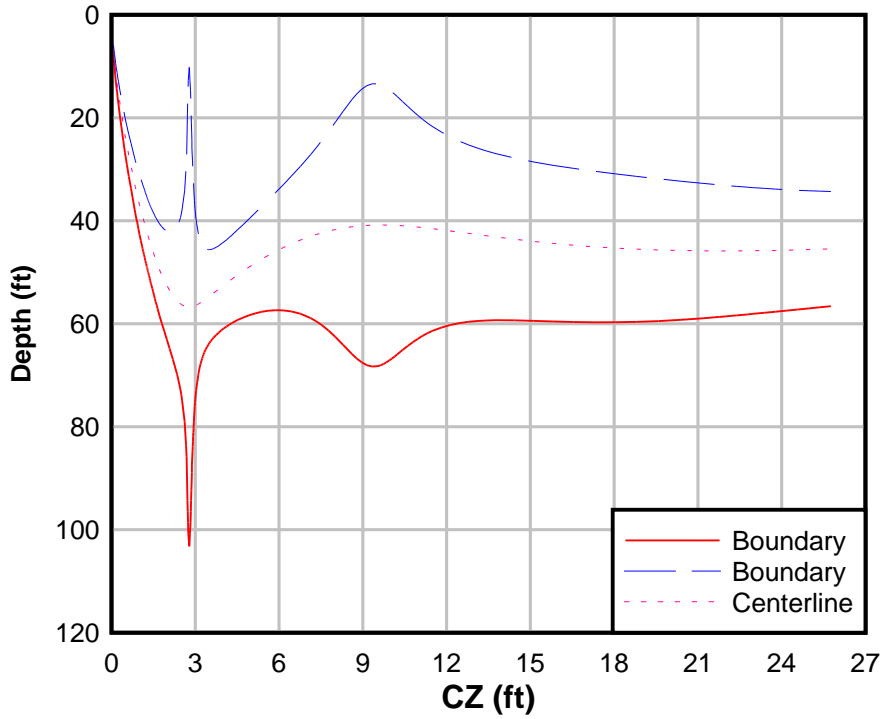
OOCPC Model-Chukchi and Beaufort Seas
CASE-29 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 500 bbl/hr)

Depth (ft)

CZ (ft)

Boundary
Boundary
Centerline
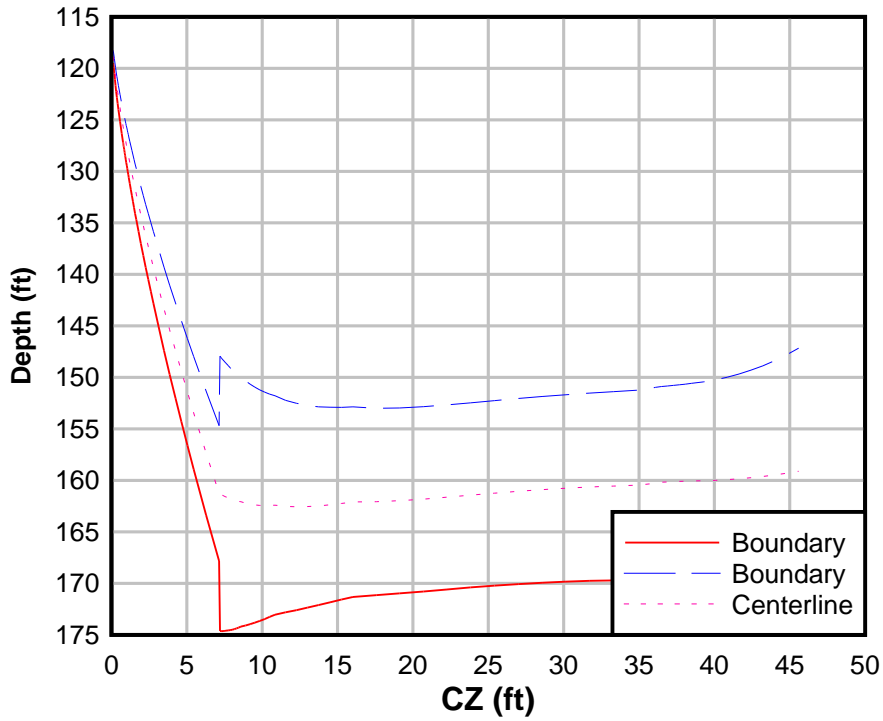
OOCPC Model-Chukchi and Beaufort Seas
CASE-30 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 30 cm/sec)
Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)
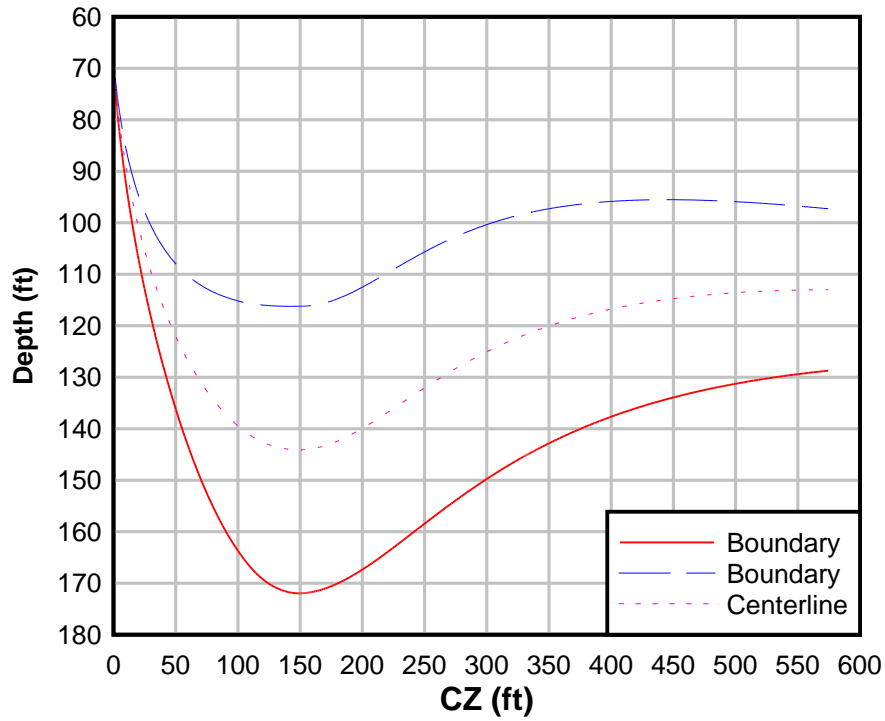
OOCPC Model-Chukchi and Beaufort Seas
CASE-31 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 40 cm/sec)
Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)
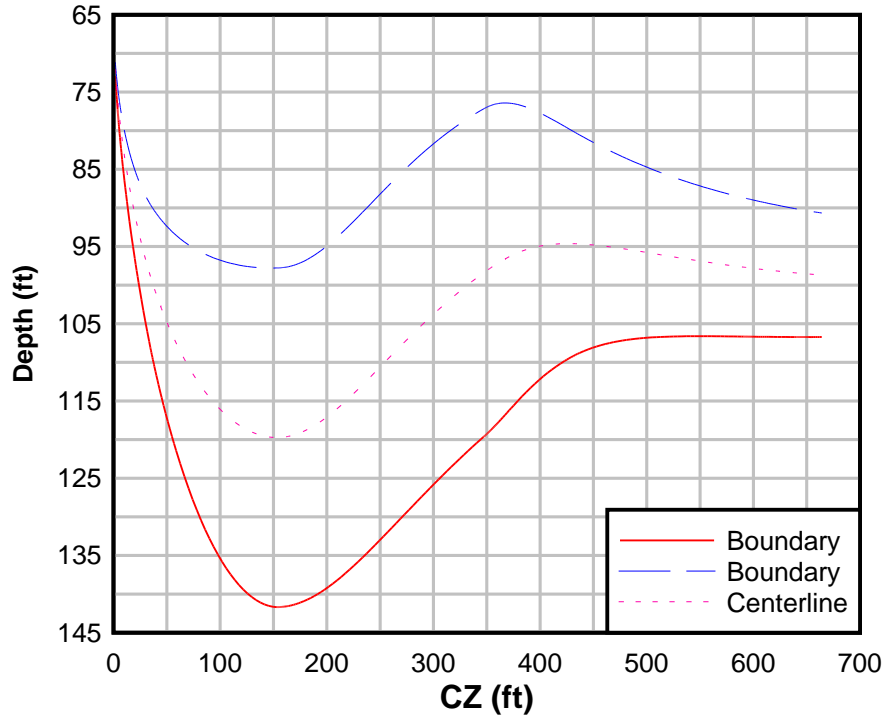
OOCPC Model-Chukchi and Beaufort Seas
CASE-32 Plume Trajectory
Ambient (Water Depth= 20 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Legend:
- Boundary
- Boundary
- Centerline

X-axis: CZ (ft)
Y-axis: Depth (ft)
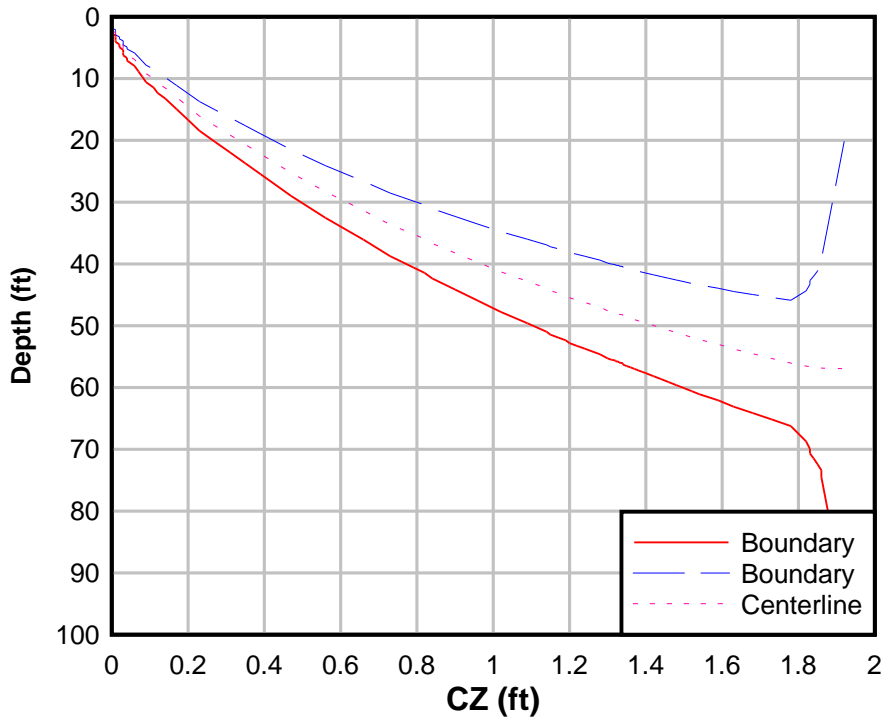
OOCPC Model-Chukchi and Beaufort Seas
CASE-33 Plume Trajectory
Ambient (Water Depth= 20 m, Current Speed= 10 cm/sec)
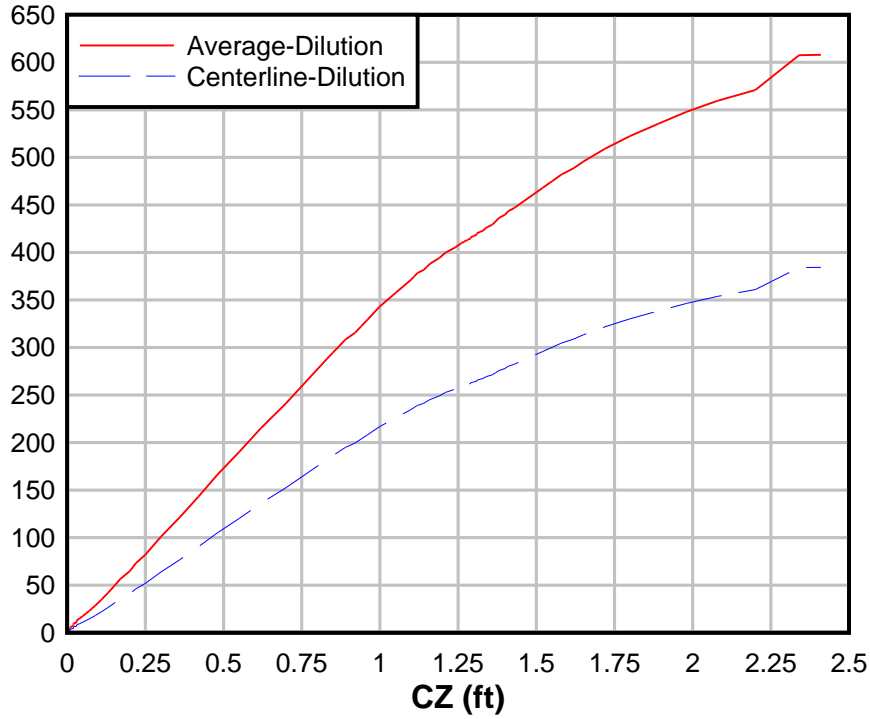**Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)**
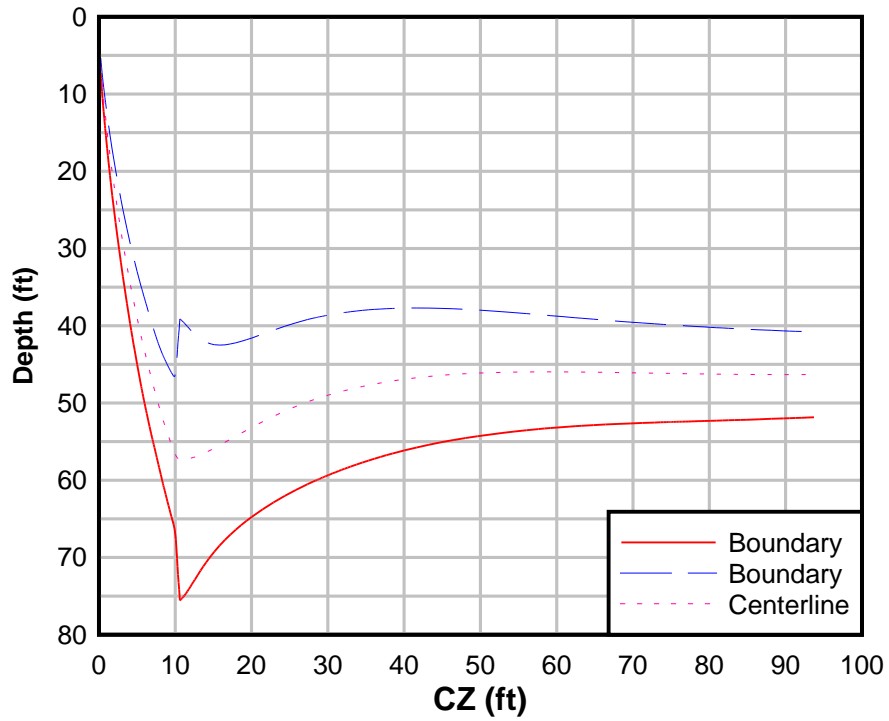
OOCPC Model-Chukchi and Beaufort Seas
CASE-34 Plume Trajectory
Ambient (Water Depth= 20 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-35 Plume Trajectory
Ambient (Water Depth= 20 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-36 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-37 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Legend:
- Boundary
- Boundary
- Centerline

X-axis: CZ (ft)
Y-axis: Depth (ft)

OOCPC Model-Chukchi and Beaufort Seas
CASE-38 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-39 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-40 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 20.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-41 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-42 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
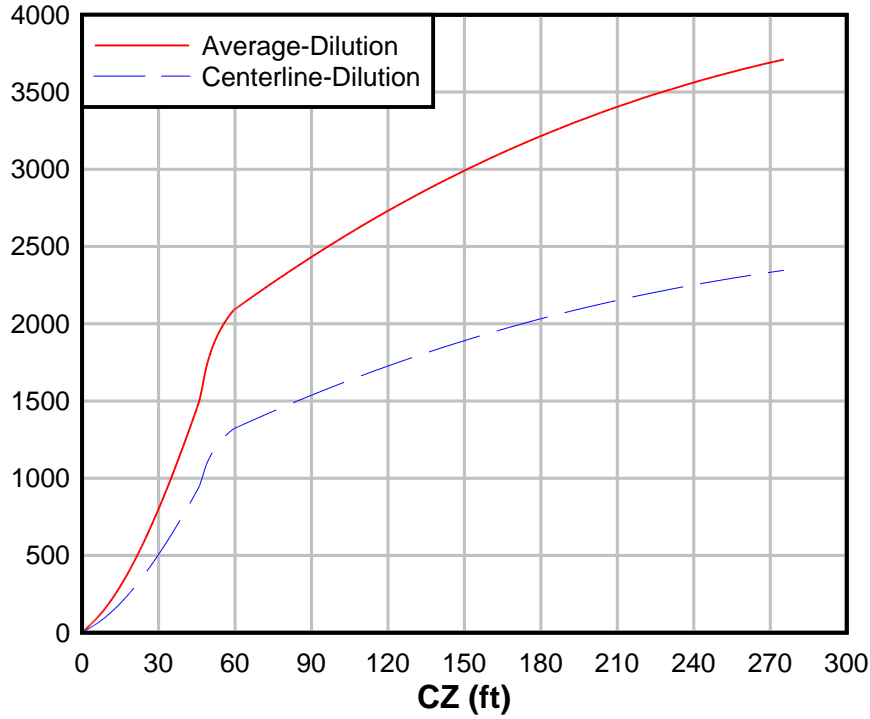### Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-43 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)
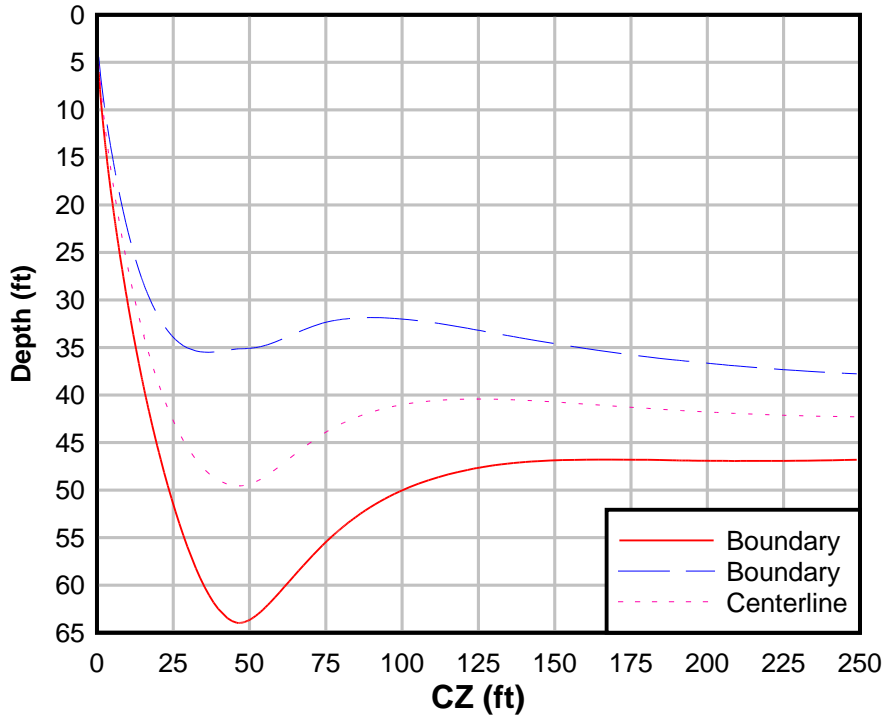
OOCPC Model-Chukchi and Beaufort Seas
CASE-44 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 40 cm/sec)
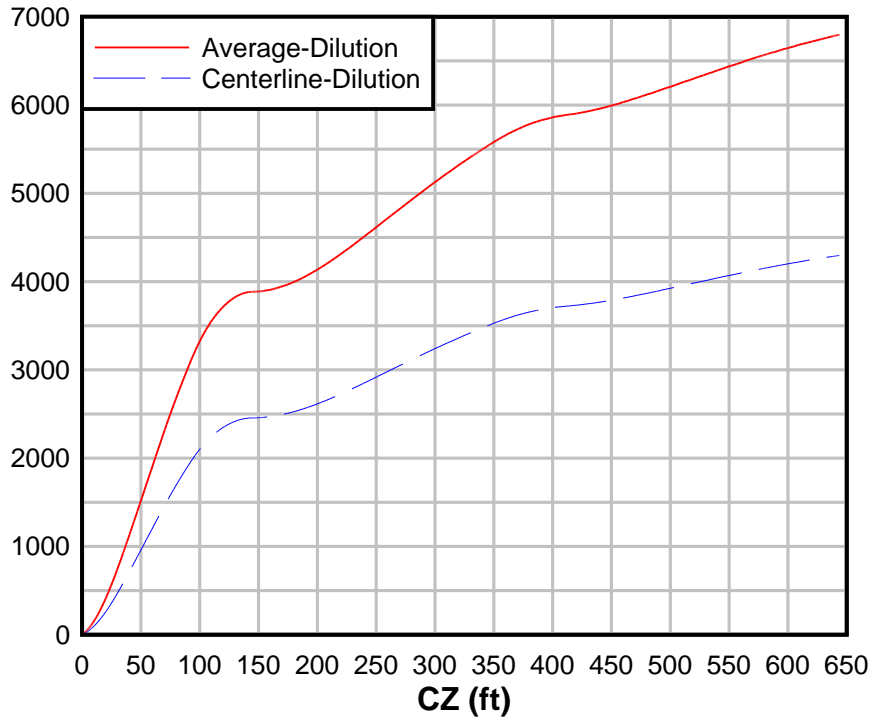**Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)**
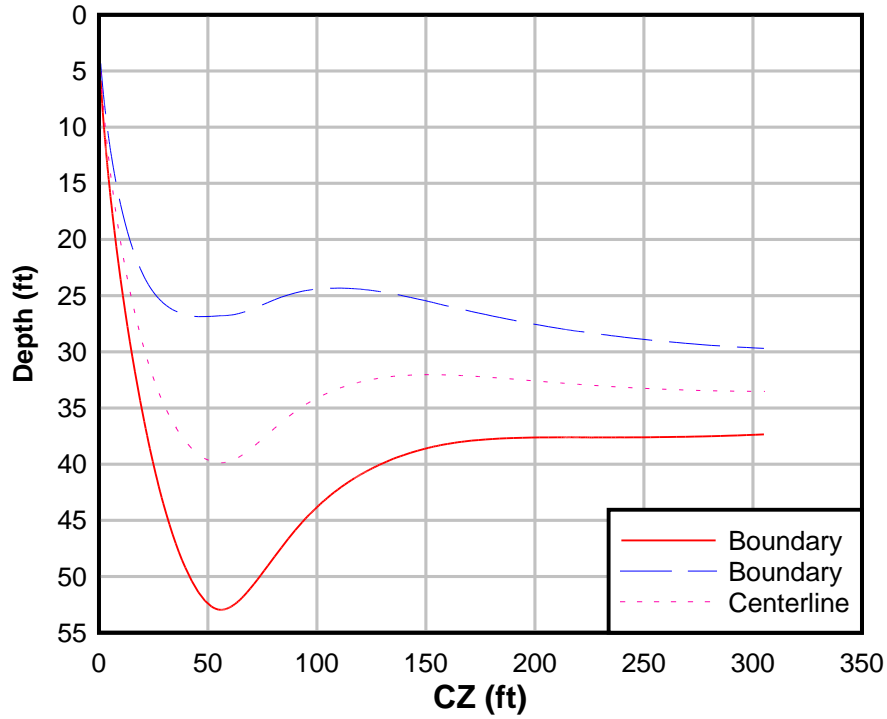
OOCPC Model-Chukchi and Beaufort Seas
CASE-45 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 20.3 m, Rate= 750 bbl/hr)
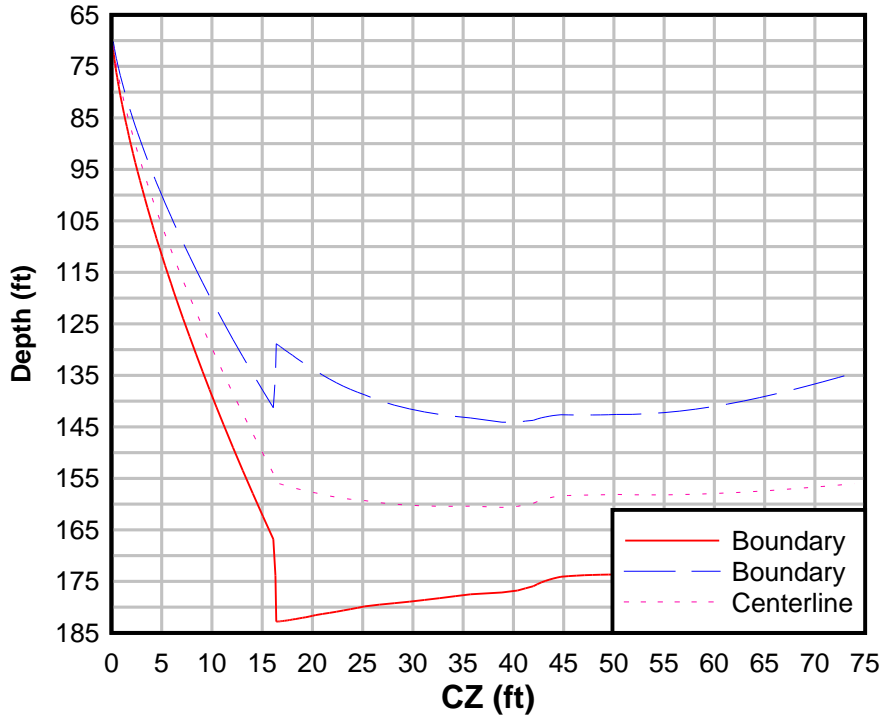
OOCPC Model-Chukchi and Beaufort Seas
CASE-46 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

Legend:
- Boundary (red solid)
- Boundary (blue dashed)
- Centerline (pink dotted)

X-axis: CZ (ft), values 0, 0.3, 0.6, 0.9, 1.2, 1.5, 1.8, 2.1, 2.4, 2.7, 3

Y-axis: Depth (ft), values 0, 20, 40, 60, 80, 100, 120, 140
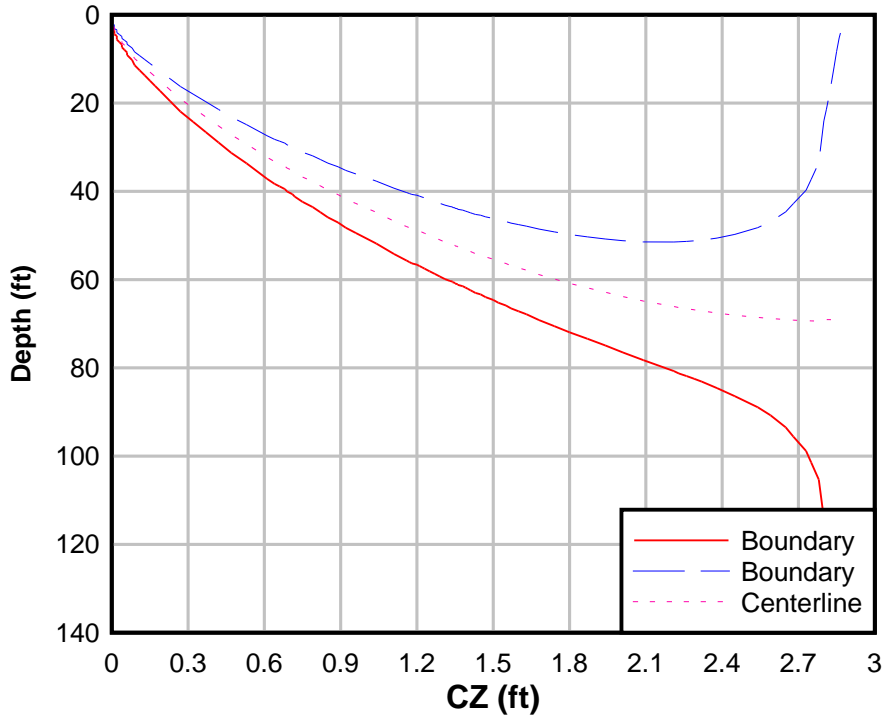
OOCPC Model-Chukchi and Beaufort Seas
CASE-47 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
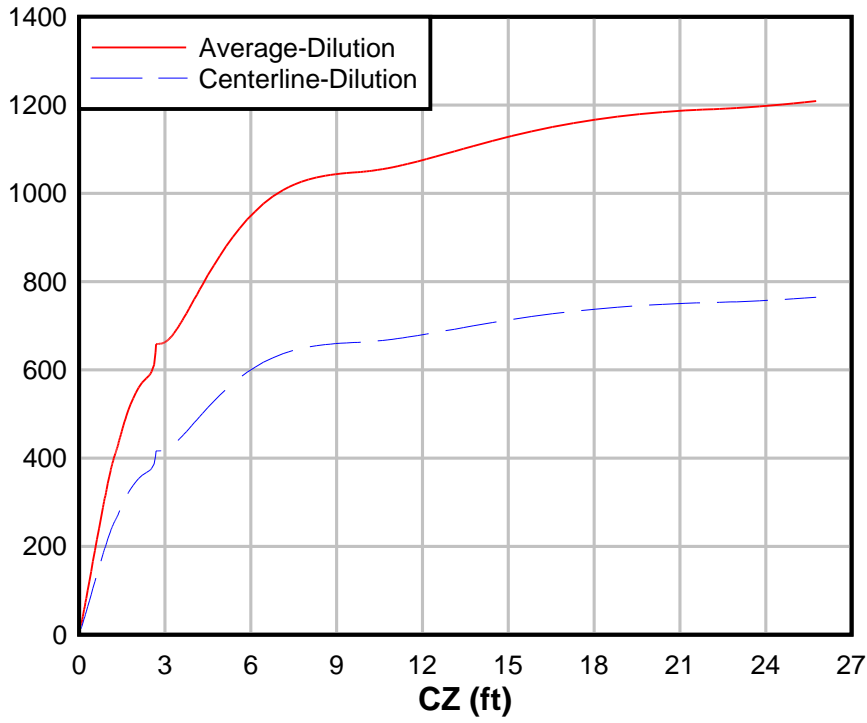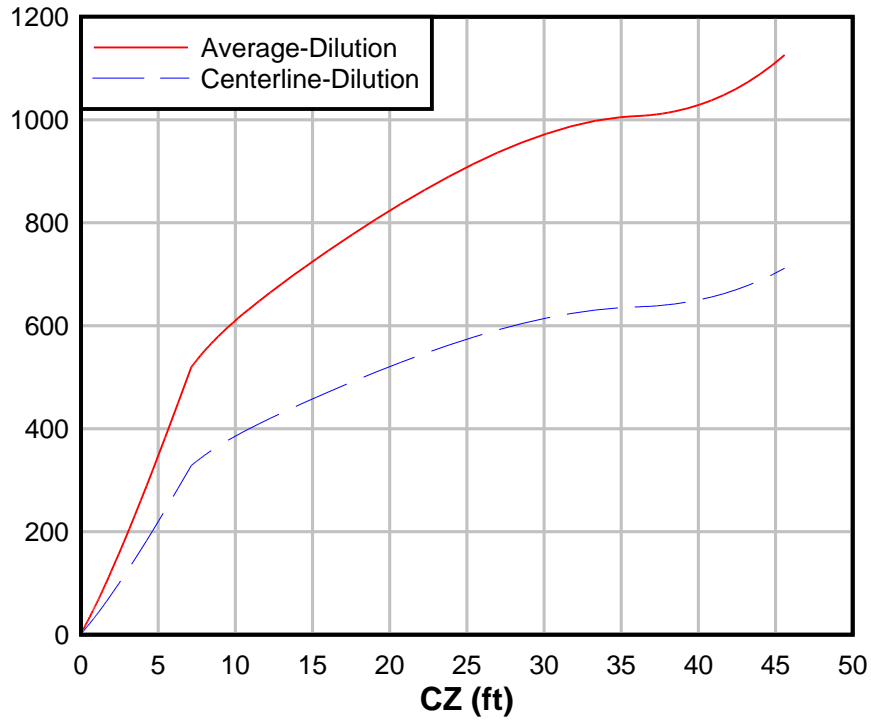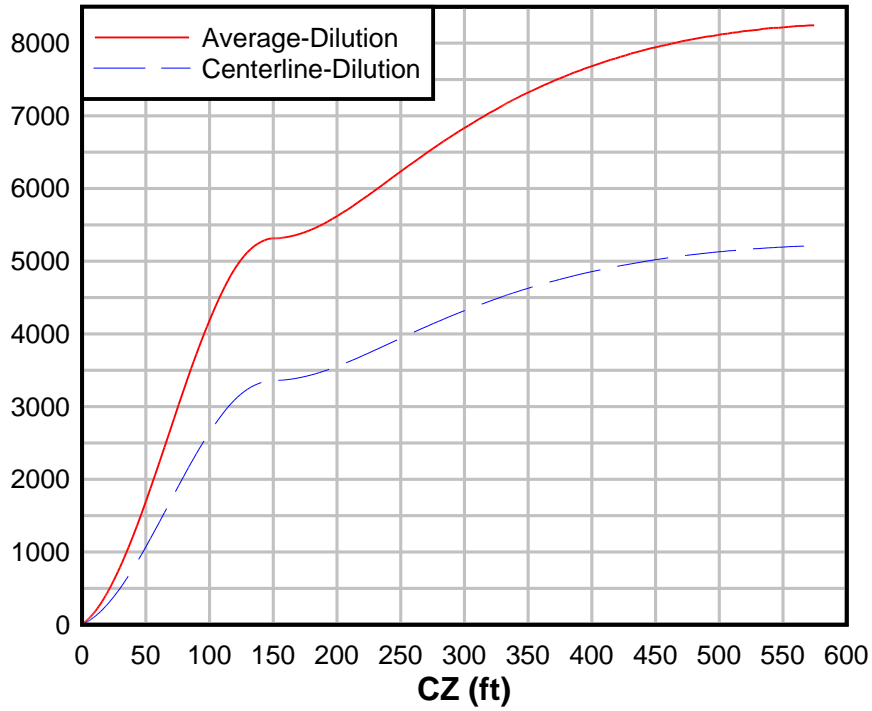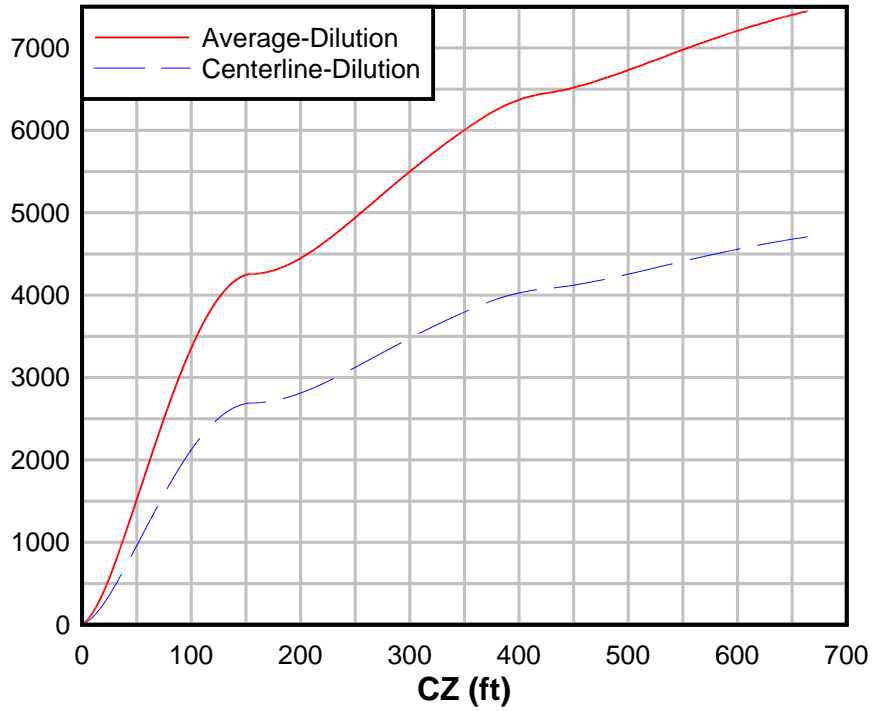**Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)**
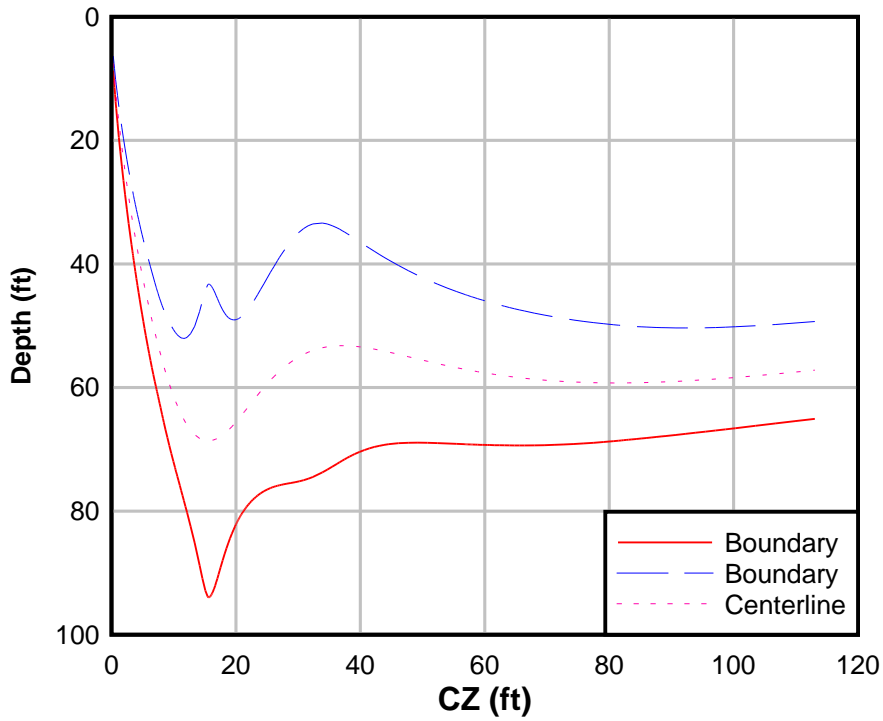
**OOCPC Model-Chukchi and Beaufort Seas
CASE-48 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)**
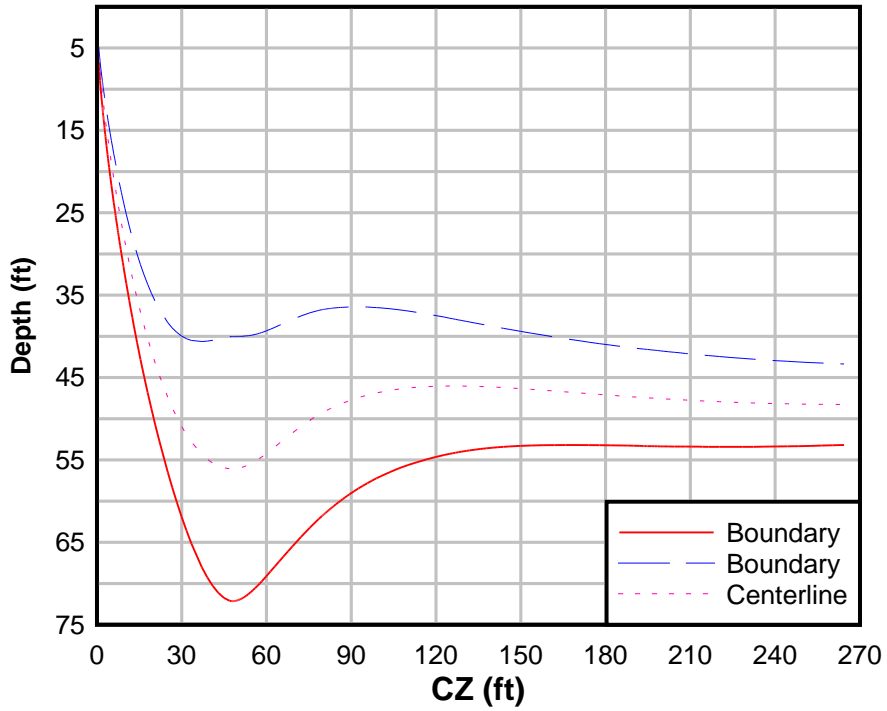
OOCPC Model-Chukchi and Beaufort Seas
CASE-49 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)
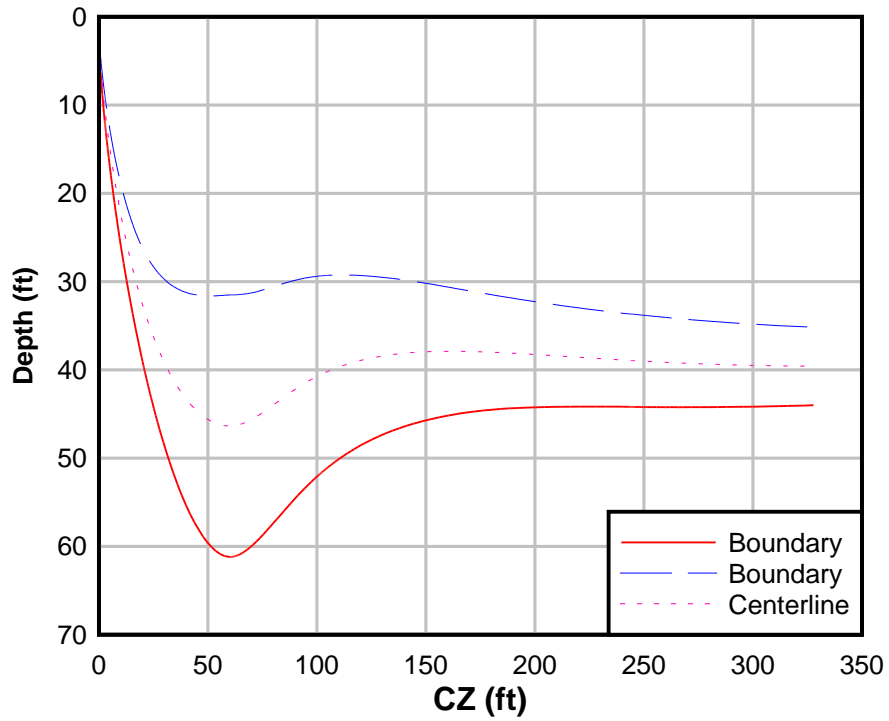
OOCPC Model-Chukchi and Beaufort Seas
CASE-50 Plume Trajectory
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 20.3 m, Rate= 1000 bbl/hr)
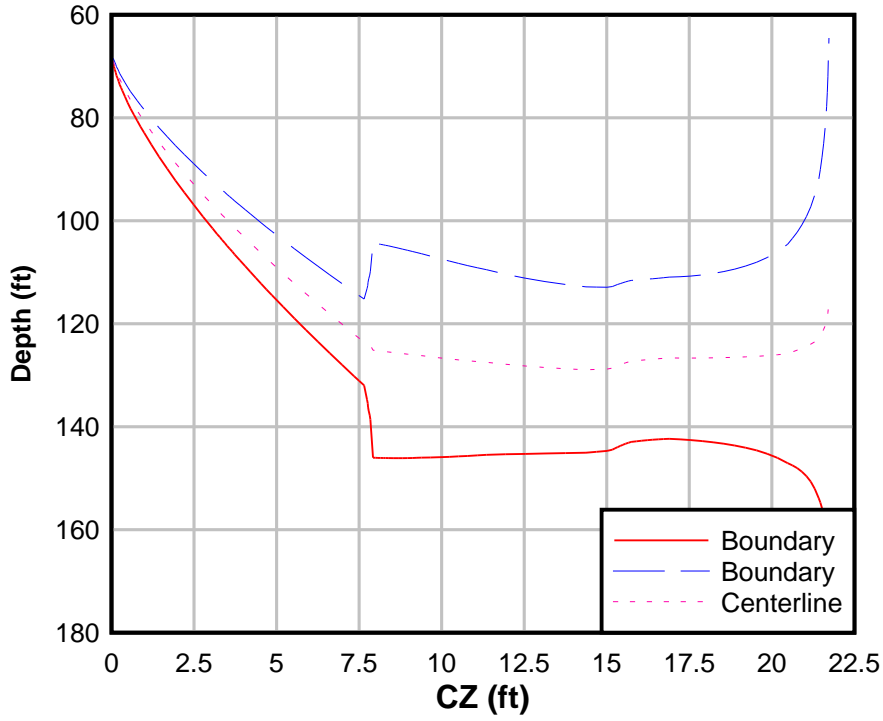
OOCPC Model-Chukchi and Beaufort Seas
CASE-51 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)
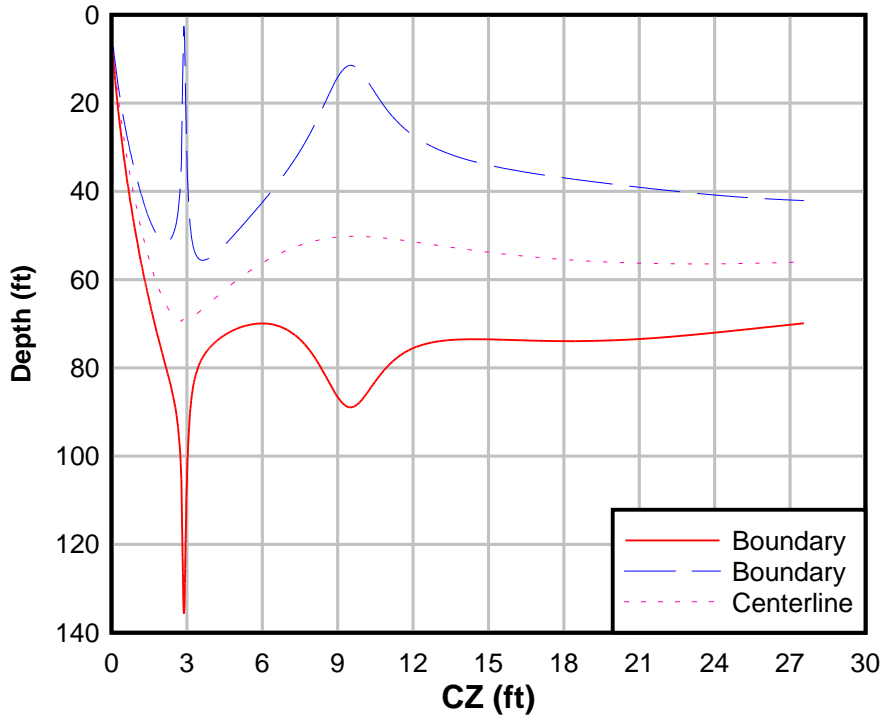
OOCPC Model-Chukchi and Beaufort Seas
CASE-52 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-53 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-54 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-55 Plume Trajectory
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 20.3 m, Rate= 1000 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-1 Dilution Factor
Ambient (Water Depth= 2 m, Current Speed= 2 cm/sec)
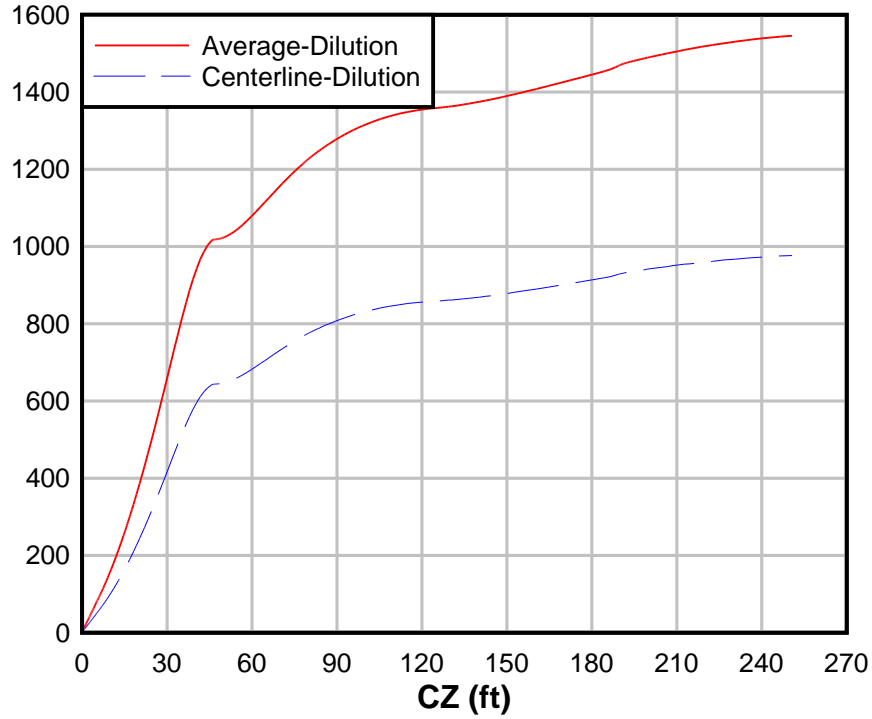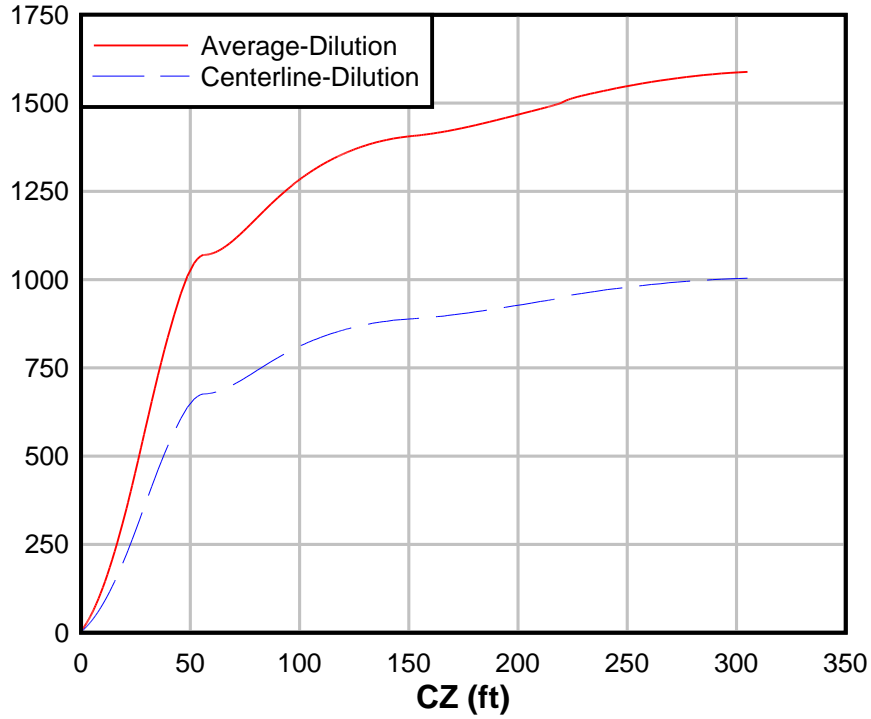**Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)**

OOCPC Model-Chukchi and Beaufort Seas
CASE-2 Dilution Factor
Ambient (Water Depth= 2 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Legend:
— Average-Dilution
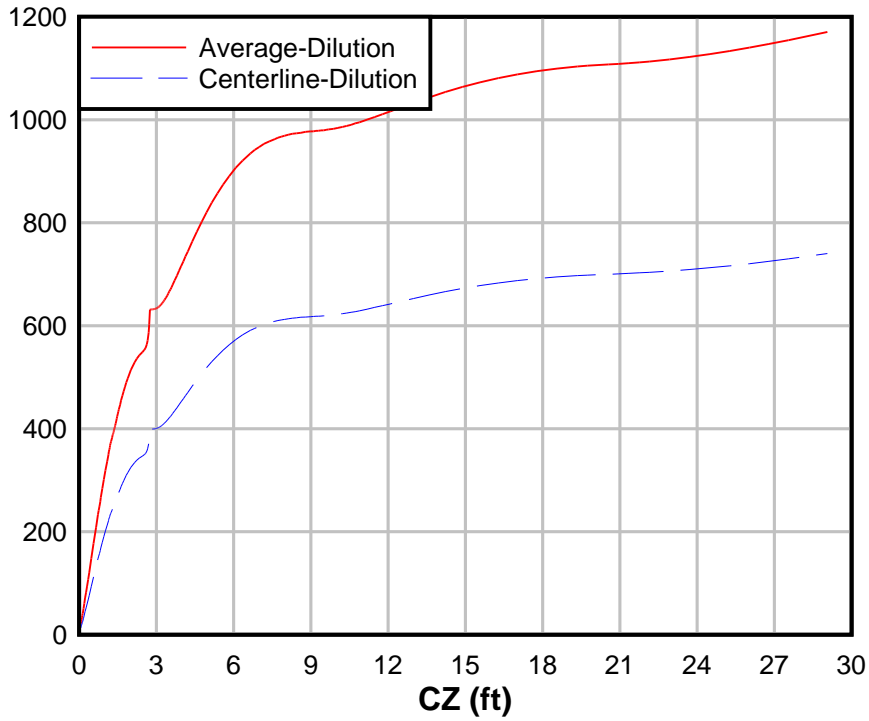– – Centerline-Dilution

X-axis: CZ (ft)

OOCPC Model-Chukchi and Beaufort Seas
CASE-3 Dilution Factor
Ambient (Water Depth= 2 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)
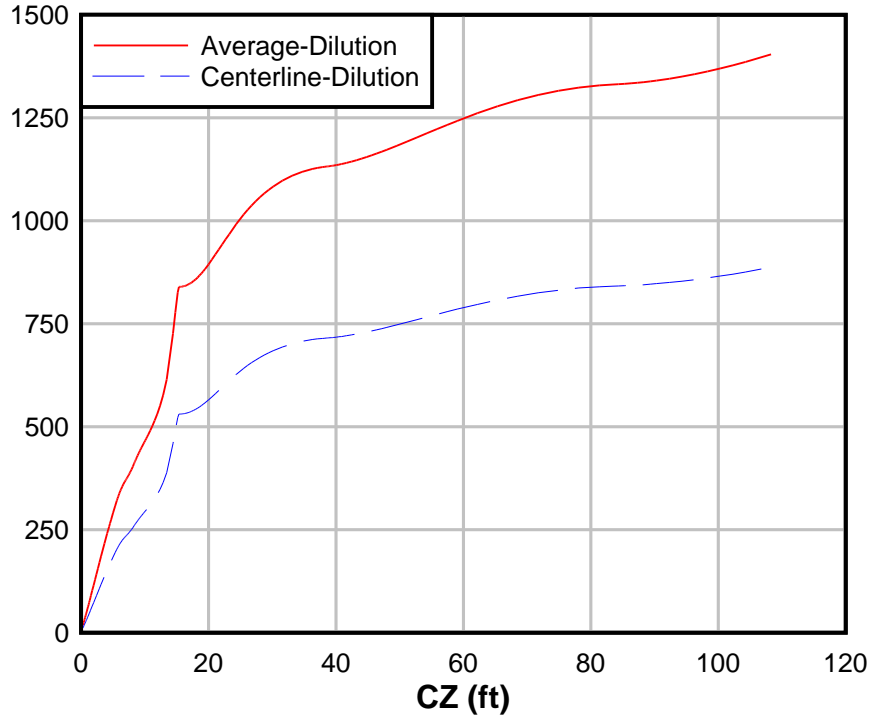
OOCPC Model-Chukchi and Beaufort Seas
CASE-4 Dilution Factor
Ambient (Water Depth= 2 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-5 Dilution Factor
Ambient (Water Depth= 5 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)
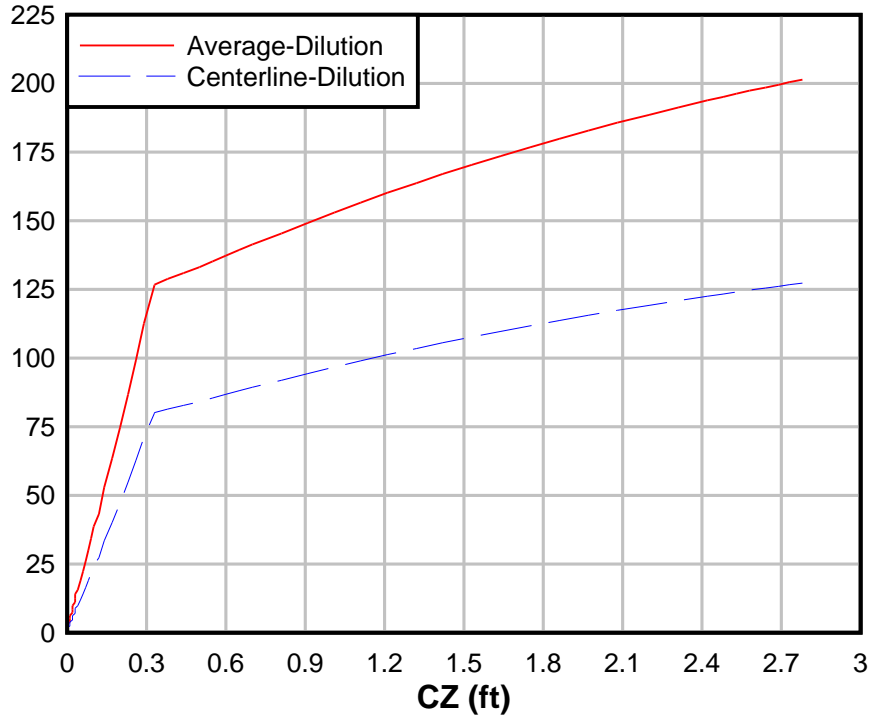
OOCPC Model-Chukchi and Beaufort Seas
CASE-6 Dilution Factor
Ambient (Water Depth= 5 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)
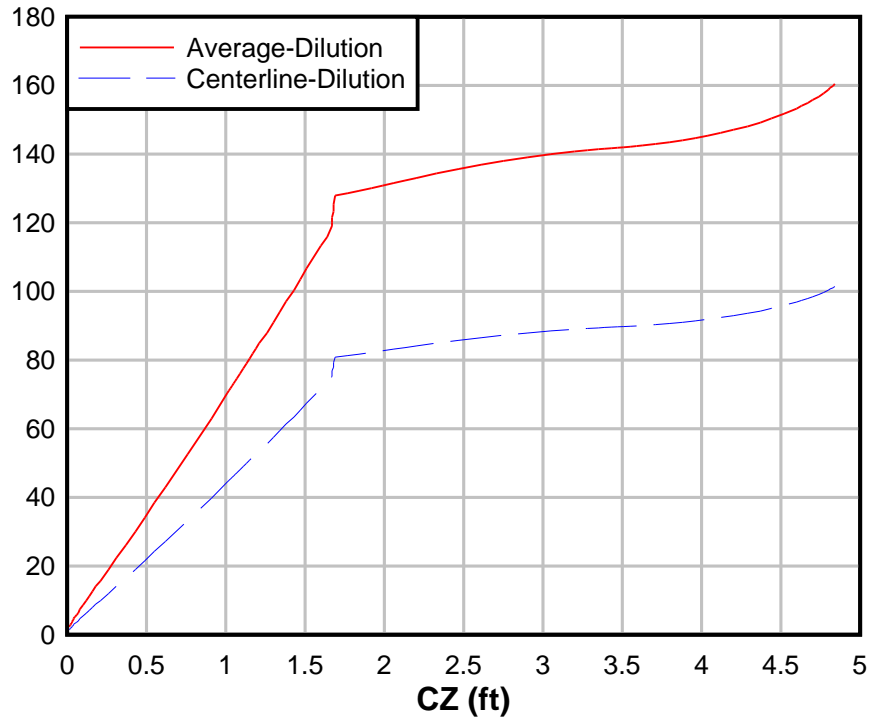
OOCPC Model-Chukchi and Beaufort Seas
CASE-7 Dilution Factor
Ambient (Water Depth= 5 m, Current Speed= 30 cm/sec)
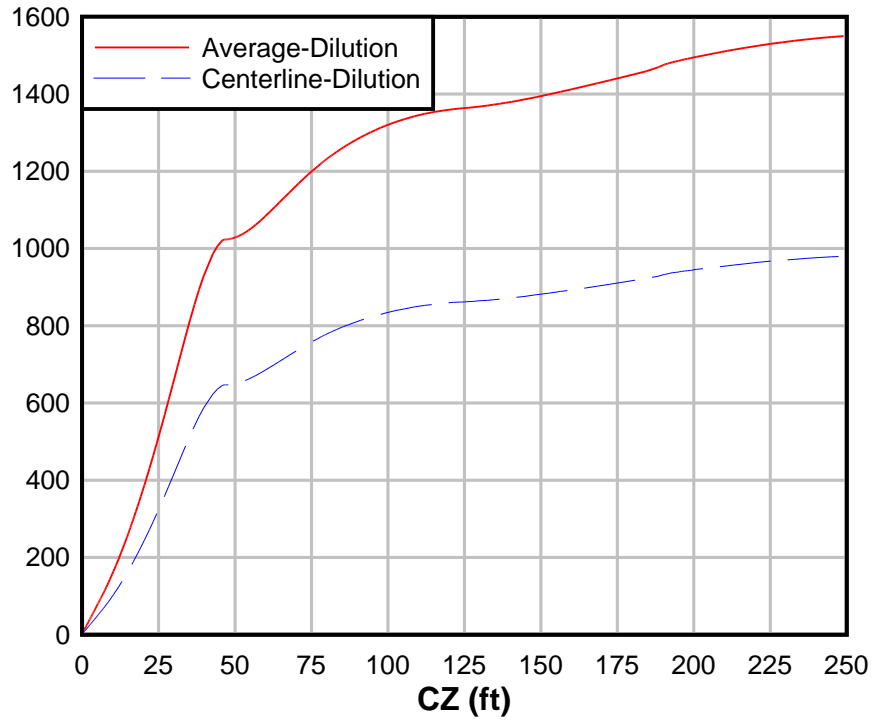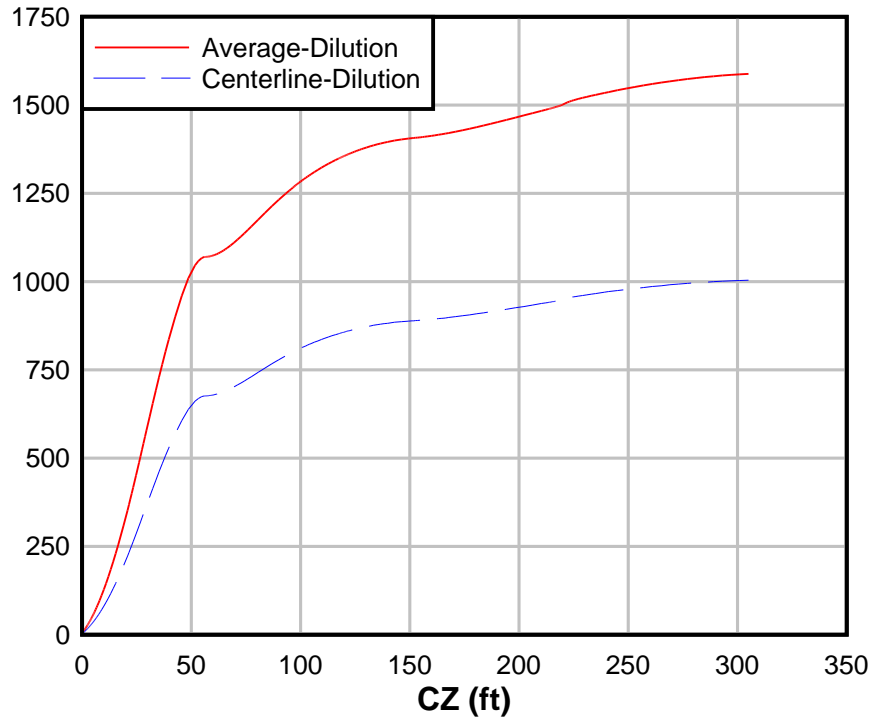## Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-8 Dilution Factor
Ambient (Water Depth= 5 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-9 Dilution Factor
Ambient (Water Depth= 20 m, Current Speed= 2 cm/sec)
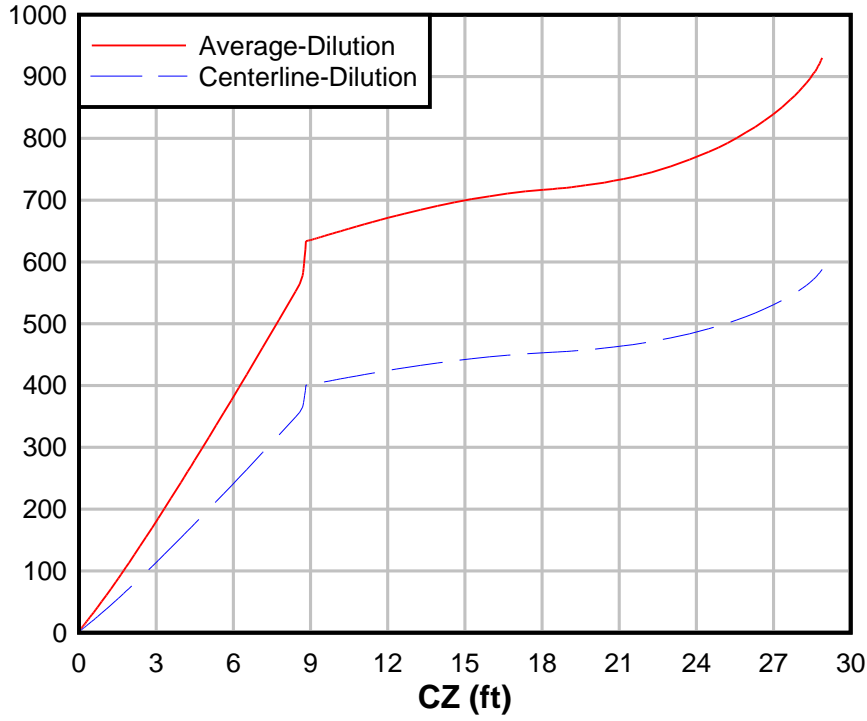**Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)**

OOCPC Model-Chukchi and Beaufort Seas
CASE-10 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)
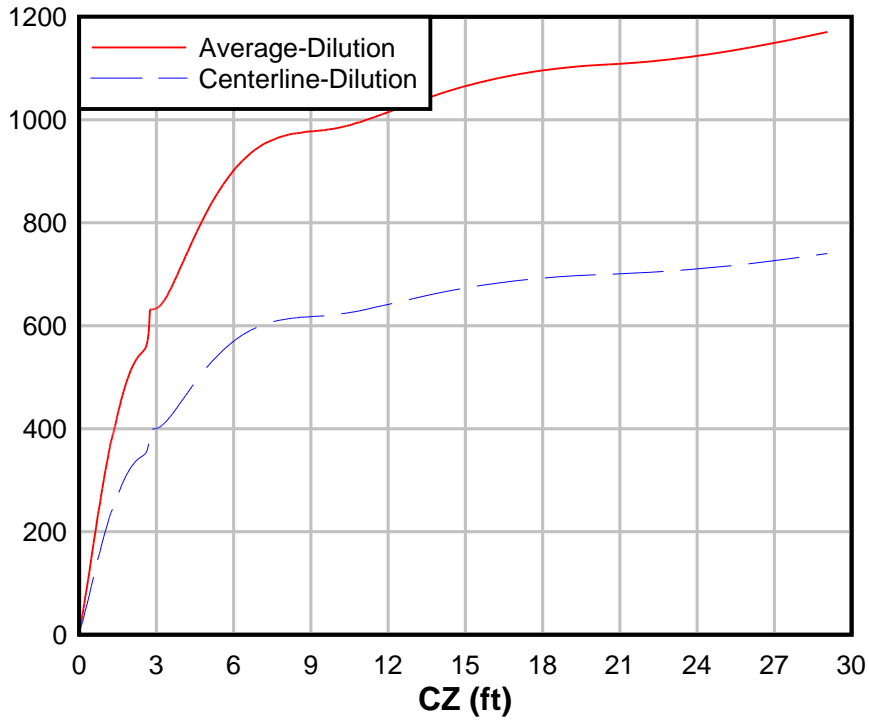
OOCPC Model-Chukchi and Beaufort Seas
CASE-11 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Legend:
- Average-Dilution
- Centerline-Dilution
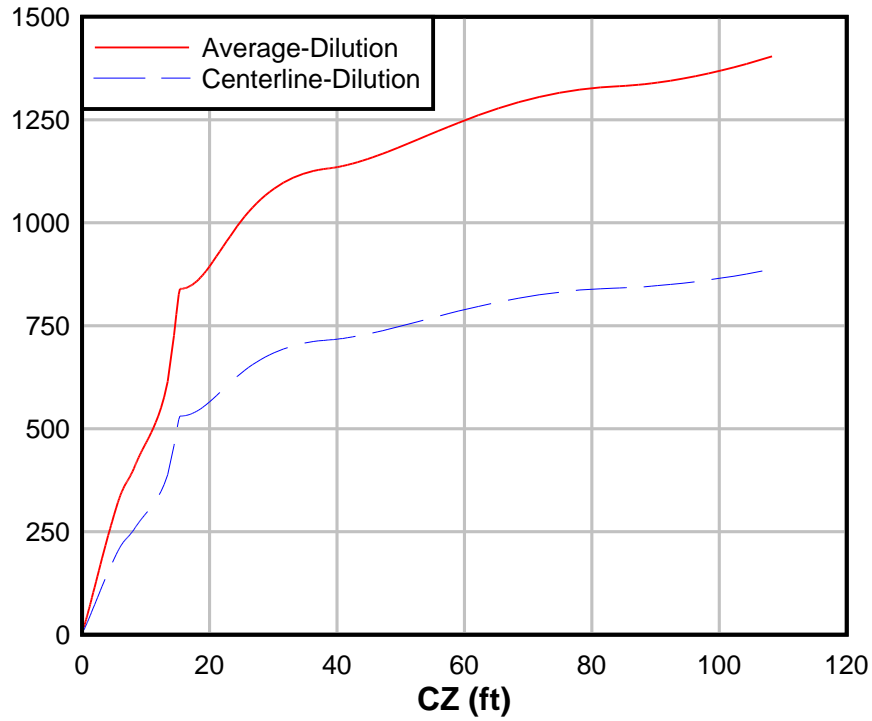
X-axis: CZ (ft)
Y-axis: 0 to 1600

OOCPC Model-Chukchi and Beaufort Seas
CASE-12 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 250 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-13 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
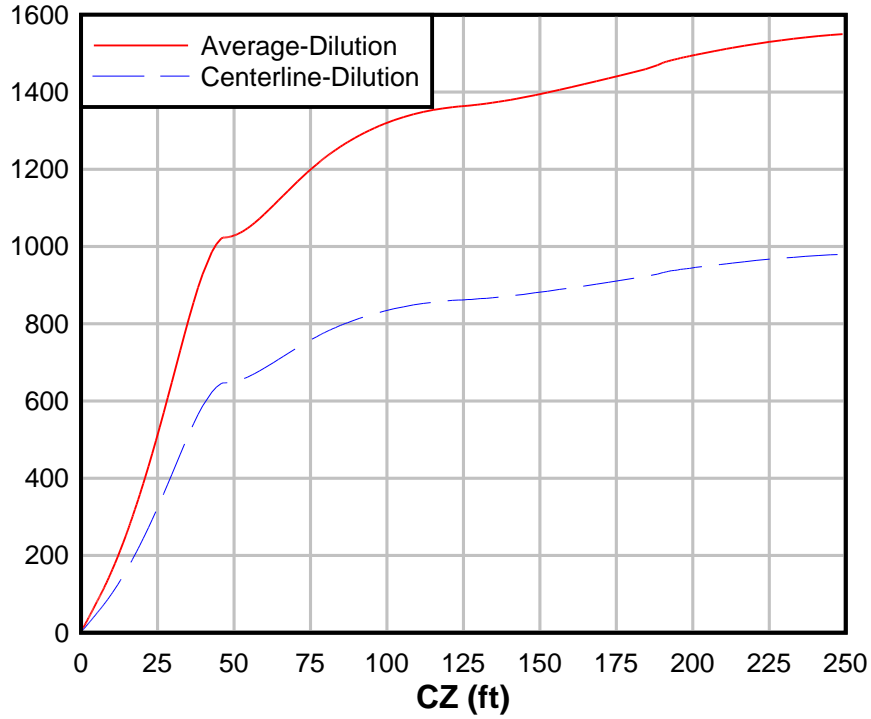**Discharge (Depth= 38.3 m, Rate= 250 bbl/hr)**

OOCPC Model-Chukchi and Beaufort Seas
CASE-14 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 250 bbl/hr)
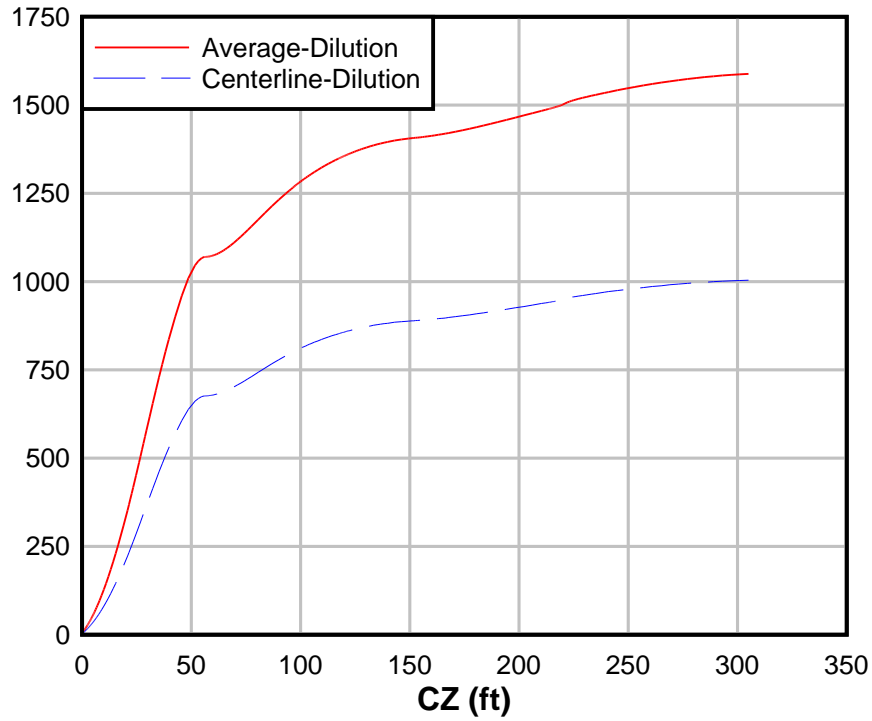
OOCPC Model-Chukchi and Beaufort Seas
CASE-15 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 38.3 m, Rate= 250 bbl/hr)

Legend:
- Average-Dilution
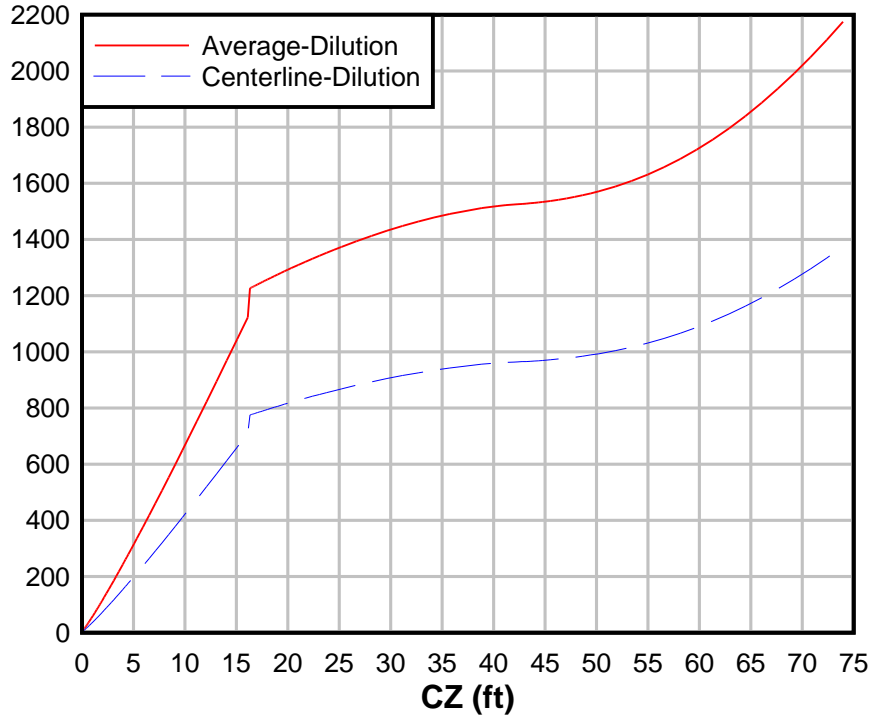- Centerline-Dilution

X-axis: CZ (ft)
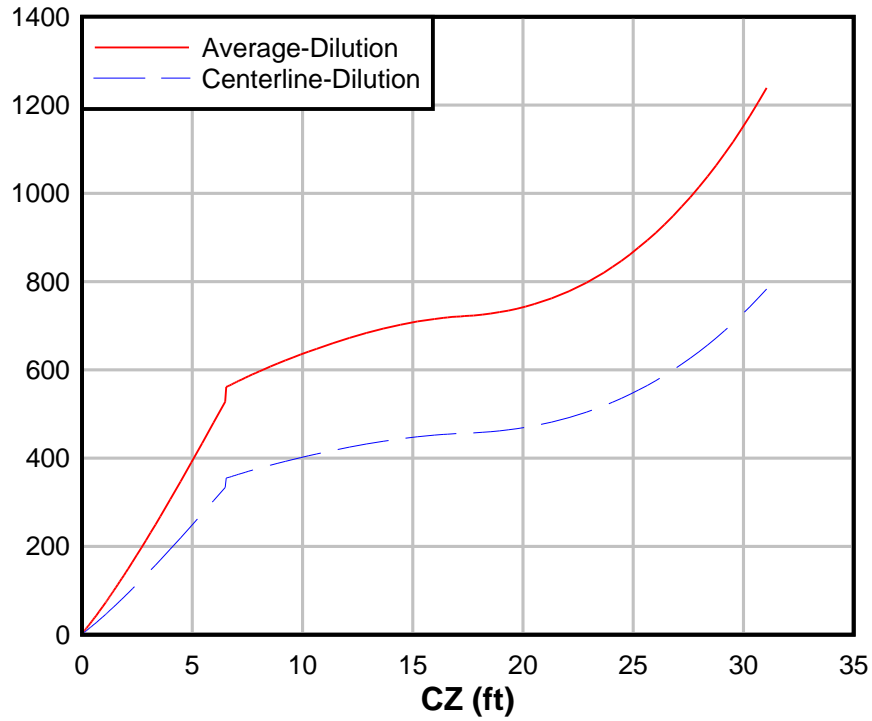
OOCPC Model-Chukchi and Beaufort Seas
CASE-16 Dilution Factor
Ambient (Water Depth= 5 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

Legend:
- Average-Dilution
- Centerline-Dilution

X-axis: CZ (ft)
Y-axis: 0 to 140

OOCPC Model-Chukchi and Beaufort Seas
CASE-17 Dilution Factor
Ambient (Water Depth= 5 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
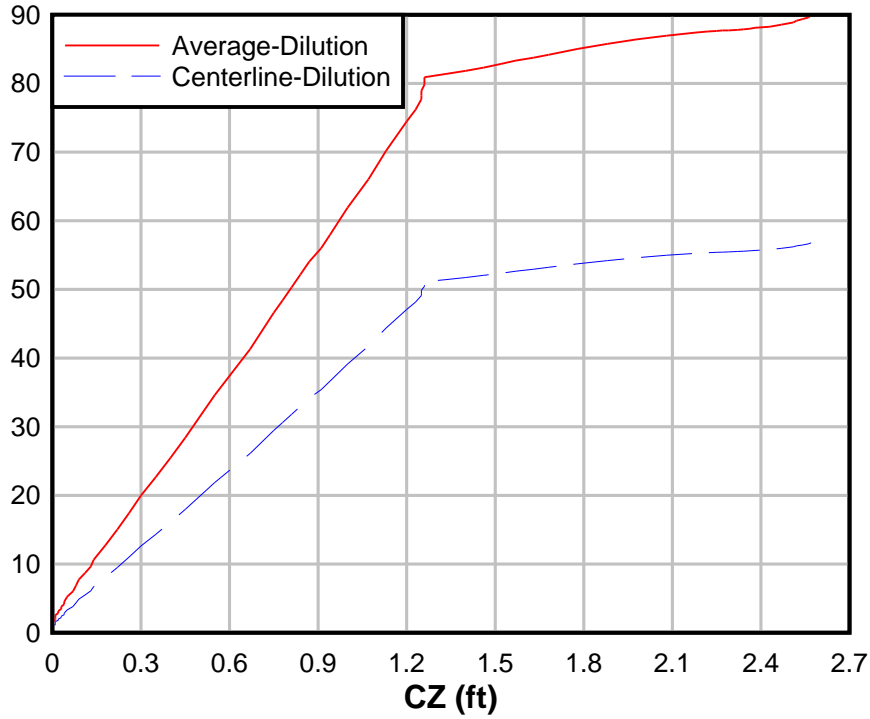
OOCPC Model-Chukchi and Beaufort Seas
CASE-18 Dilution Factor
Ambient (Water Depth= 5 m, Current Speed= 30 cm/sec)
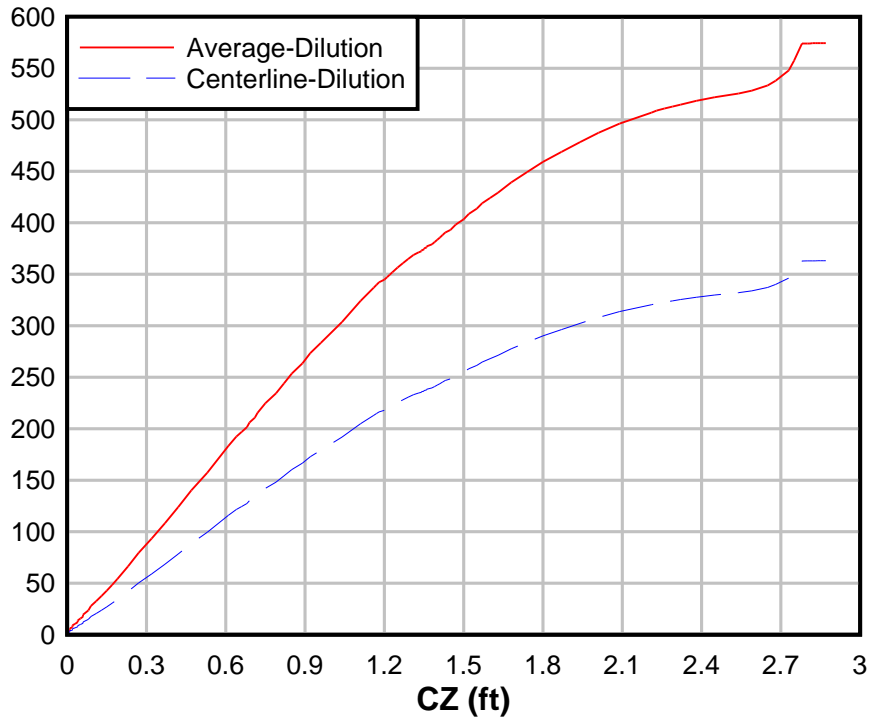**Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)**
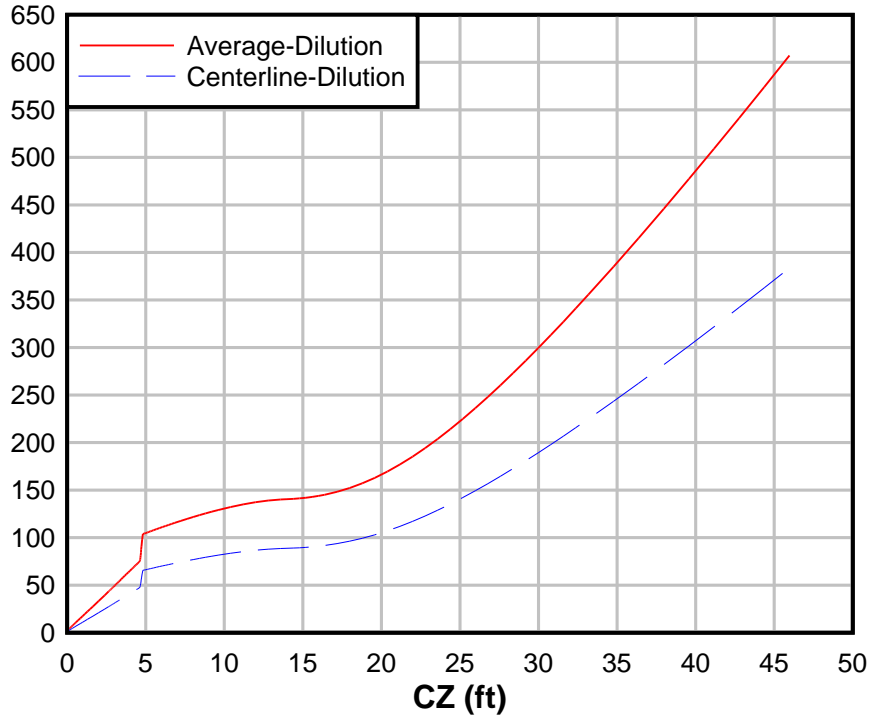
OOCPC Model-Chukchi and Beaufort Seas
CASE-19 Dilution Factor
Ambient (Water Depth= 5 m, Current Speed= 40 cm/sec)
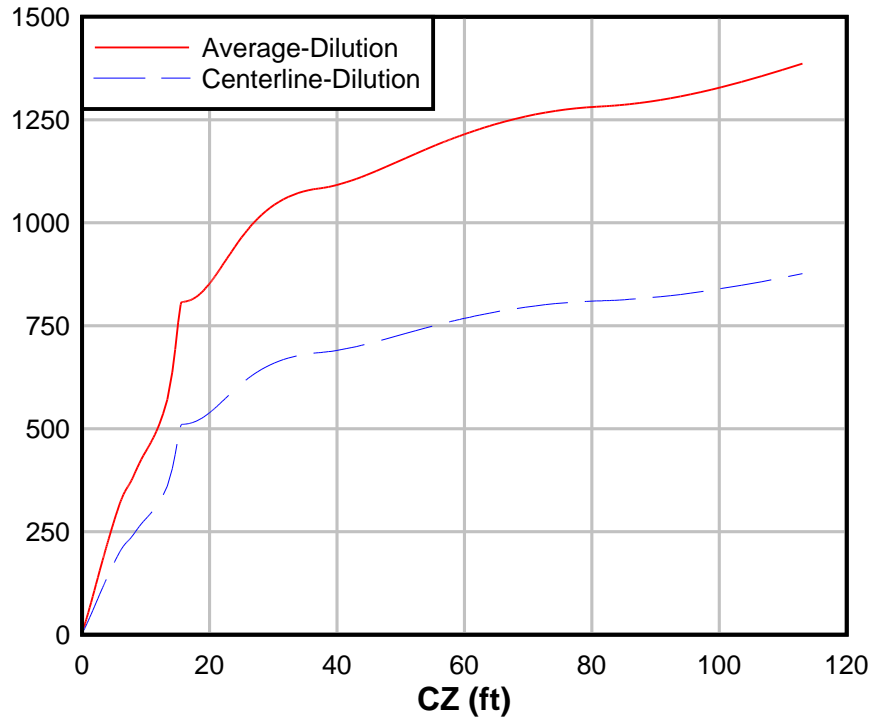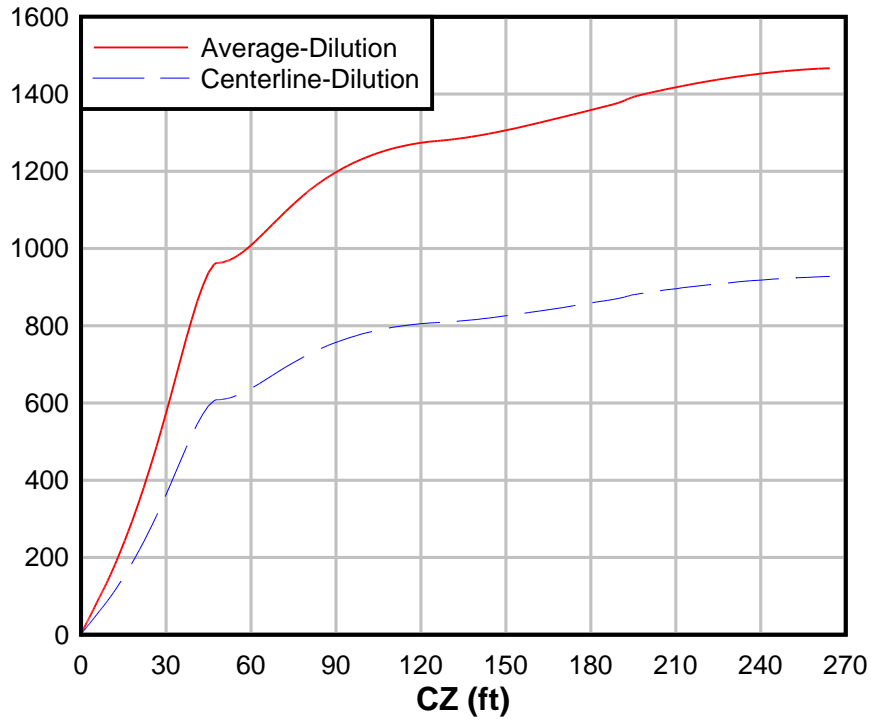**Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)**
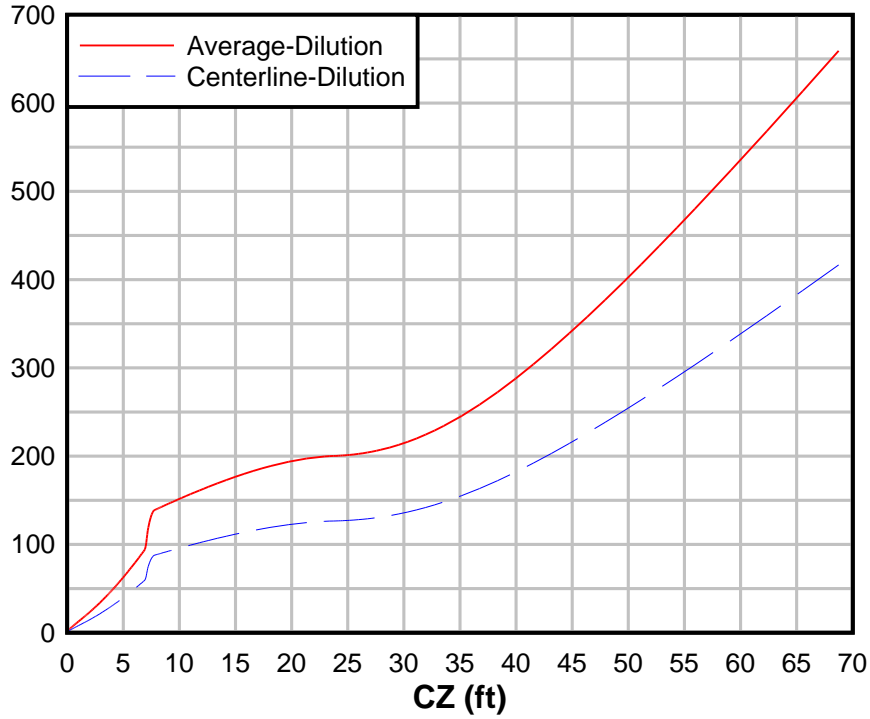
OOCPC Model-Chukchi and Beaufort Seas
CASE-20 Dilution Factor
Ambient (Water Depth= 20 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-21 Dilution Factor
Ambient (Water Depth= 20 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
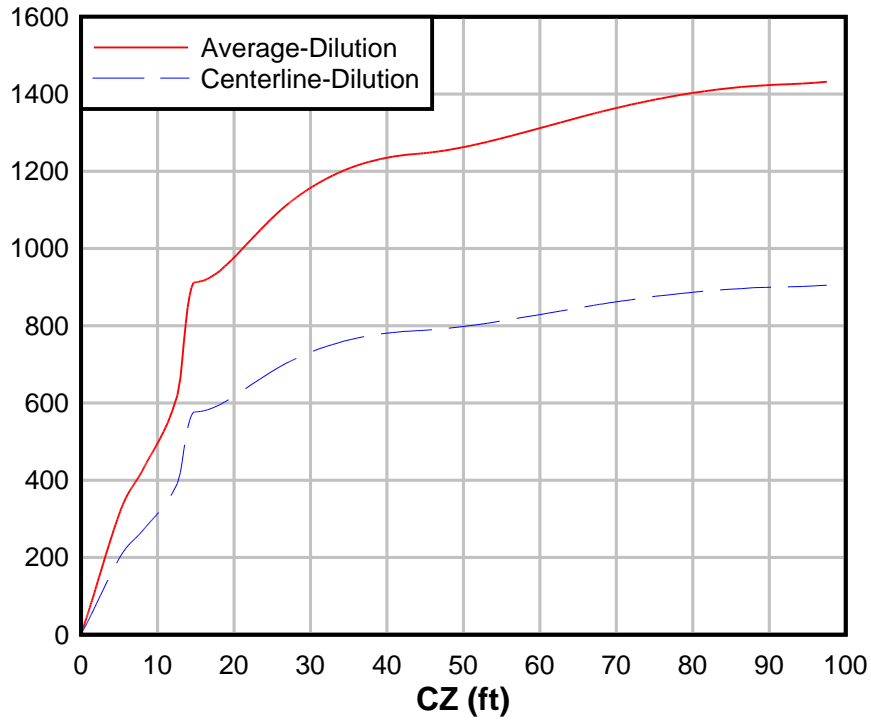
OOCPC Model-Chukchi and Beaufort Seas
CASE-22 Dilution Factor
Ambient (Water Depth= 20 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
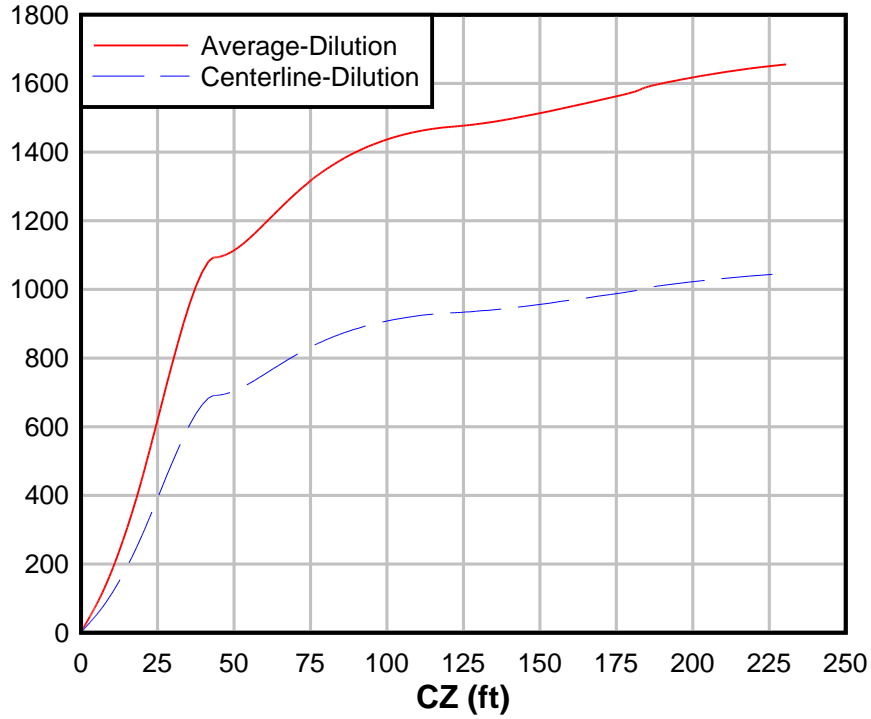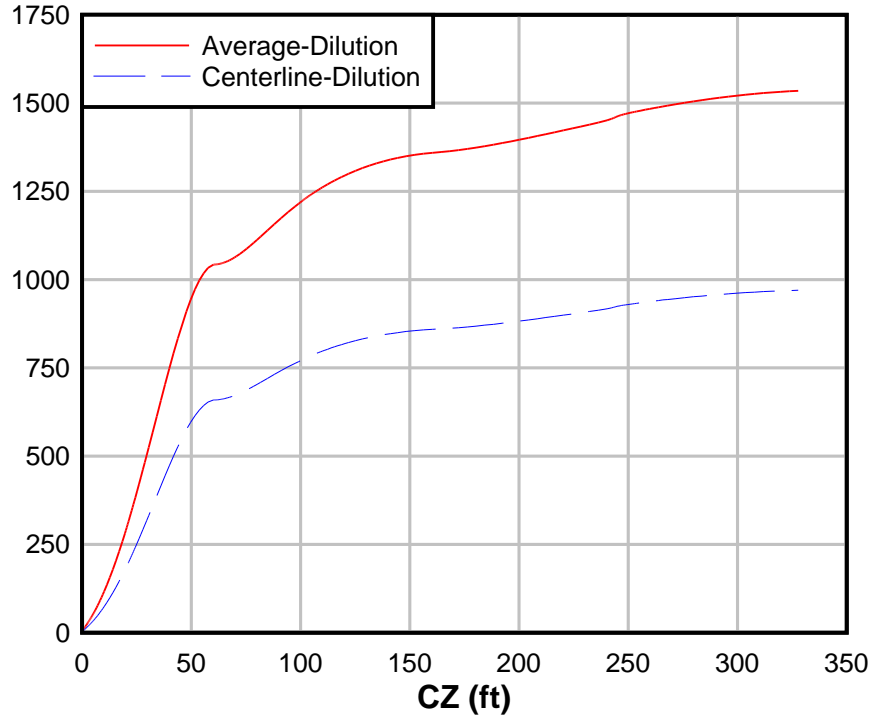
OOCPC Model-Chukchi and Beaufort Seas
CASE-23 Dilution Factor
Ambient (Water Depth= 20 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

Legend:
- Average-Dilution
- Centerline-Dilution

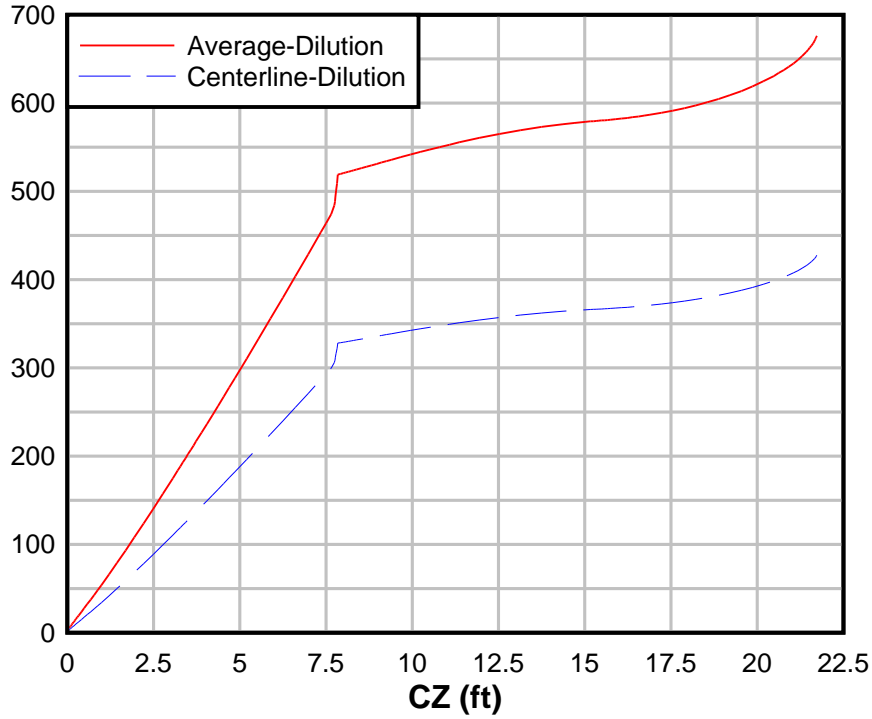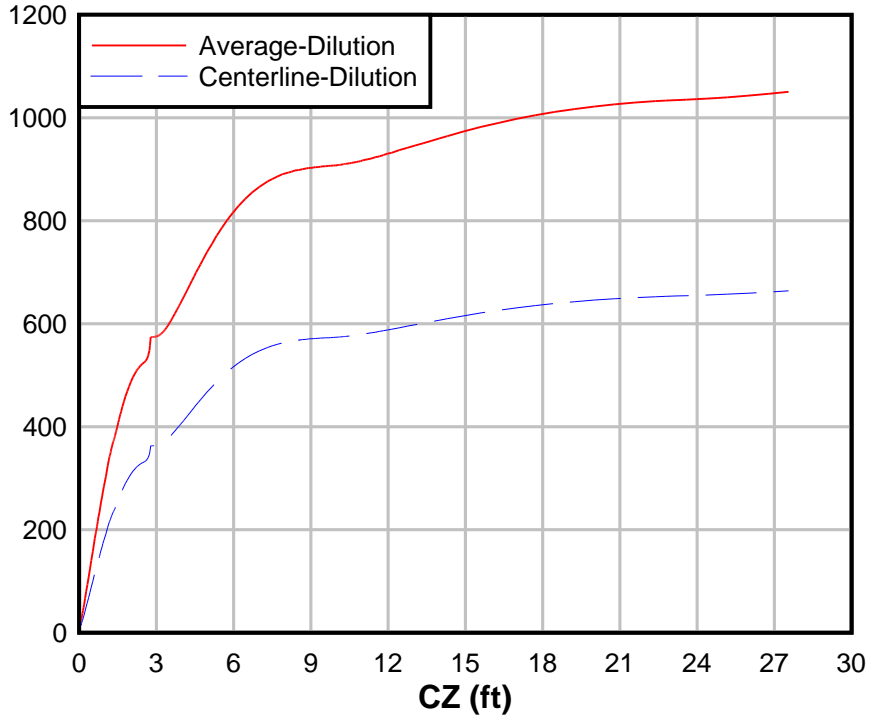X-axis: CZ (ft)
Y-axis: 0 to 1800
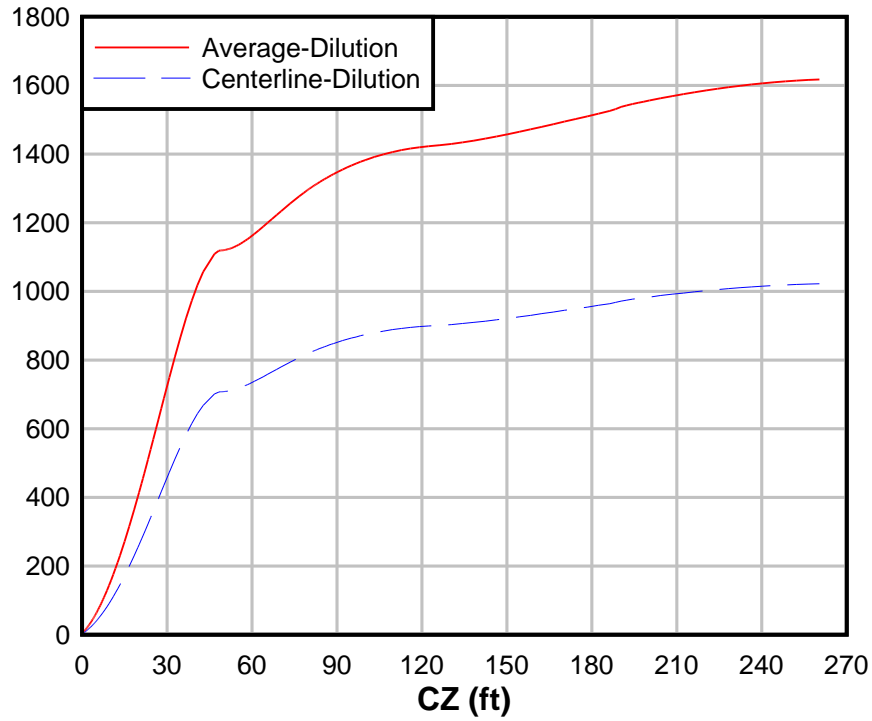
OOCPC Model-Chukchi and Beaufort Seas
CASE-24 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

Average-Dilution
Centerline-Dilution

CZ (ft)
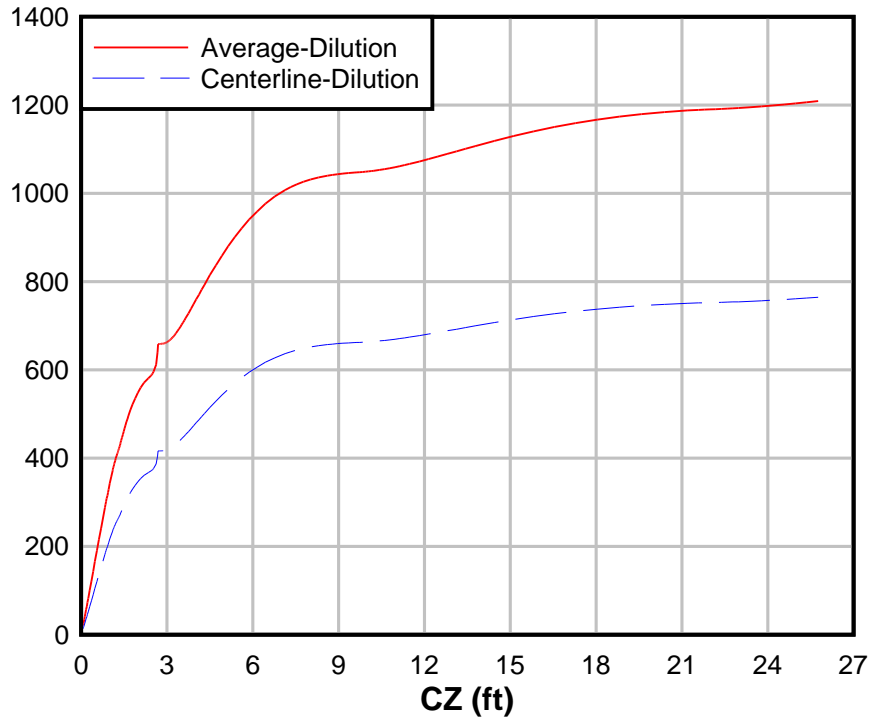
OOCPC Model-Chukchi and Beaufort Seas
CASE-25 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 500 bbl/hr)
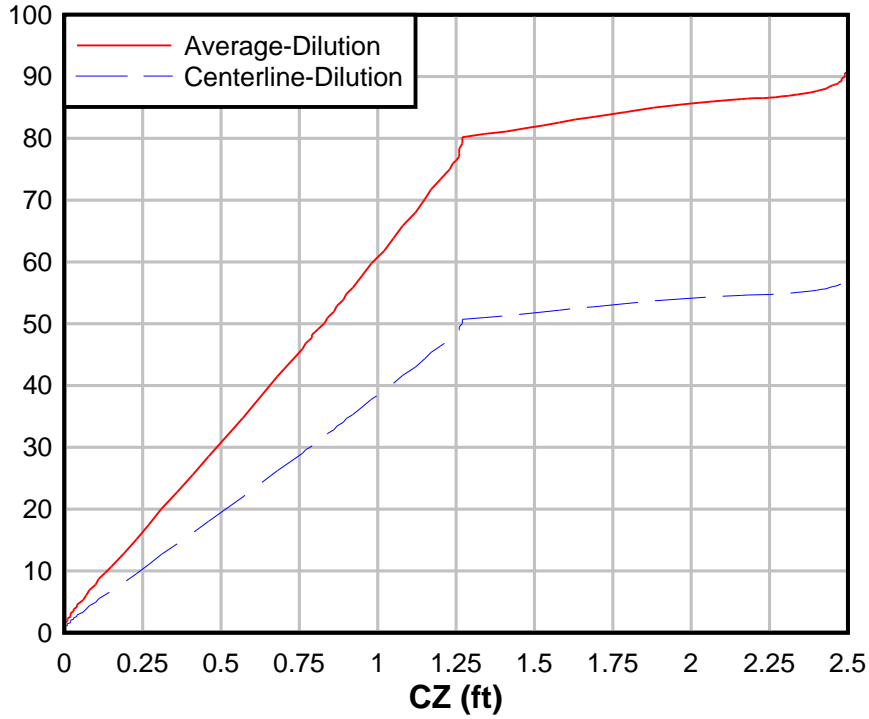
OOCPC Model-Chukchi and Beaufort Seas
CASE-26 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 30 cm/sec)
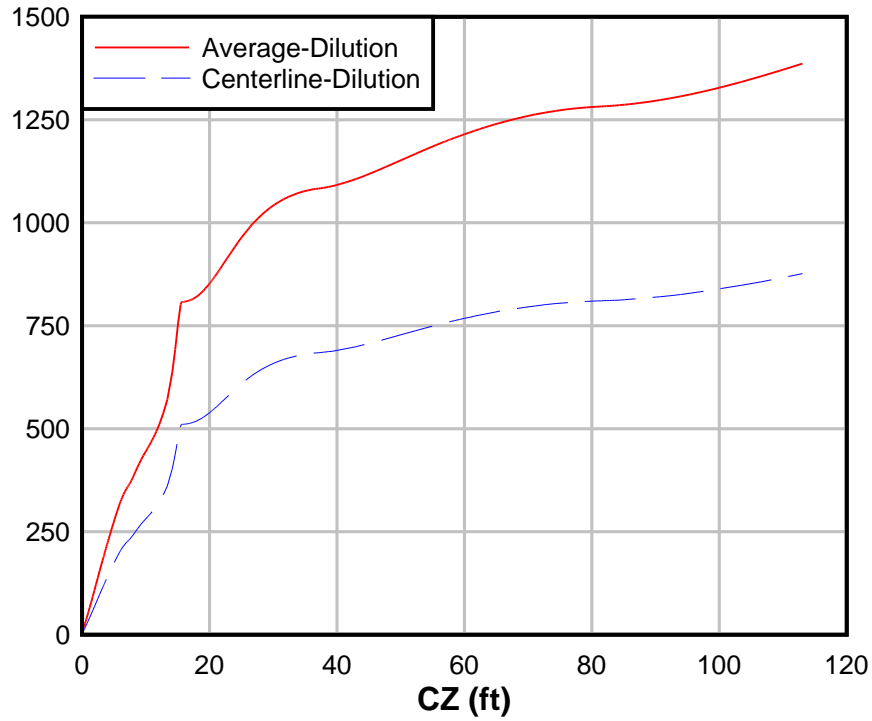## Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-27 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 40 cm/sec)
Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-28 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

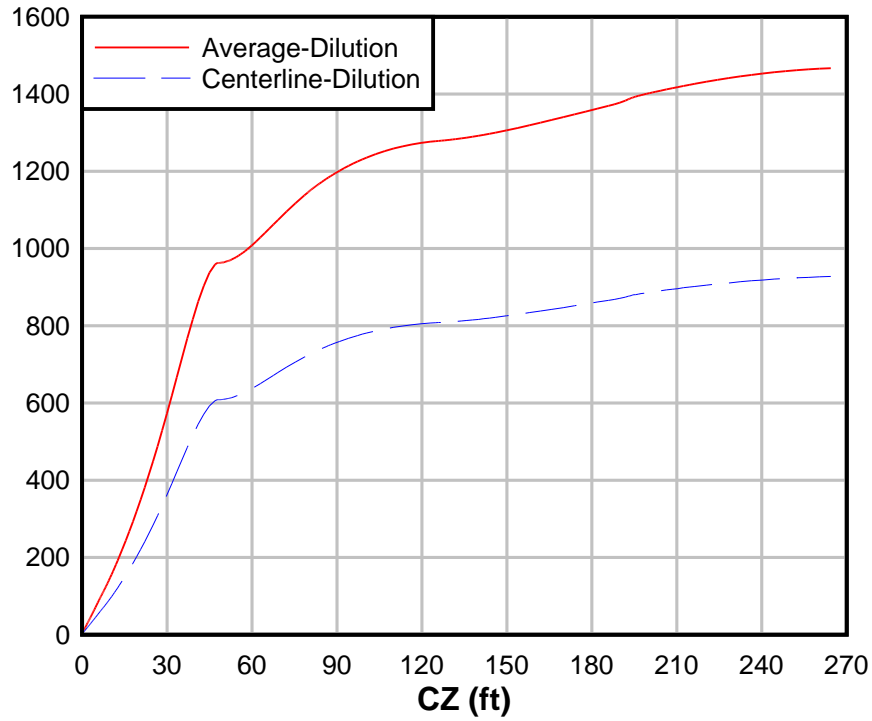
Legend:
— Average-Dilution
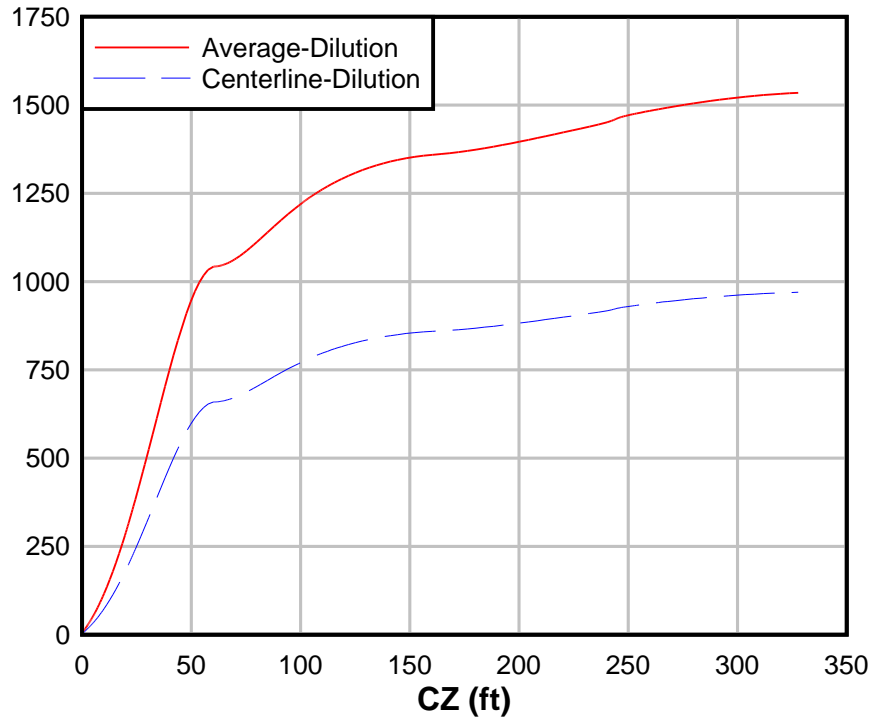– – Centerline-Dilution

X-axis: CZ (ft)

OOCPC Model-Chukchi and Beaufort Seas
CASE-29 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 500 bbl/hr)

Legend:
- Average-Dilution
- Centerline-Dilution

X-axis: CZ (ft)

OOCPC Model-Chukchi and Beaufort Seas
CASE-30 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 30 cm/sec)
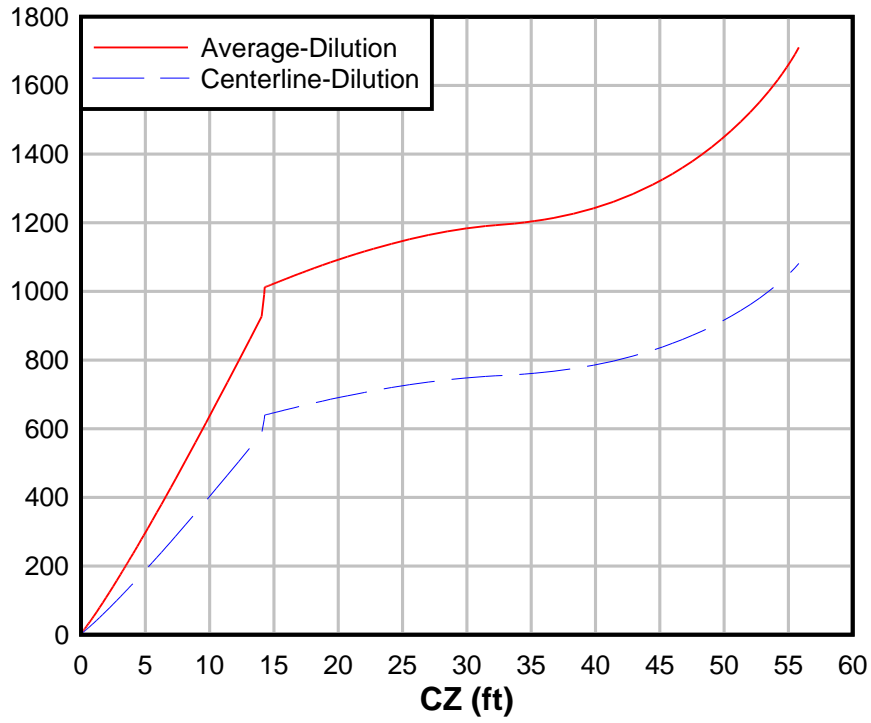**Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)**

OOCPC Model-Chukchi and Beaufort Seas
CASE-31 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 40 cm/sec)
Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-32 Dilution Factor
Ambient (Water Depth= 20 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)
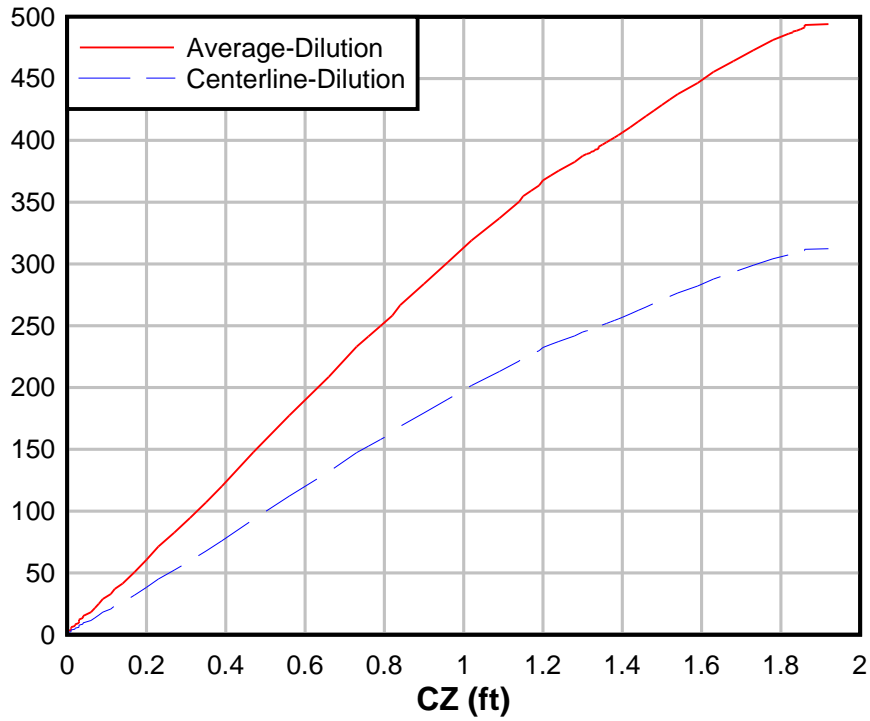
OOCPC Model-Chukchi and Beaufort Seas
CASE-33 Dilution Factor
Ambient (Water Depth= 20 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)
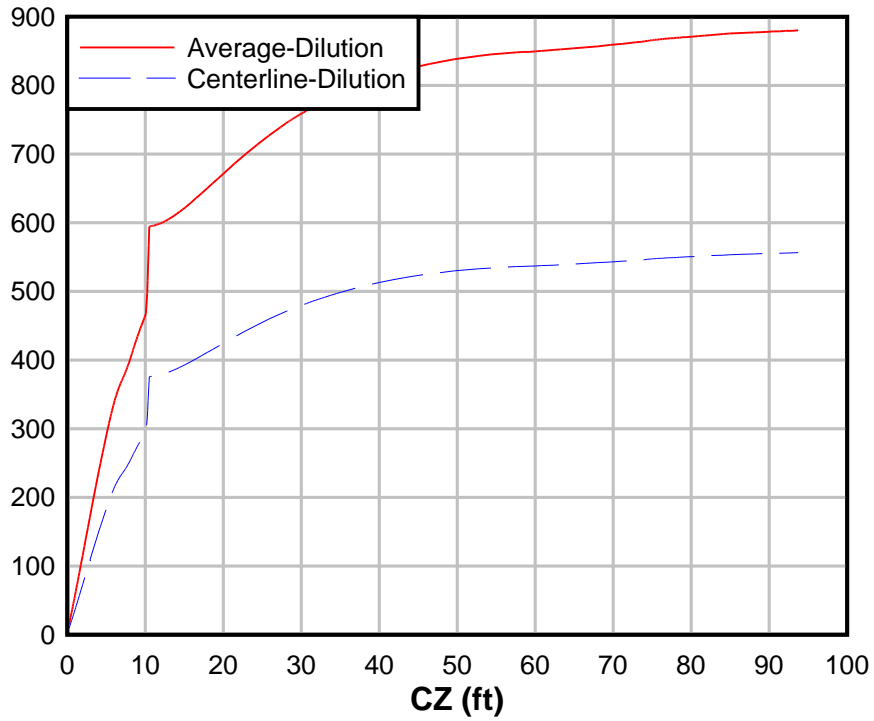
OOCPC Model-Chukchi and Beaufort Seas
CASE-34 Dilution Factor
Ambient (Water Depth= 20 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-35 Dilution Factor
Ambient (Water Depth= 20 m, Current Speed= 40 cm/sec)
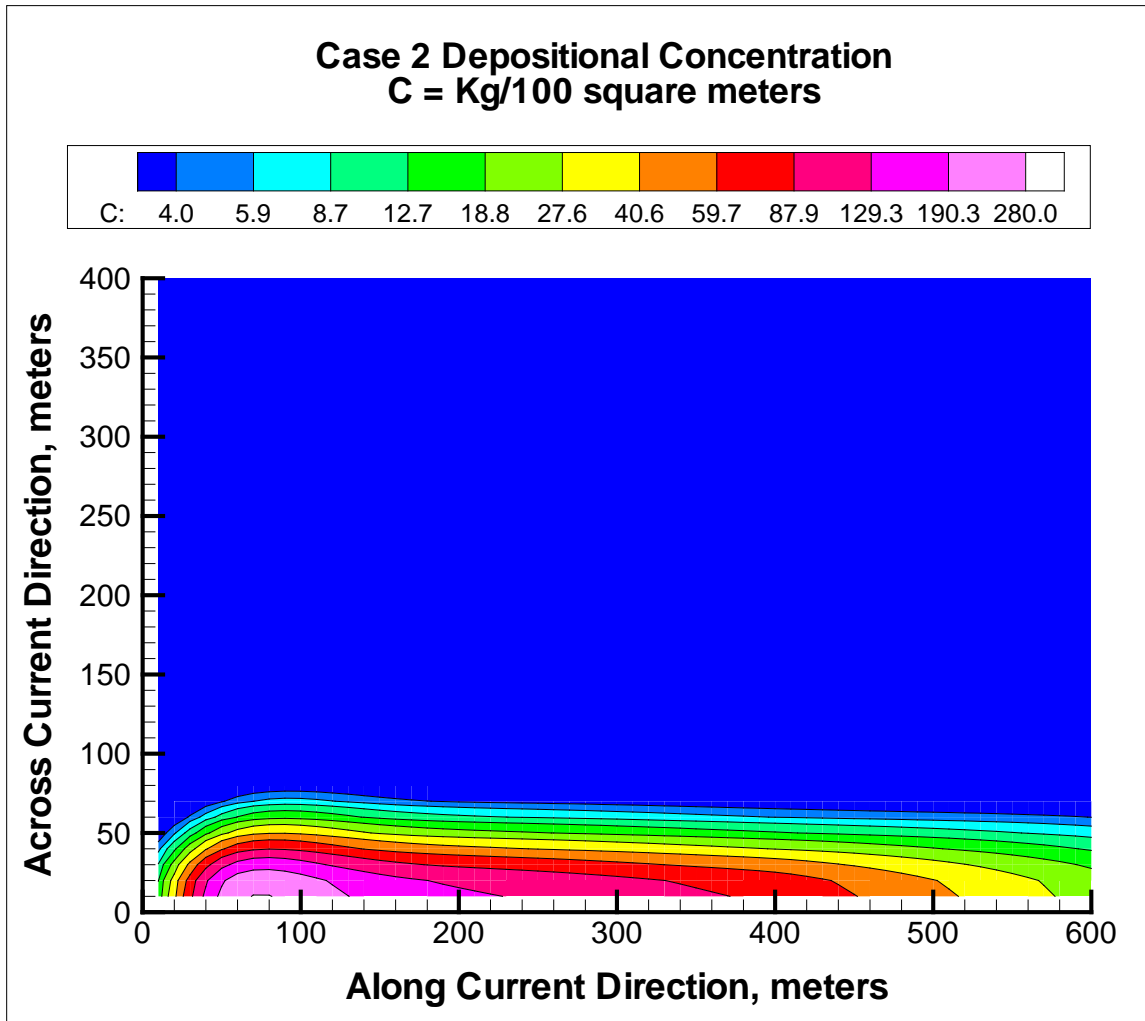## Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-36 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-37 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-38 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-39 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-40 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 20.3 m, Rate= 750 bbl/hr)

Legend:
- Average-Dilution
- Centerline-Dilution

X-axis: CZ (ft)
Y-axis: 0 to 1000

OOCPC Model-Chukchi and Beaufort Seas
CASE-41 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-42 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-43 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-44 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-45 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 20.3 m, Rate= 750 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-46 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-47 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-48 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-49 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-50 Dilution Factor
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 20.3 m, Rate= 1000 bbl/hr)

Legend:
- Average-Dilution (red solid line)
- Centerline-Dilution (blue dashed line)

X-axis: CZ (ft), ranging from 0 to 22.5
Y-axis: ranging from 0 to 700

OOCPC Model-Chukchi and Beaufort Seas
CASE-51 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-52 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-53 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-54 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

OOCPC Model-Chukchi and Beaufort Seas
CASE-55 Dilution Factor
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
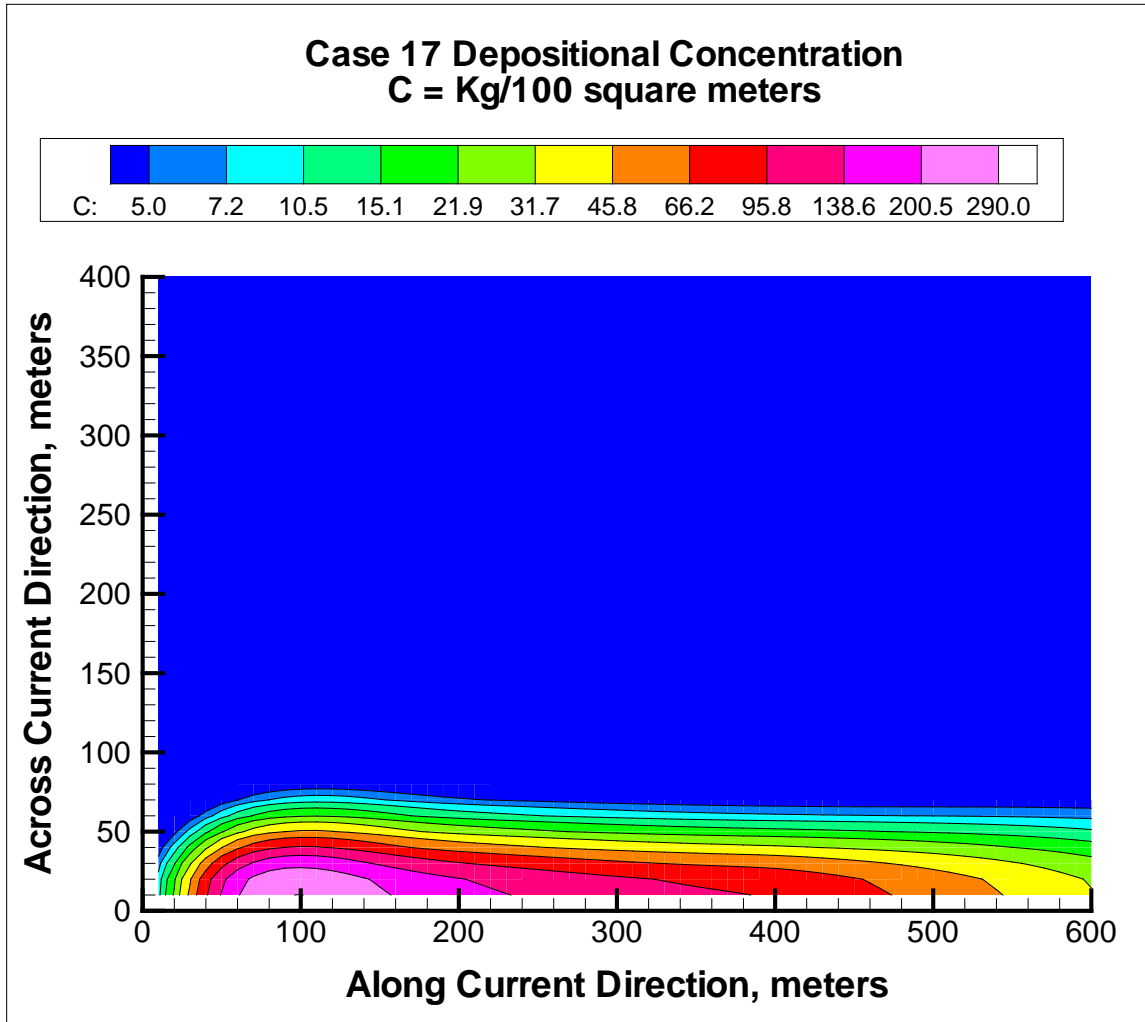**Discharge (Depth= 20.3 m, Rate= 1000 bbl/hr)**

**CASE-1 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 2 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)**

OOC Model Failed to Produce Meaningful Results

CASE-2 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 2 m, Current Speed= 10 cm/sec)
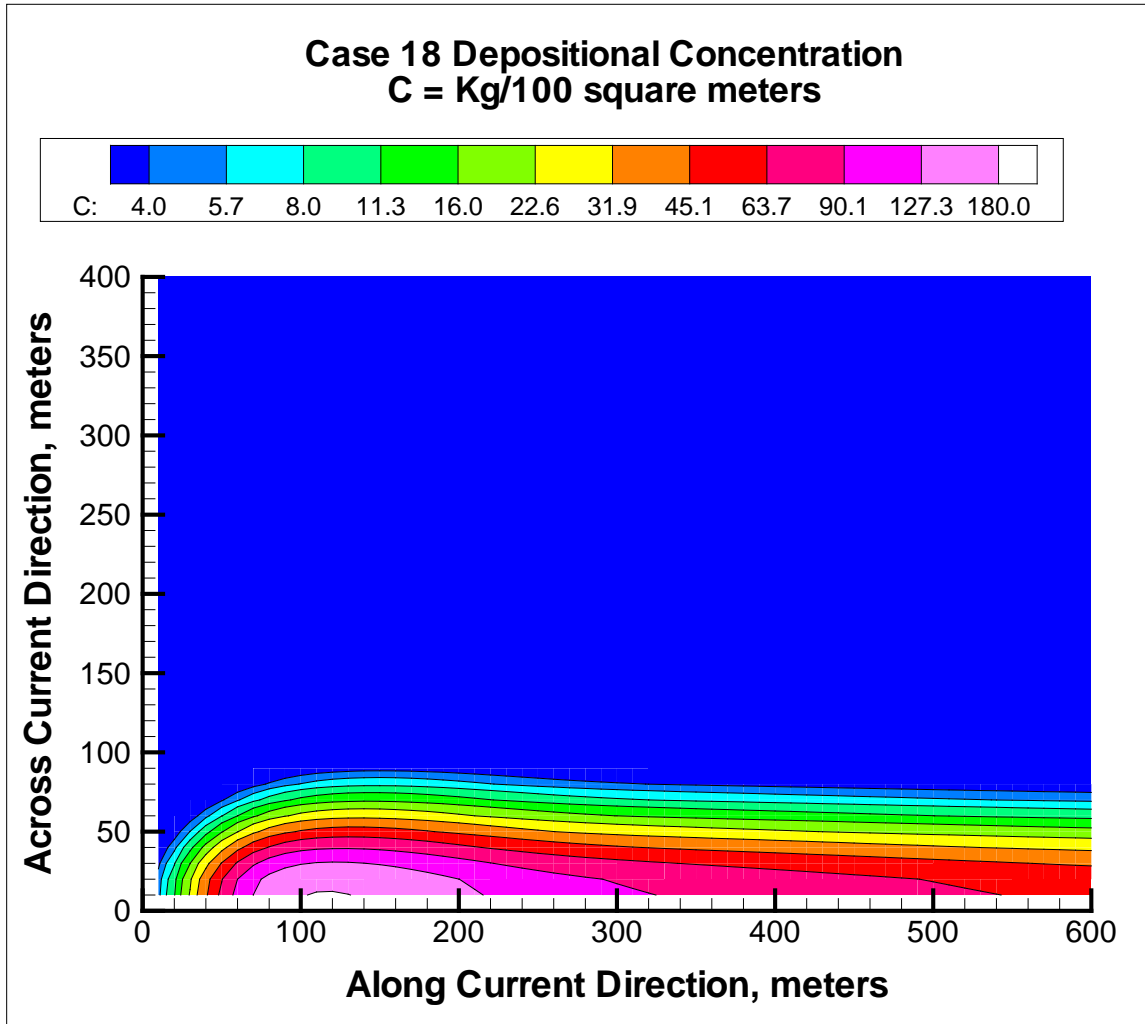**Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)**

Case 2 Depositional Concentration
C = Kg/100 square meters

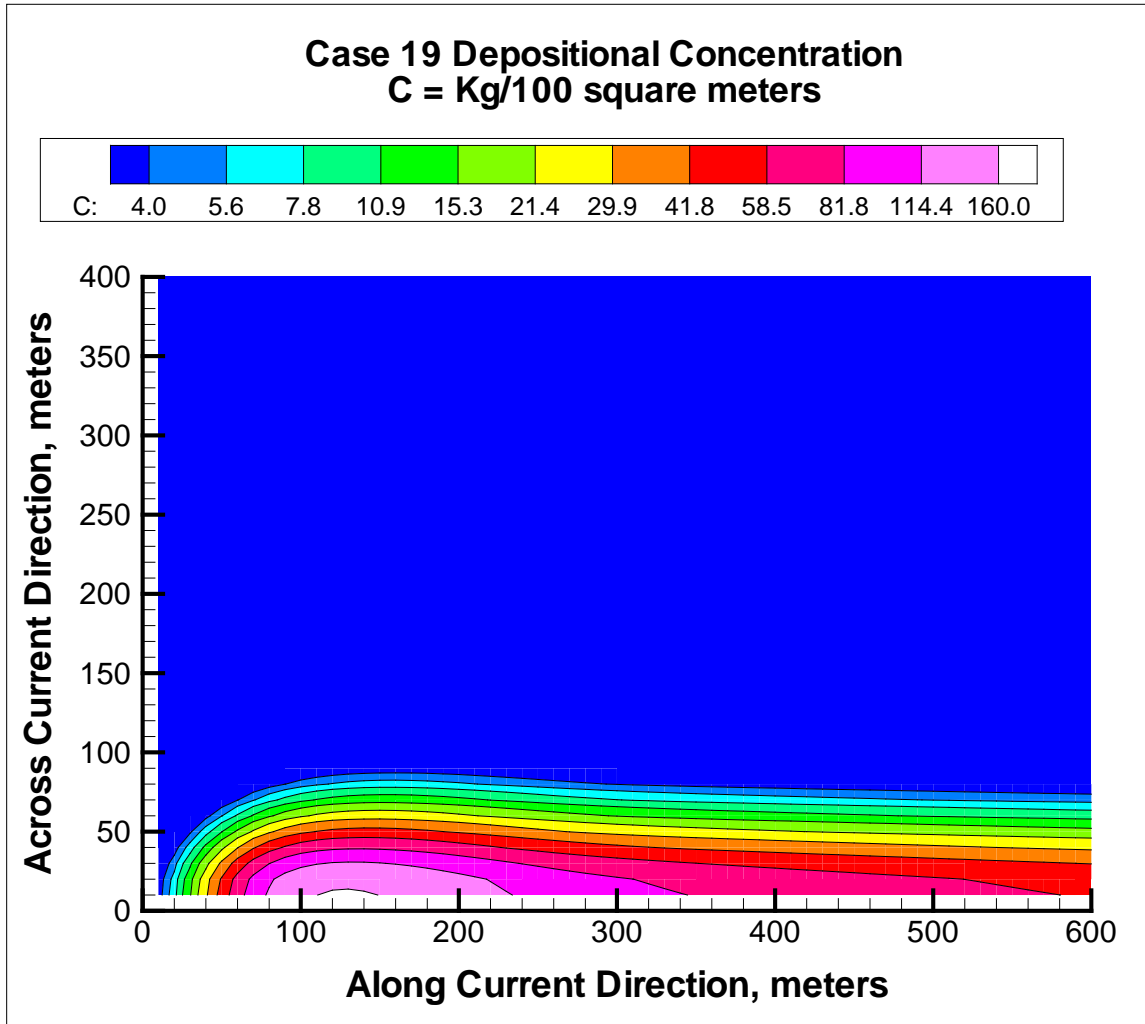C: 4.0 5.9 8.7 12.7 18.8 27.6 40.6 59.7 87.9 129.3 190.3 280.0

CASE-3 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 2 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Case 3 Depositional Concentration
C = Kg/100 square meters

C: 3.0   4.4   6.3   9.2   13.3   19.4   28.2   40.9   59.4   86.3   125.3   182.0

CASE-4 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 2 m, Current Speed= 40 cm/sec)
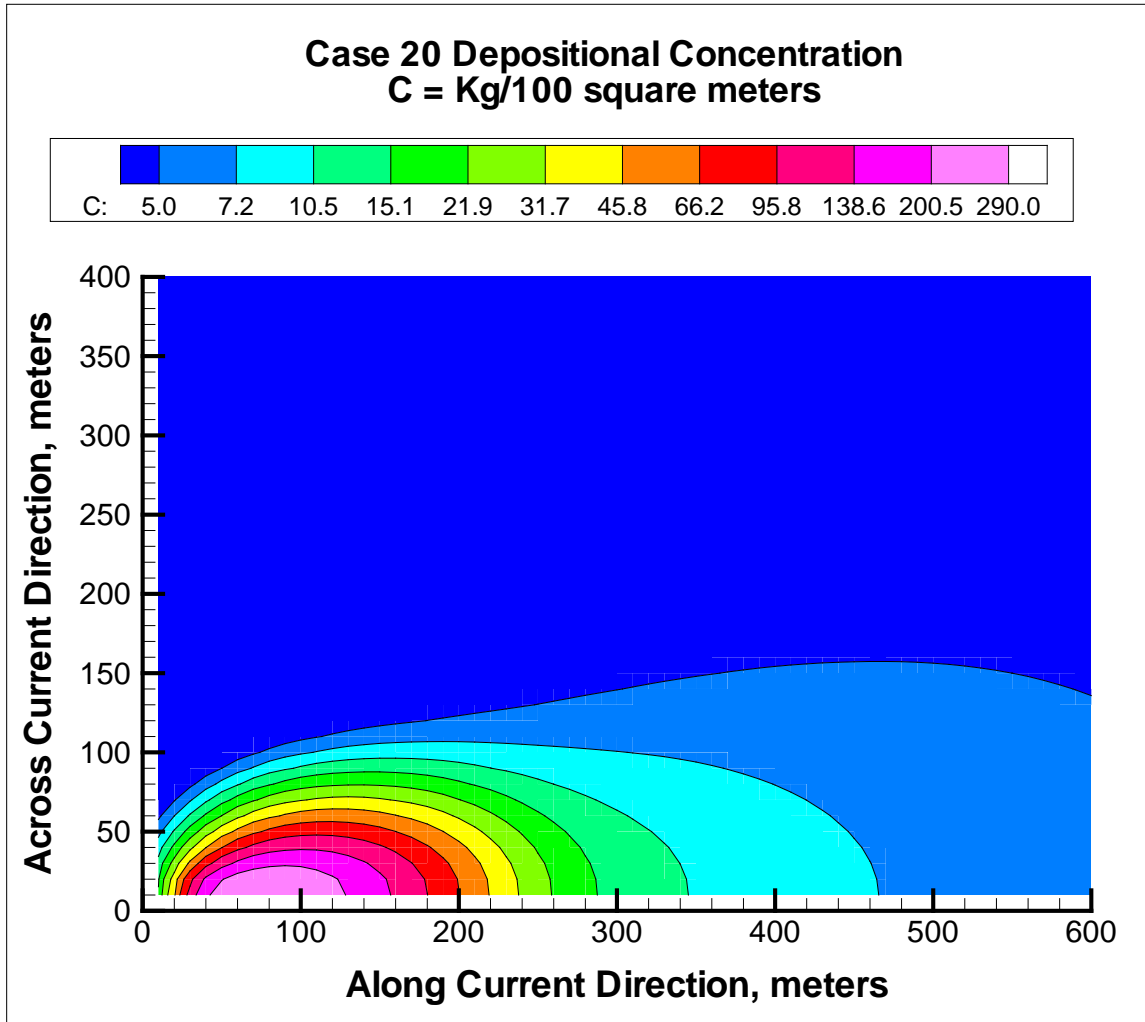**Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)**

Case 4 Depositional Concentration
C = Kg/100 square meters

C: 2.0 3.0 4.4 6.6 9.8 14.7 21.8 32.5 48.4 72.1 107.4 160.0

CASE-5 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 2 cm/sec)
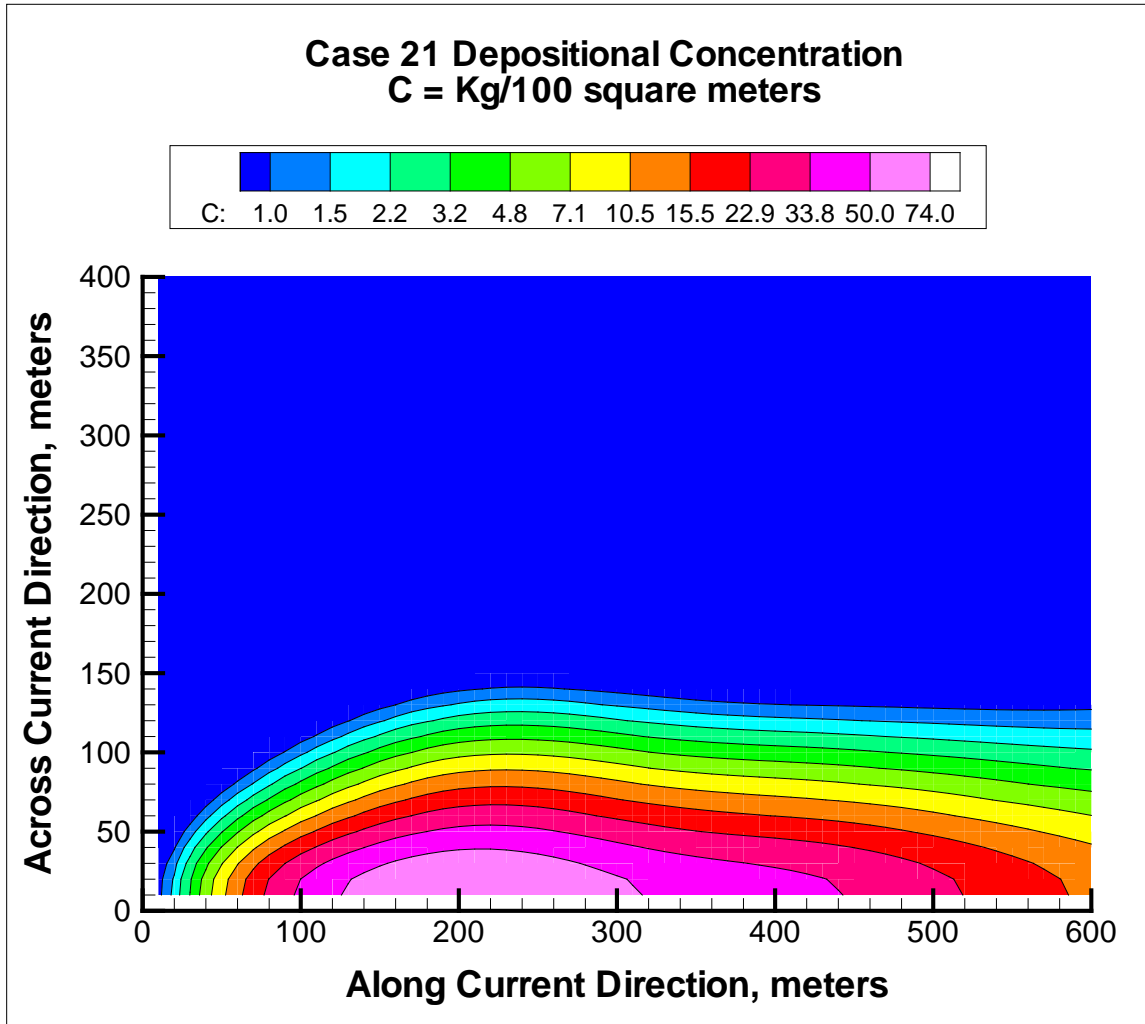**Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)**

Case 5 Depositional Concentration
C = Kg/100 square meters

C: 5.0 7.7 11.9 18.3 28.2 43.4 66.8 103.0 158.6 244.4 376.5 580.0

CASE-6 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 10 cm/sec)
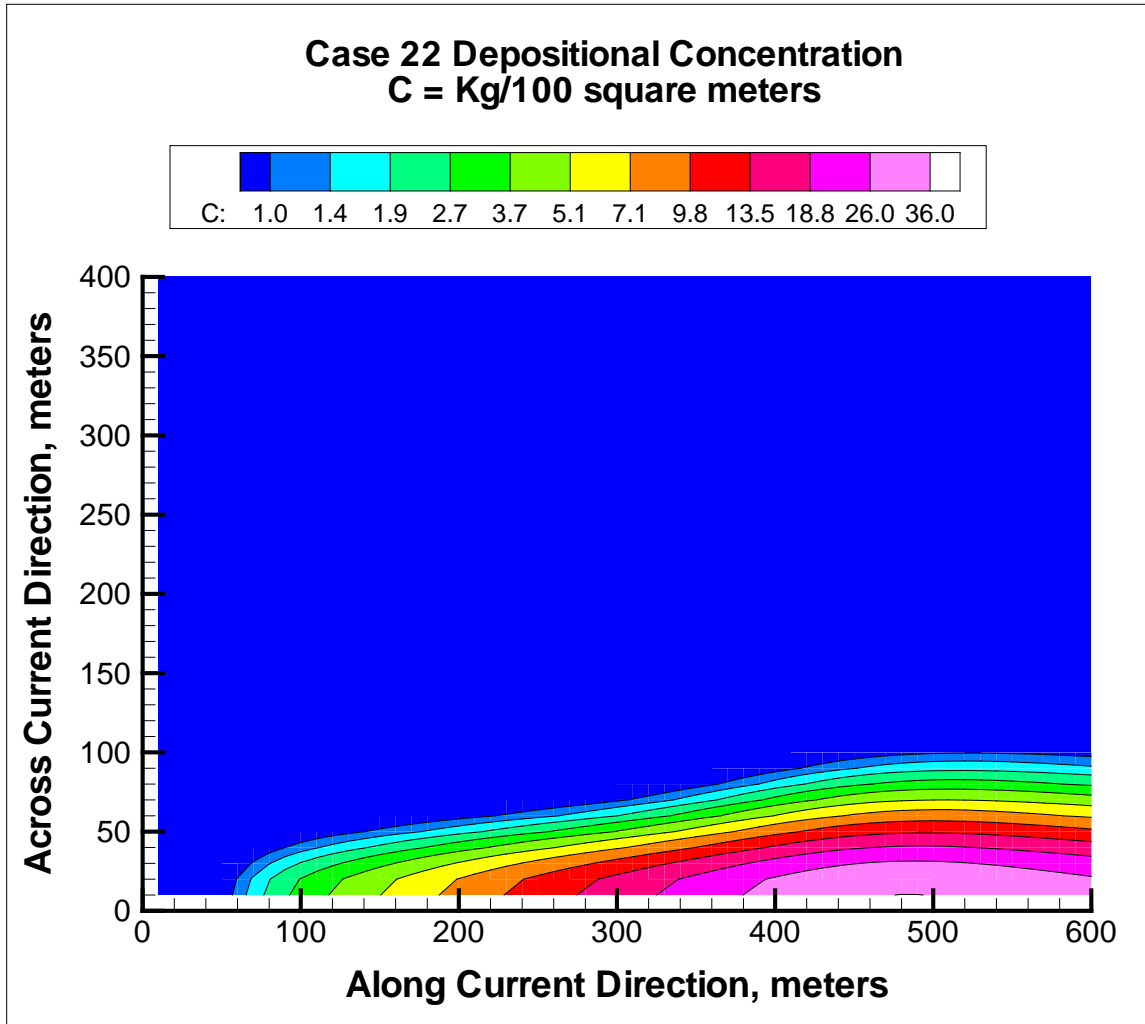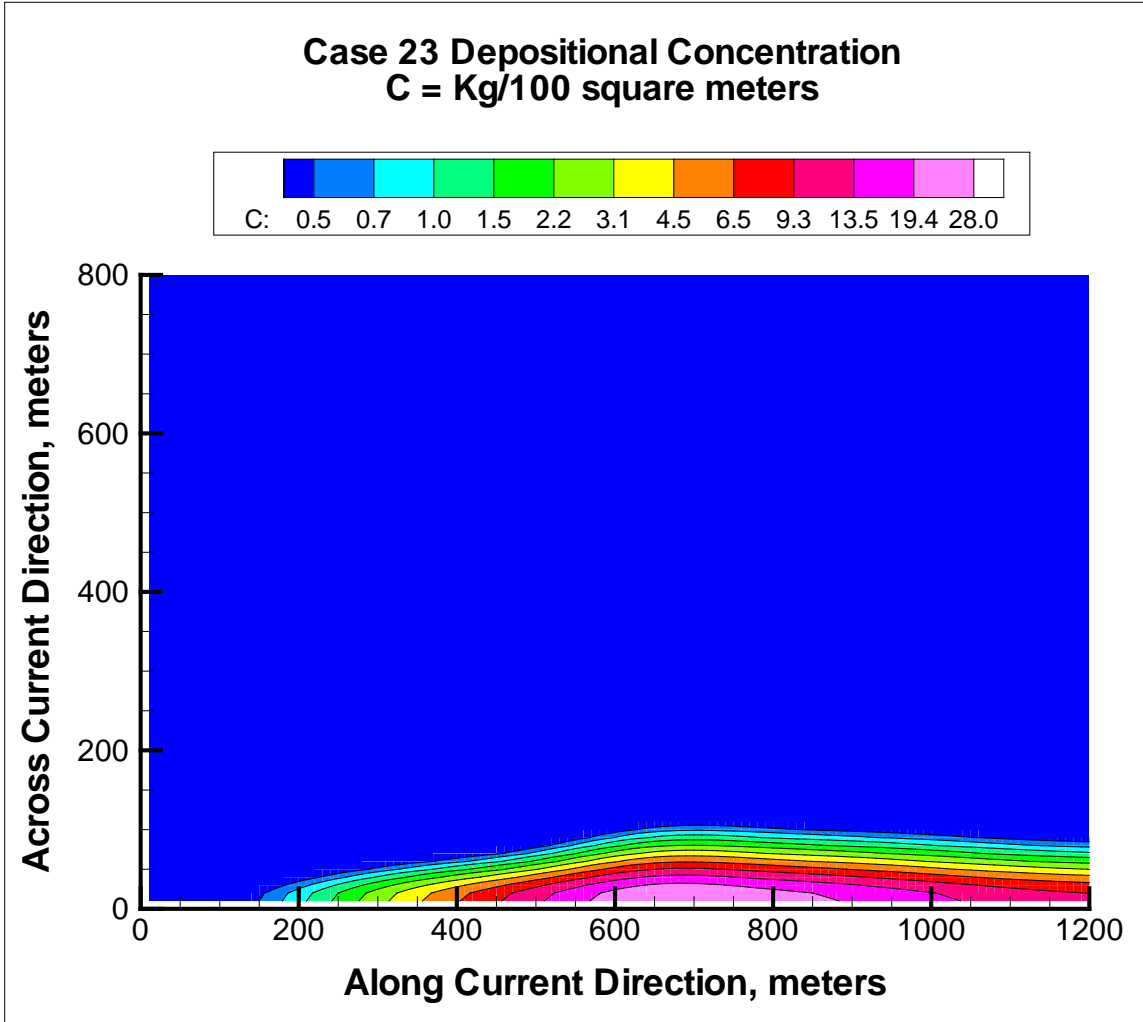Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Case 6 Depositional Concentration
C = Kg/100 square meters

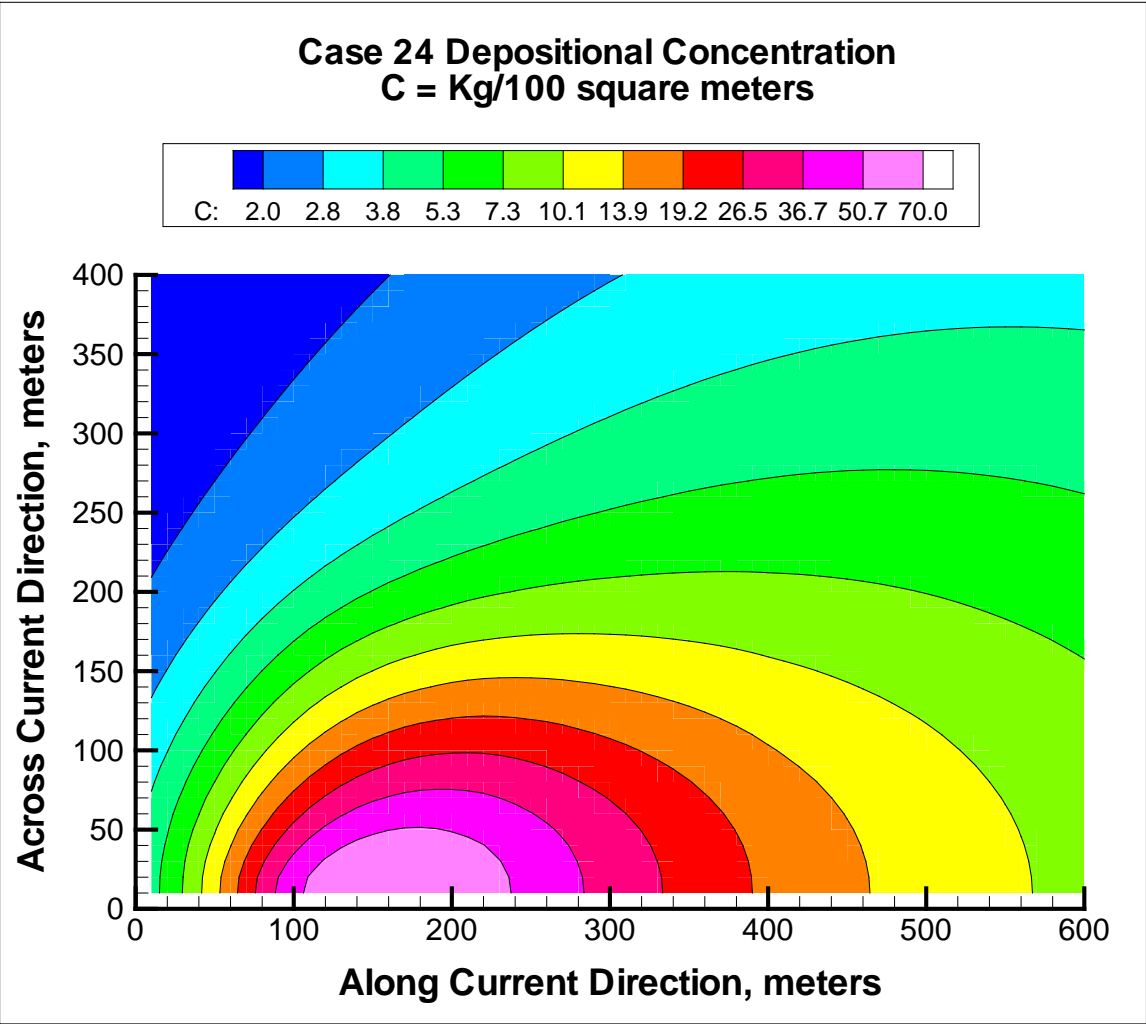C: 2.0 3.0 4.5 6.7 10.1 15.1 22.6 33.8 50.6 75.8 113.5 170.0

CASE-7 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Case 7 Depositional Concentration
C = Kg/100 square meters

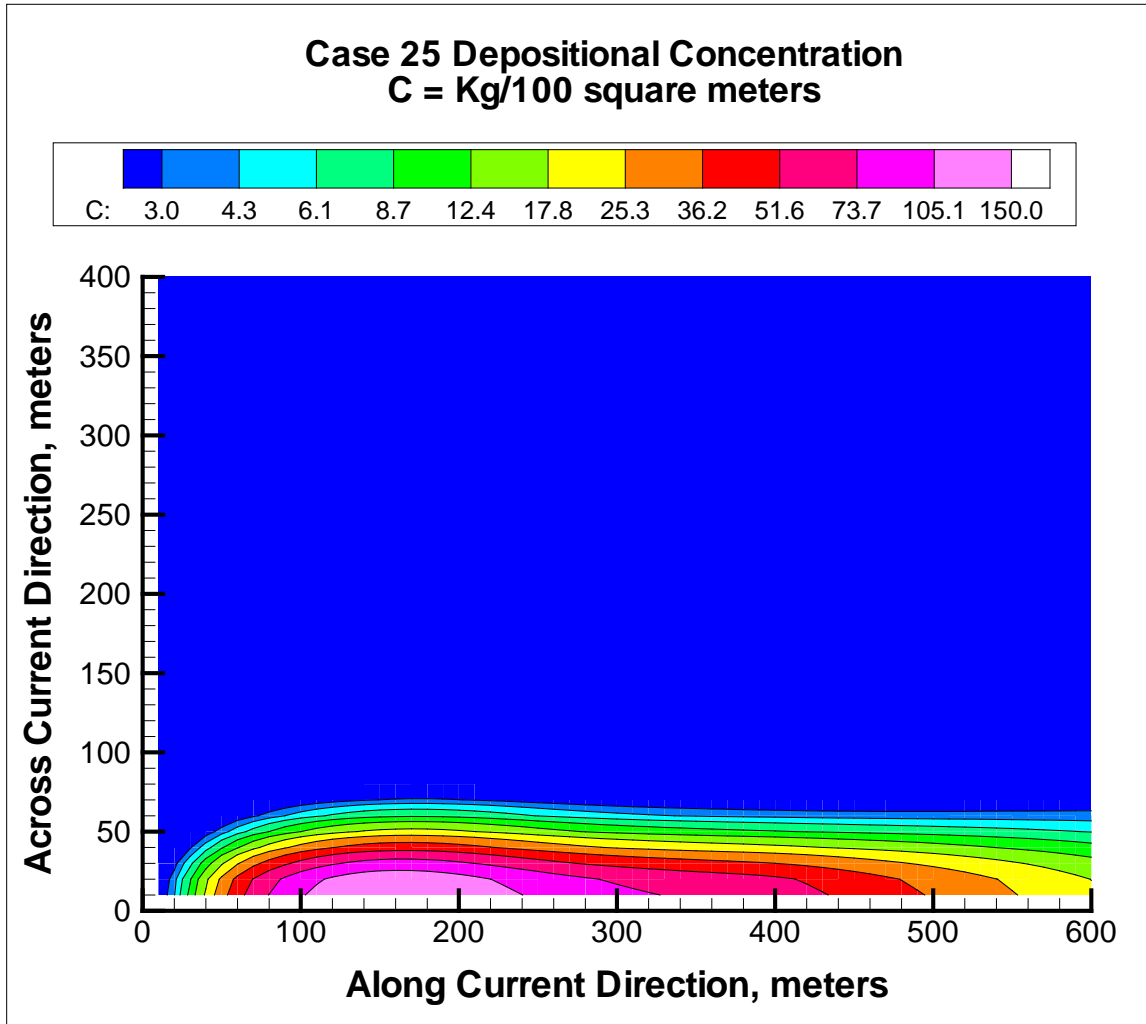C: 2.0 2.9 4.2 6.1 8.9 12.9 18.7 27.1 39.3 57.0 82.7 120.0

CASE-8 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Case 8 Depositional Concentration
C = Kg/100 square meters

C: 2.0 2.9 4.1 5.8 8.3 11.8 16.9 24.1 34.4 49.1 70.1 100.0

CASE-9 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Case 9 Depositional Concentration
C = Kg/100 square meters

C: 2.0 2.9 4.2 6.1 8.9 12.9 18.7 27.1 39.3 57.0 82.7 120.0

**CASE-10 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
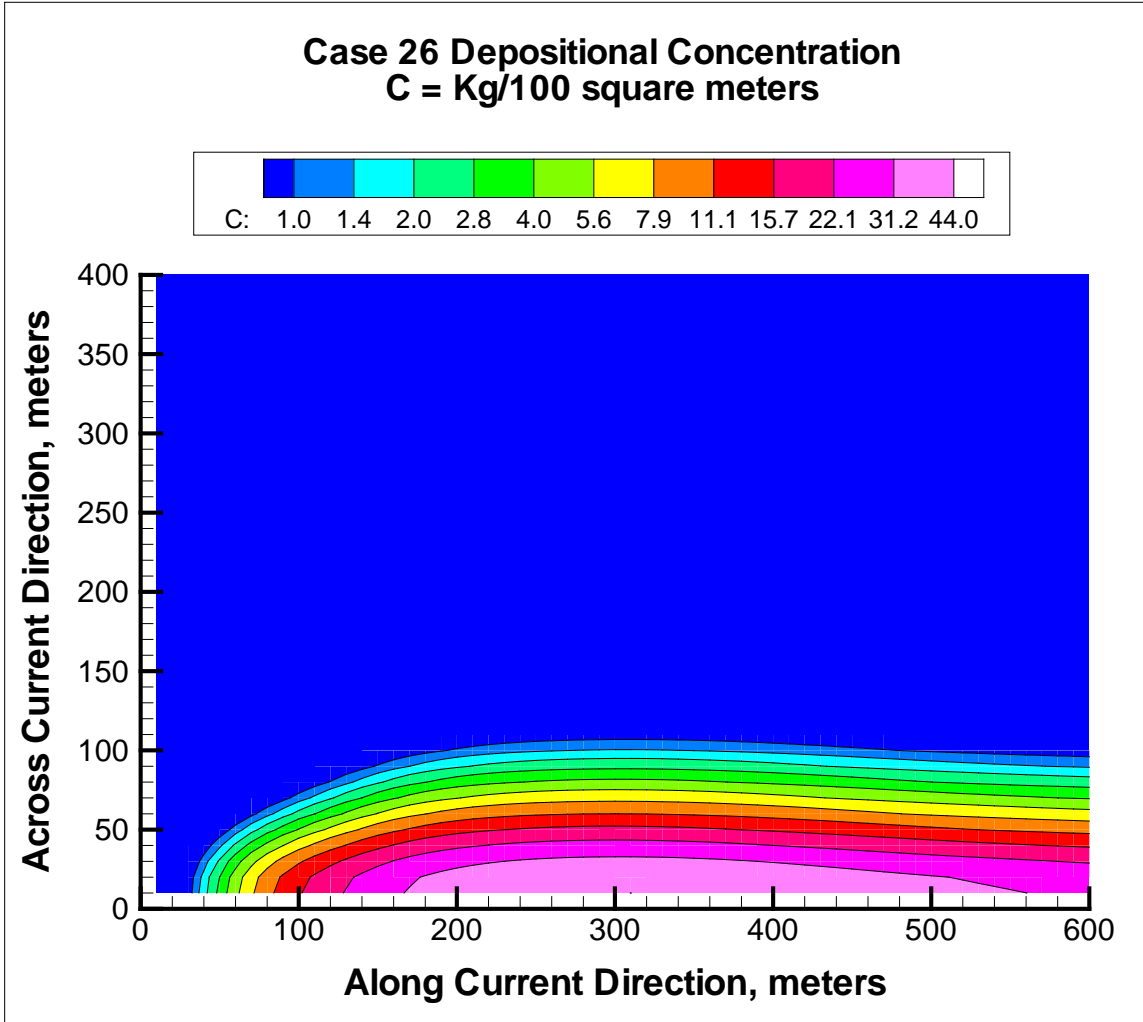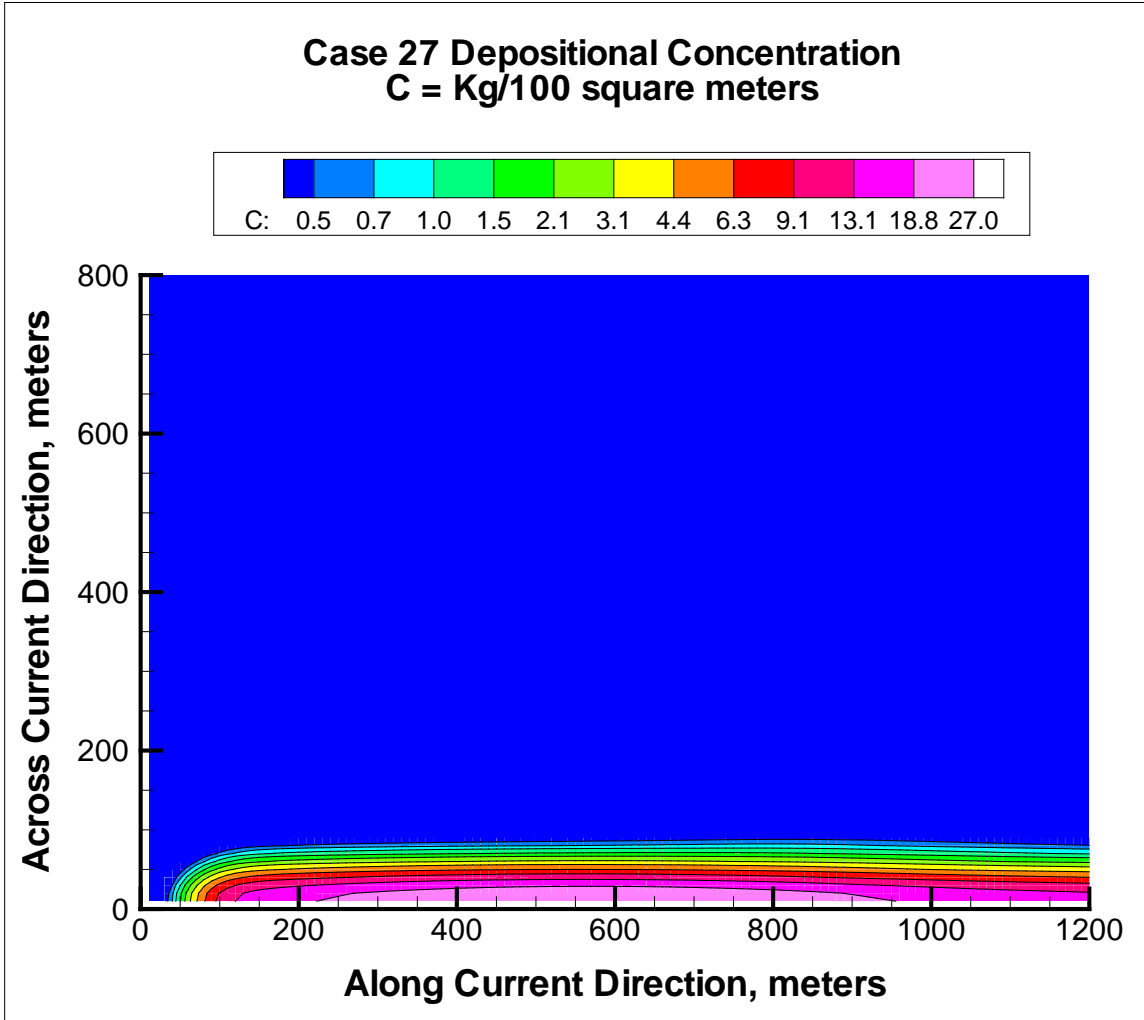Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)**

**Case 10 Depositional Concentration
C = Kg/100 square meters**

C: 1.0 1.4 1.9 2.7 3.8 5.2 7.3 10.1 14.1 19.6 27.3 38.0

CASE-11 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Case 11 Depositional Concentration
C = Kg/100 square meters
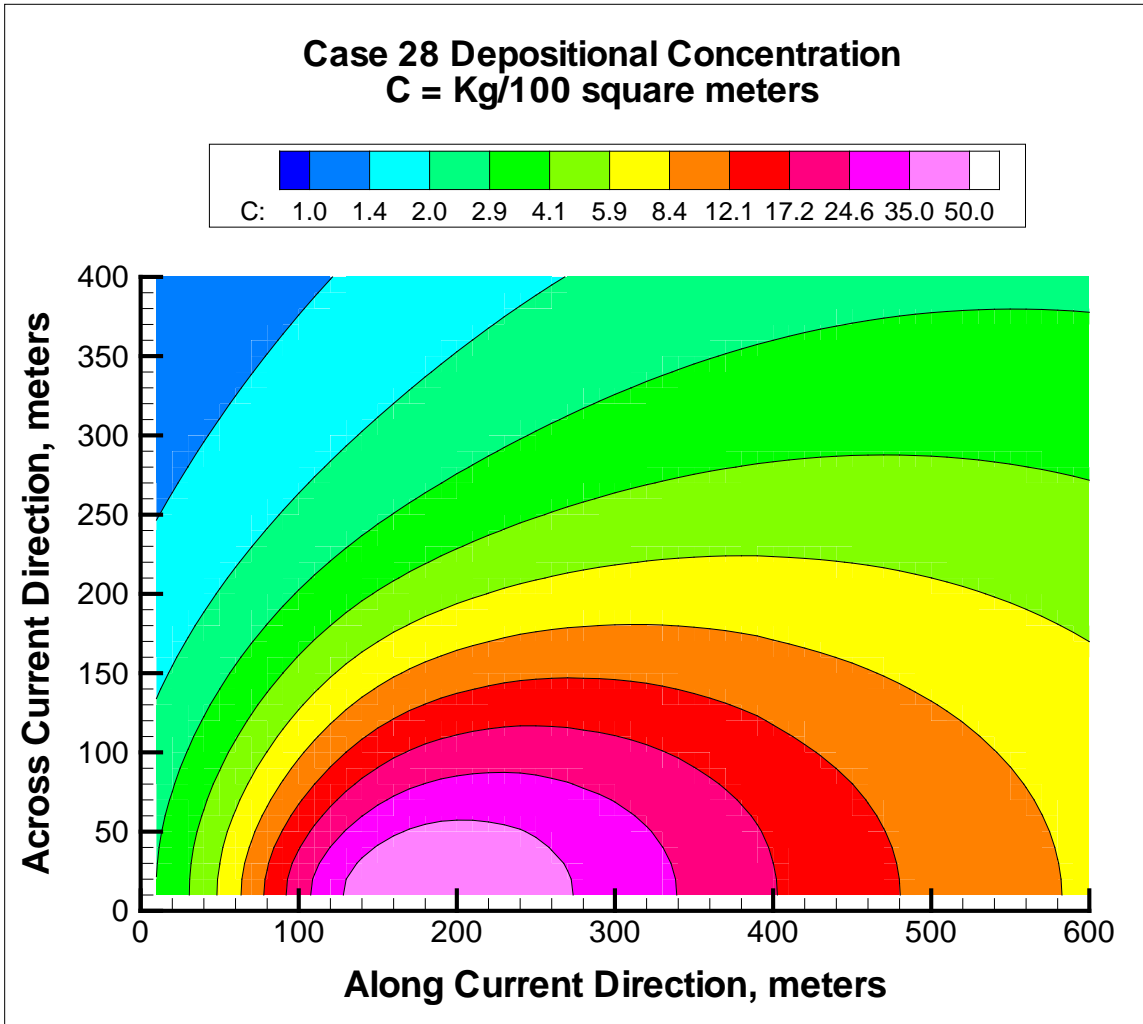
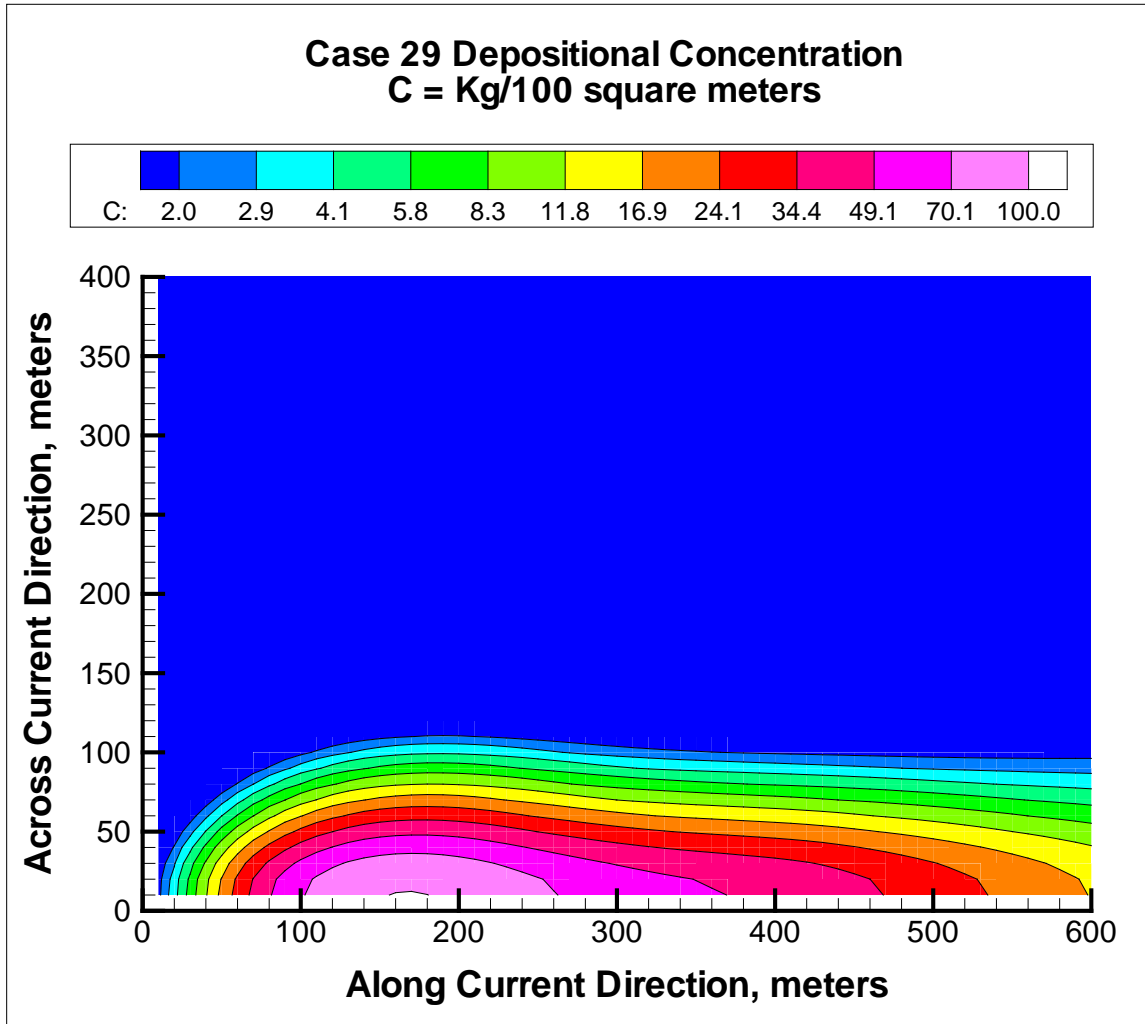C: 1.0 1.4 1.8 2.5 3.4 4.6 6.3 8.5 11.6 15.7 21.4 29.0

CASE-12 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 250 bbl/hr)

Case 12 Depositional Concentration
C = Kg/100 square meters

C: 2.0   2.9   4.1   5.8   8.3   11.8   16.9   24.1   34.4   49.1   70.1   100.0

CASE-13 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
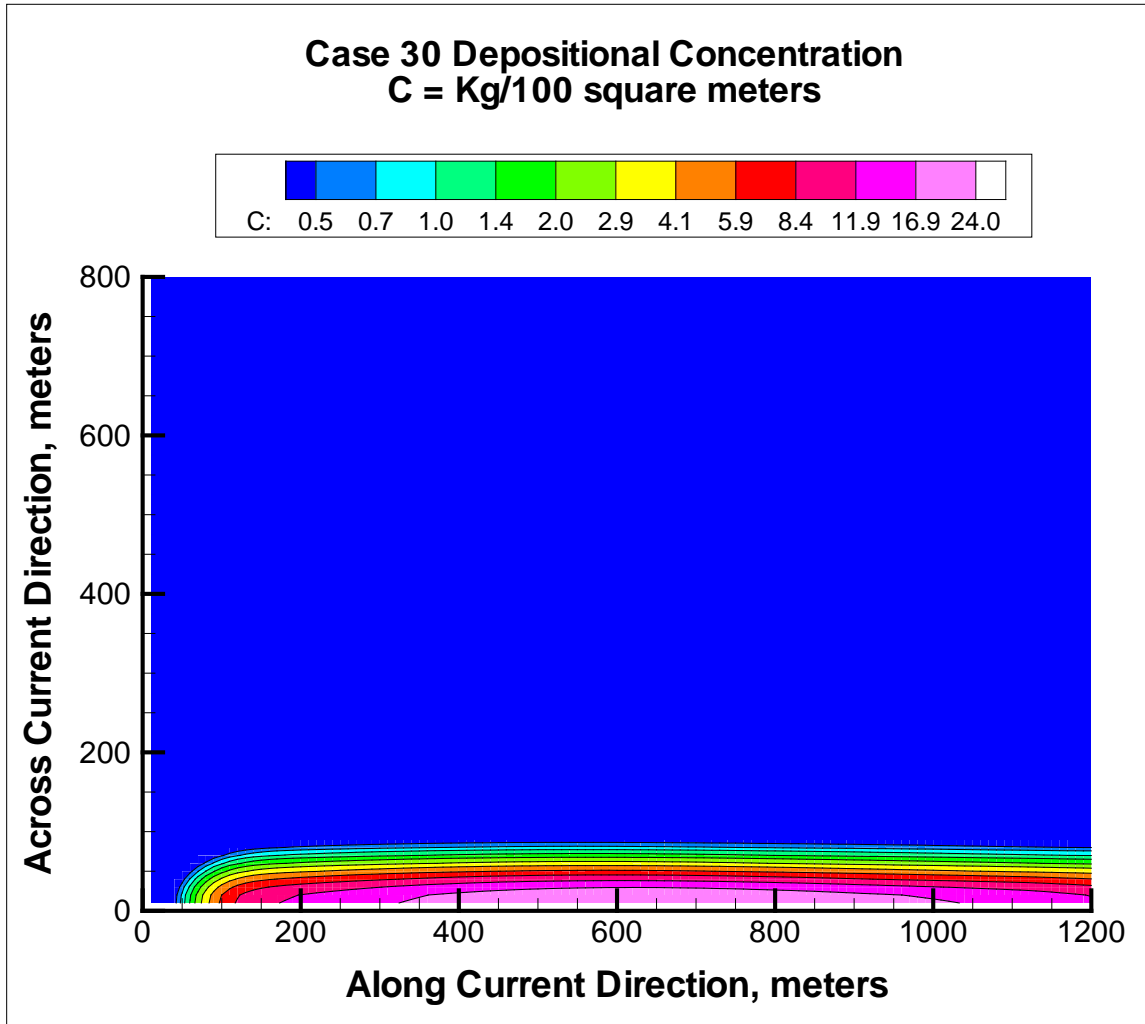**Discharge (Depth= 38.3 m, Rate= 250 bbl/hr)**

Case 13 Depositional Concentration
C = Kg/100 square meters

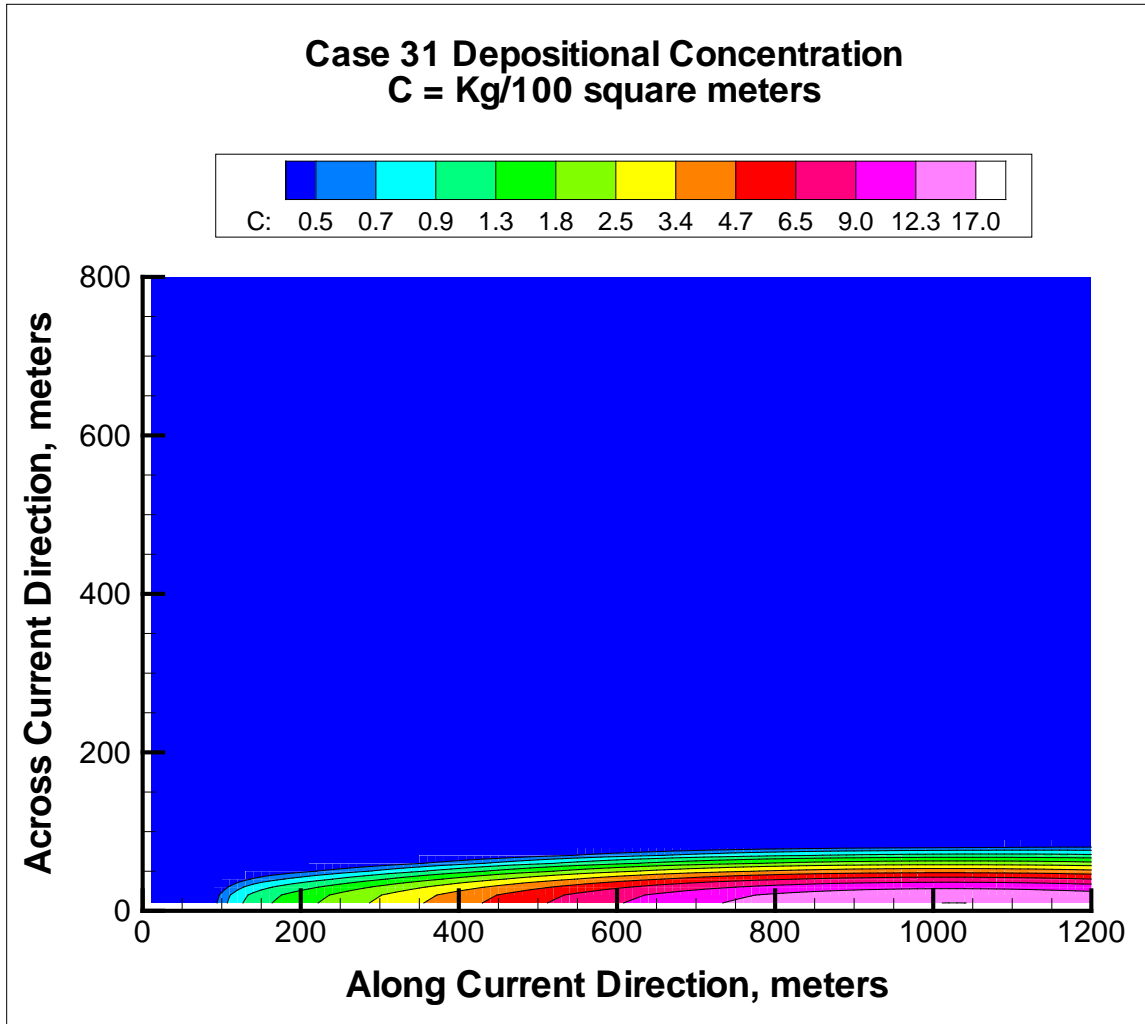C: 2.0 2.9 4.3 6.4 9.4 13.8 20.3 29.9 43.9 64.7 95.1 140.0

CASE-14 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 250 bbl/hr)

Case 14 Depositional Concentration
C = Kg/100 square meters

CASE-15 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
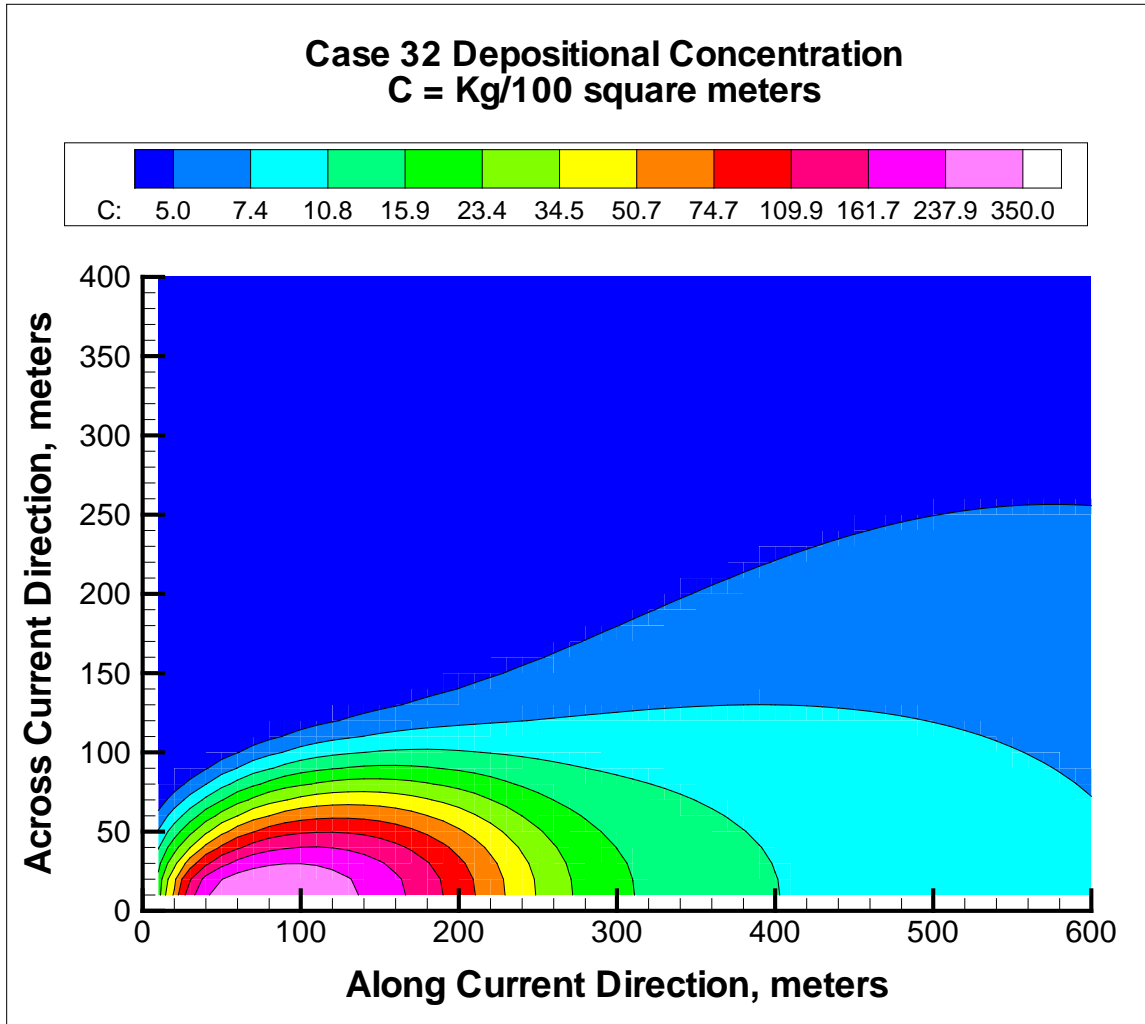**Discharge (Depth= 38.3 m, Rate= 250 bbl/hr)**

Case 15 Depositional Concentration
C = Kg/100 square meters

C: 1.0 1.5 2.2 3.2 4.6 6.8 10.0 14.7 21.5 31.6 46.3 68.0

CASE-16 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 2 cm/sec)
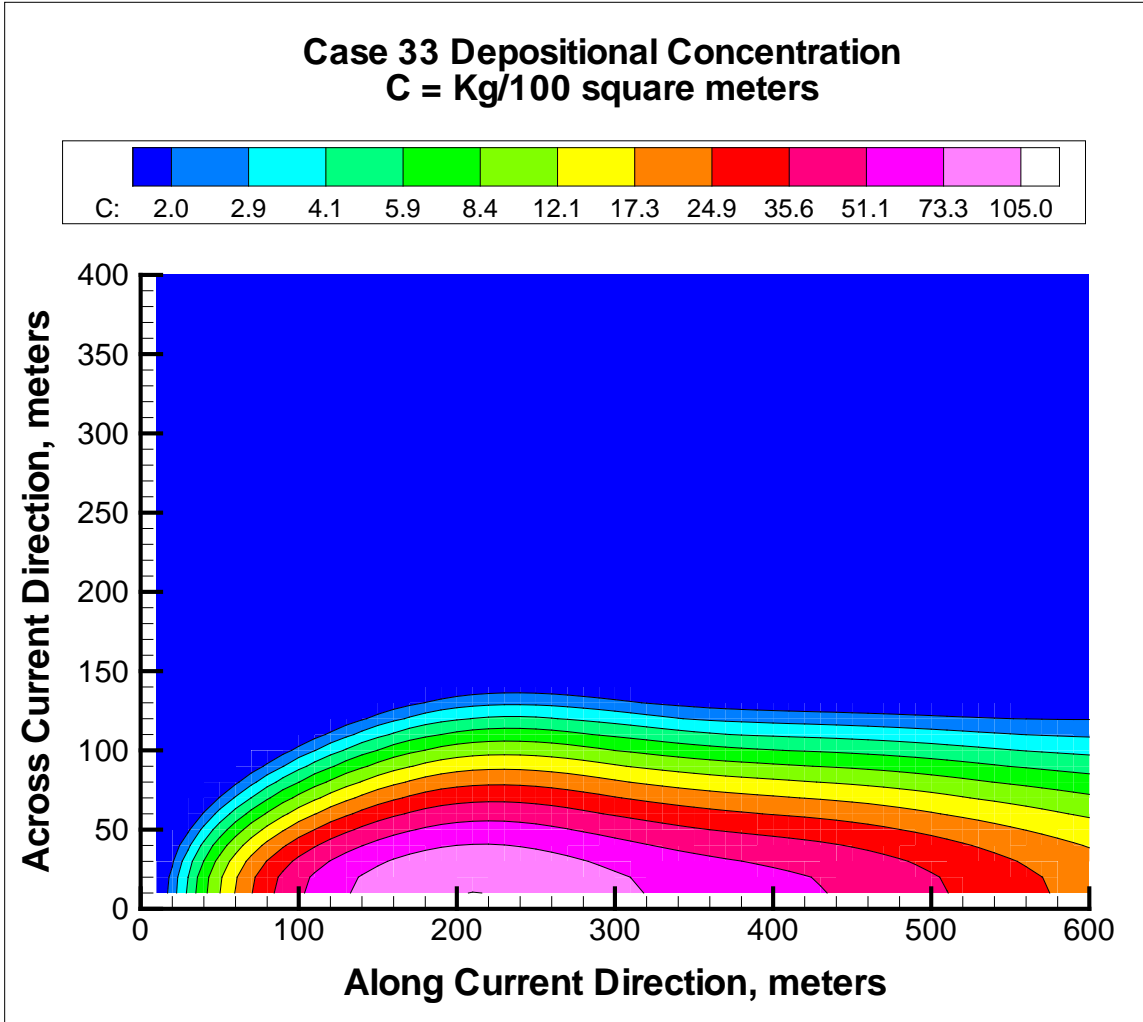**Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)**

Case 16 Depositional Concentration
C = Kg/100 square meters

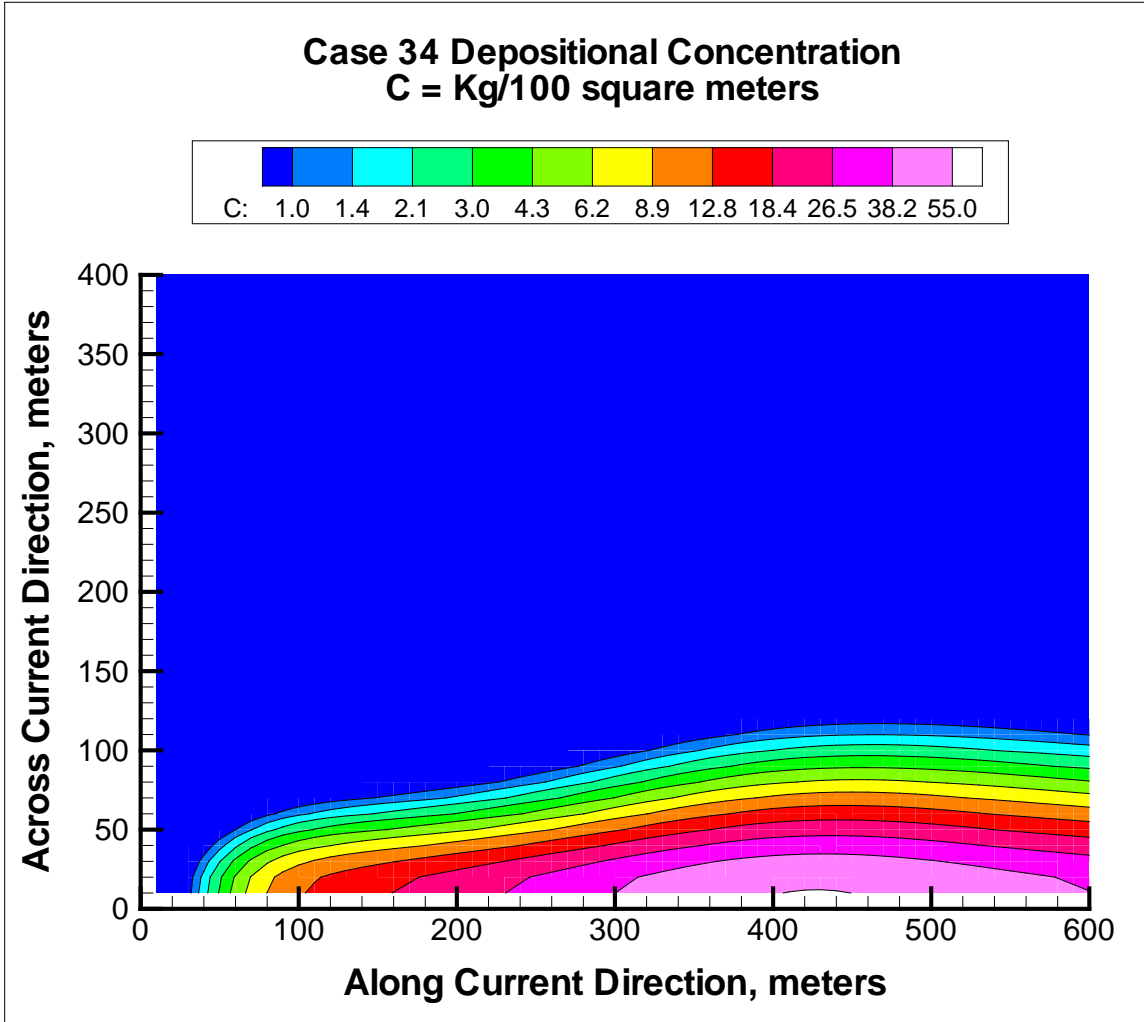C: 6.0 9.5 15.1 23.9 38.0 60.3 95.6 151.6 240.5 381.5 605.2 960.0

CASE-17 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

Case 17 Depositional Concentration
C = Kg/100 square meters

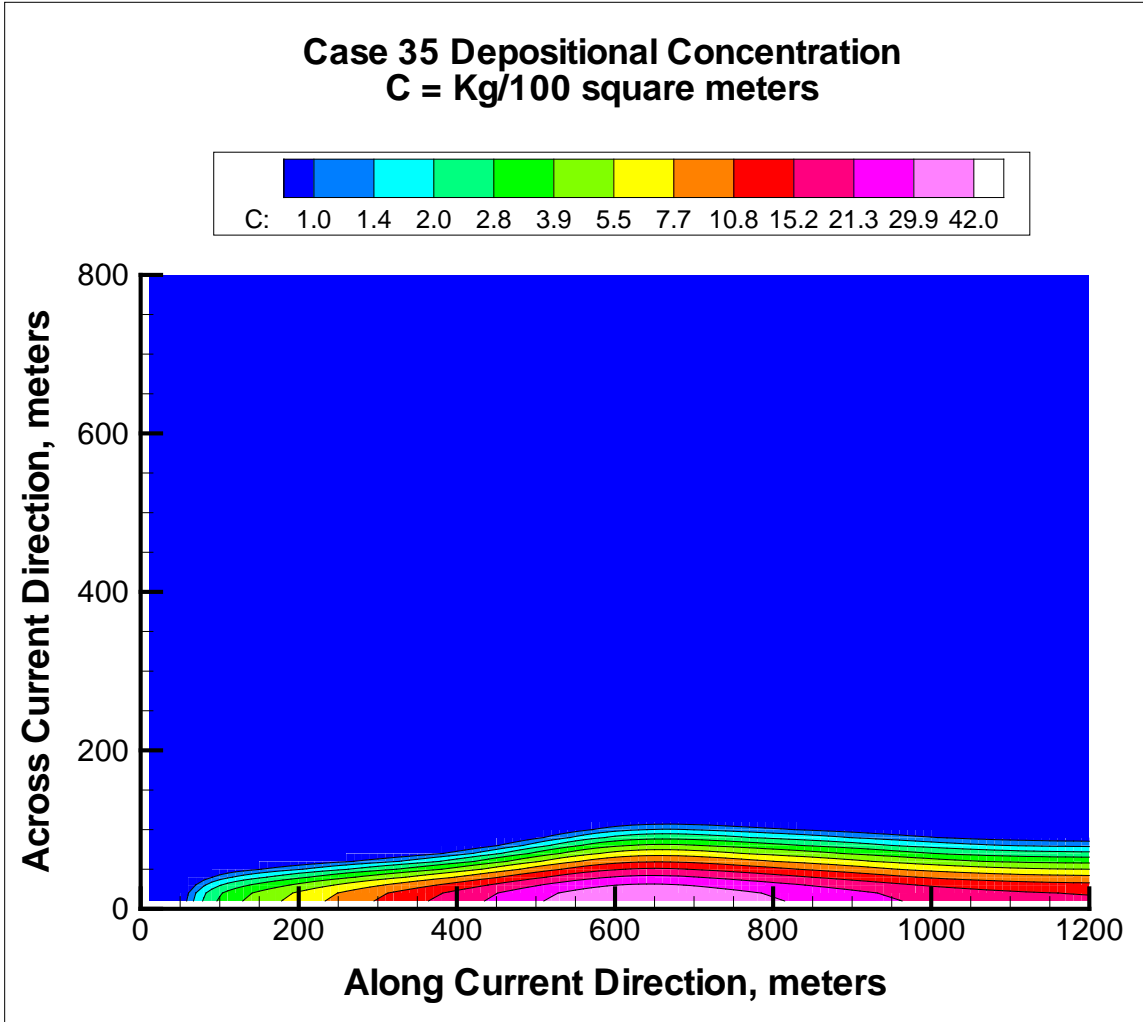C: 5.0 7.2 10.5 15.1 21.9 31.7 45.8 66.2 95.8 138.6 200.5 290.0

CASE-18 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

Case 18 Depositional Concentration
C = Kg/100 square meters

C: 4.0   5.7   8.0   11.3   16.0   22.6   31.9   45.1   63.7   90.1   127.3   180.0

CASE-19 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 40 cm/sec)
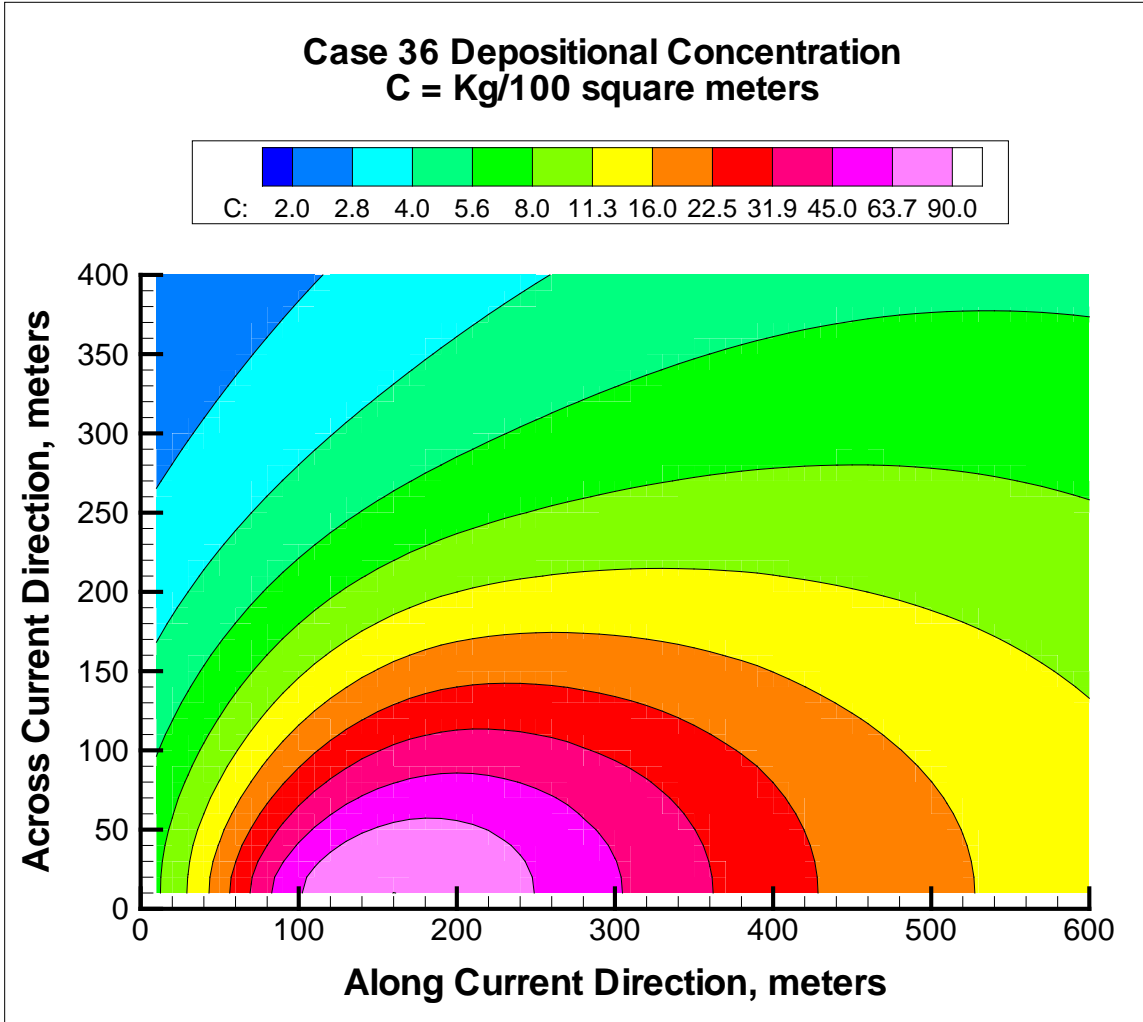**Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)**

Case 19 Depositional Concentration
C = Kg/100 square meters

C: 4.0 5.6 7.8 10.9 15.3 21.4 29.9 41.8 58.5 81.8 114.4 160.0

CASE-20 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 2 cm/sec)
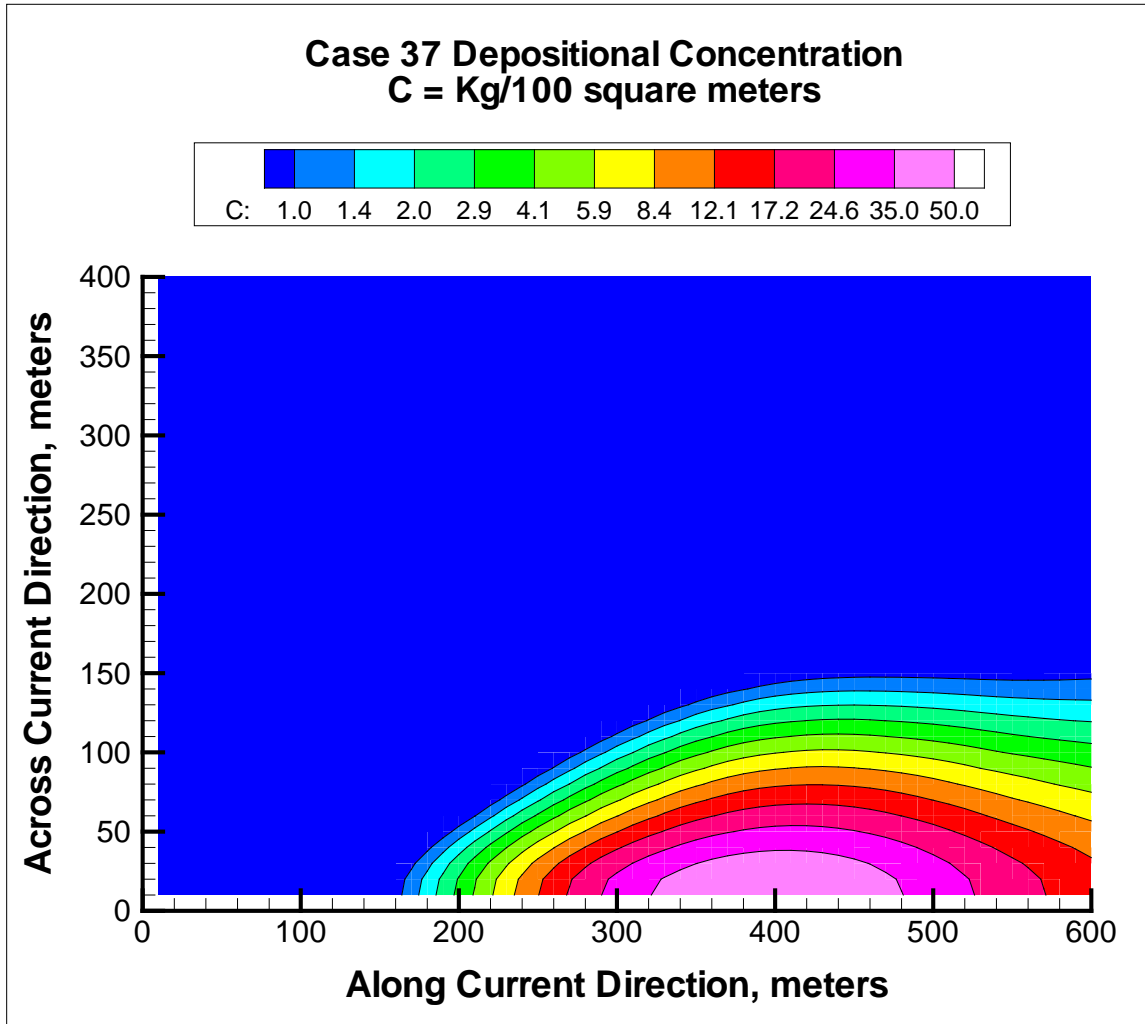### Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

Case 20 Depositional Concentration
C = Kg/100 square meters

C: 5.0 7.2 10.5 15.1 21.9 31.7 45.8 66.2 95.8 138.6 200.5 290.0

CASE-21 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 10 cm/sec)
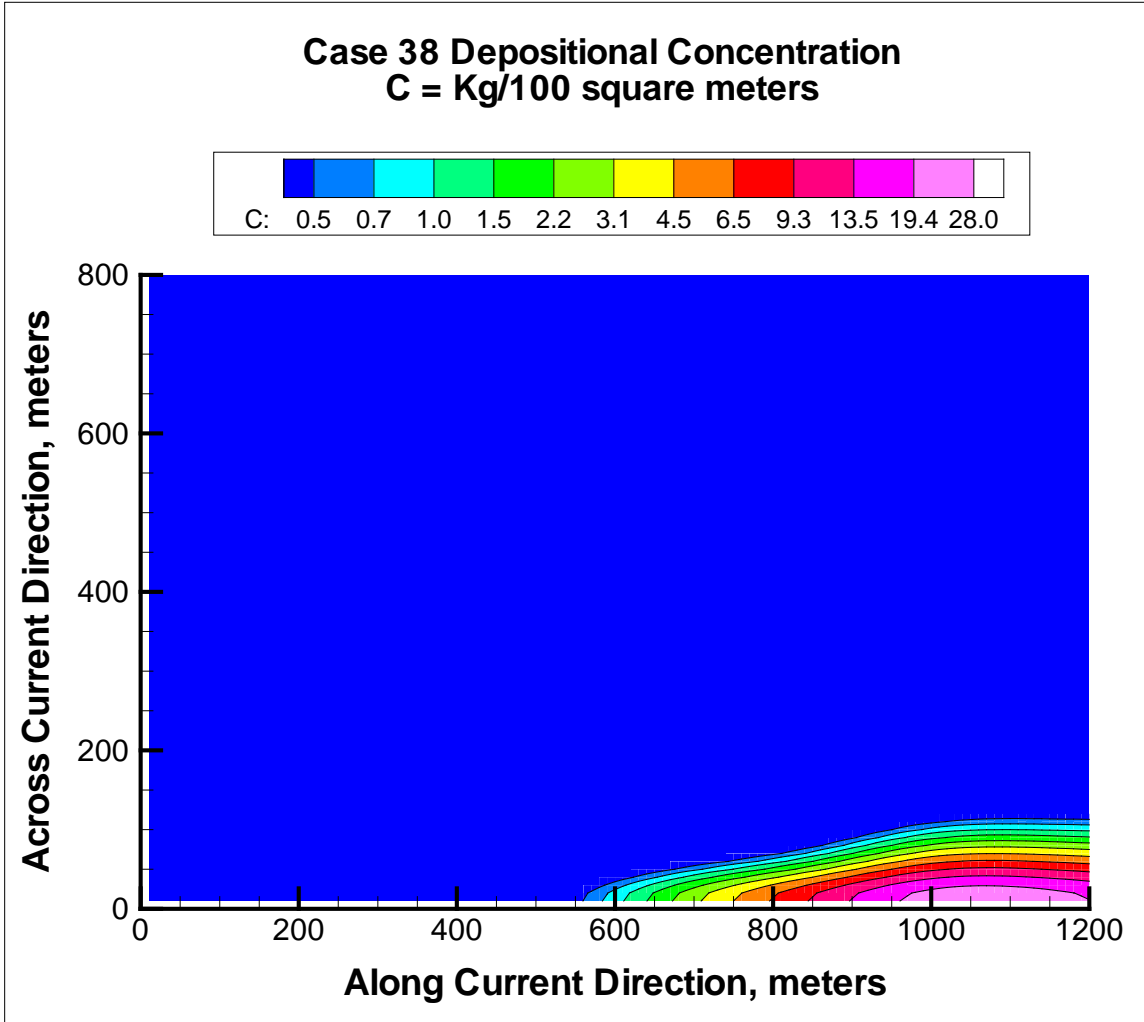## Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

Case 21 Depositional Concentration
C = Kg/100 square meters

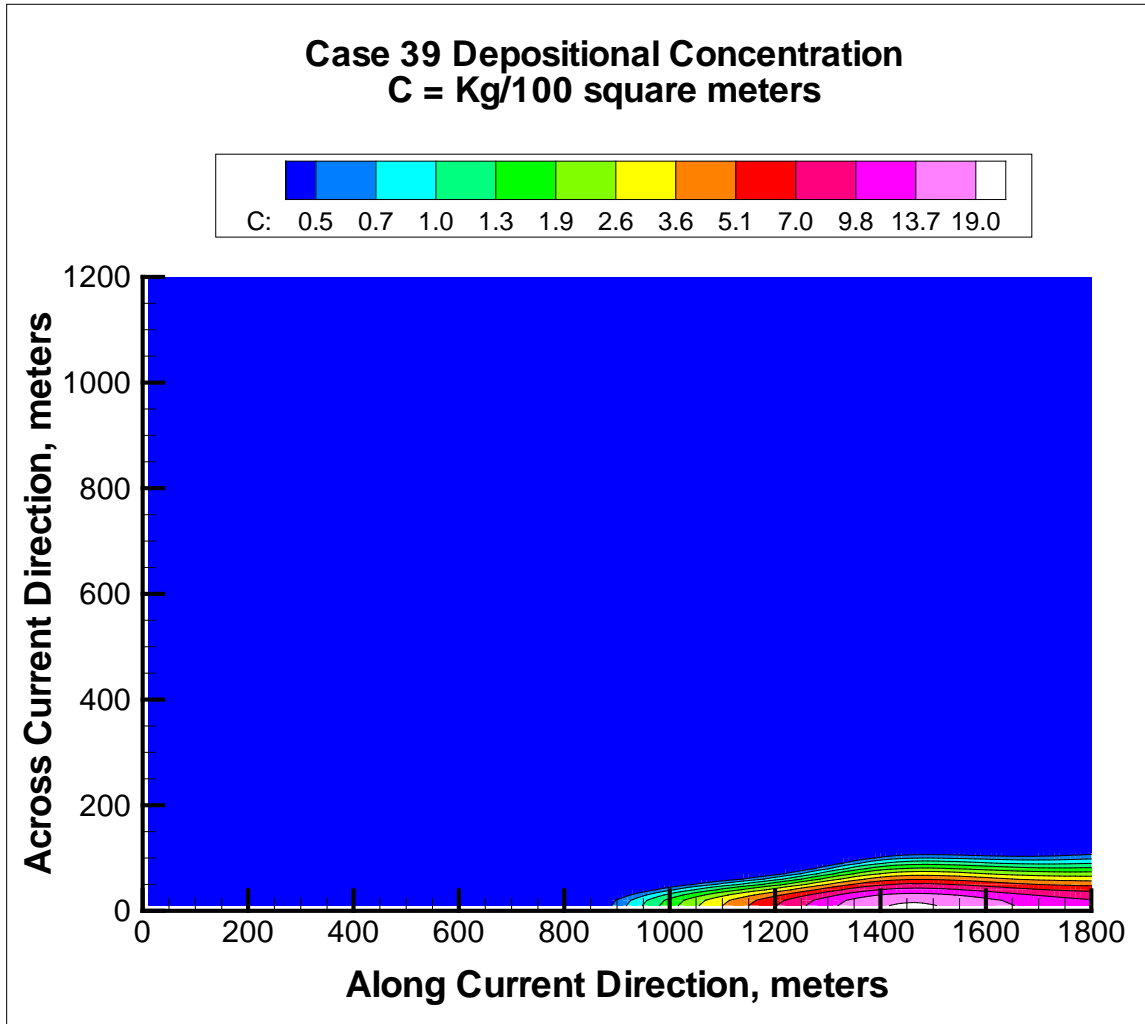C: 1.0 1.5 2.2 3.2 4.8 7.1 10.5 15.5 22.9 33.8 50.0 74.0

CASE-22 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

Case 22 Depositional Concentration
C = Kg/100 square meters

C: 1.0 1.4 1.9 2.7 3.7 5.1 7.1 9.8 13.5 18.8 26.0 36.0

CASE-23 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 40 cm/sec)
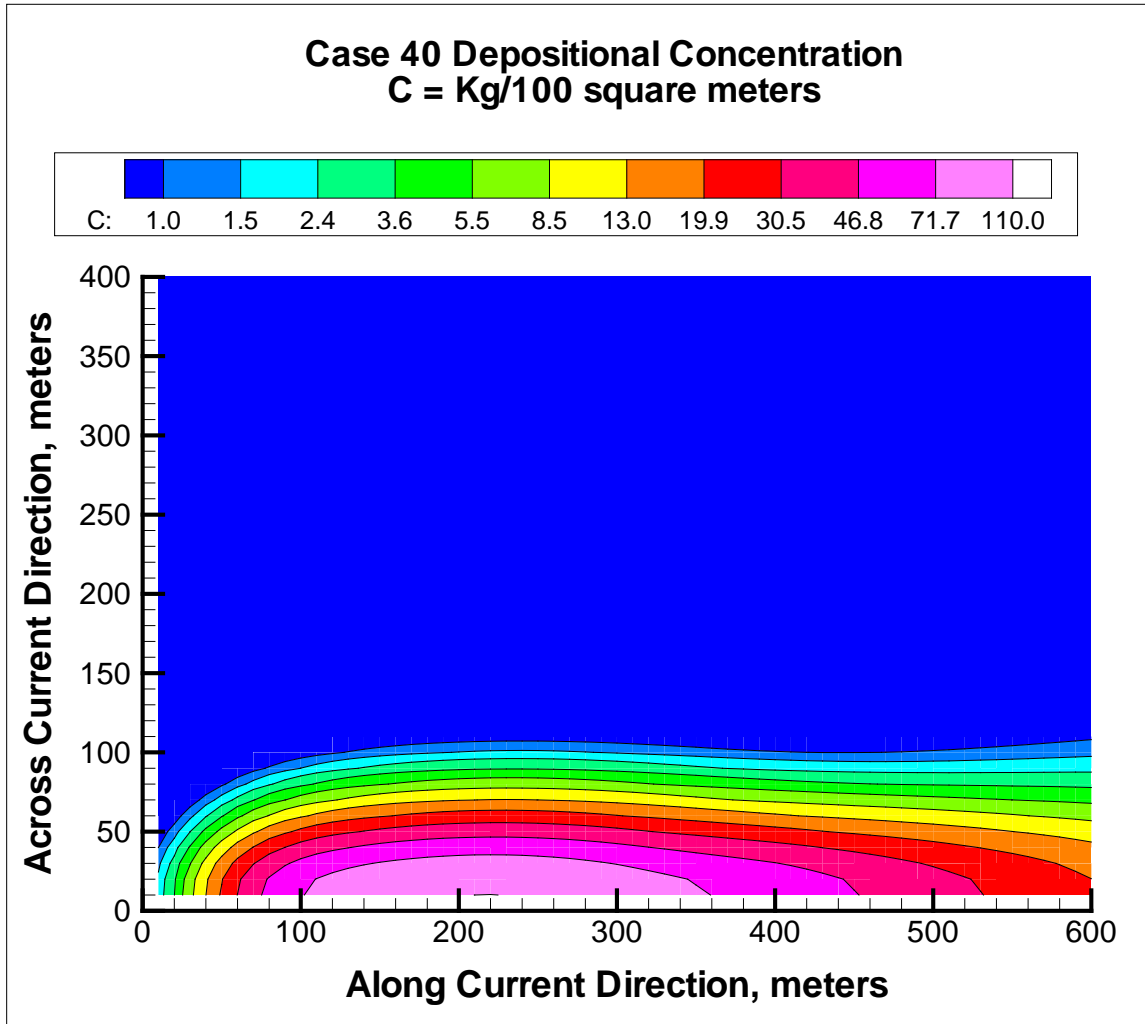### Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

Case 23 Depositional Concentration
C = Kg/100 square meters

C: 0.5 0.7 1.0 1.5 2.2 3.1 4.5 6.5 9.3 13.5 19.4 28.0

CASE-24 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
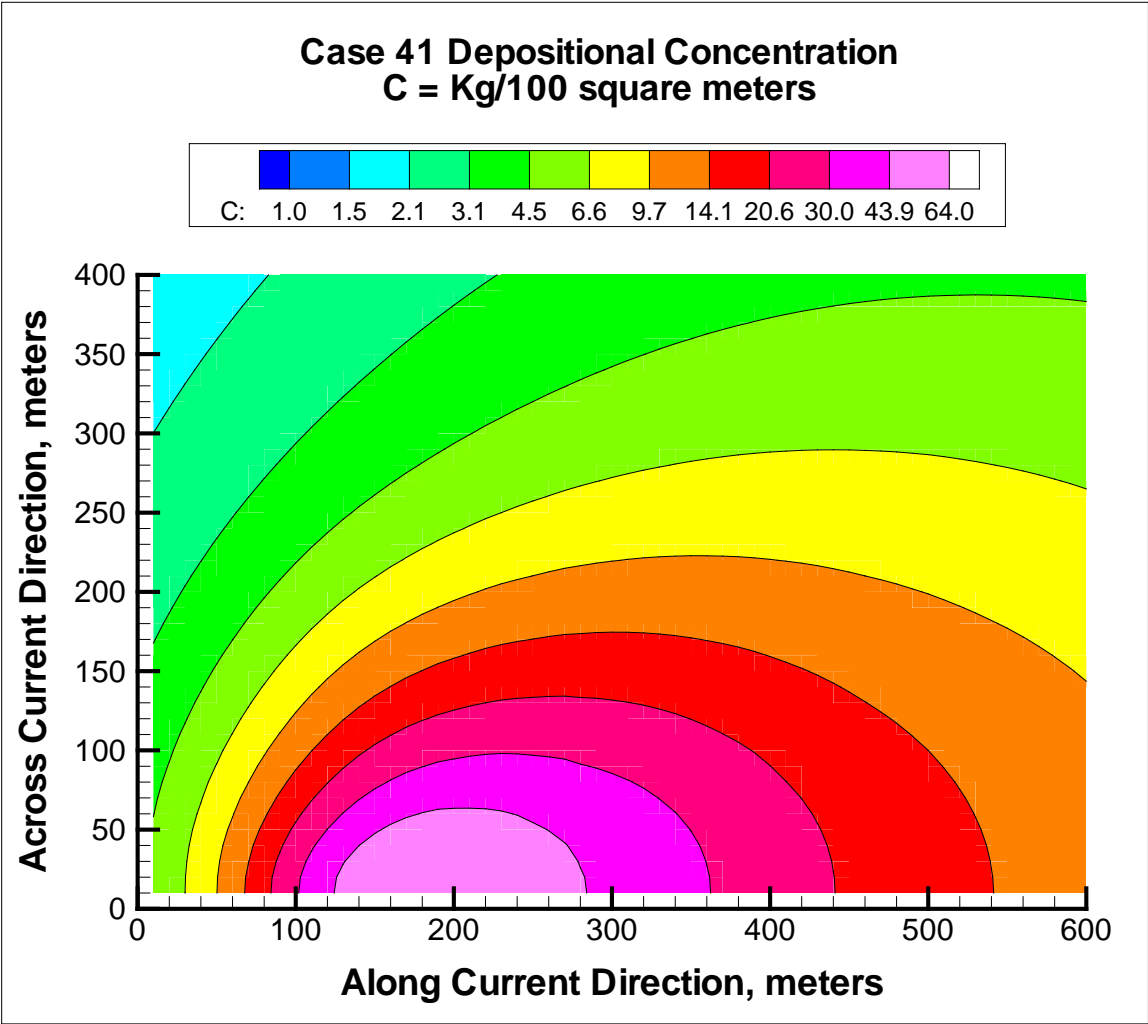**Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)**

Case 24 Depositional Concentration
C = Kg/100 square meters

C: 2.0 2.8 3.8 5.3 7.3 10.1 13.9 19.2 26.5 36.7 50.7 70.0

Along Current Direction, meters

Across Current Direction, meters

CASE-25 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
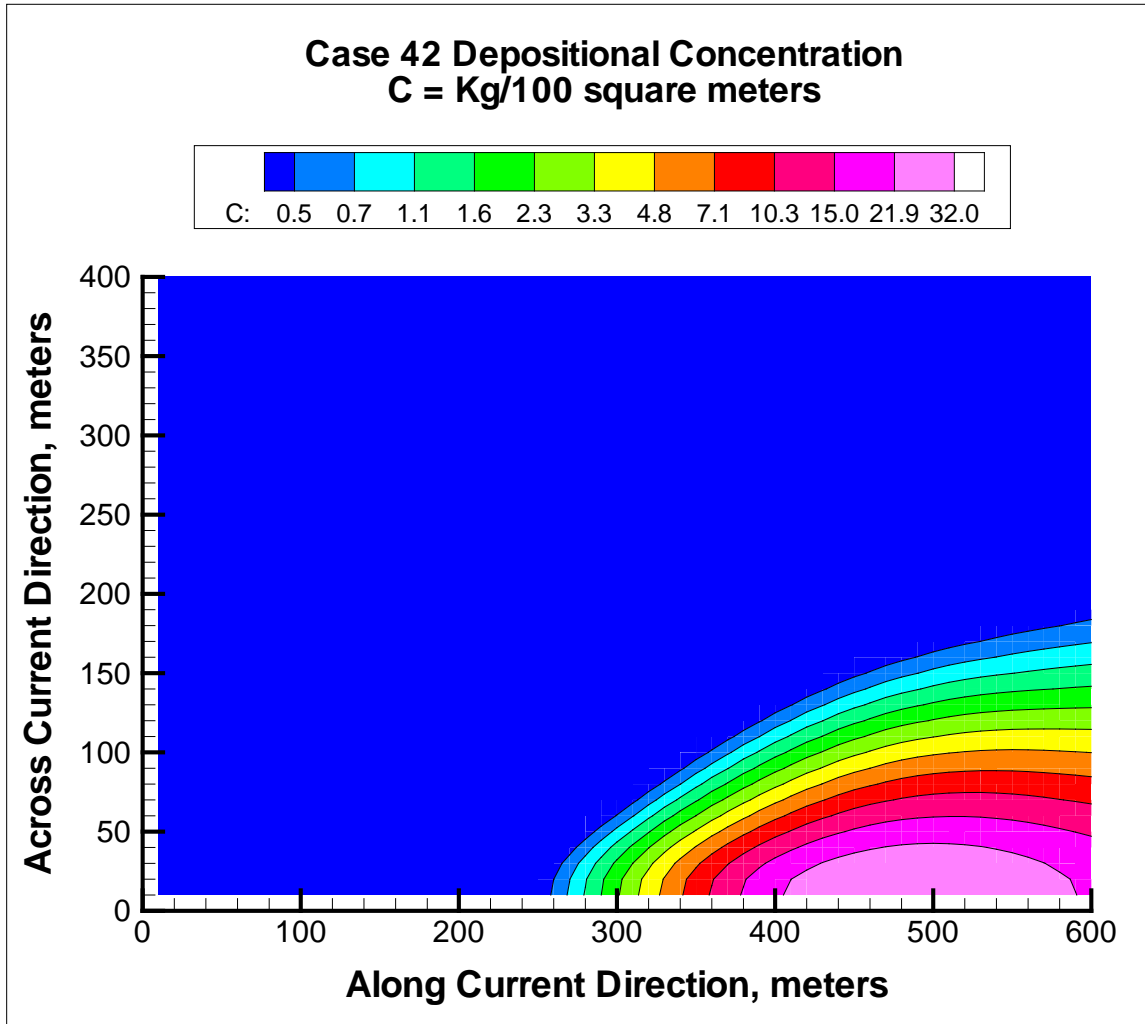**Discharge (Depth= 35.3 m, Rate= 500 bbl/hr)**

Case 25 Depositional Concentration
C = Kg/100 square meters

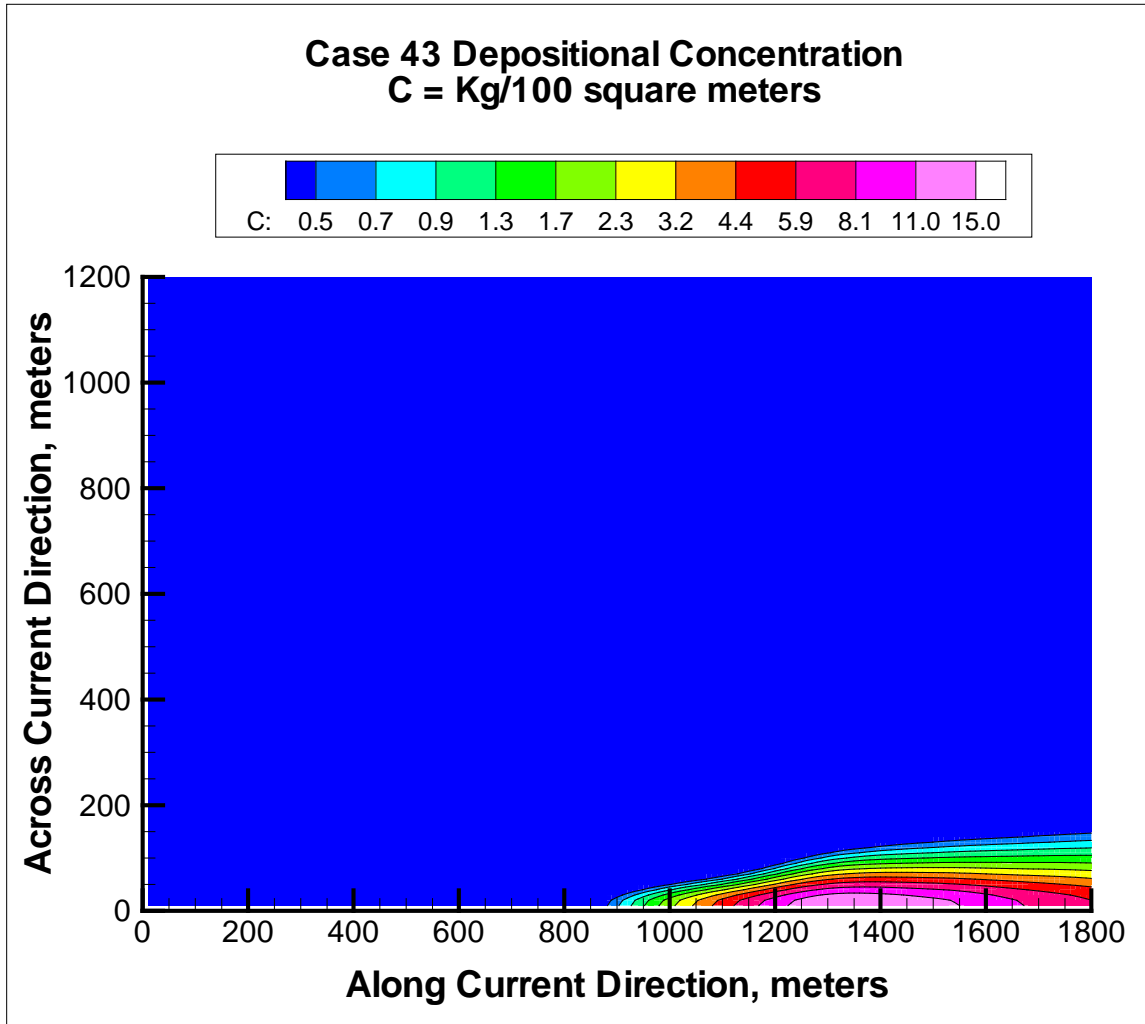C: 3.0 4.3 6.1 8.7 12.4 17.8 25.3 36.2 51.6 73.7 105.1 150.0

CASE-26 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 30 cm/sec)
Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)

Case 26 Depositional Concentration
C = Kg/100 square meters

C: 1.0 1.4 2.0 2.8 4.0 5.6 7.9 11.1 15.7 22.1 31.2 44.0

CASE-27 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 40 cm/sec)
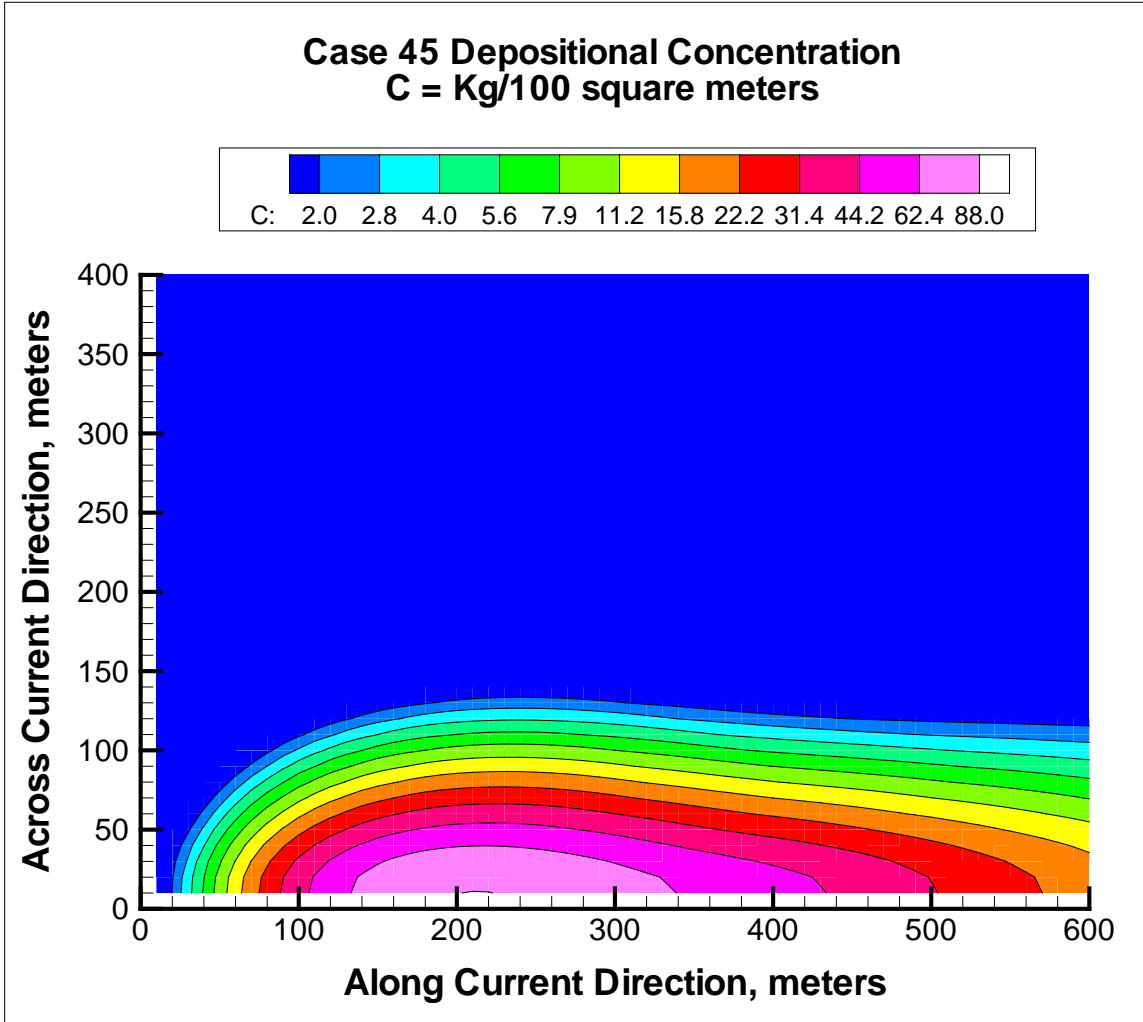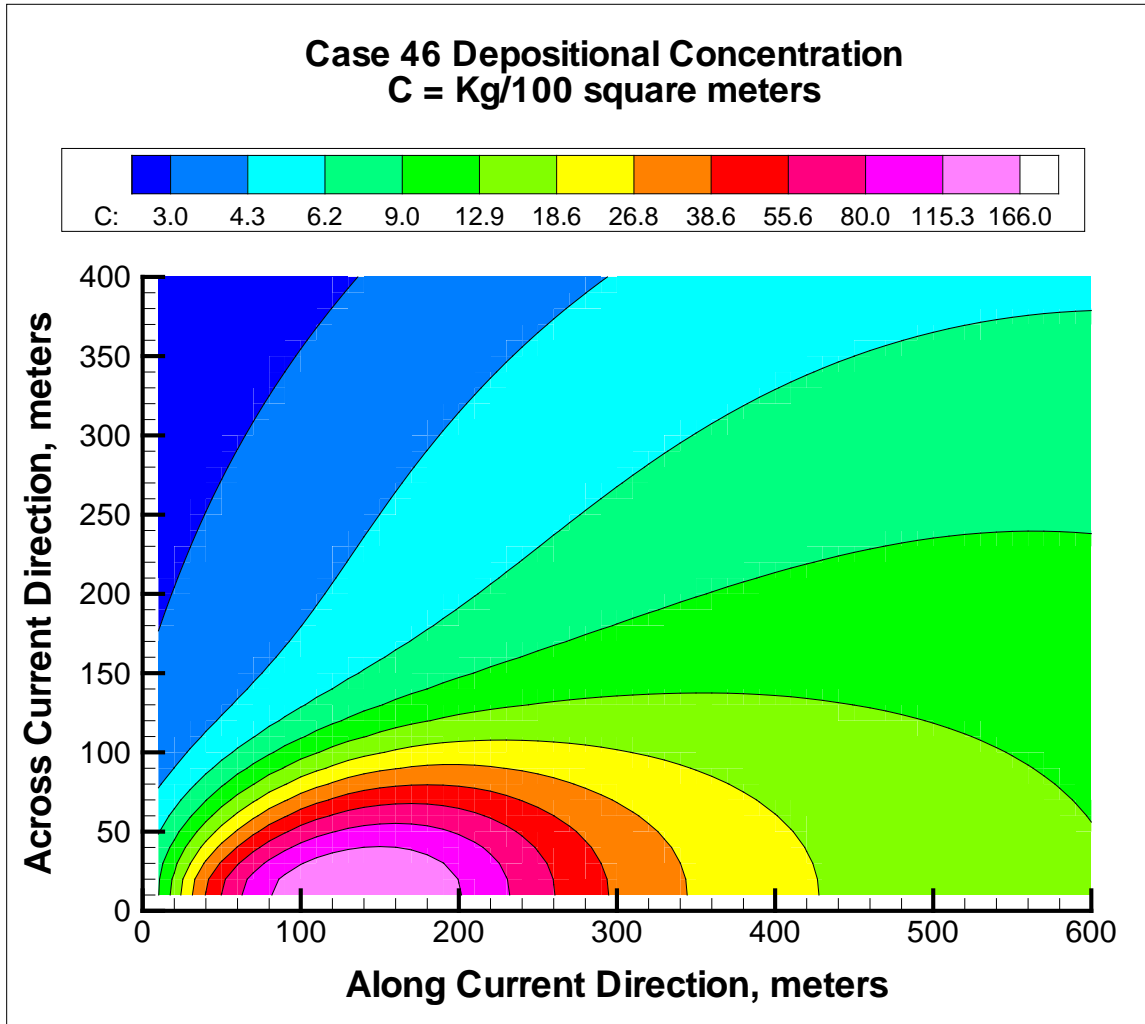Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)

CASE-28 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

Case 28 Depositional Concentration
C = Kg/100 square meters

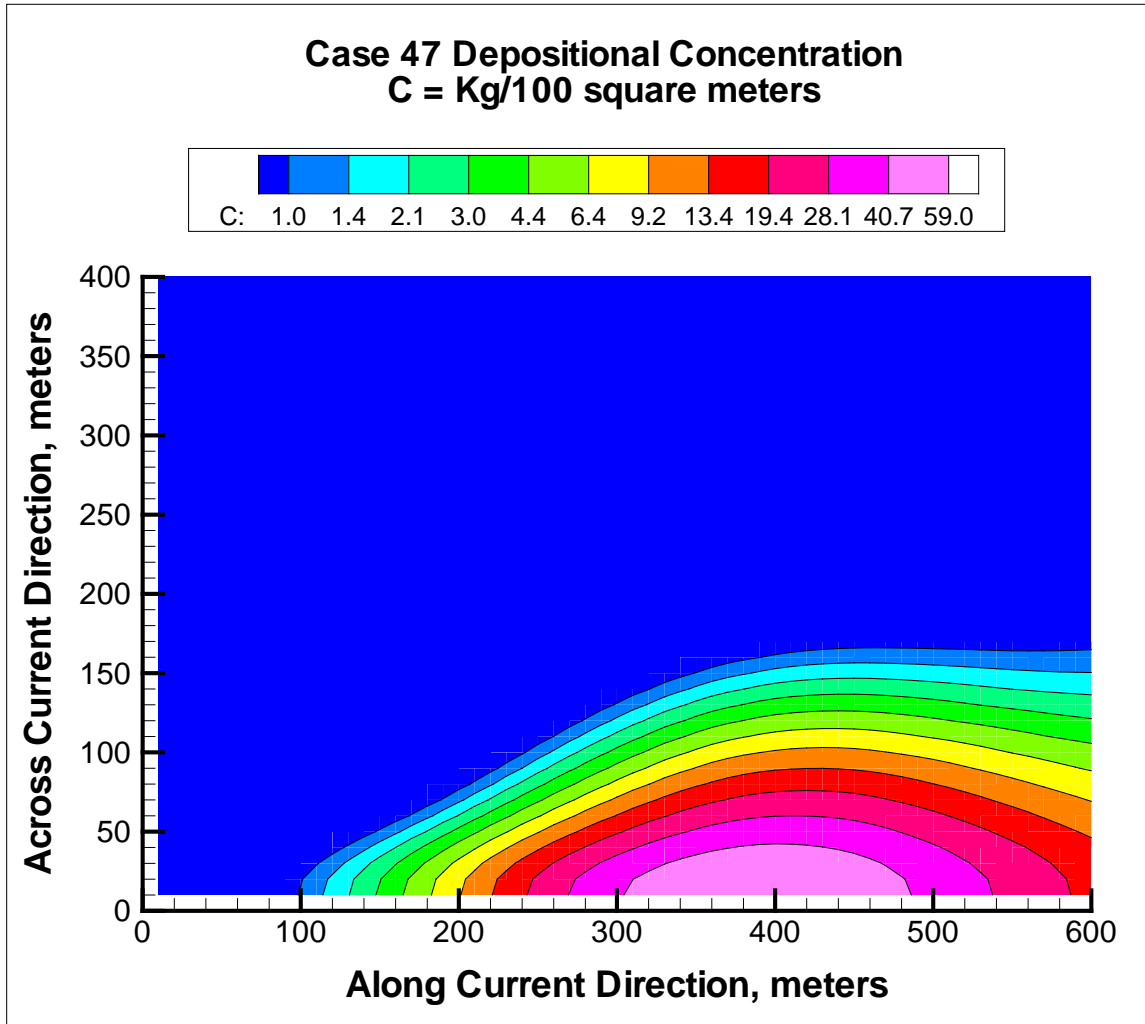C: 1.0 1.4 2.0 2.9 4.1 5.9 8.4 12.1 17.2 24.6 35.0 50.0

CASE-29 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 500 bbl/hr)

Case 29 Depositional Concentration
C = Kg/100 square meters

C: 2.0 2.9 4.1 5.8 8.3 11.8 16.9 24.1 34.4 49.1 70.1 100.0

CASE-30 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 30 cm/sec)
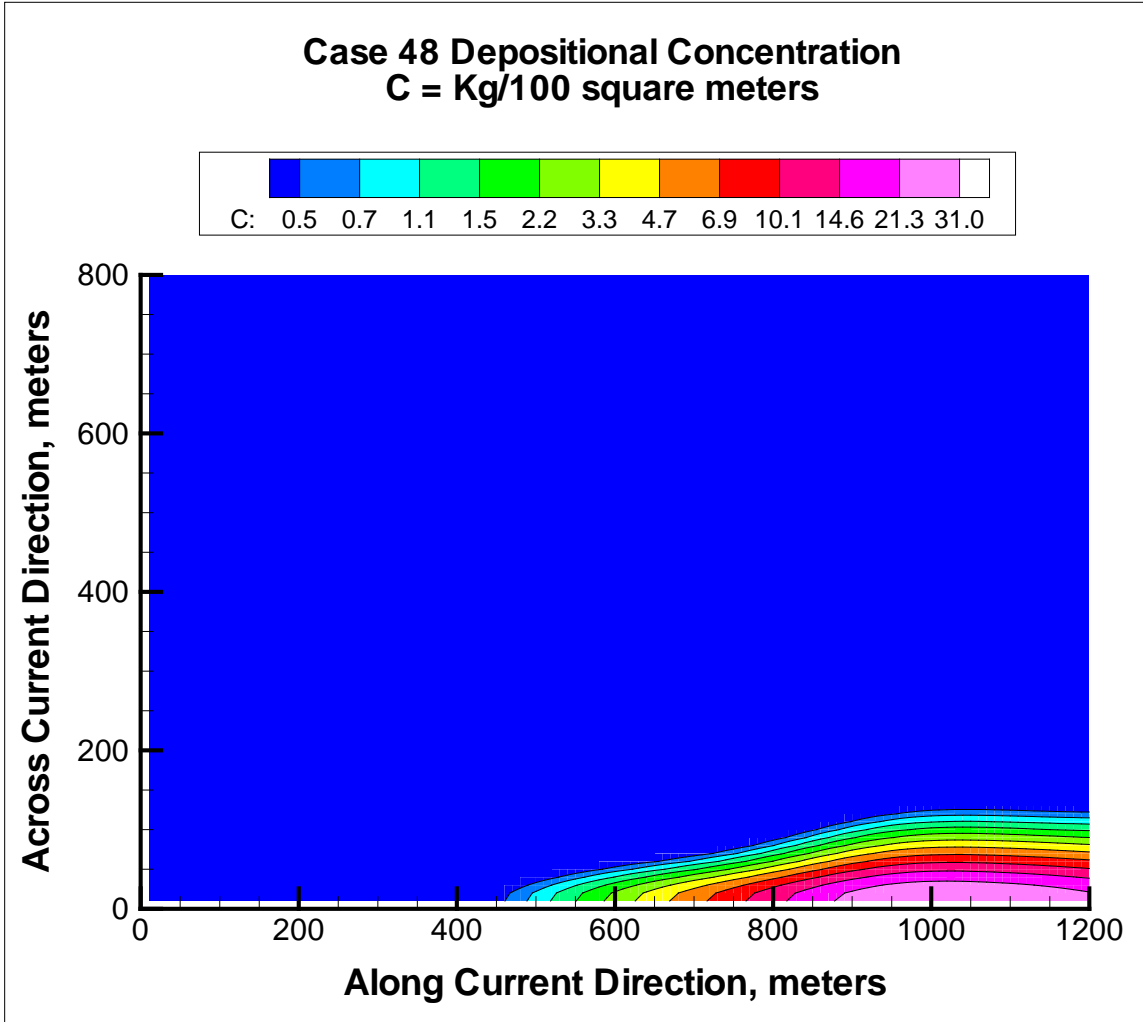**Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)**

Case 30 Depositional Concentration
C = Kg/100 square meters

C: 0.5 0.7 1.0 1.4 2.0 2.9 4.1 5.9 8.4 11.9 16.9 24.0

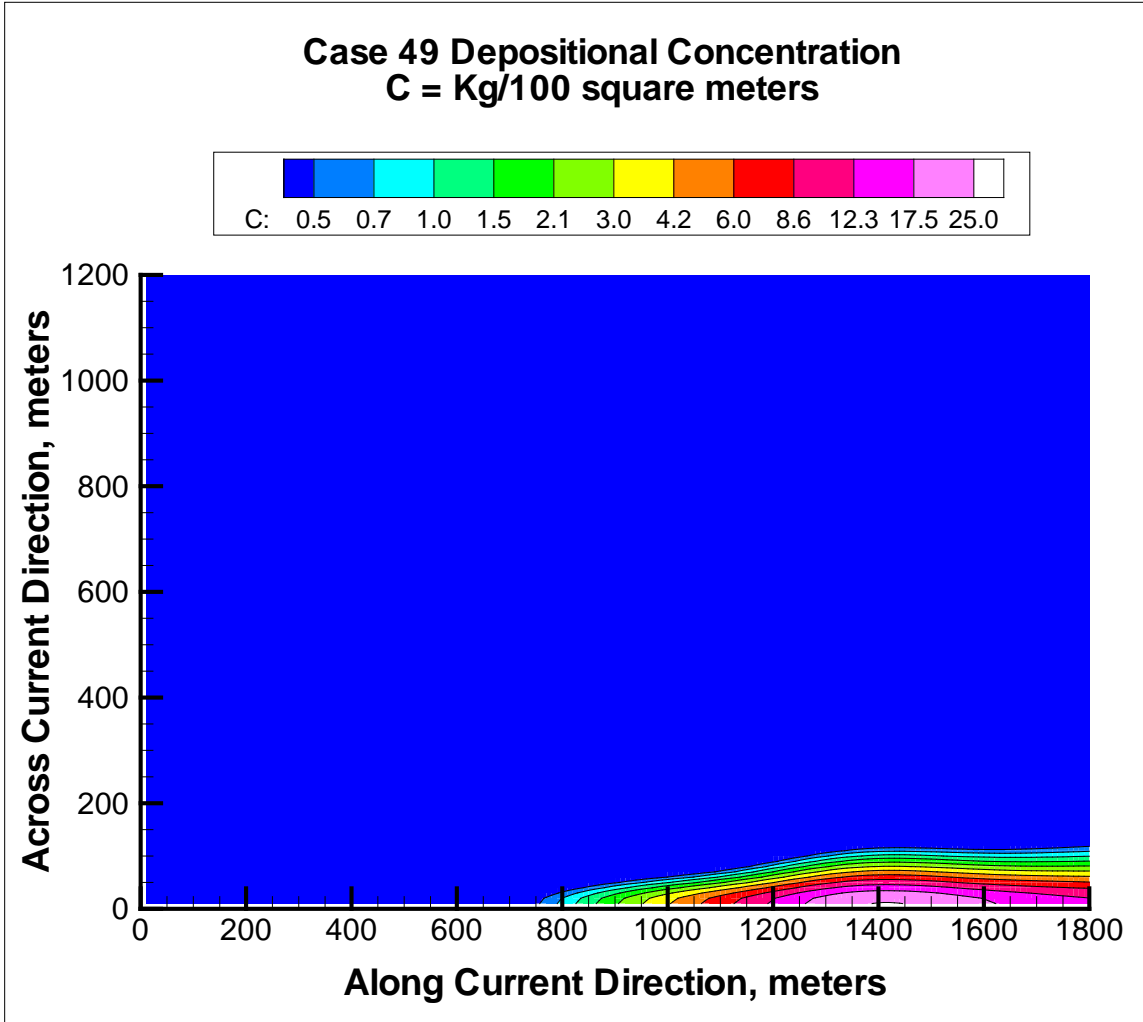Across Current Direction, meters

Along Current Direction, meters

CASE-31 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 40 cm/sec)
Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)

Case 31 Depositional Concentration
C = Kg/100 square meters

C: 0.5 0.7 0.9 1.3 1.8 2.5 3.4 4.7 6.5 9.0 12.3 17.0

CASE-32 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 2 cm/sec)
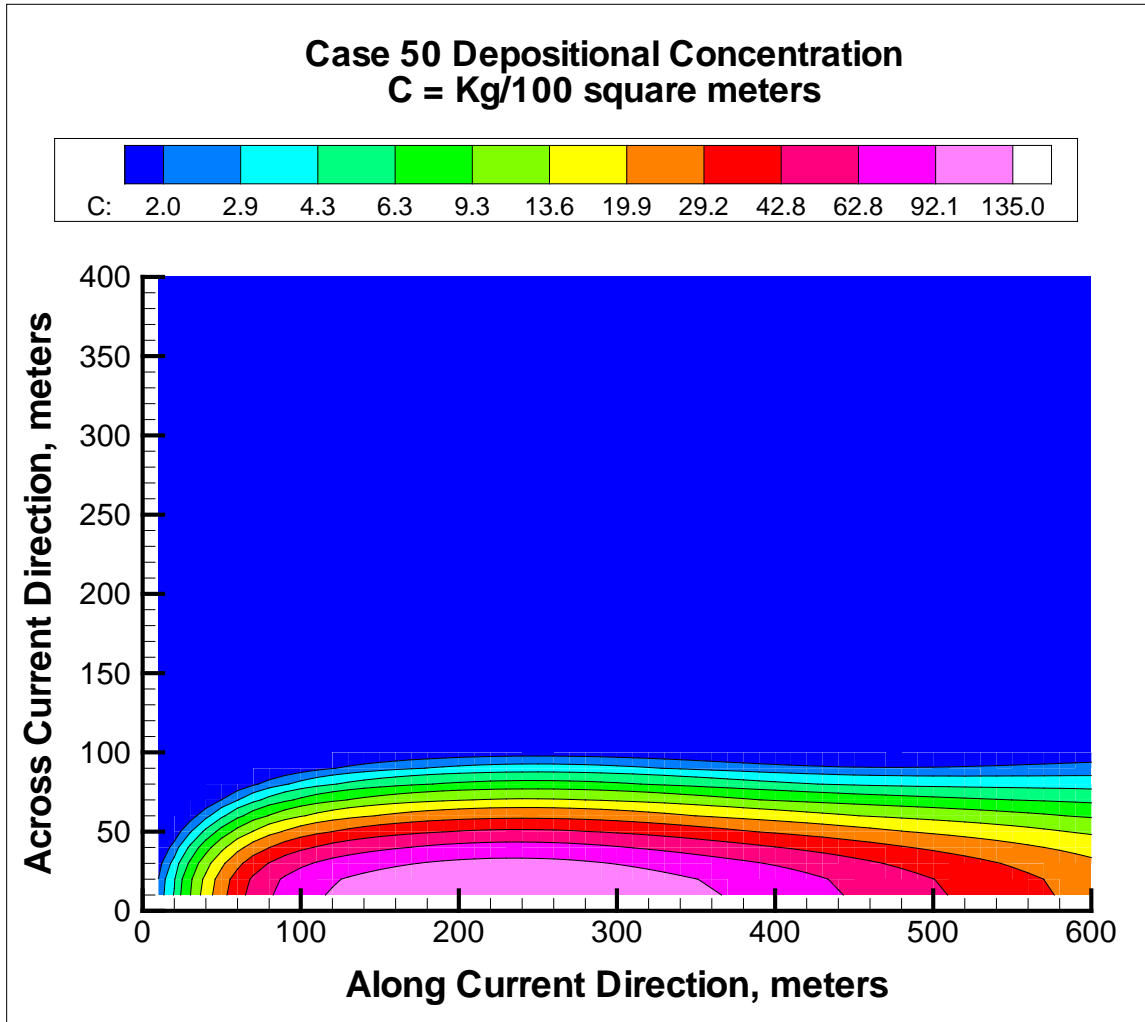**Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)**

Case 32 Depositional Concentration
C = Kg/100 square meters

C: 5.0   7.4   10.8   15.9   23.4   34.5   50.7   74.7   109.9   161.7   237.9   350.0
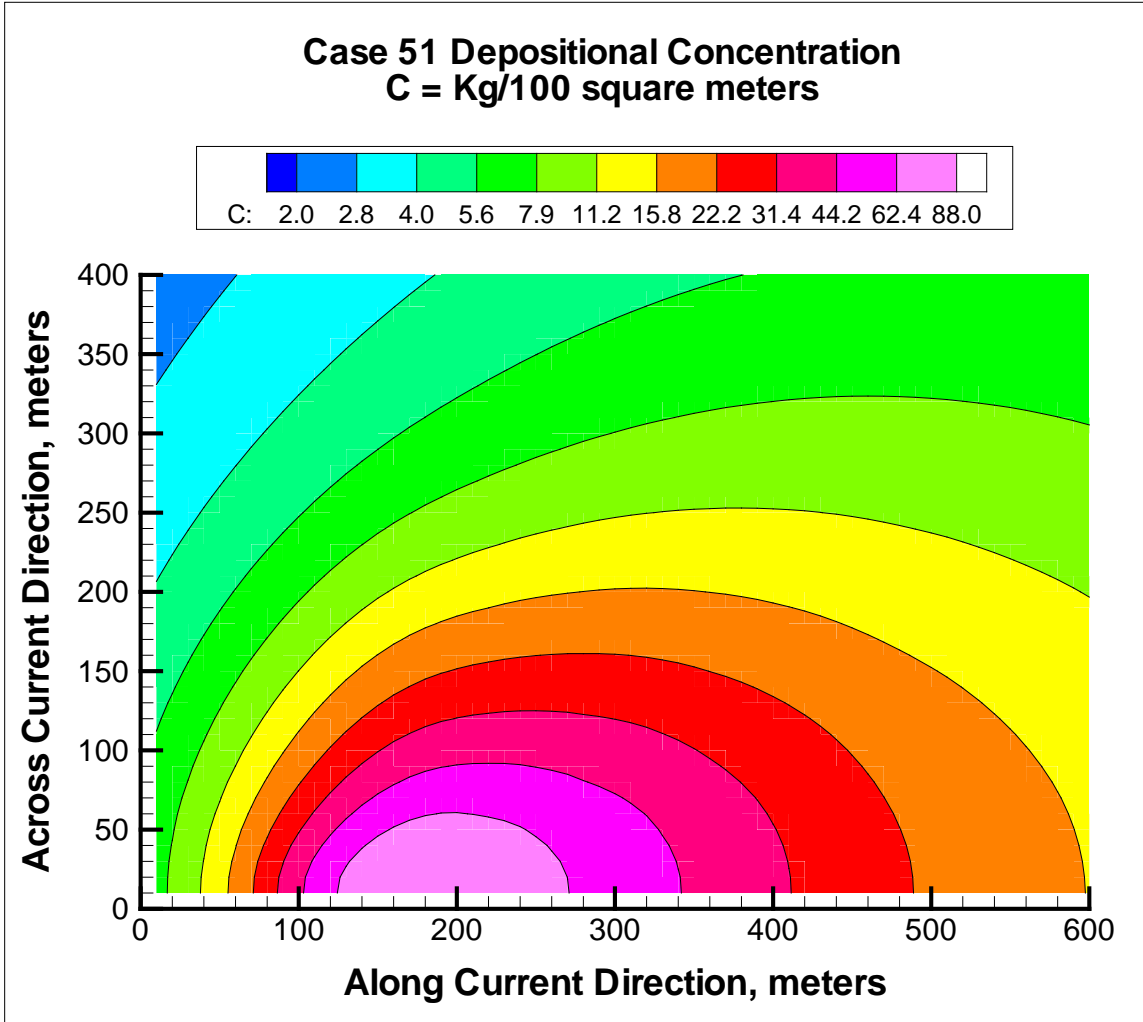
CASE-33 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Case 33 Depositional Concentration
C = Kg/100 square meters

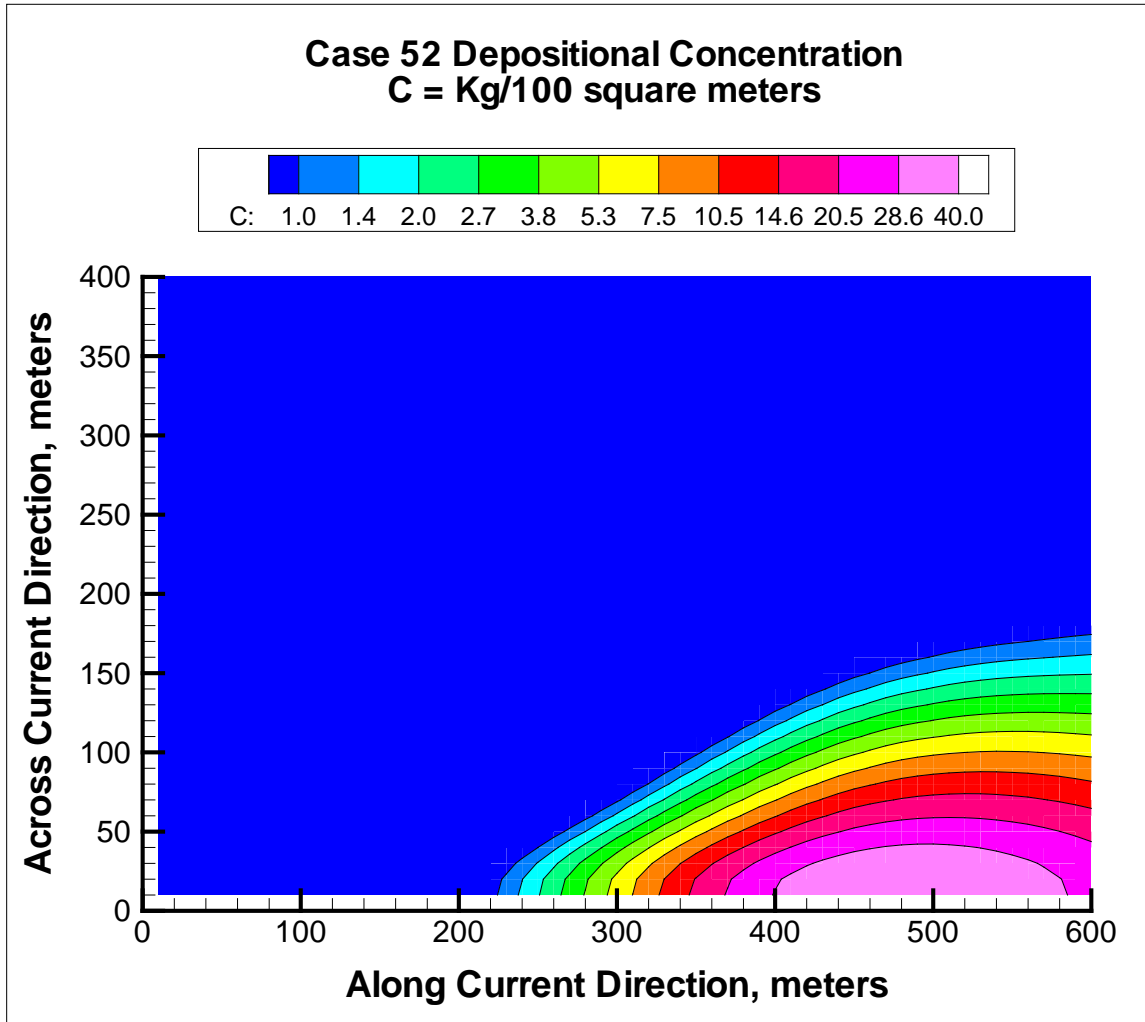C: 2.0 2.9 4.1 5.9 8.4 12.1 17.3 24.9 35.6 51.1 73.3 105.0

CASE-34 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 30 cm/sec)
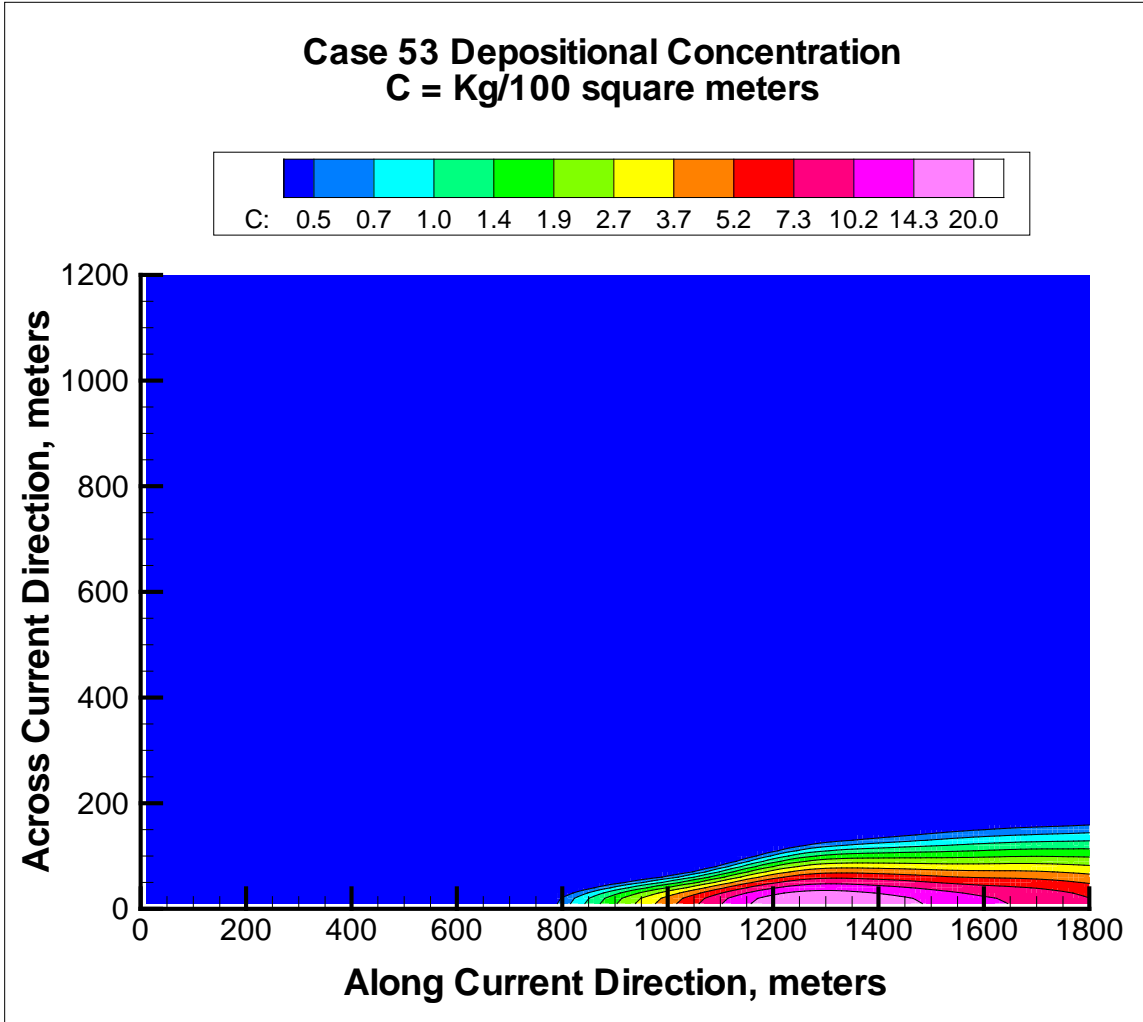**Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)**

Case 34 Depositional Concentration
C = Kg/100 square meters

C: 1.0 1.4 2.1 3.0 4.3 6.2 8.9 12.8 18.4 26.5 38.2 55.0

Across Current Direction, meters
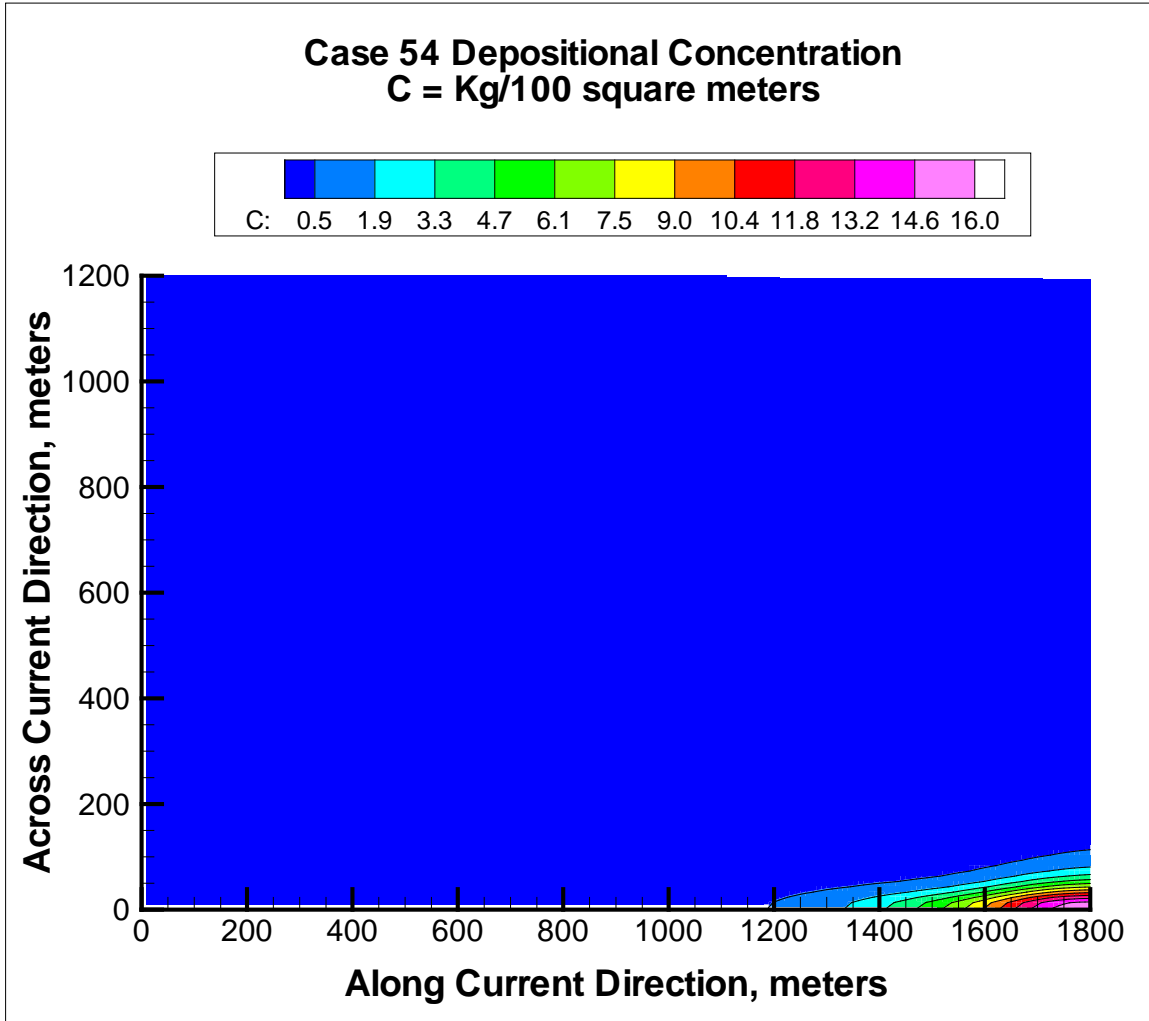
Along Current Direction, meters

CASE-35 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Case 35 Depositional Concentration
C = Kg/100 square meters

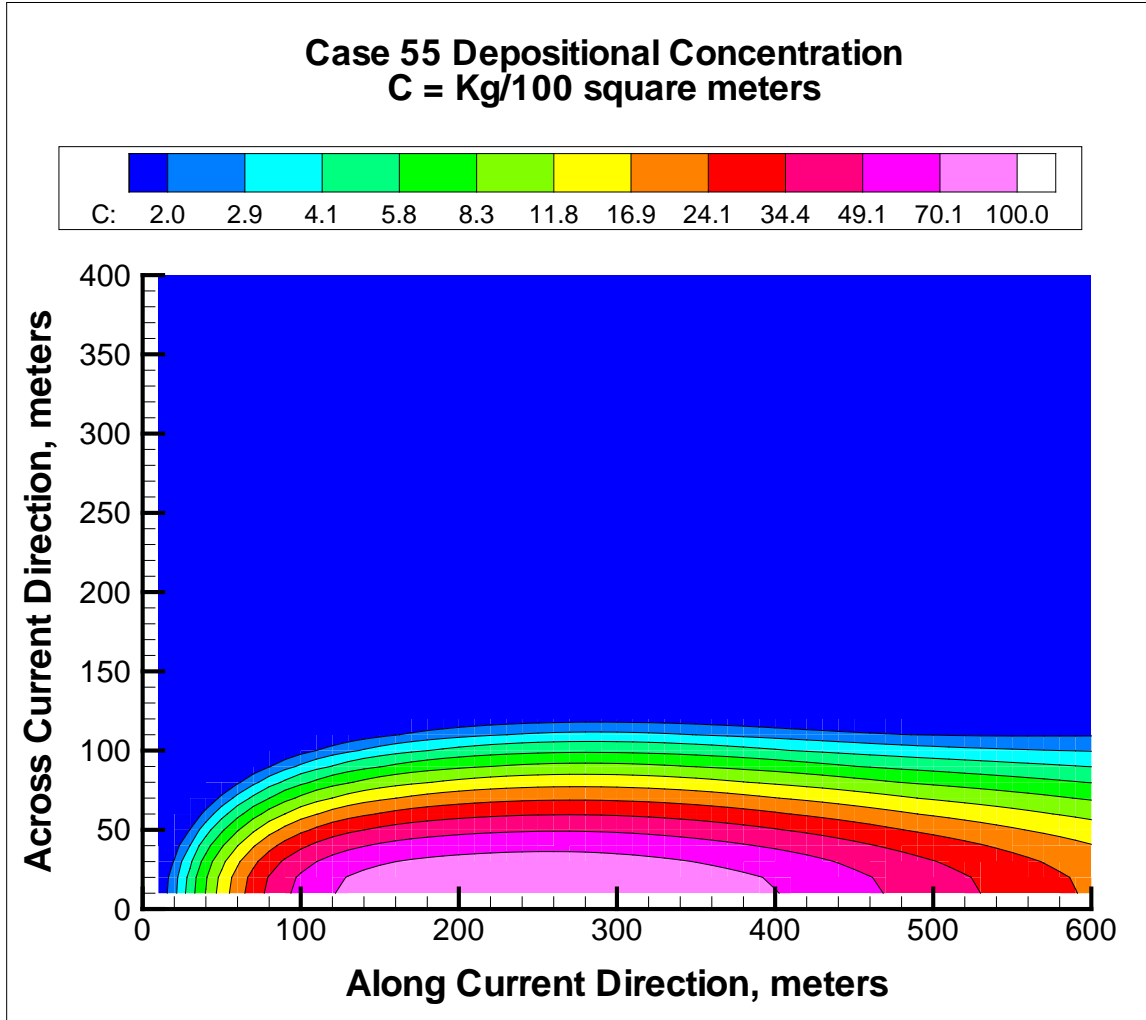C: 1.0   1.4   2.0   2.8   3.9   5.5   7.7 10.8 15.2 21.3 29.9 42.0

CASE-36 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Case 36 Depositional Concentration
C = Kg/100 square meters

C: 2.0 2.8 4.0 5.6 8.0 11.3 16.0 22.5 31.9 45.0 63.7 90.0

CASE-37 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
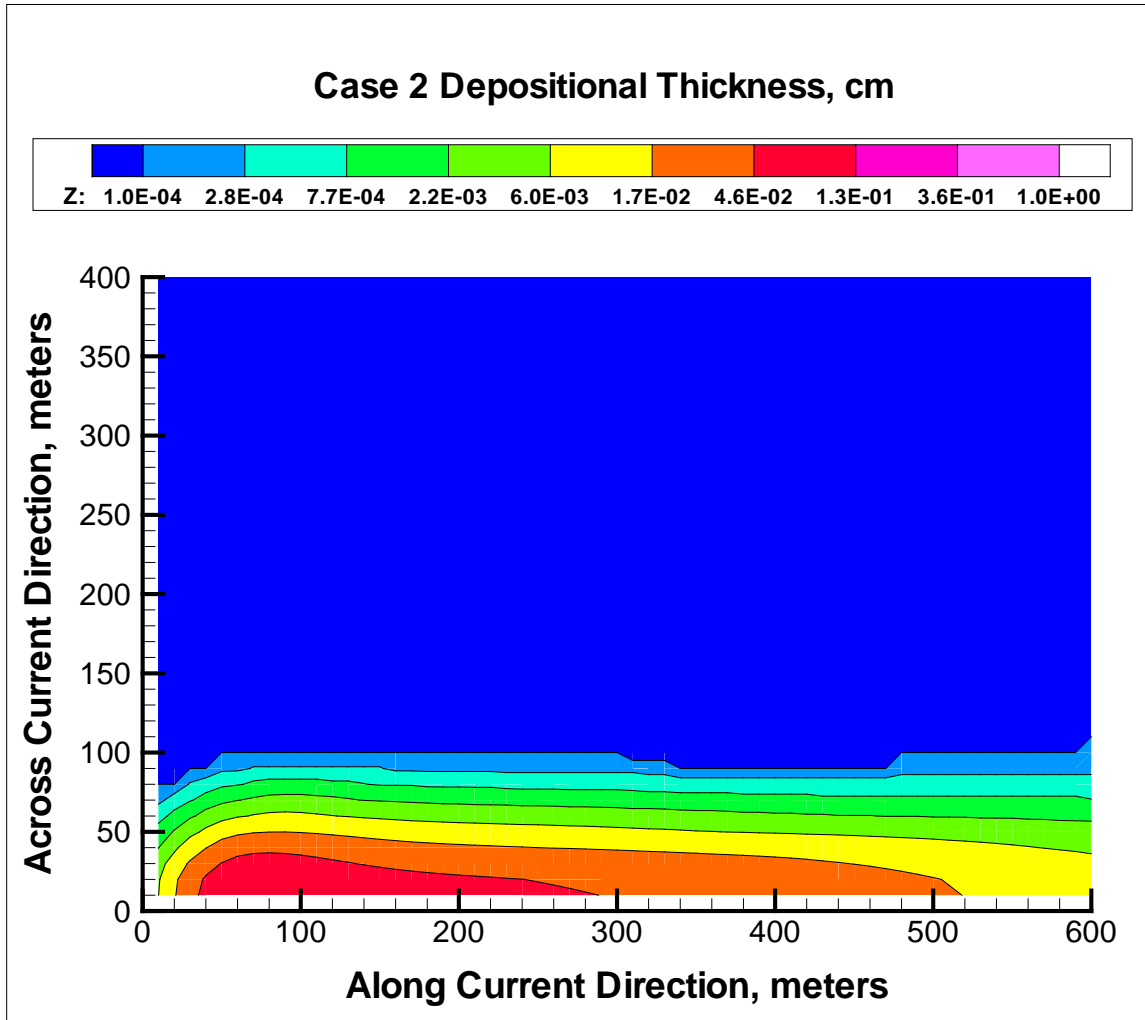## Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Case 37 Depositional Concentration
C = Kg/100 square meters

C: 1.0 1.4 2.0 2.9 4.1 5.9 8.4 12.1 17.2 24.6 35.0 50.0

CASE-38 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Case 38 Depositional Concentration
C = Kg/100 square meters

C: 0.5 0.7 1.0 1.5 2.2 3.1 4.5 6.5 9.3 13.5 19.4 28.0

CASE-39 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 40 cm/sec)
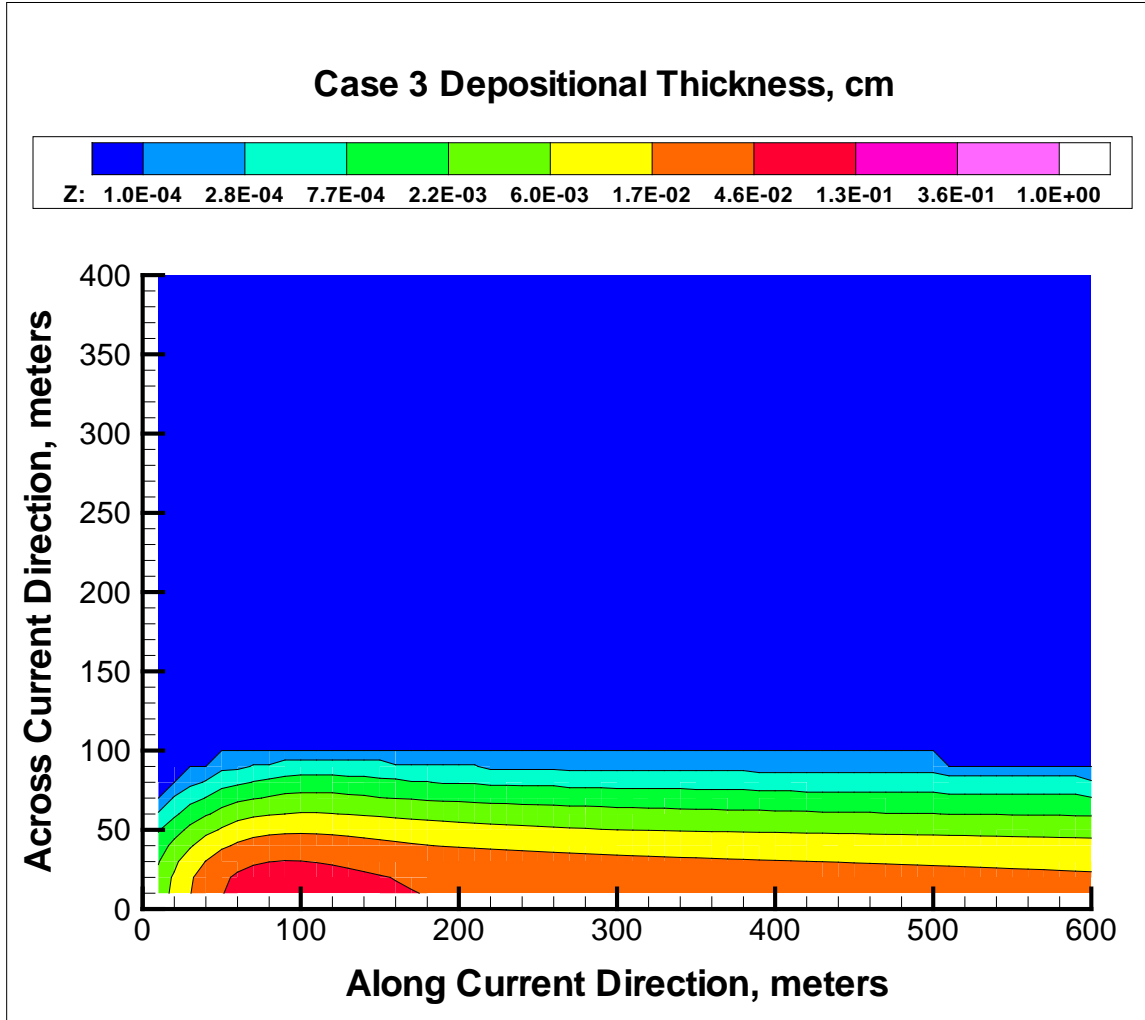**Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)**

Case 39 Depositional Concentration
C = Kg/100 square meters

C: 0.5 0.7 1.0 1.3 1.9 2.6 3.6 5.1 7.0 9.8 13.7 19.0

CASE-40 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
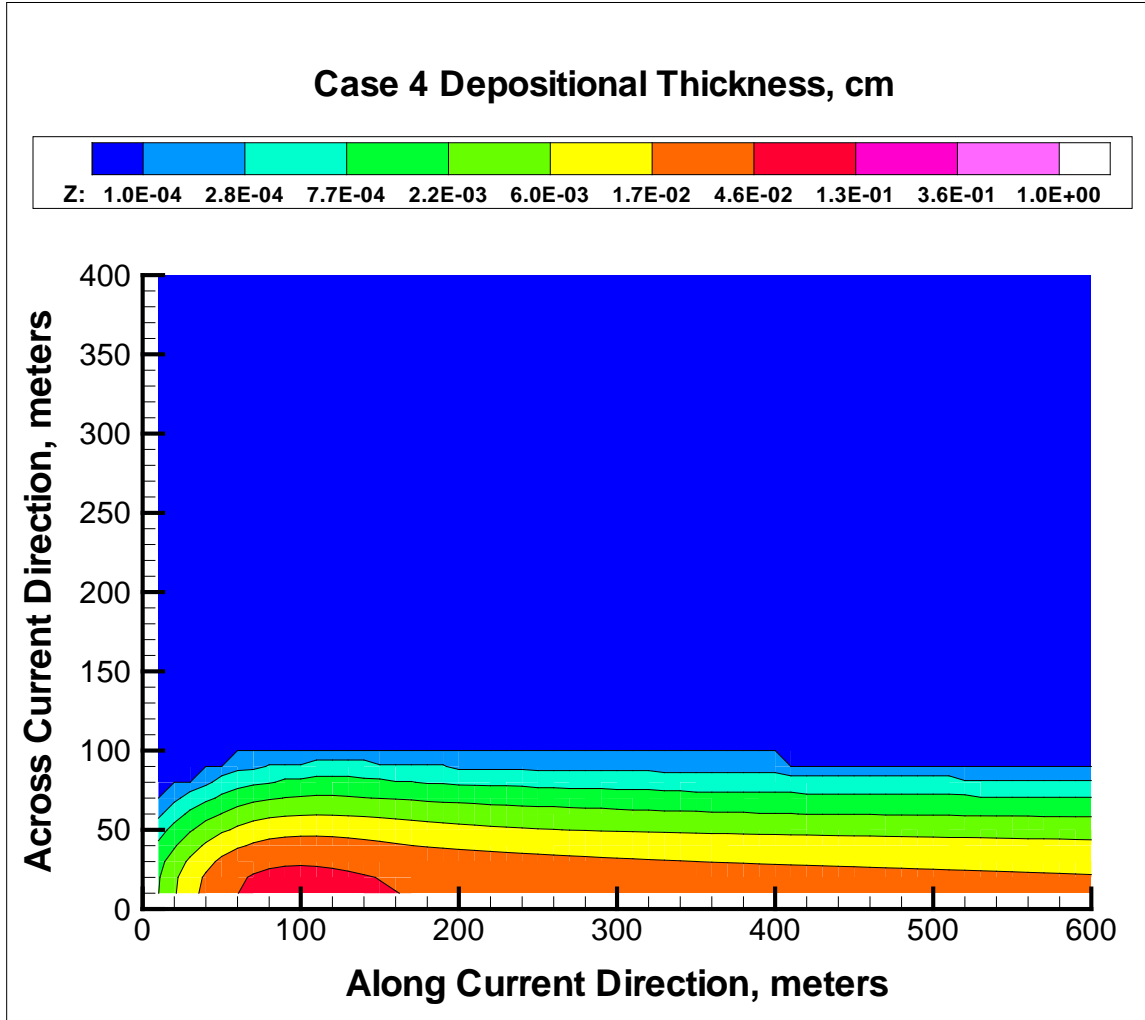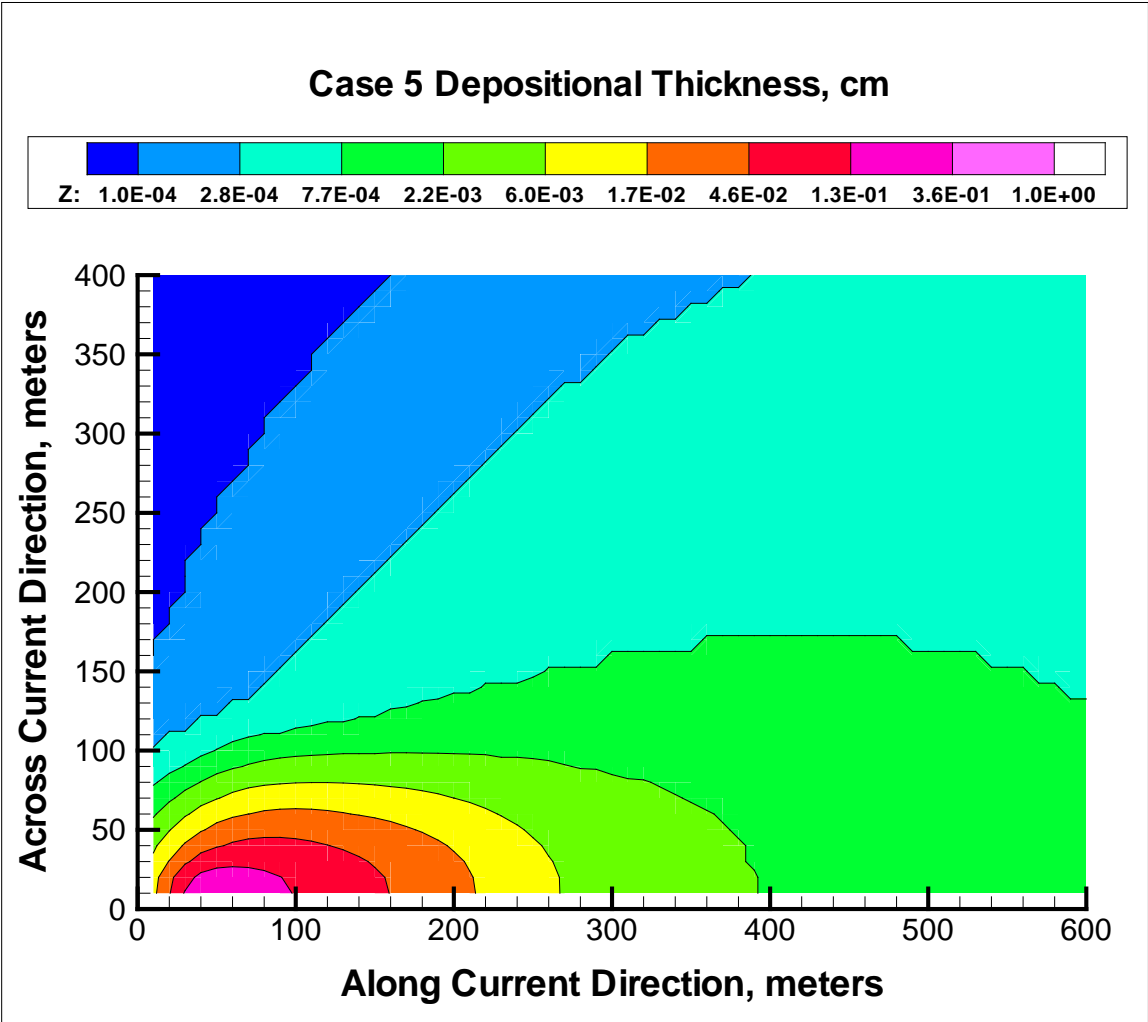Discharge (Depth= 20.3 m, Rate= 750 bbl/hr)

CASE-41 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Case 41 Depositional Concentration
C = Kg/100 square meters

C: 1.0 1.5 2.1 3.1 4.5 6.6 9.7 14.1 20.6 30.0 43.9 64.0
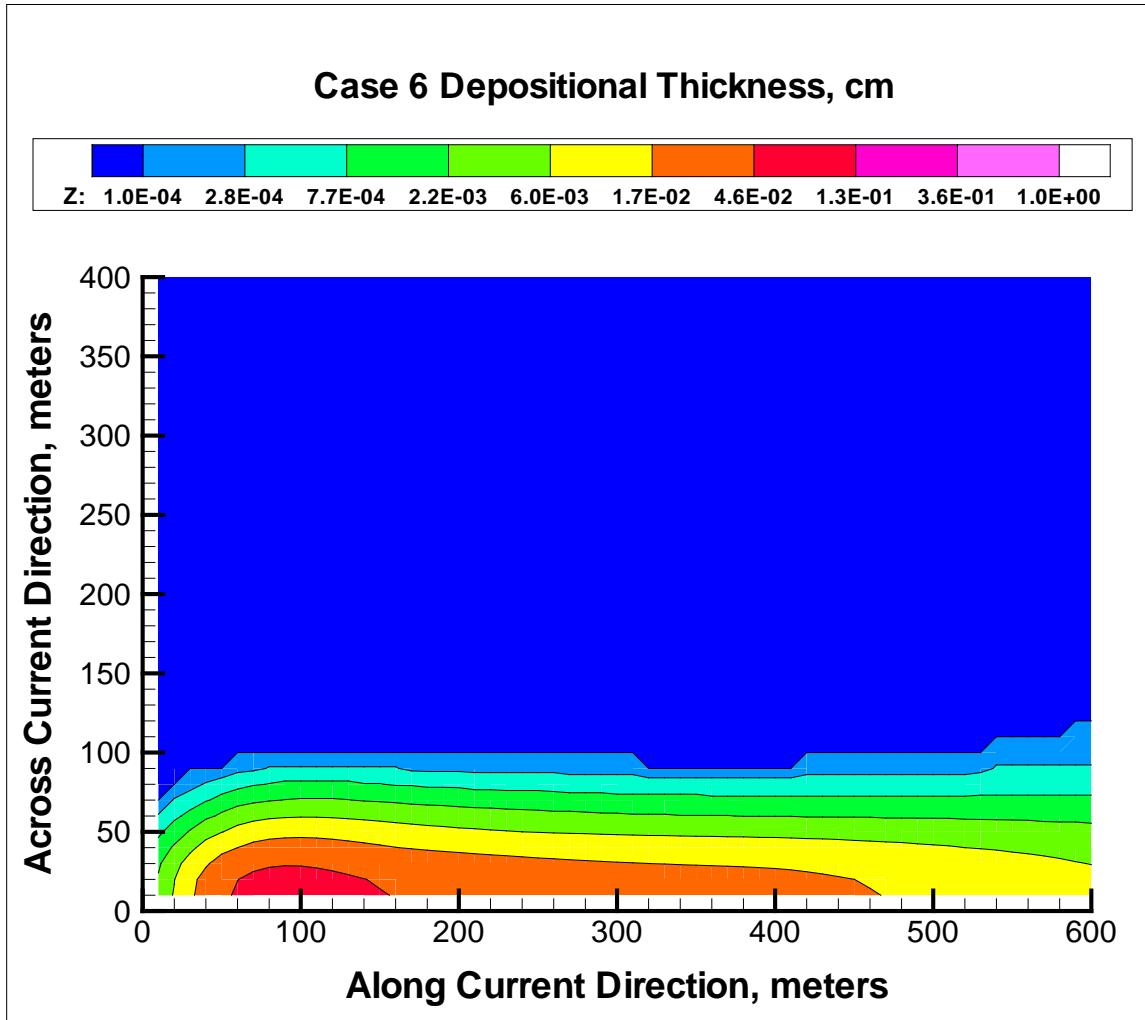
CASE-42 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Case 42 Depositional Concentration
C = Kg/100 square meters

C: 0.5 0.7 1.1 1.6 2.3 3.3 4.8 7.1 10.3 15.0 21.9 32.0

CASE-43 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Case 43 Depositional Concentration
C = Kg/100 square meters

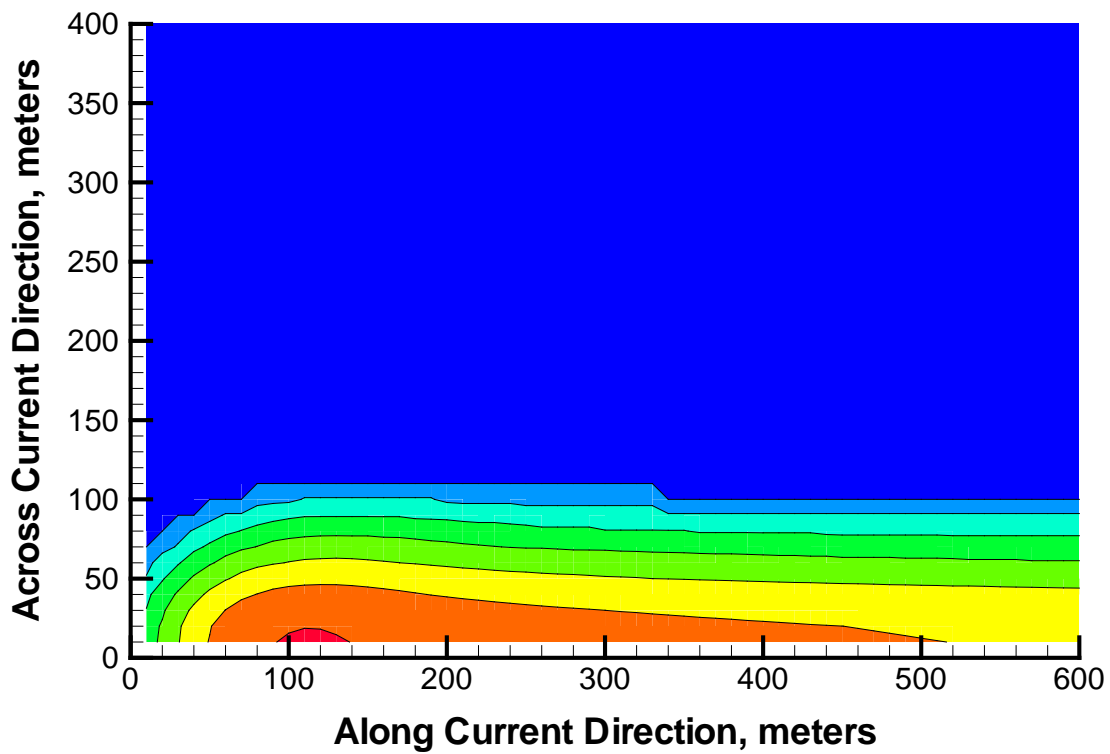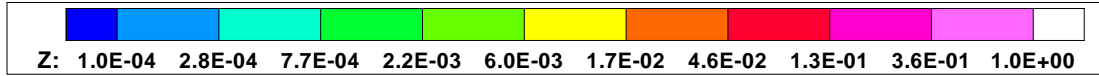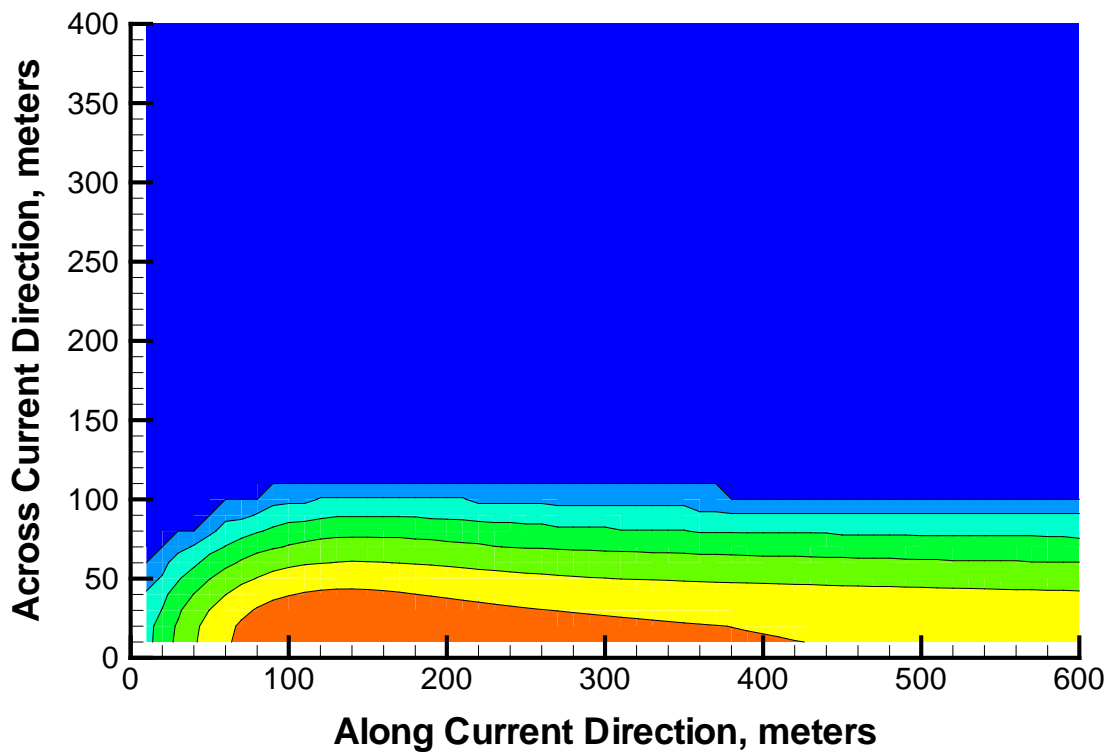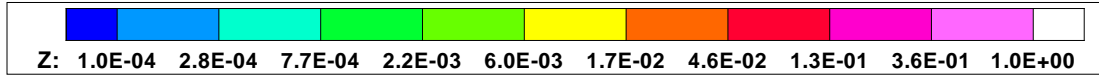C: 0.5 0.7 0.9 1.3 1.7 2.3 3.2 4.4 5.9 8.1 11.0 15.0

**CASE-44 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)**

OOC Model Failed to Produce Meaningful Results

CASE-45 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 20.3 m, Rate= 750 bbl/hr)

Case 45 Depositional Concentration
C = Kg/100 square meters

C: 2.0 2.8 4.0 5.6 7.9 11.2 15.8 22.2 31.4 44.2 62.4 88.0

CASE-46 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

Case 46 Depositional Concentration
C = Kg/100 square meters

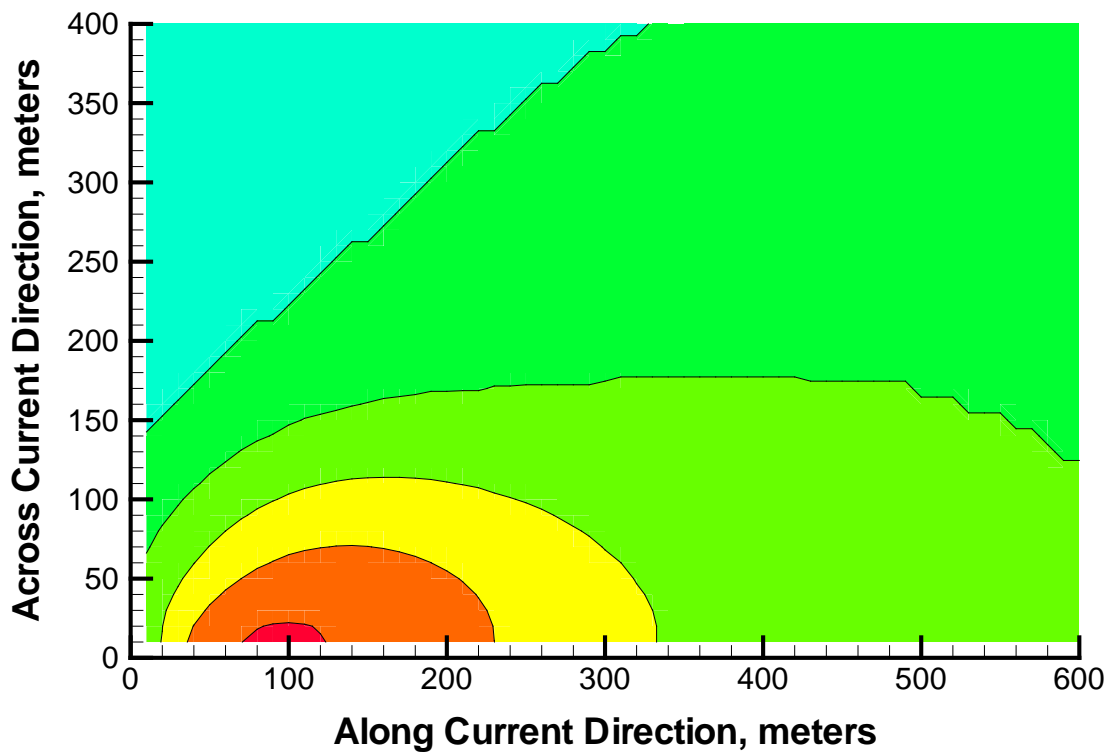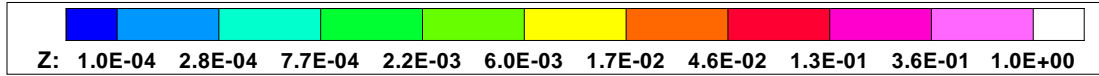C: 3.0 4.3 6.2 9.0 12.9 18.6 26.8 38.6 55.6 80.0 115.3 166.0

CASE-47 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

Case 47 Depositional Concentration
C = Kg/100 square meters

C: 1.0 1.4 2.1 3.0 4.4 6.4 9.2 13.4 19.4 28.1 40.7 59.0

CASE-48 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

Case 48 Depositional Concentration
C = Kg/100 square meters

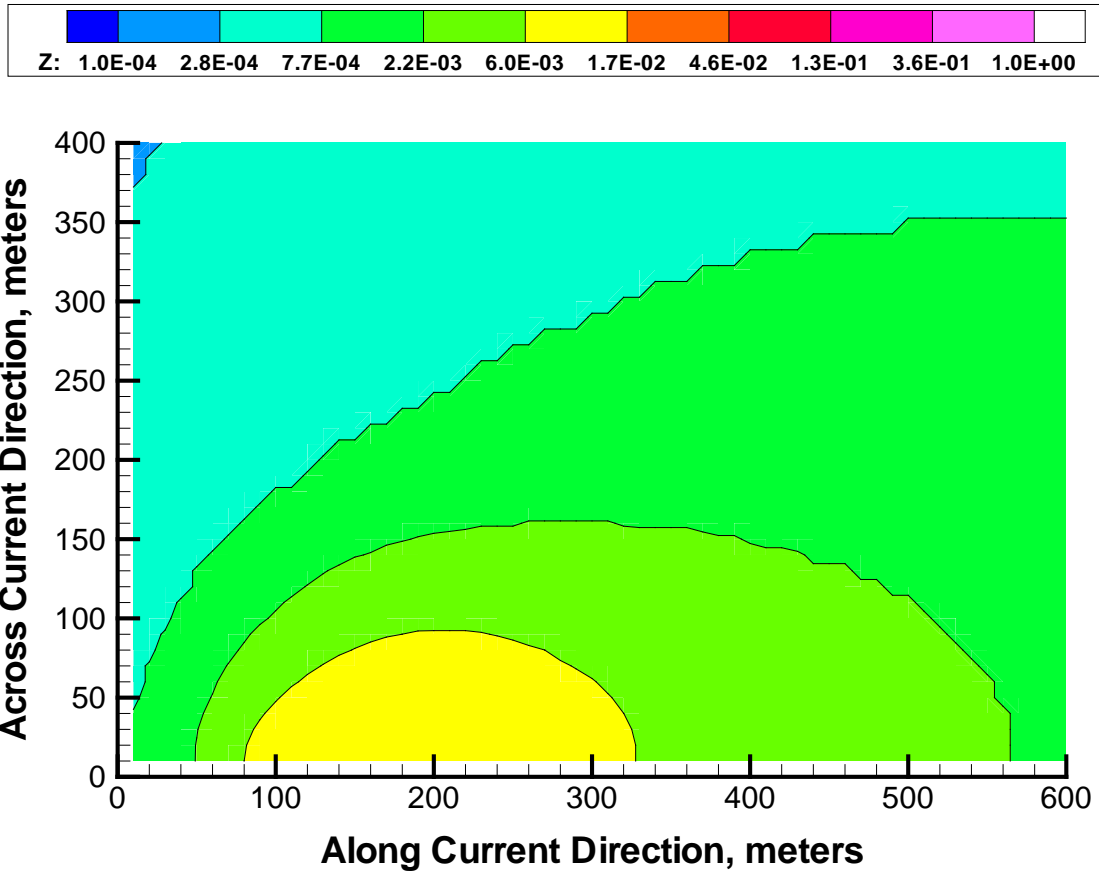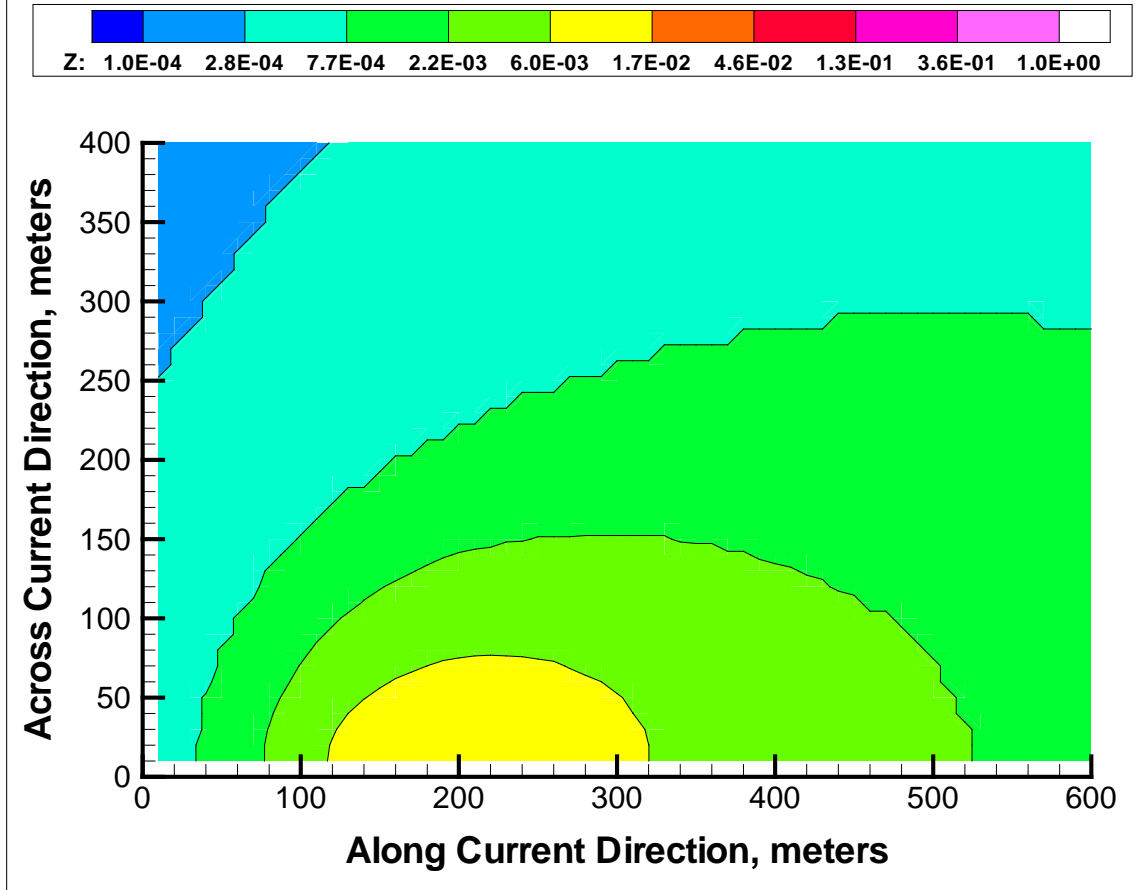C: 0.5 0.7 1.1 1.5 2.2 3.3 4.7 6.9 10.1 14.6 21.3 31.0

CASE-49 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

Case 49 Depositional Concentration
C = Kg/100 square meters

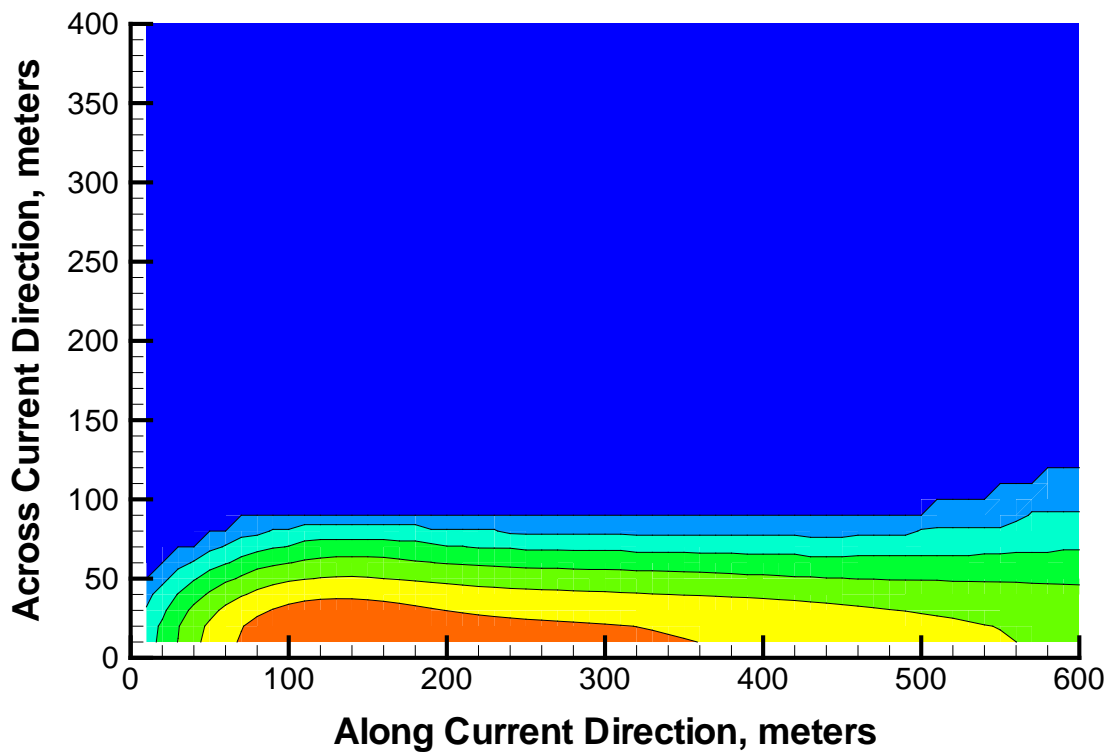C: 0.5 0.7 1.0 1.5 2.1 3.0 4.2 6.0 8.6 12.3 17.5 25.0

CASE-50 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 20.3 m, Rate= 1000 bbl/hr)

Case 50 Depositional Concentration
C = Kg/100 square meters

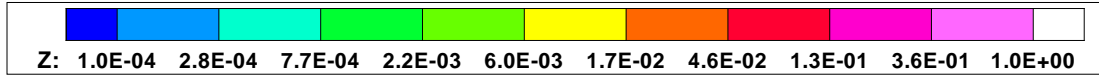C: 2.0   2.9   4.3   6.3   9.3   13.6   19.9   29.2   42.8   62.8   92.1   135.0

CASE-51 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

Case 51 Depositional Concentration
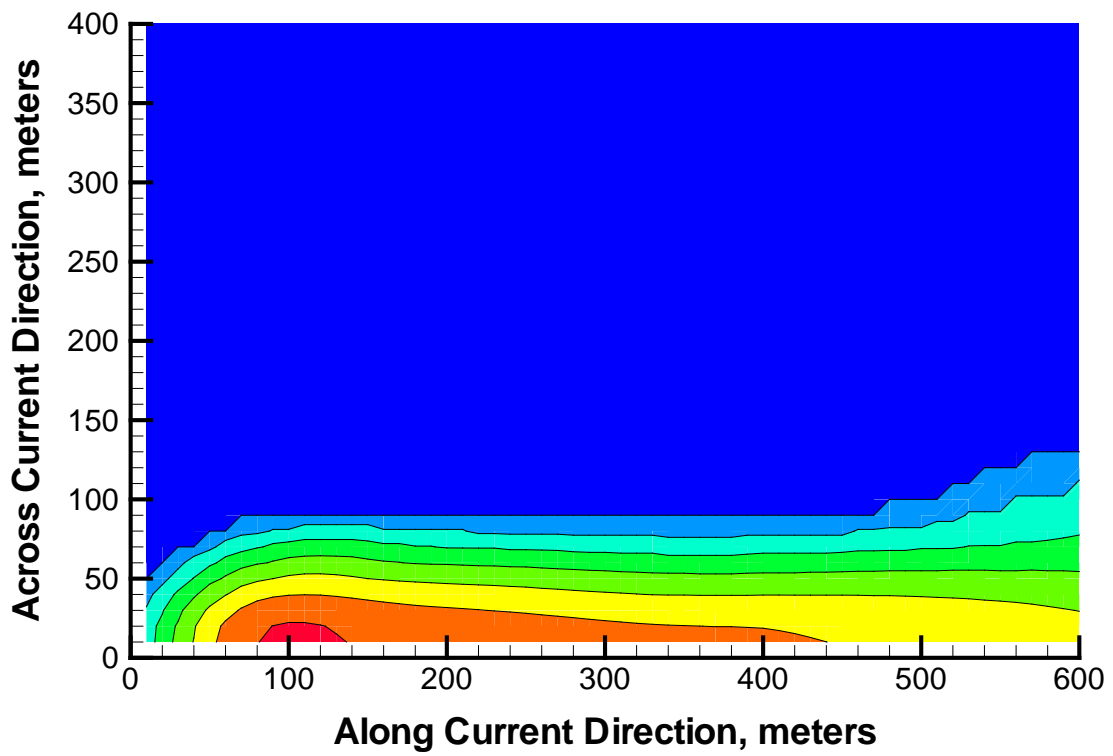**C = Kg/100 square meters**

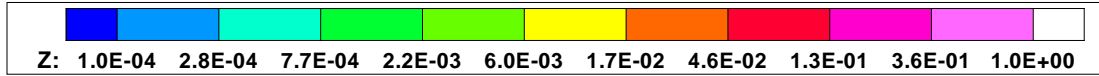C: 2.0 2.8 4.0 5.6 7.9 11.2 15.8 22.2 31.4 44.2 62.4 88.0

CASE-52 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

Case 52 Depositional Concentration
C = Kg/100 square meters

C: 1.0 1.4 2.0 2.7 3.8 5.3 7.5 10.5 14.6 20.5 28.6 40.0

Across Current Direction, meters

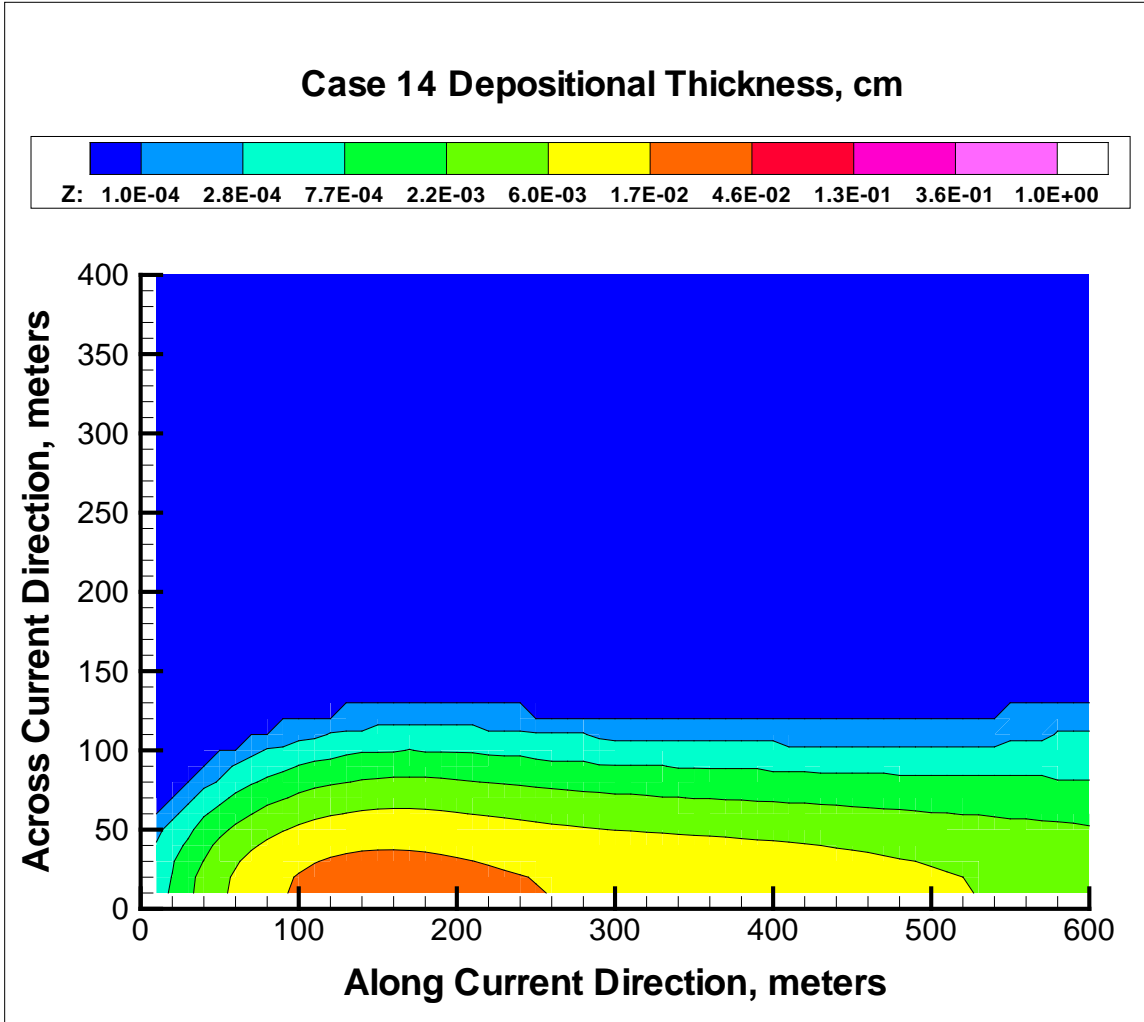Along Current Direction, meters

**CASE-53 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)**

Case 53 Depositional Concentration
C = Kg/100 square meters
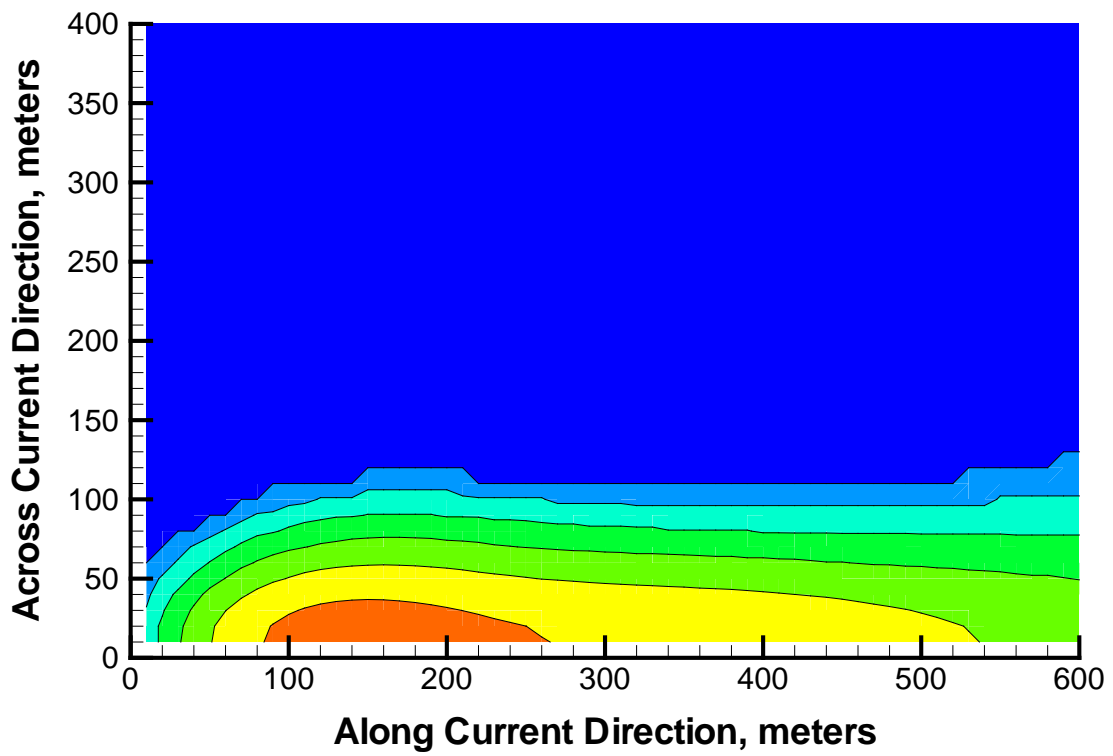
C: 0.5 0.7 1.0 1.4 1.9 2.7 3.7 5.2 7.3 10.2 14.3 20.0

CASE-54 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

Case 54 Depositional Concentration
C = Kg/100 square meters

C: 0.5 1.9 3.3 4.7 6.1 7.5 9.0 10.4 11.8 13.2 14.6 16.0
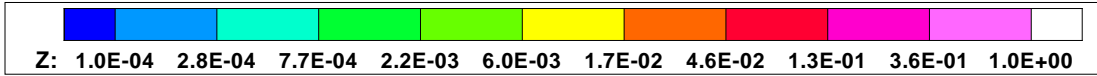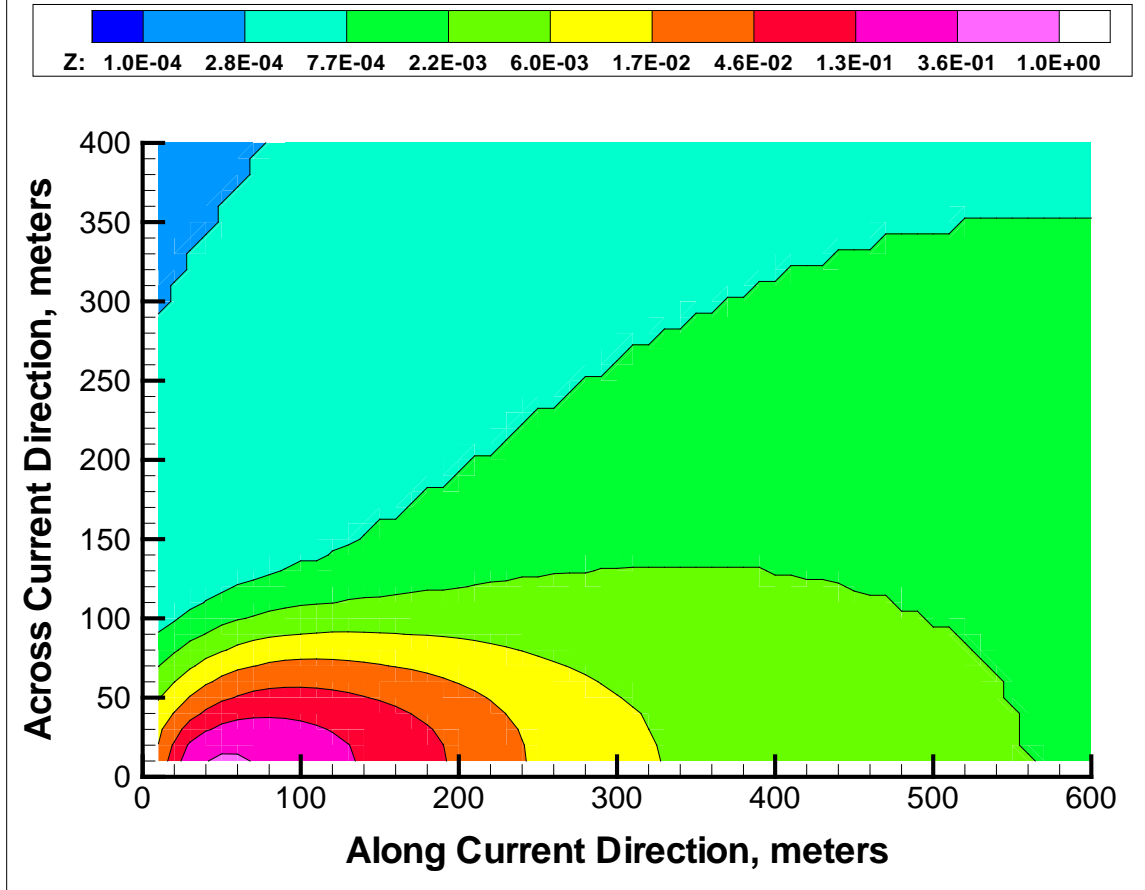
CASE-55 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 20.3 m, Rate= 1000 bbl/hr)

Case 55 Depositional Concentration
C = Kg/100 square meters

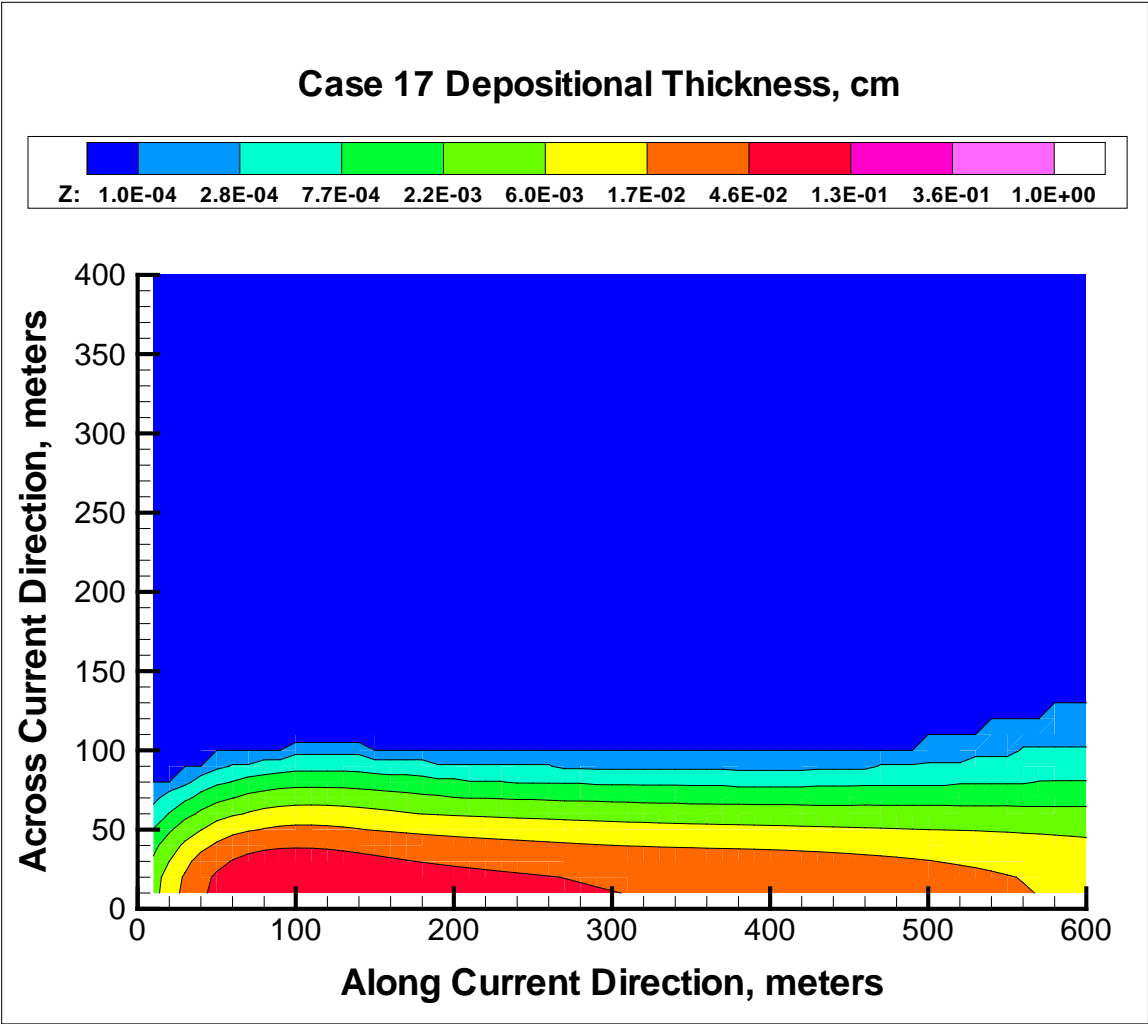C: 2.0 2.9 4.1 5.8 8.3 11.8 16.9 24.1 34.4 49.1 70.1 100.0

CASE-1 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 2 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

OOC Model Failed to Produce Meaningful Results

CASE-2 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 2 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Case 2 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-3 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 2 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Case 3 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-4 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 2 m, Current Speed= 40 cm/sec)
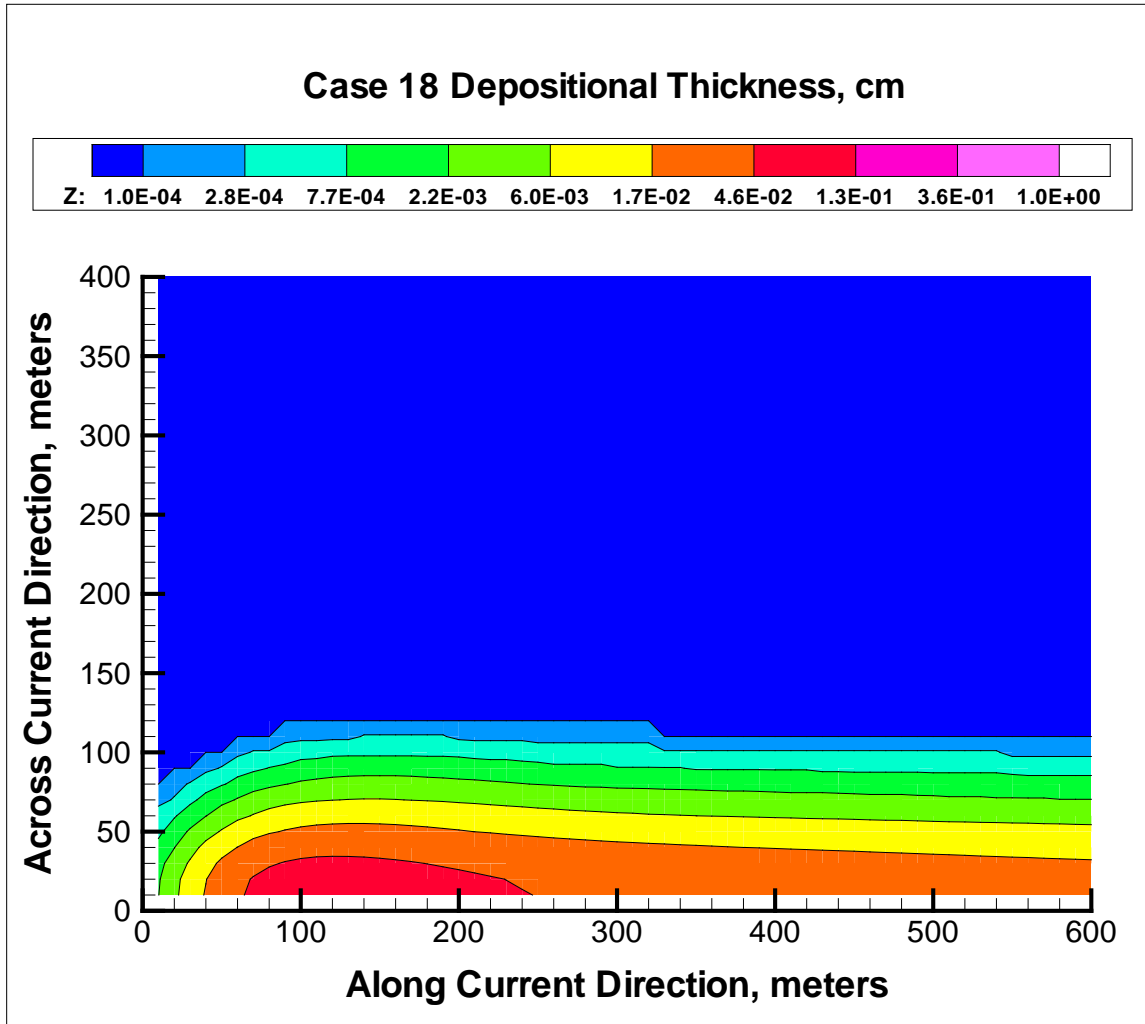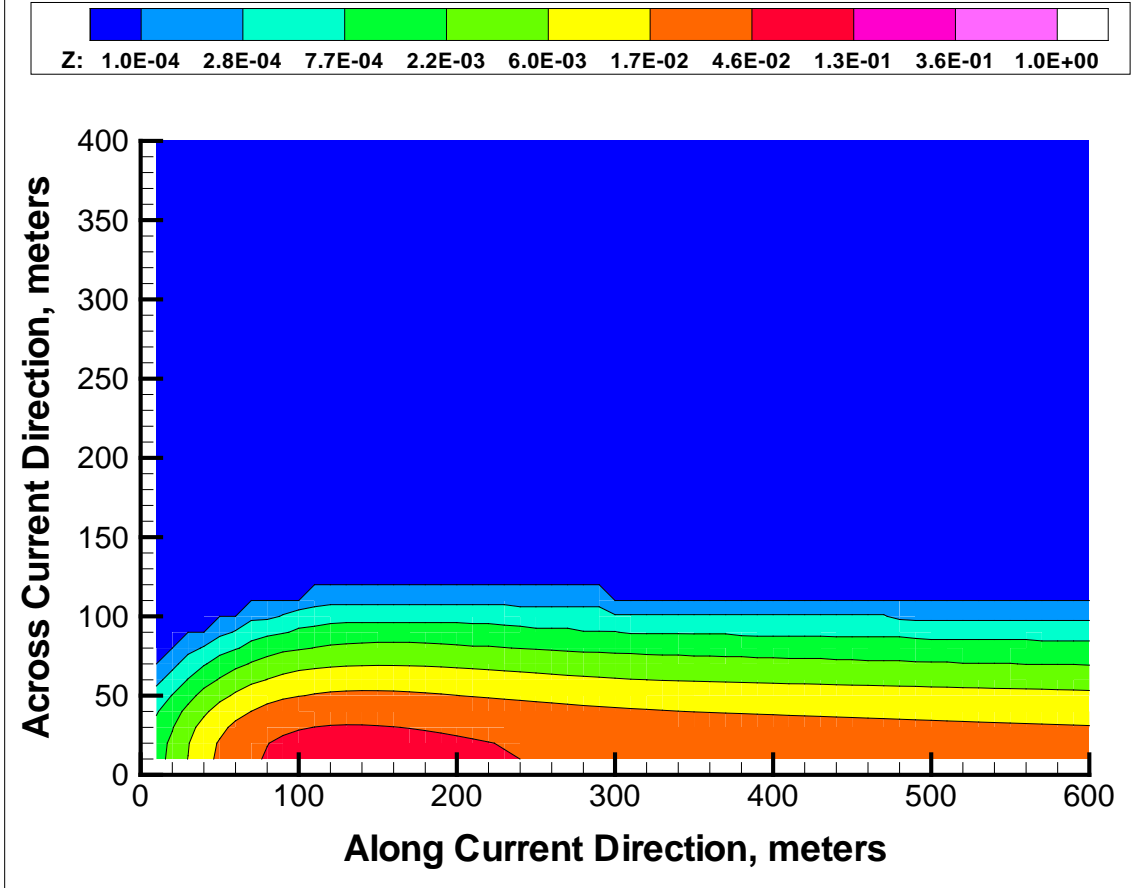**Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)**

Case 4 Depositional Thickness, cm

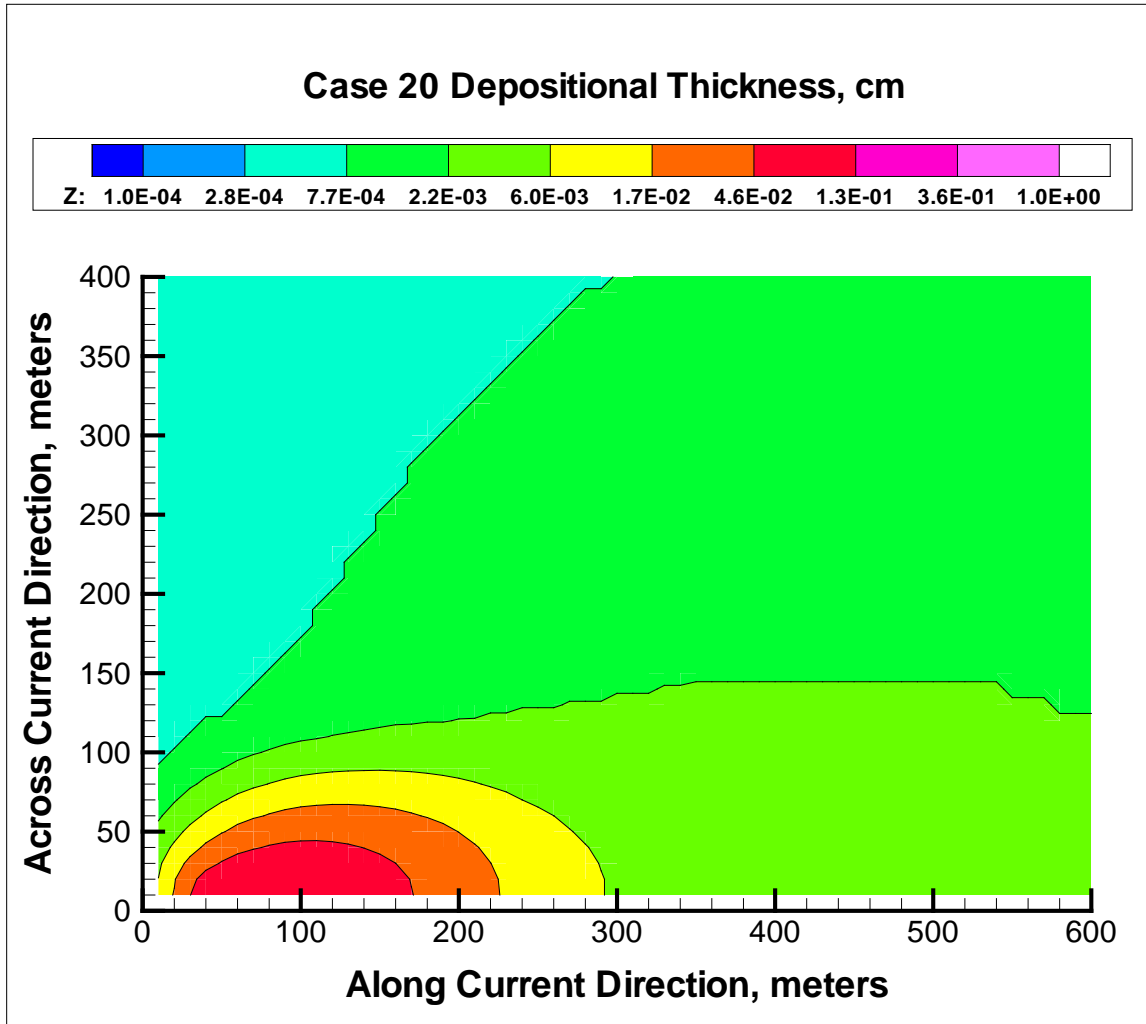Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-5 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Case 5 Depositional Thickness, cm
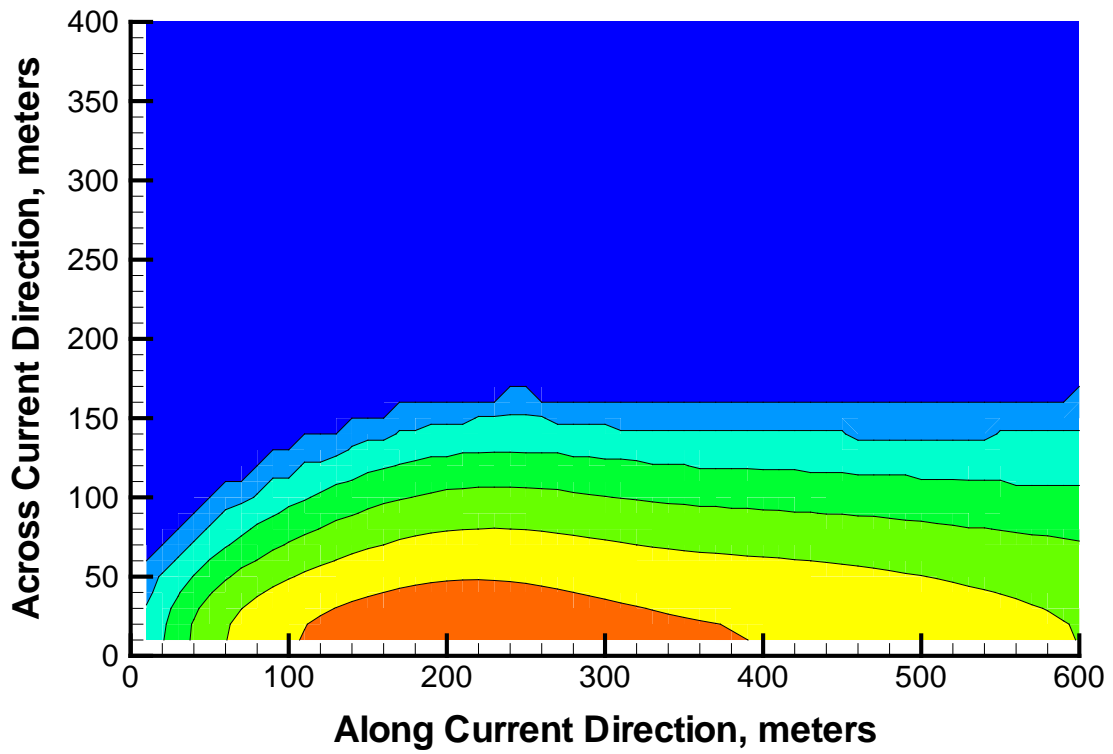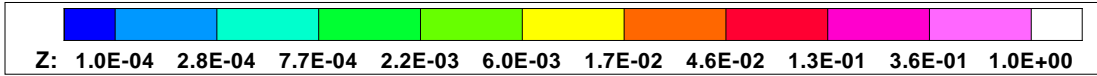
Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

X-axis: **Along Current Direction, meters**
Y-axis: **Across Current Direction, meters**

CASE-6 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Case 6 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

Across Current Direction, meters
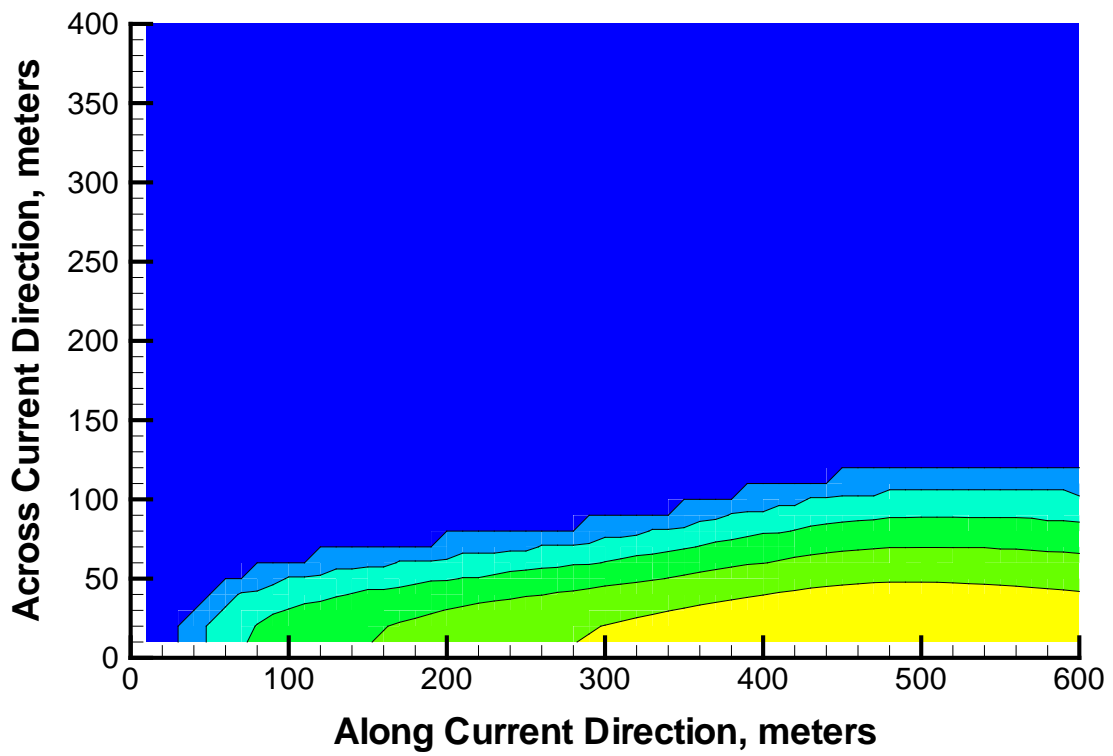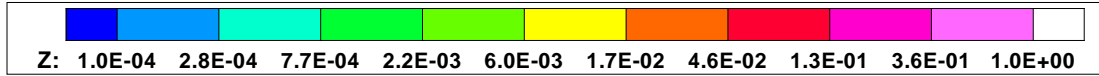
Along Current Direction, meters

CASE-7 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Case 7 Depositional Thickness, cm

CASE-8 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Case 8 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

Across Current Direction, meters

Along Current Direction, meters

CASE-9 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

**CASE-10 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)**
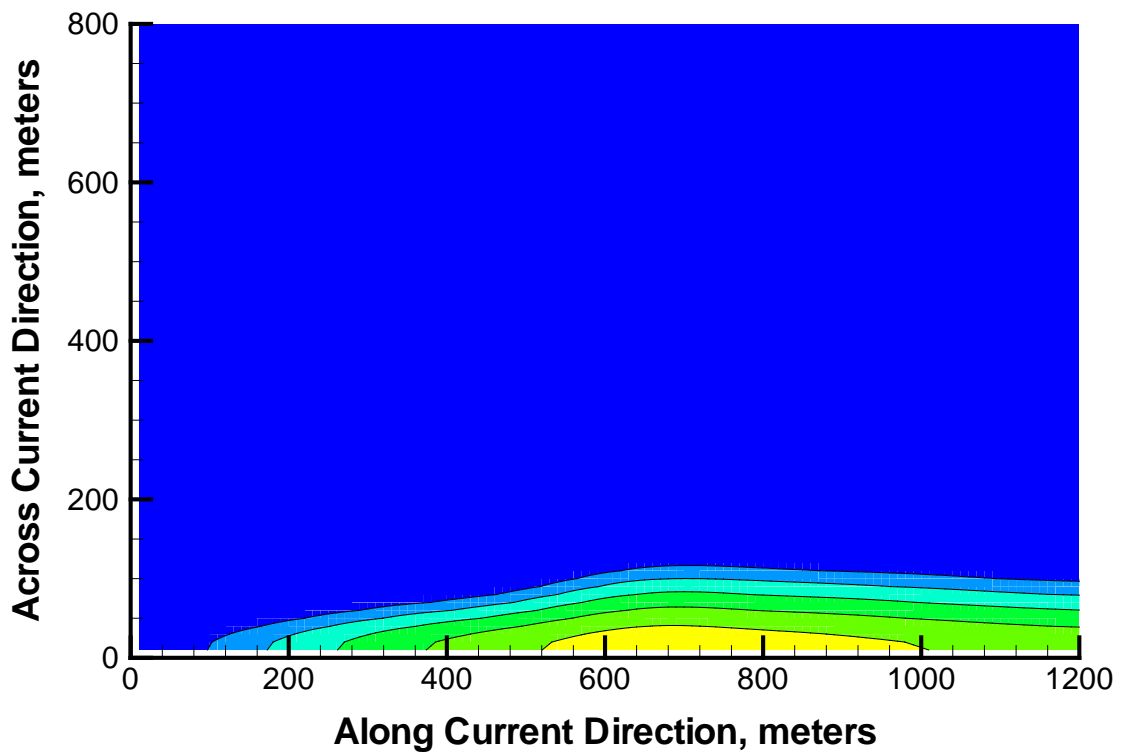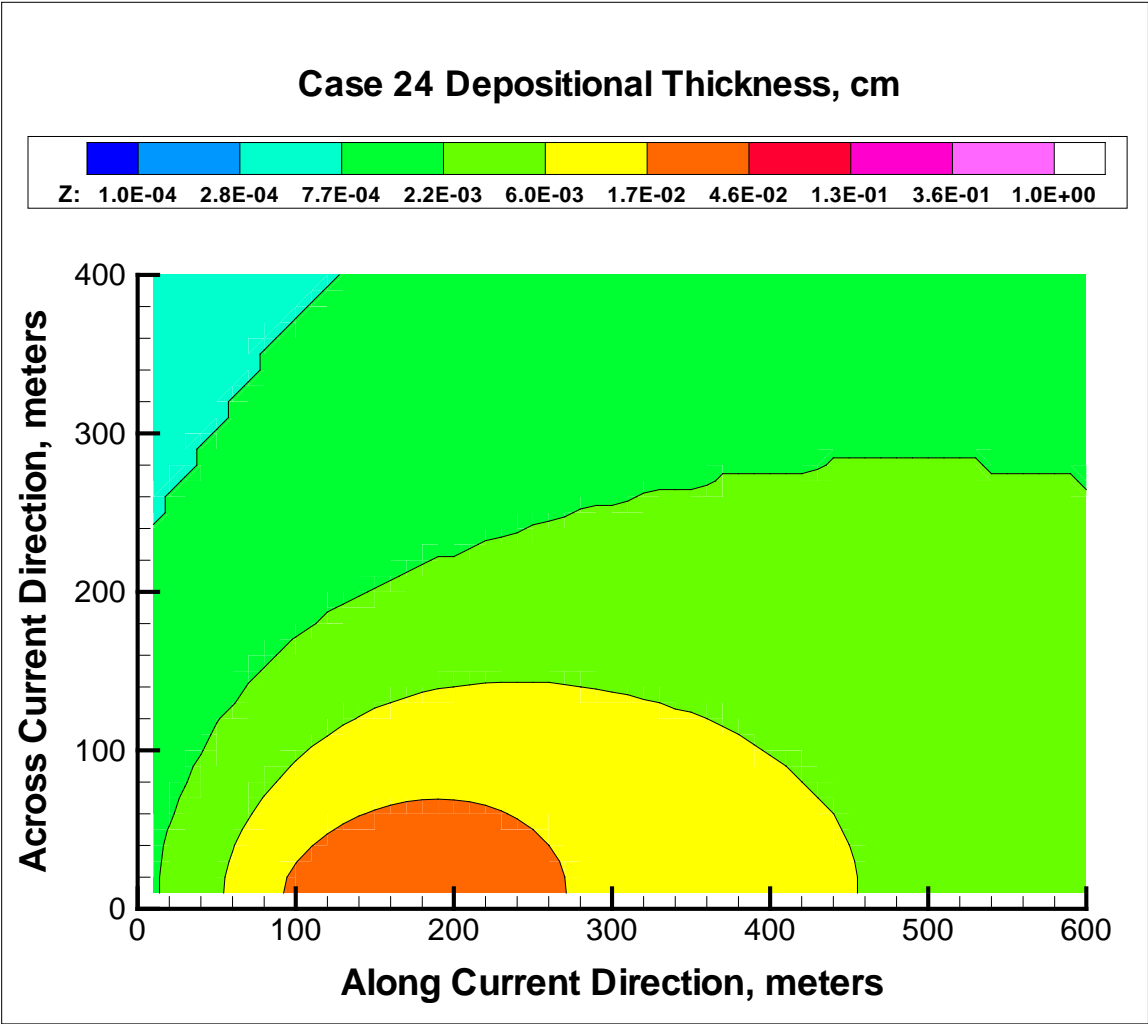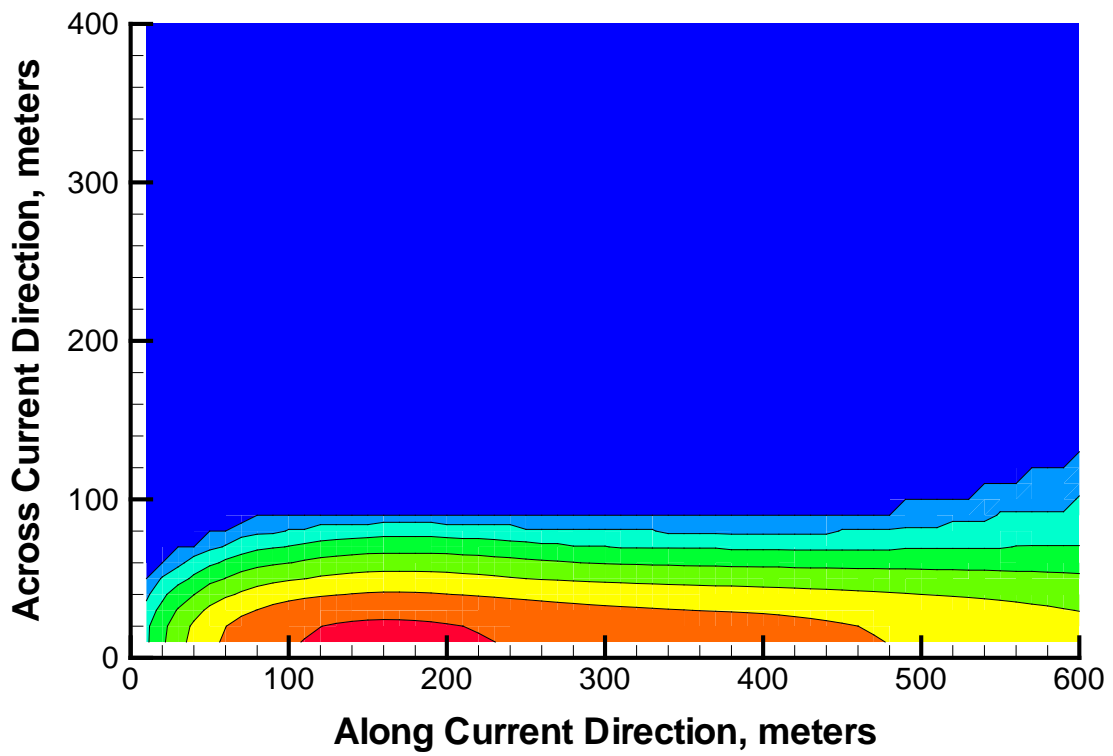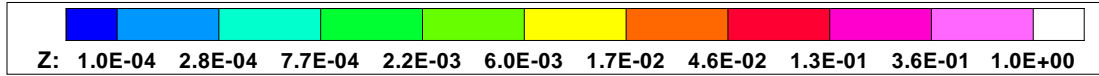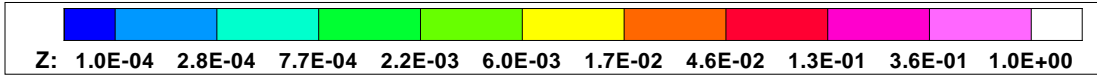
Case 10 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

Across Current Direction, meters

Along Current Direction, meters

CASE-11 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 250 bbl/hr)

Case 11 Depositional Thickness, cm
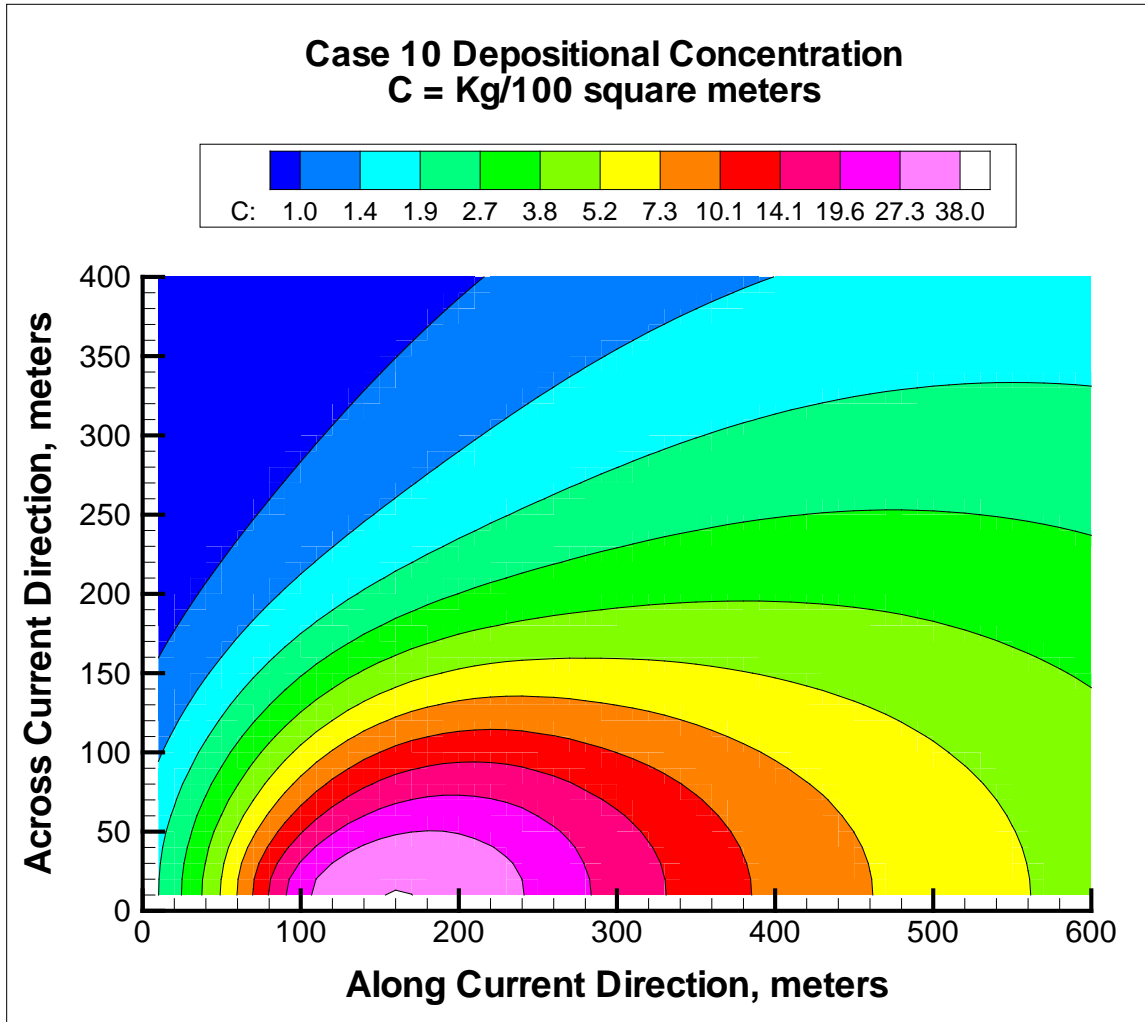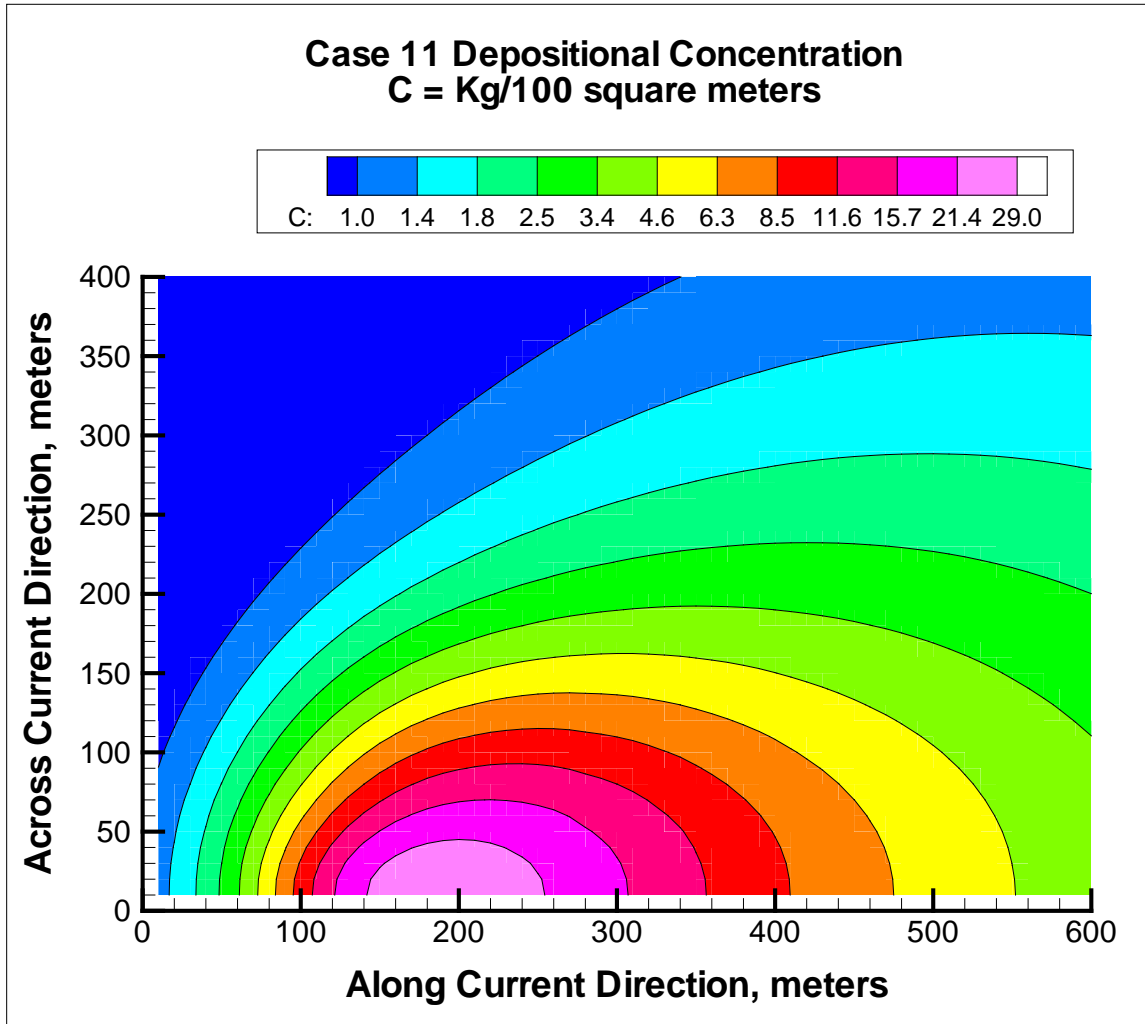
CASE-12 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 250 bbl/hr)

CASE-13 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 38.3 m, Rate= 250 bbl/hr)

Case 13 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00
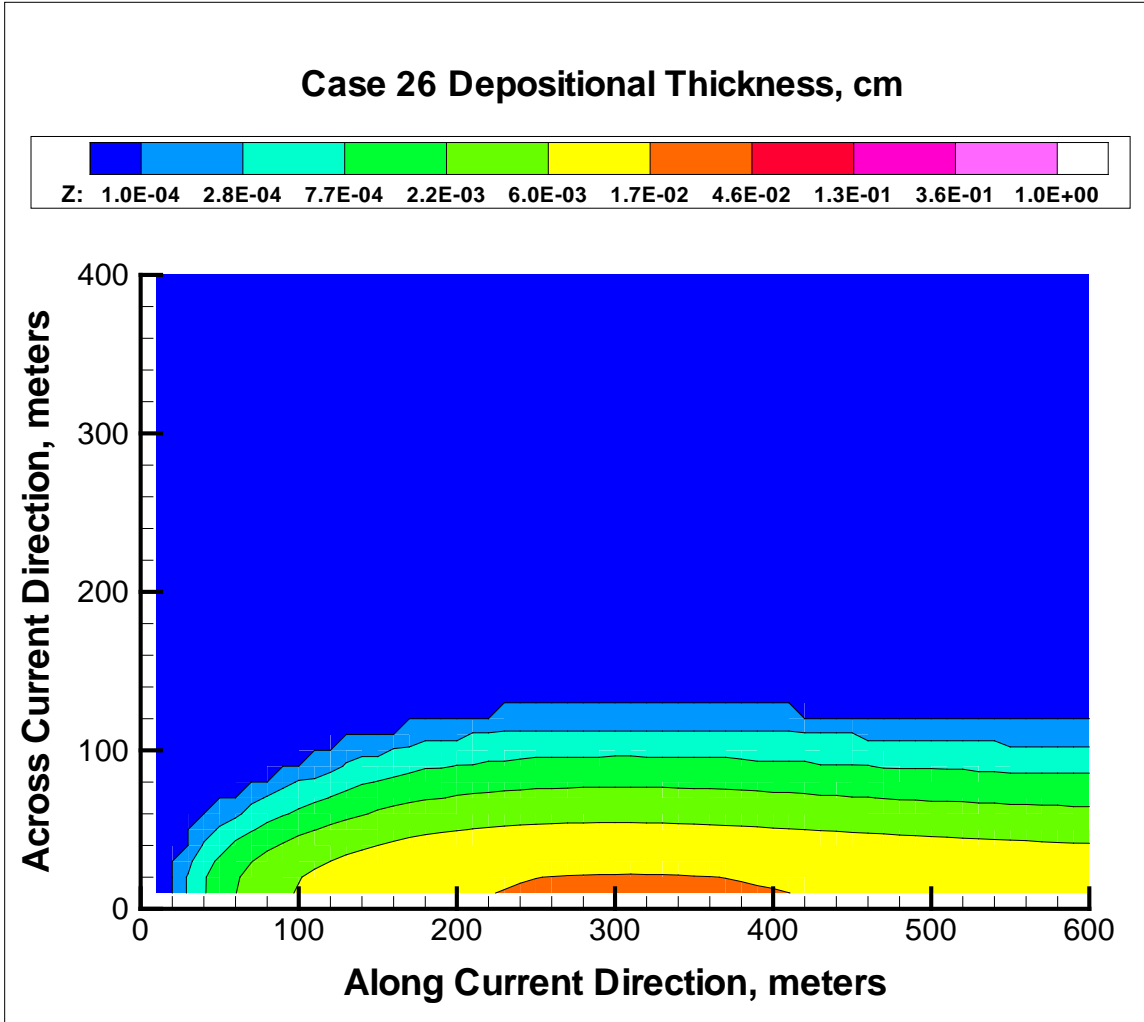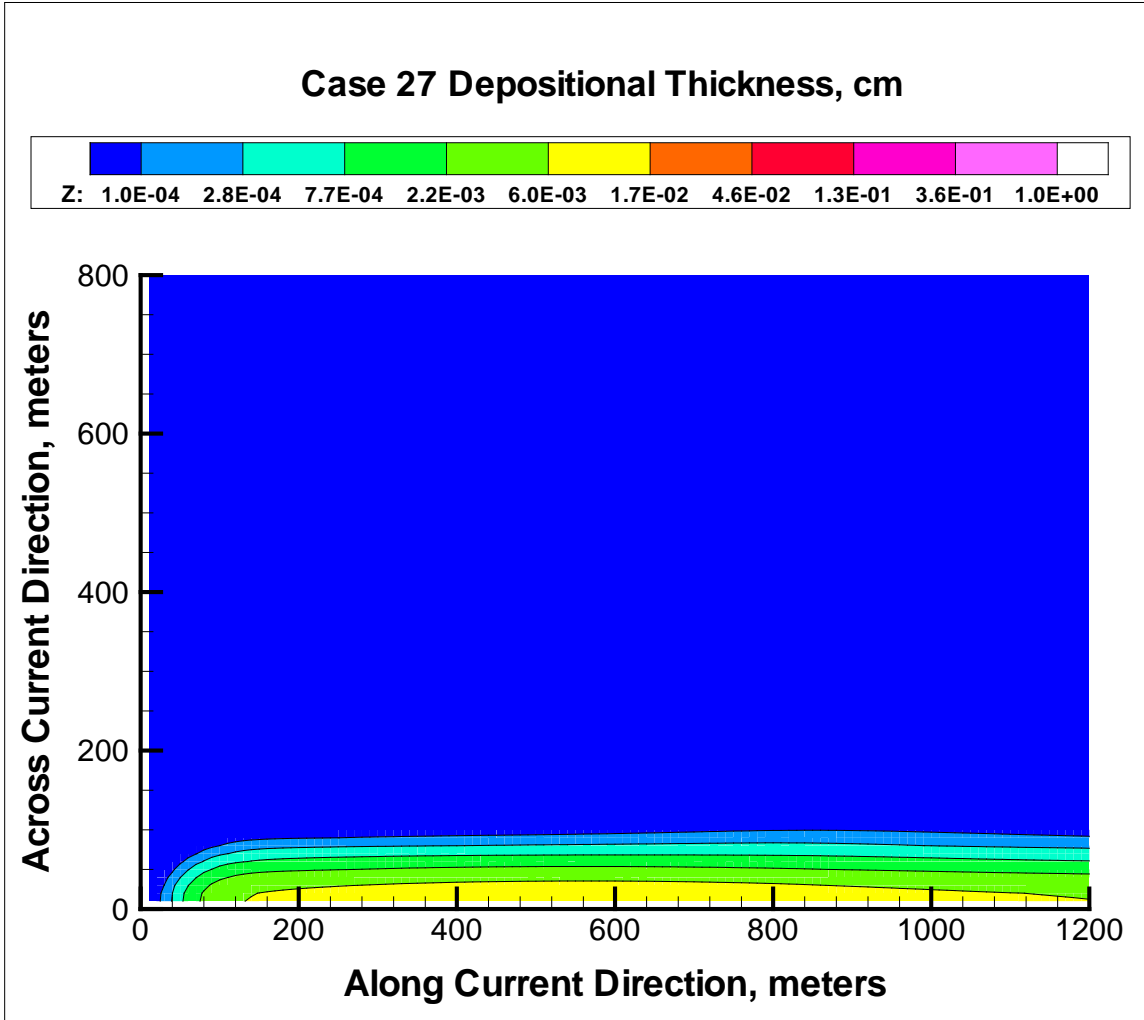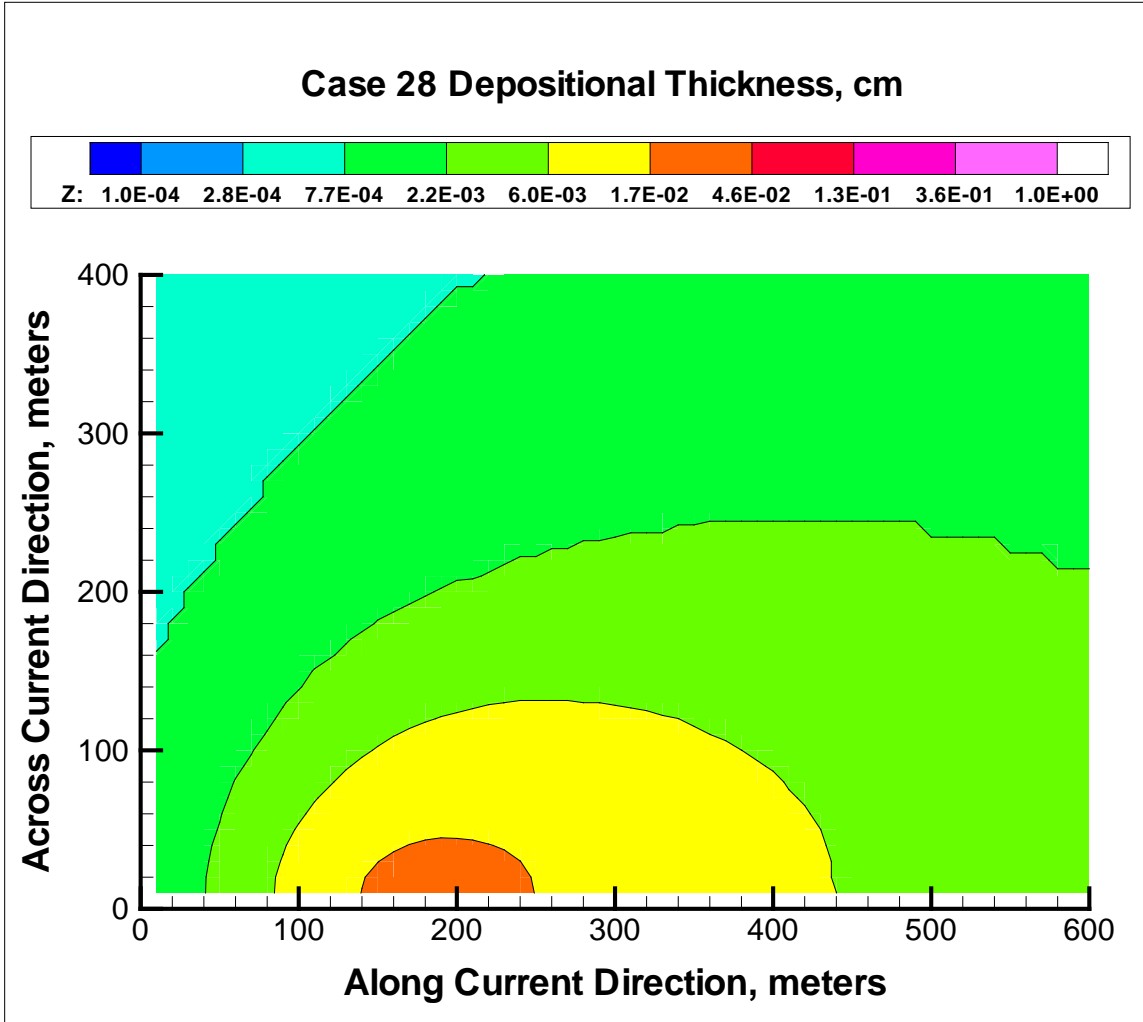
**CASE-14 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 250 bbl/hr)**

Case 14 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

Across Current Direction, meters

Along Current Direction, meters

CASE-15 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 38.3 m, Rate= 250 bbl/hr)

Case 15 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-16 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
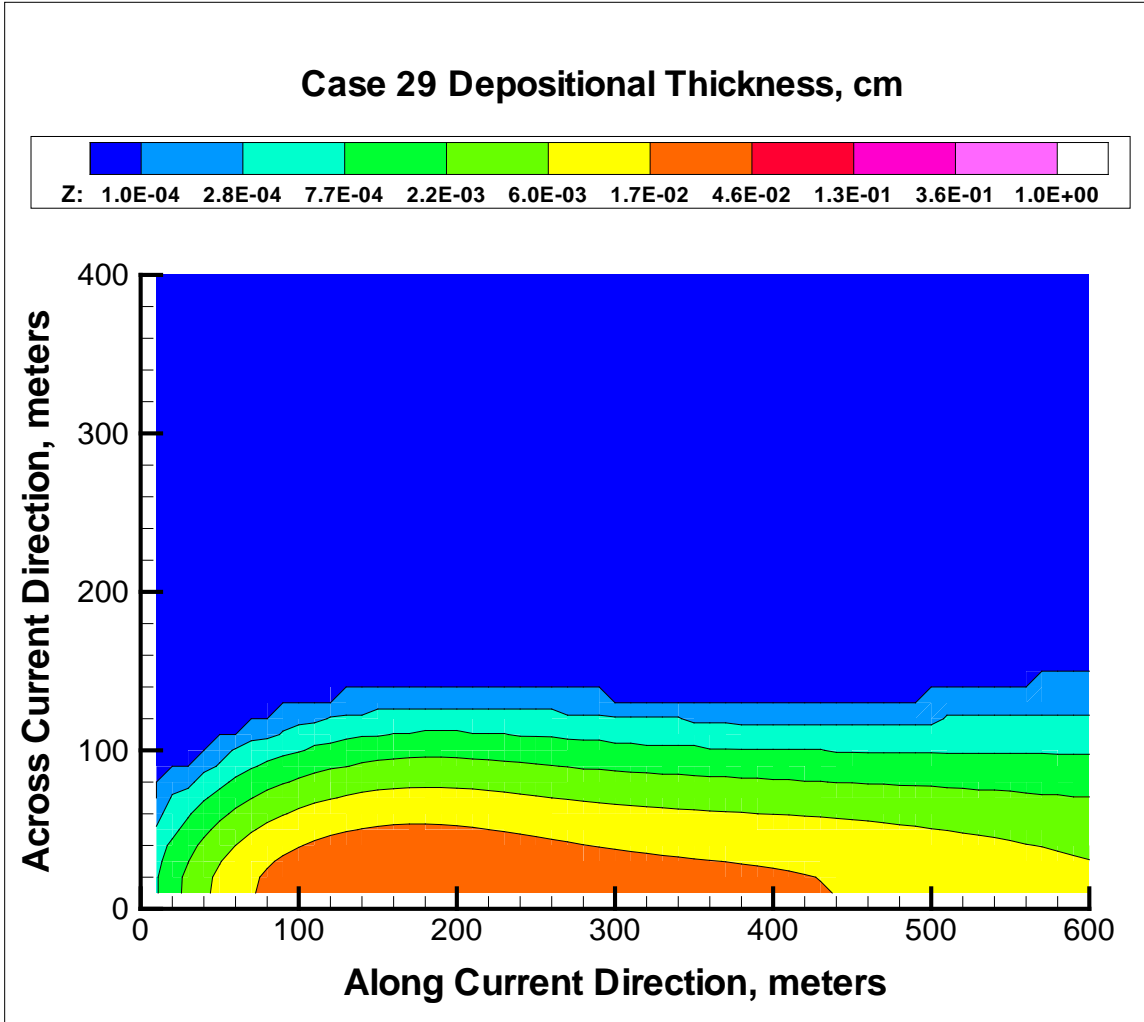

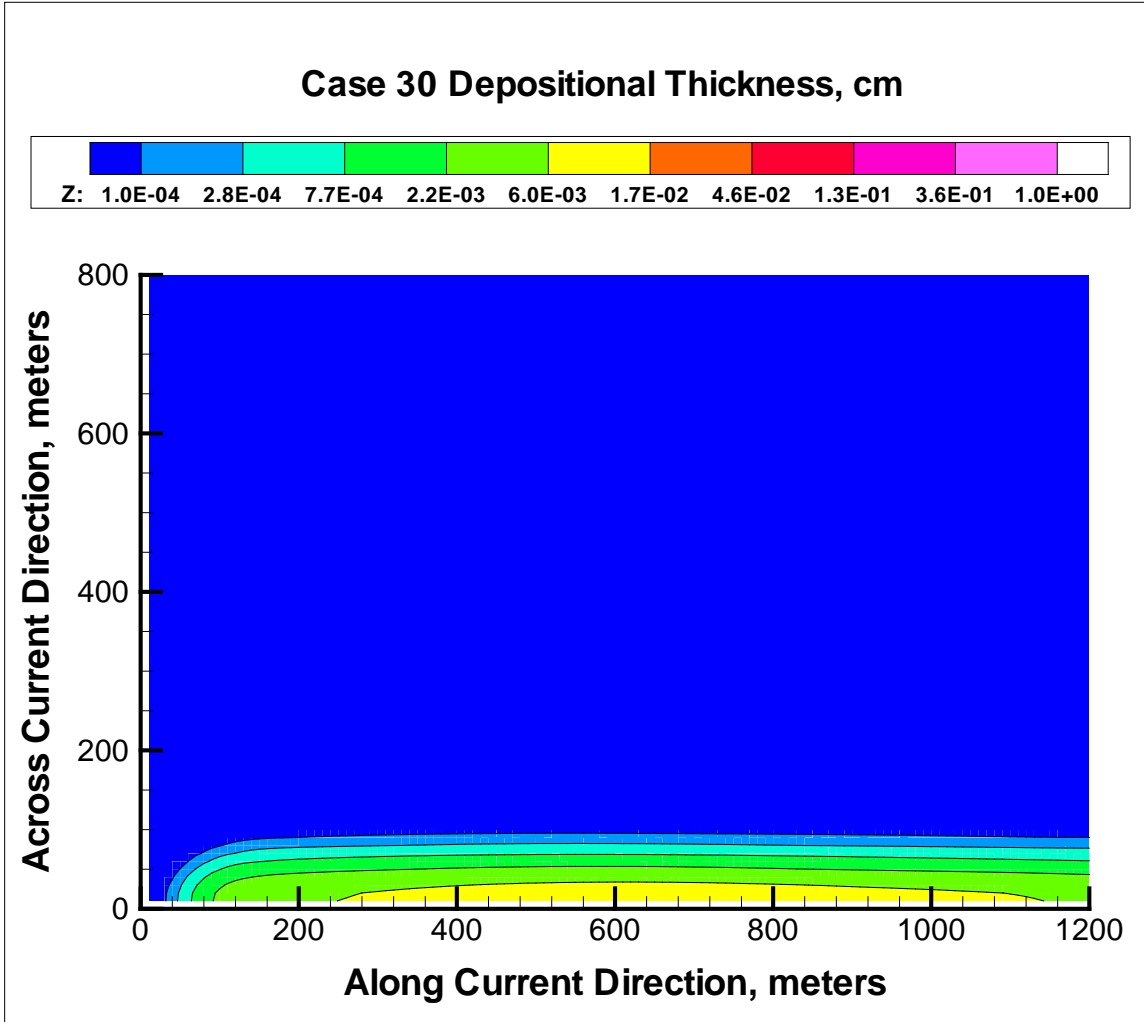Case 16 Depositional Thickness, cm

**CASE-17 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)**

Case 17 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-18 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)
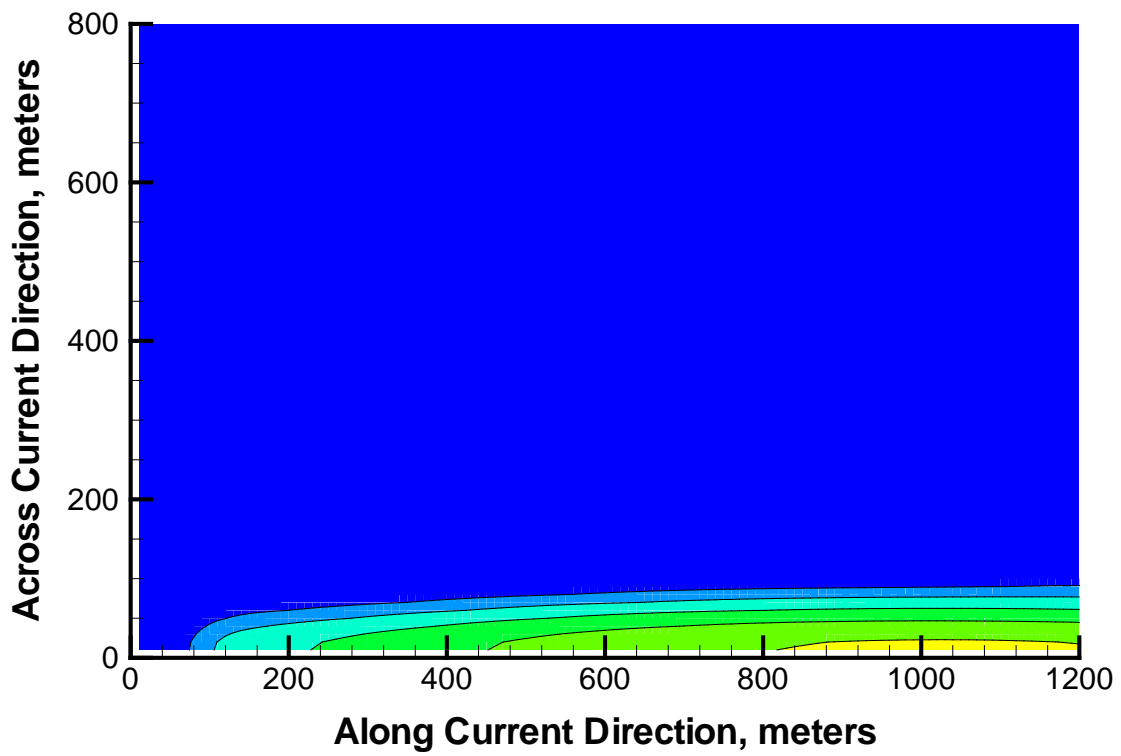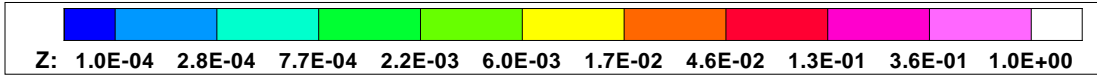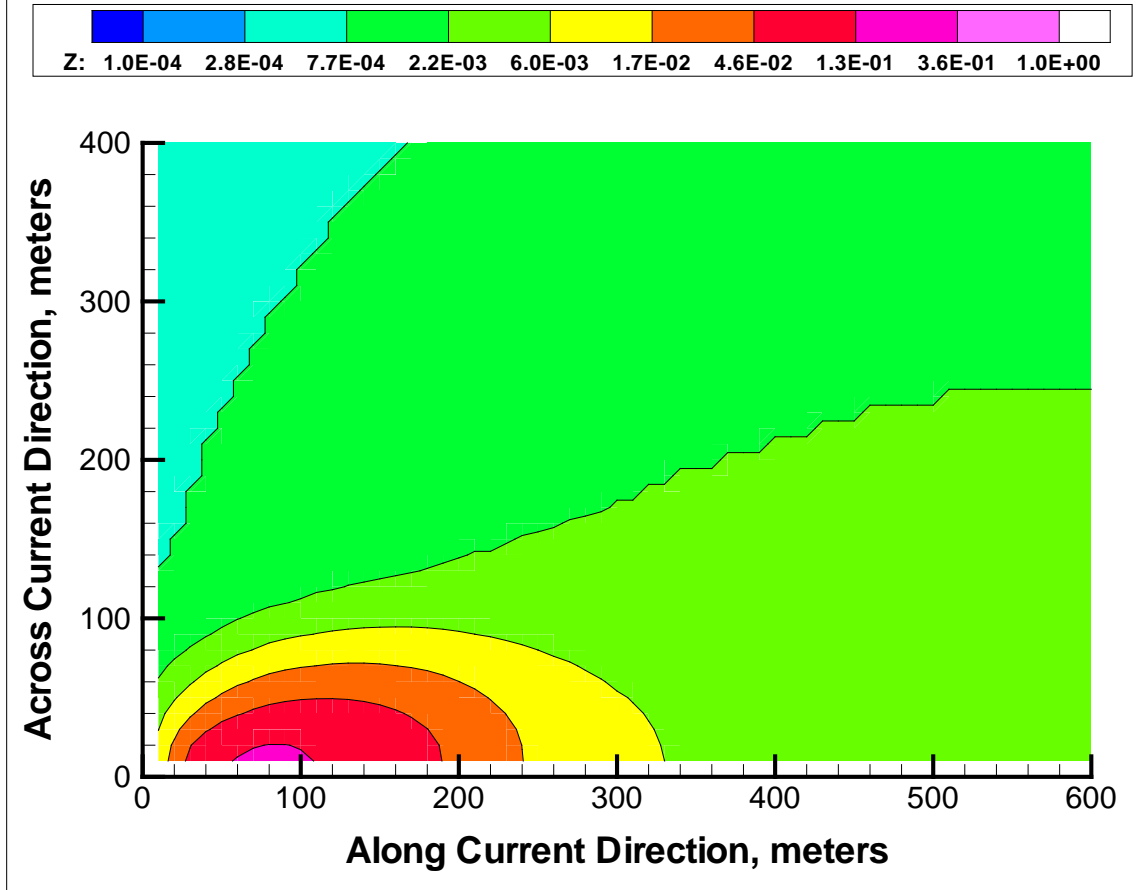

Case 18 Depositional Thickness, cm

**CASE-19 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 5 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)**

Case 19 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-20 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

Case 20 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-21 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

Case 21 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

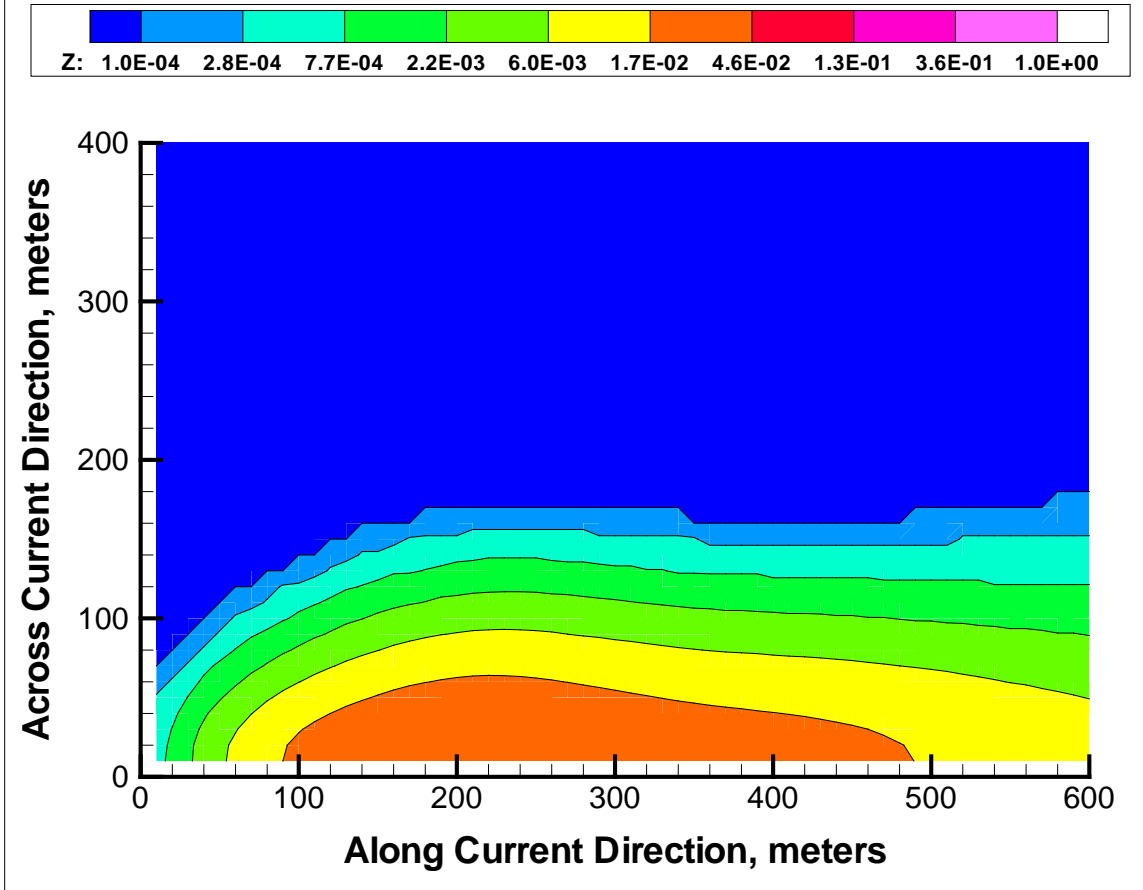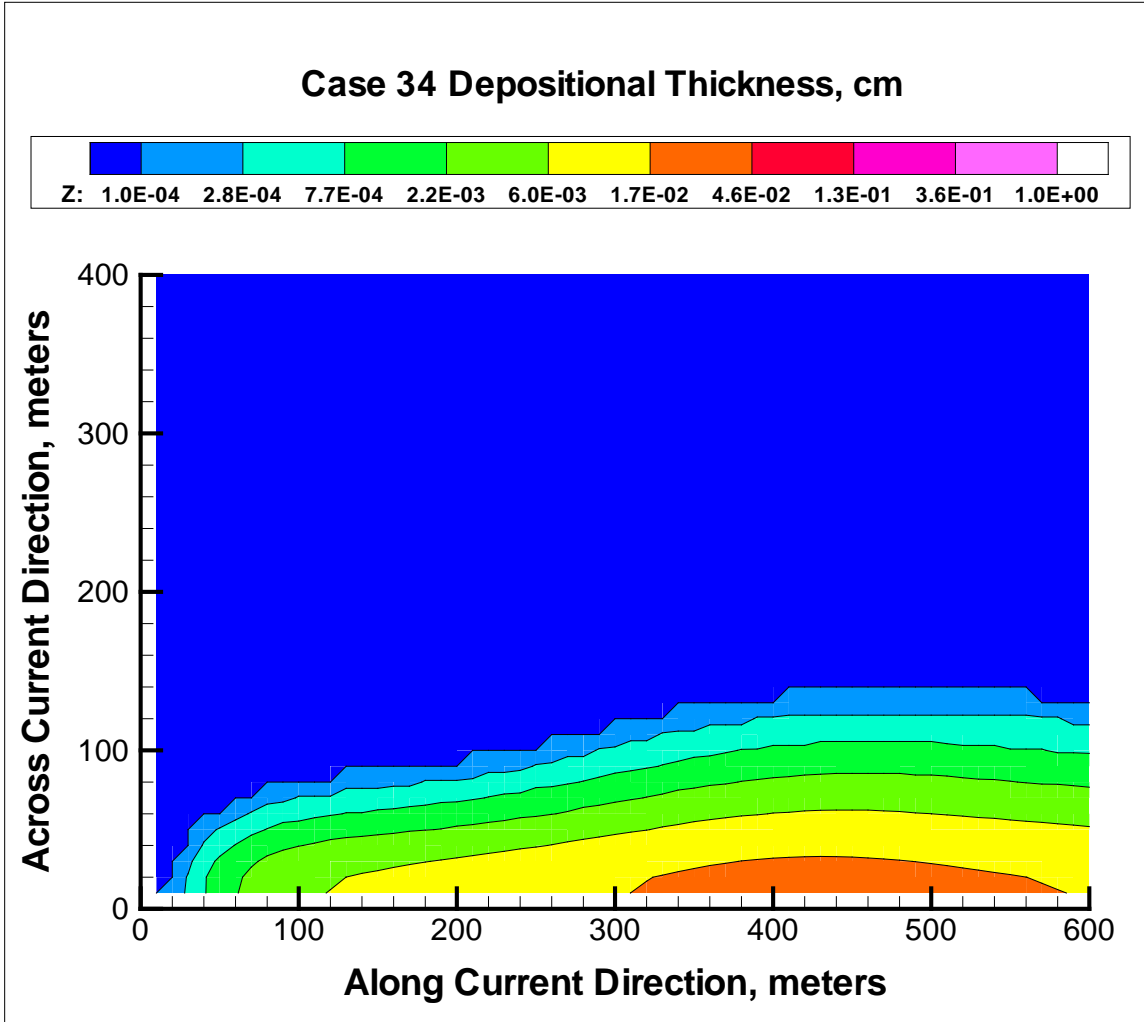Along Current Direction, meters

Across Current Direction, meters

CASE-22 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

CASE-23 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 40 cm/sec)
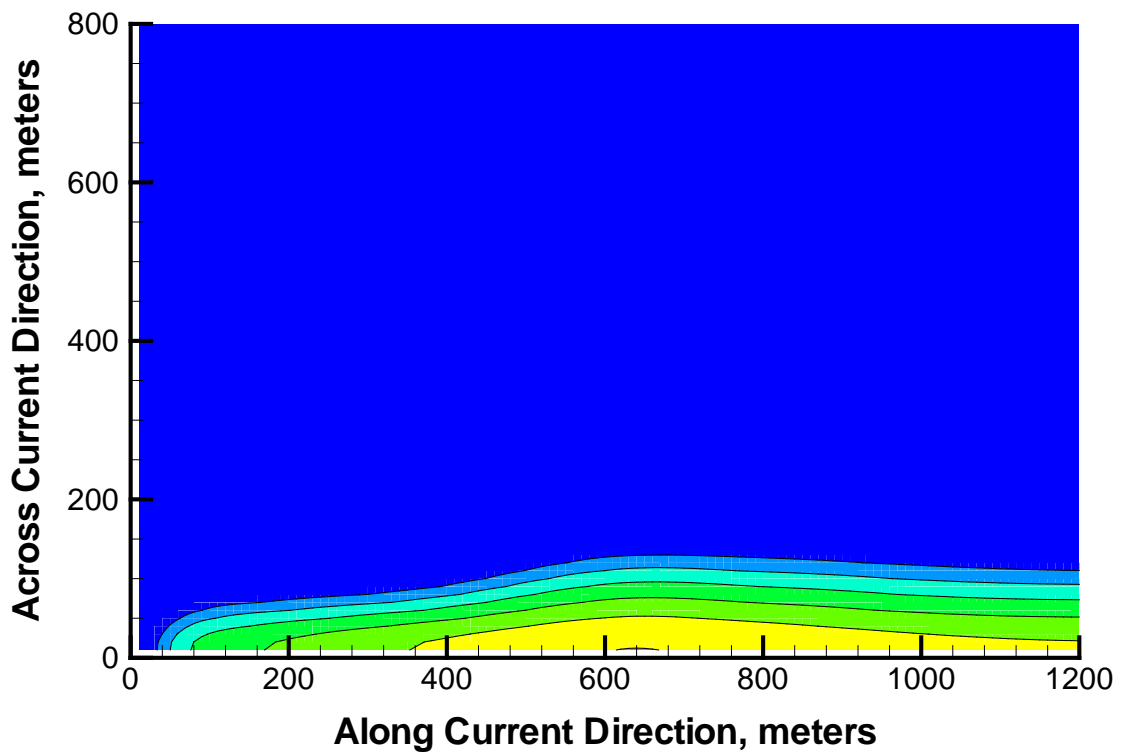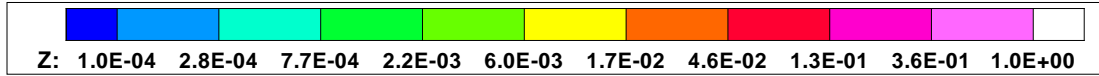**Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)**

**CASE-24 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)**

CASE-25 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 500 bbl/hr)

Case 25 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-26 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 30 cm/sec)
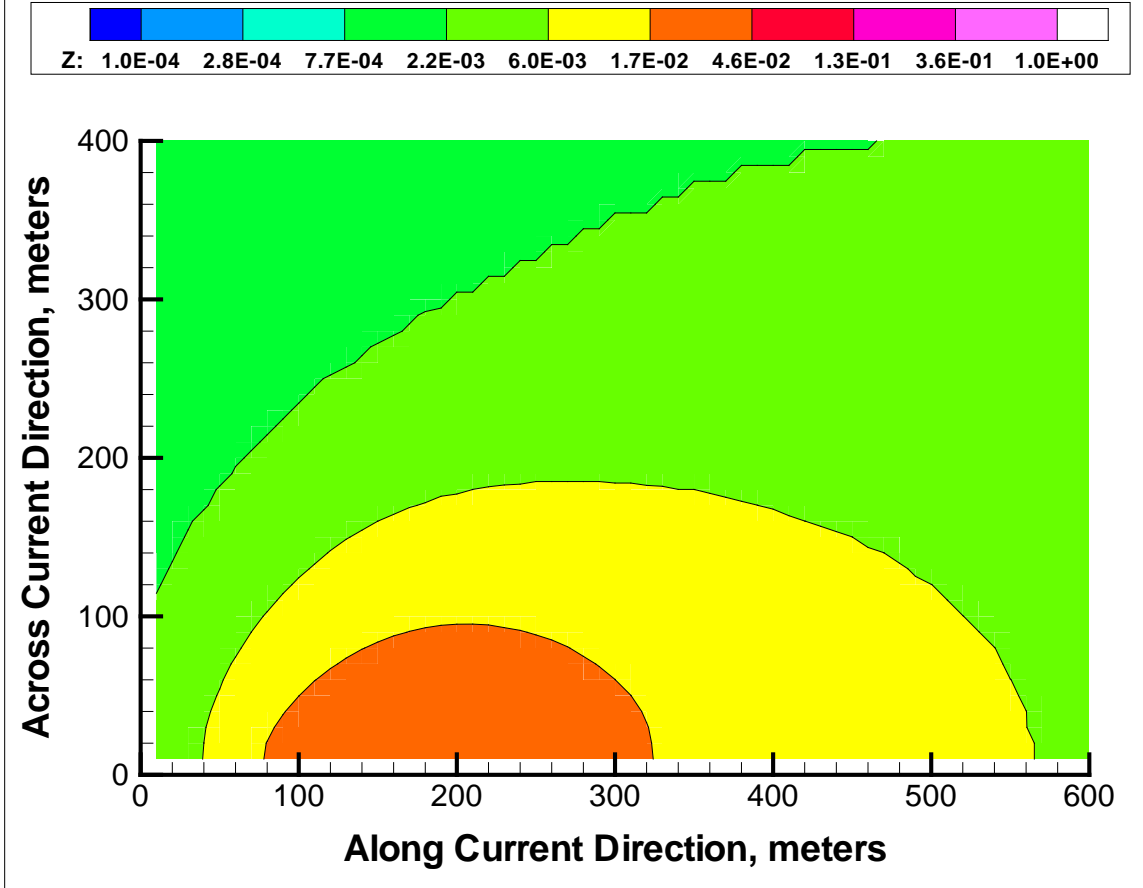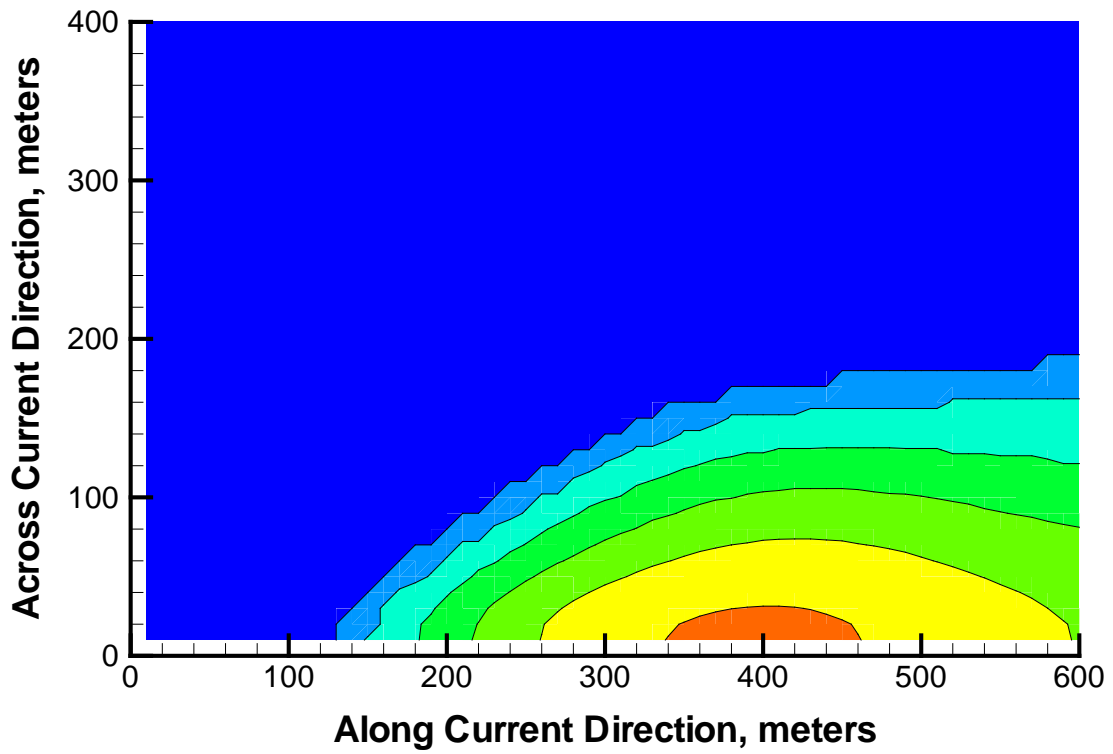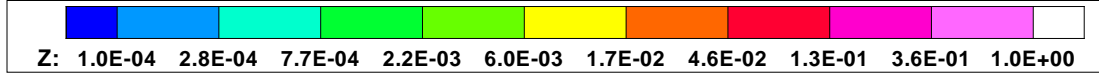Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)

CASE-27 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 40 cm/sec)
Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)

Case 27 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-28 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 500 bbl/hr)

Case 28 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

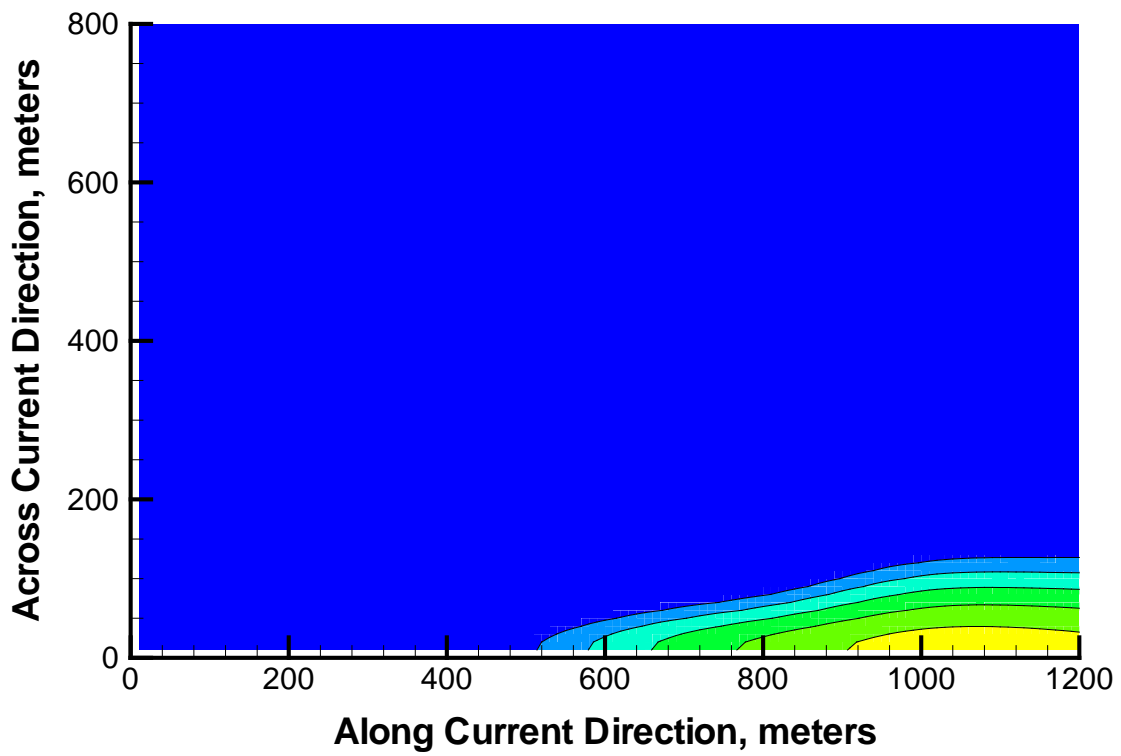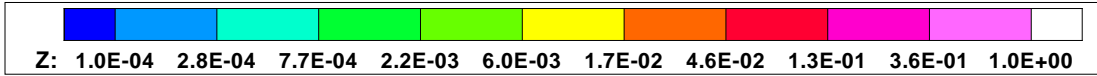Across Current Direction, meters

Along Current Direction, meters

CASE-29 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 35.3 m, Rate= 500 bbl/hr)

CASE-30 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 30 cm/sec)
Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)

Case 30 Depositional Thickness, cm

CASE-31 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 40 cm/sec)
Discharge (Depth= 20.3 m, Rate= 500 bbl/hr)
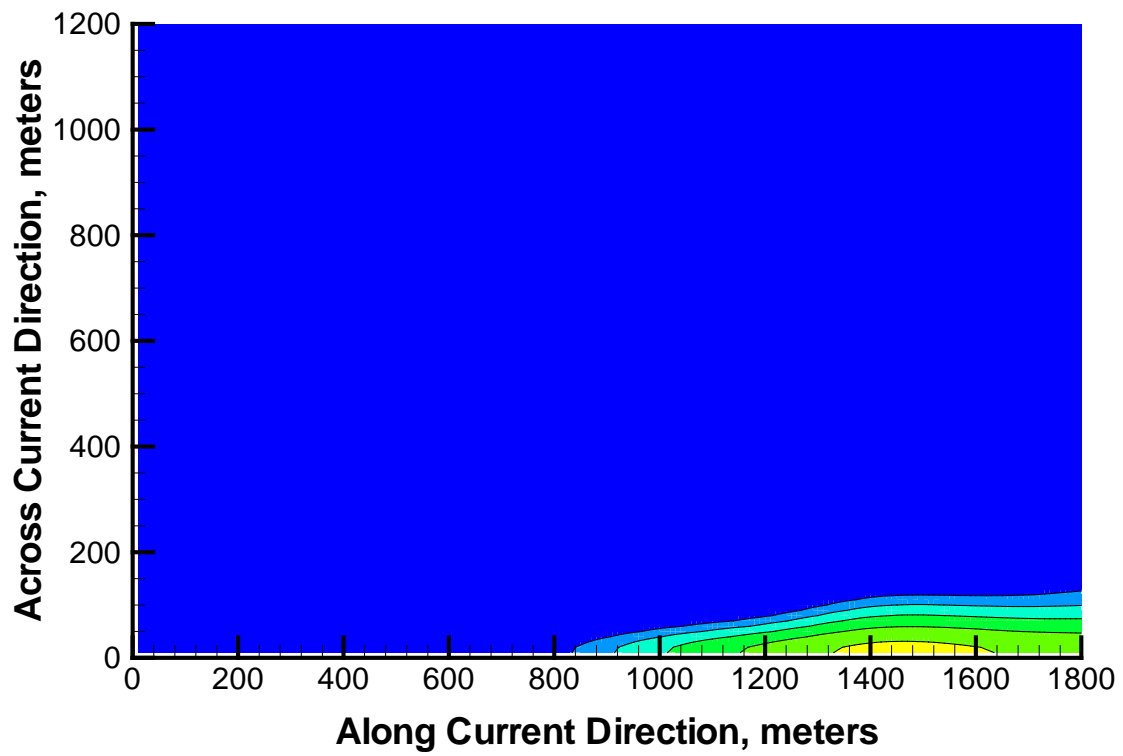

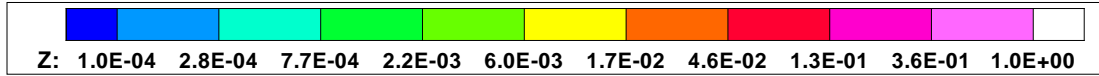Case 31 Depositional Thickness, cm

CASE-32 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Case 32 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

Across Current Direction, meters
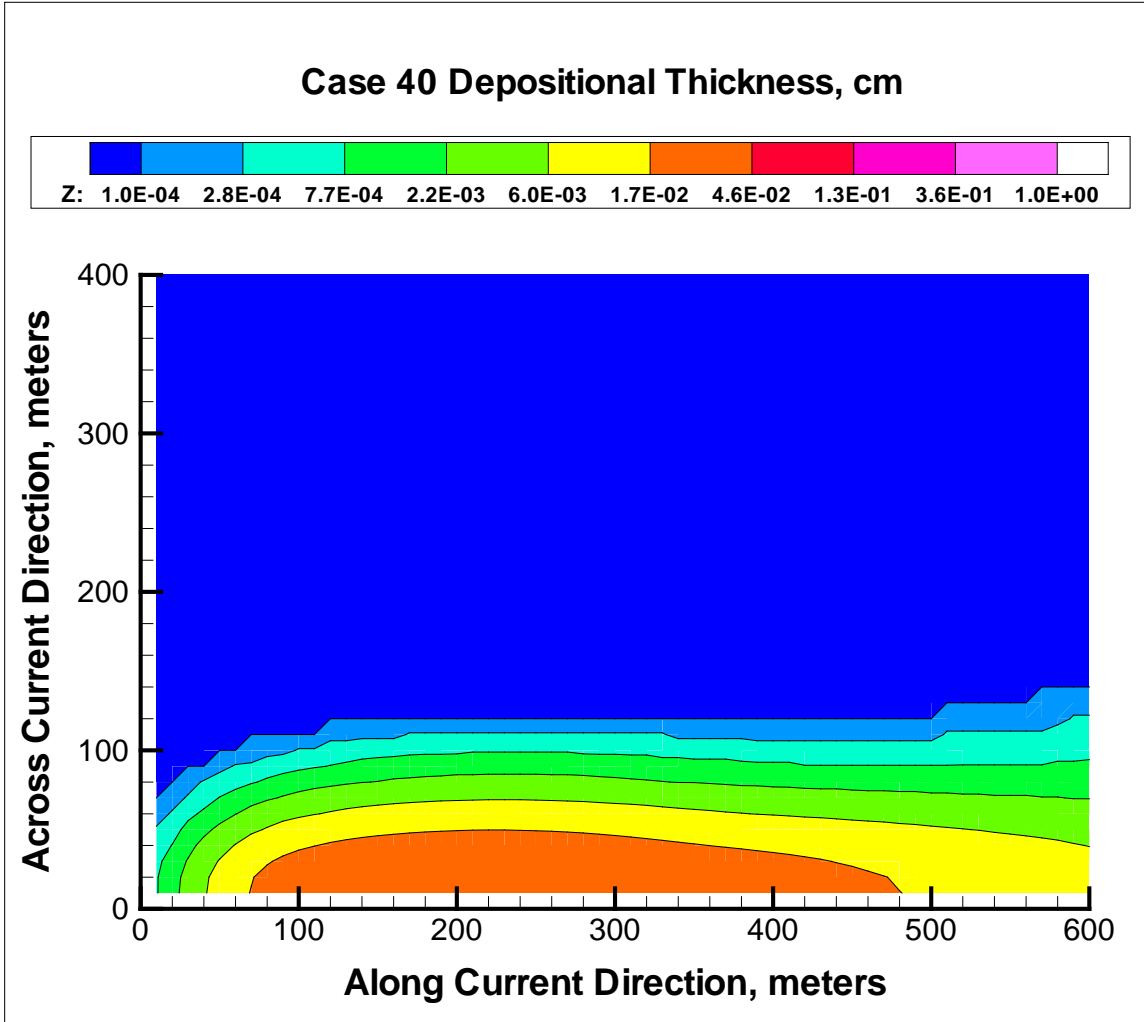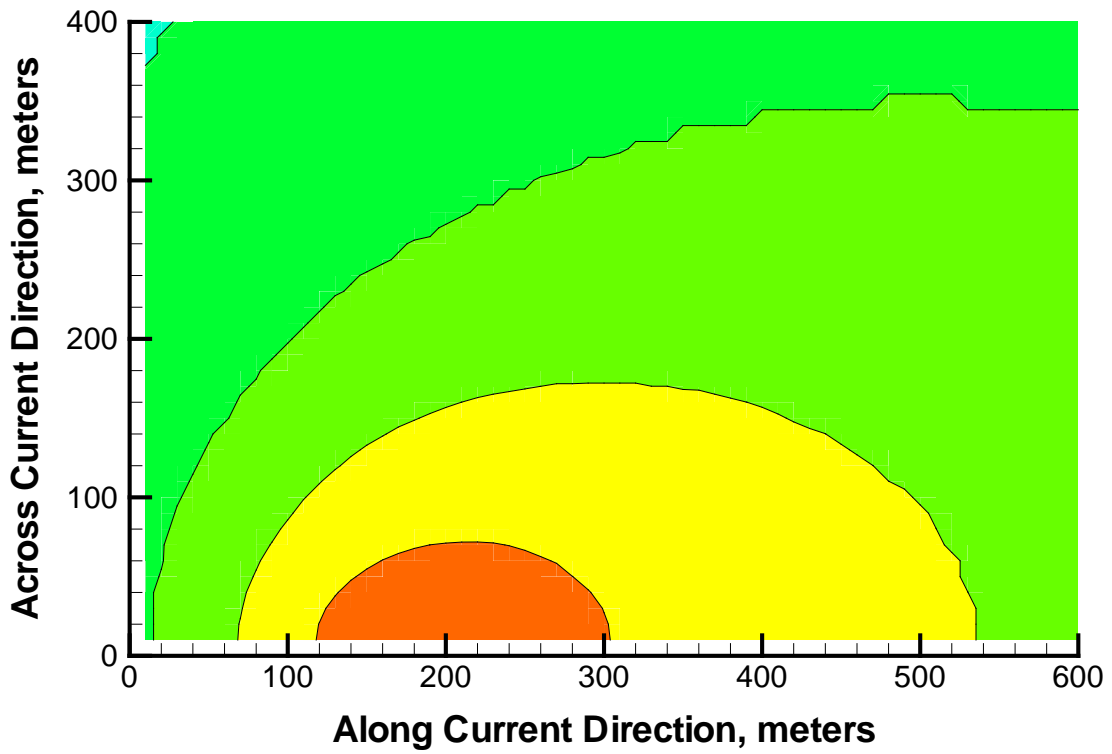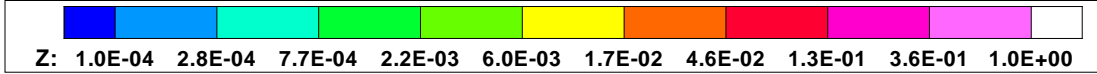
Along Current Direction, meters

**CASE-33 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)**

CASE-34 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

CASE-35 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 20 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Case 35 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-36 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
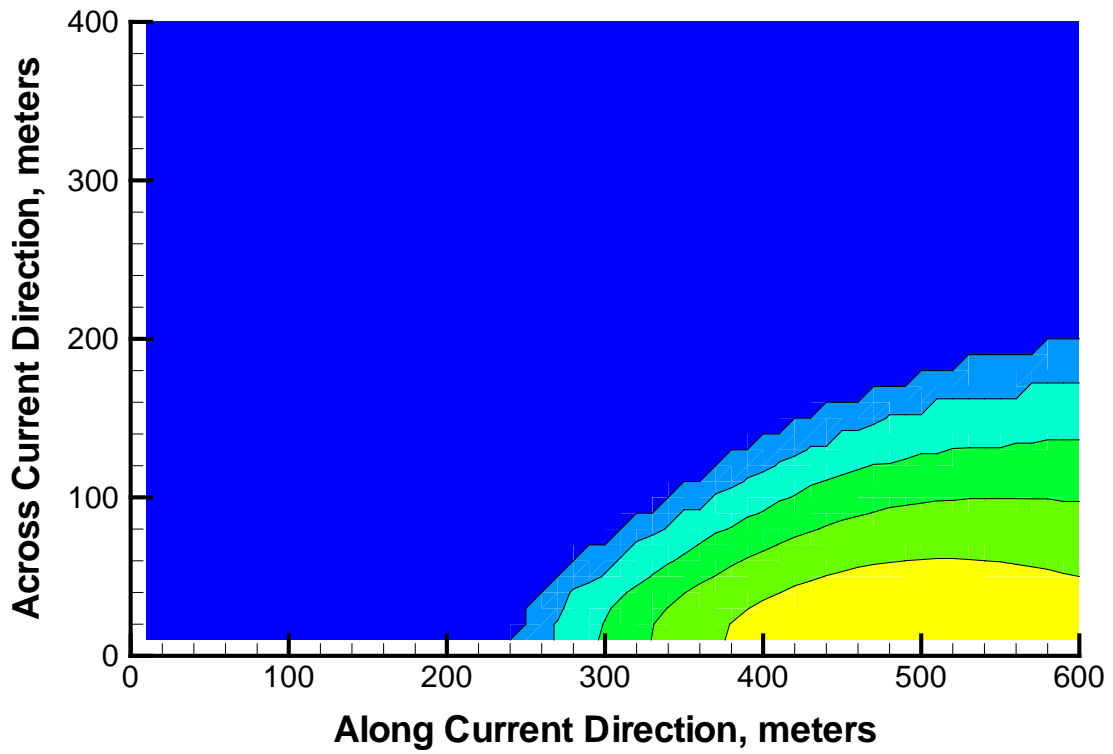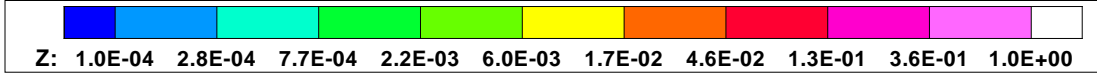**Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)**

Case 36 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-37 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Case 37 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-38 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 30 cm/sec)
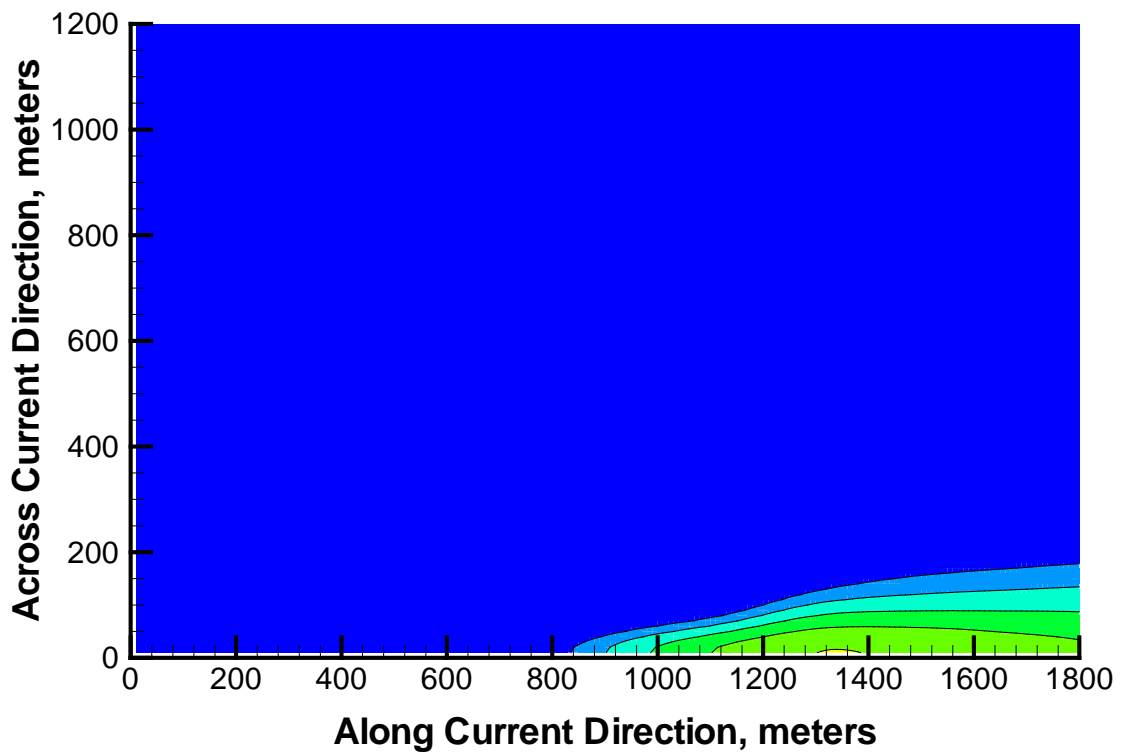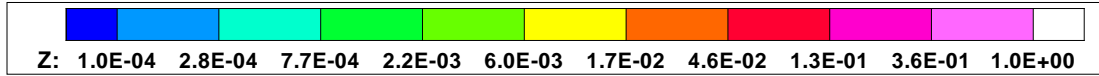## Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Case 38 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-39 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 40 cm/sec)
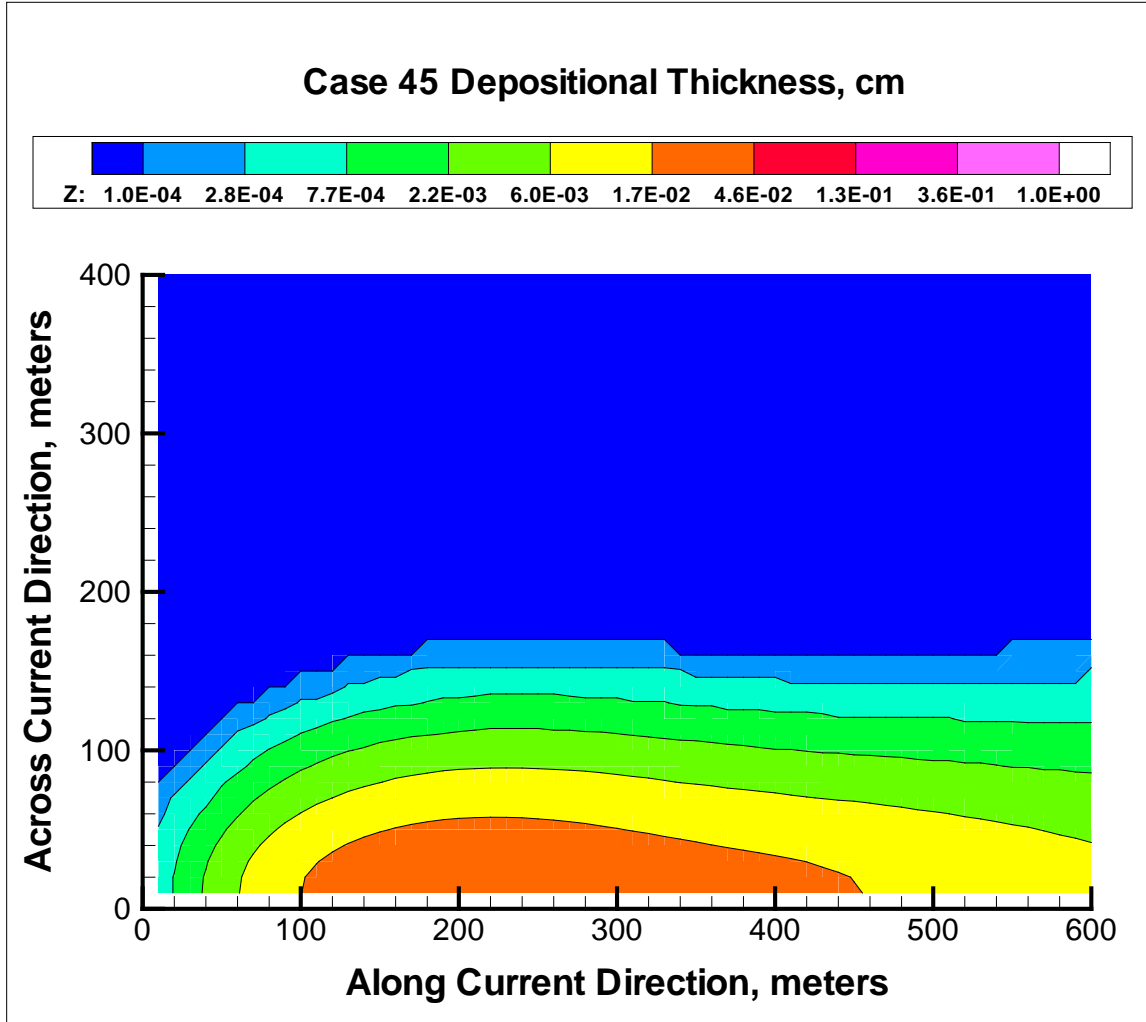**Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)**

Case 39 Depositional Thickness, cm

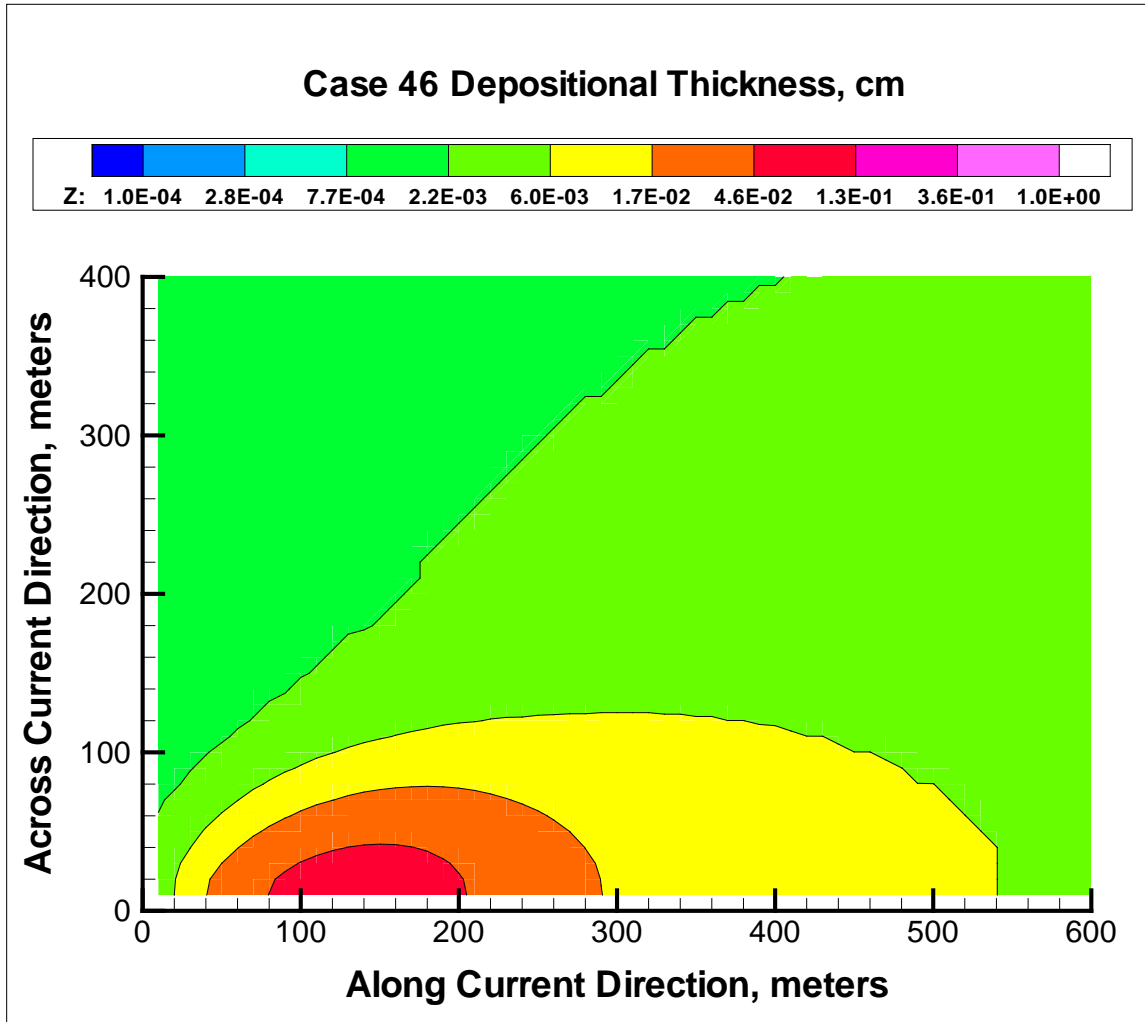Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-40 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 20.3 m, Rate= 750 bbl/hr)

CASE-41 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Case 41 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-42 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
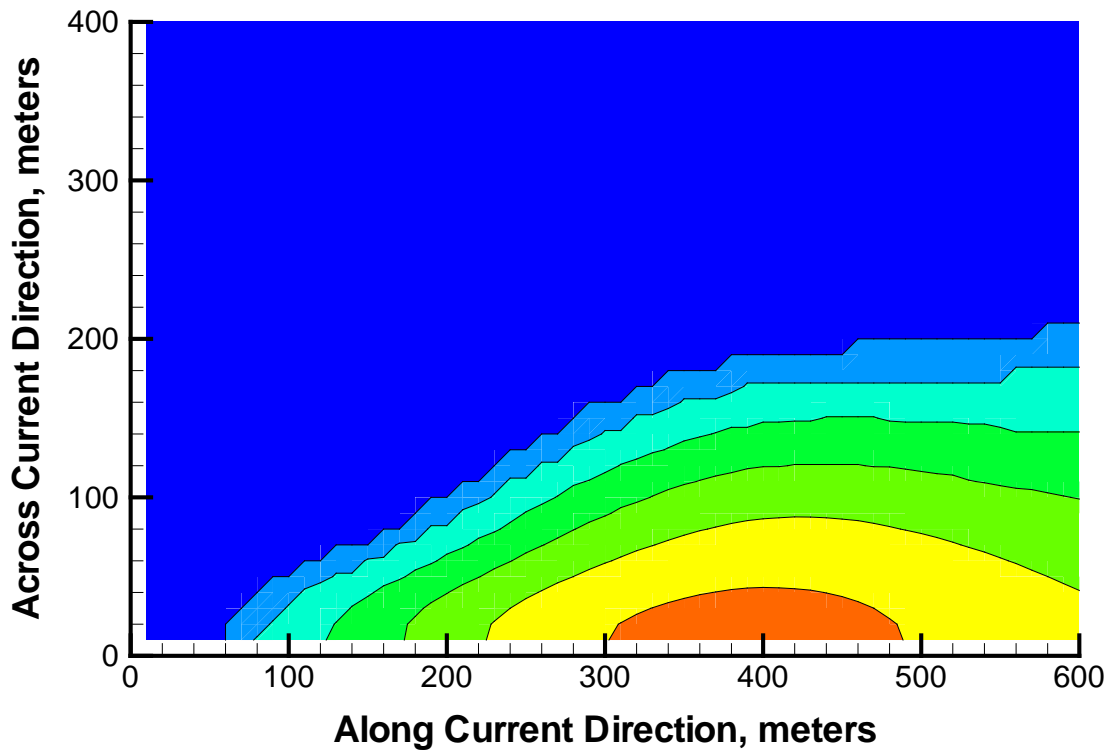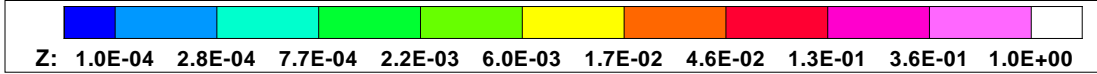Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

CASE-43 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

Case 43 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00
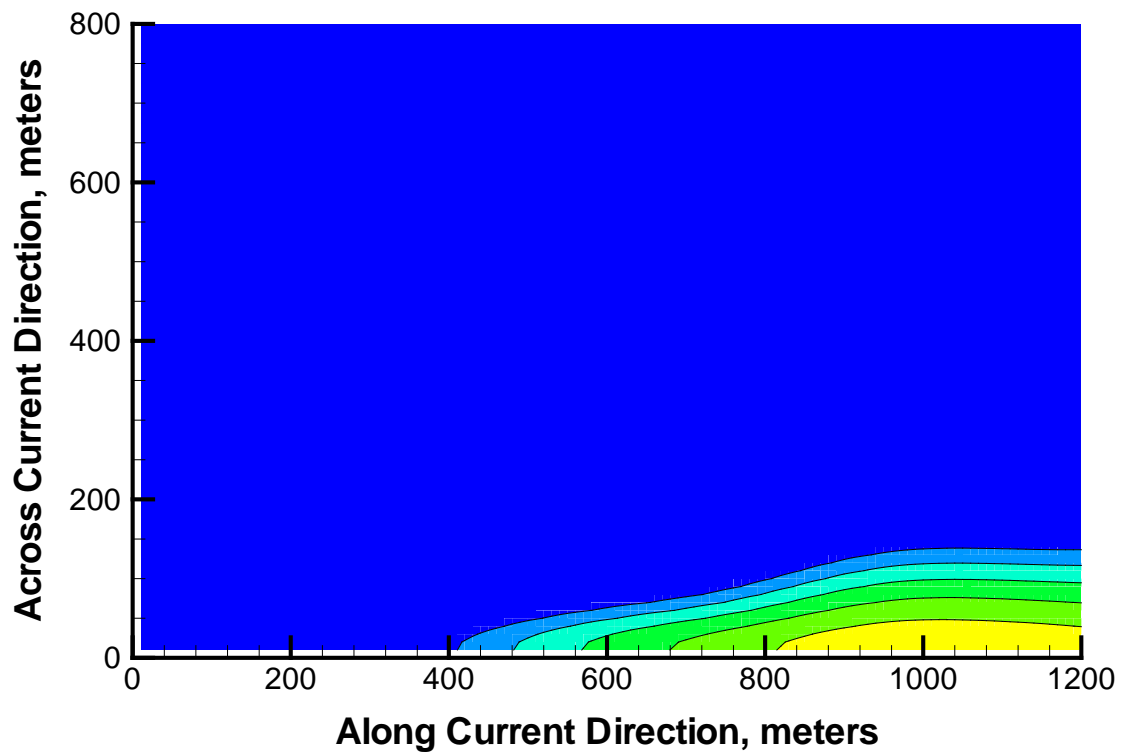
CASE-44 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 750 bbl/hr)

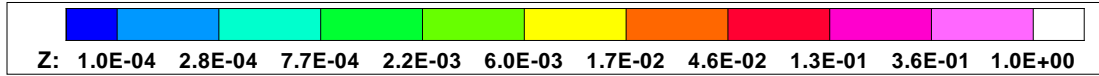OOC Model Failed to Produce Meaningful Results

CASE-45 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 20.3 m, Rate= 750 bbl/hr)

Case 45 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

Across Current Direction, meters
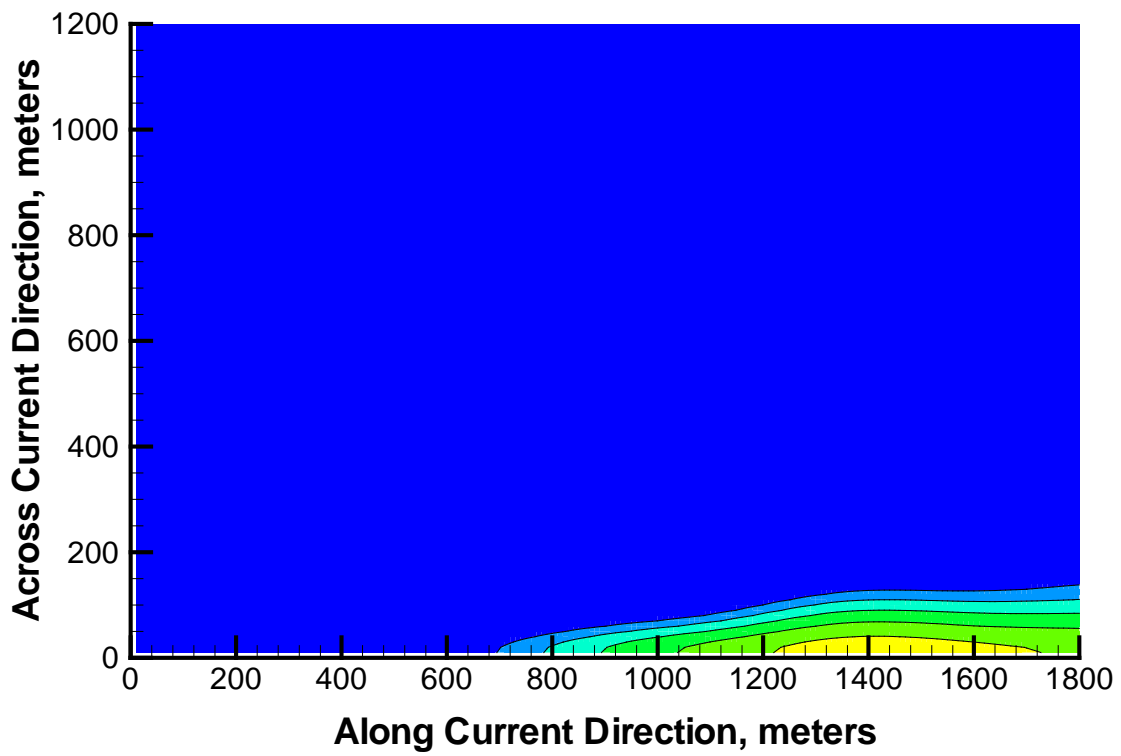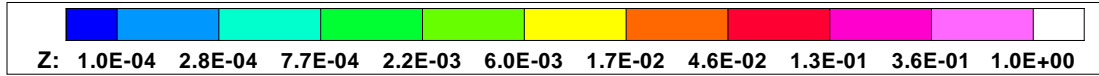
Along Current Direction, meters

CASE-46 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

Case 46 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

Along Current Direction, meters
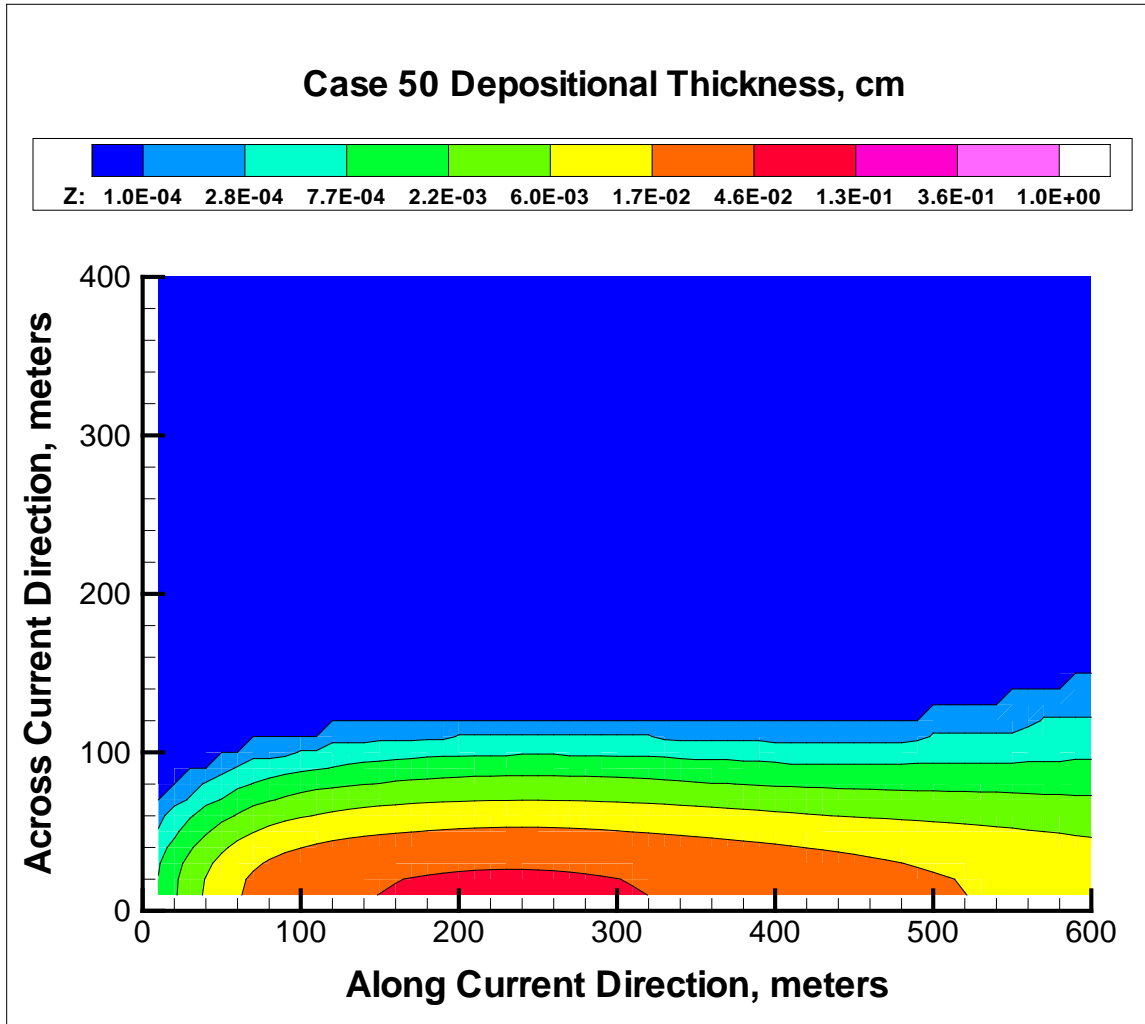
Across Current Direction, meters

CASE-47 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

Case 47 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-48 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)
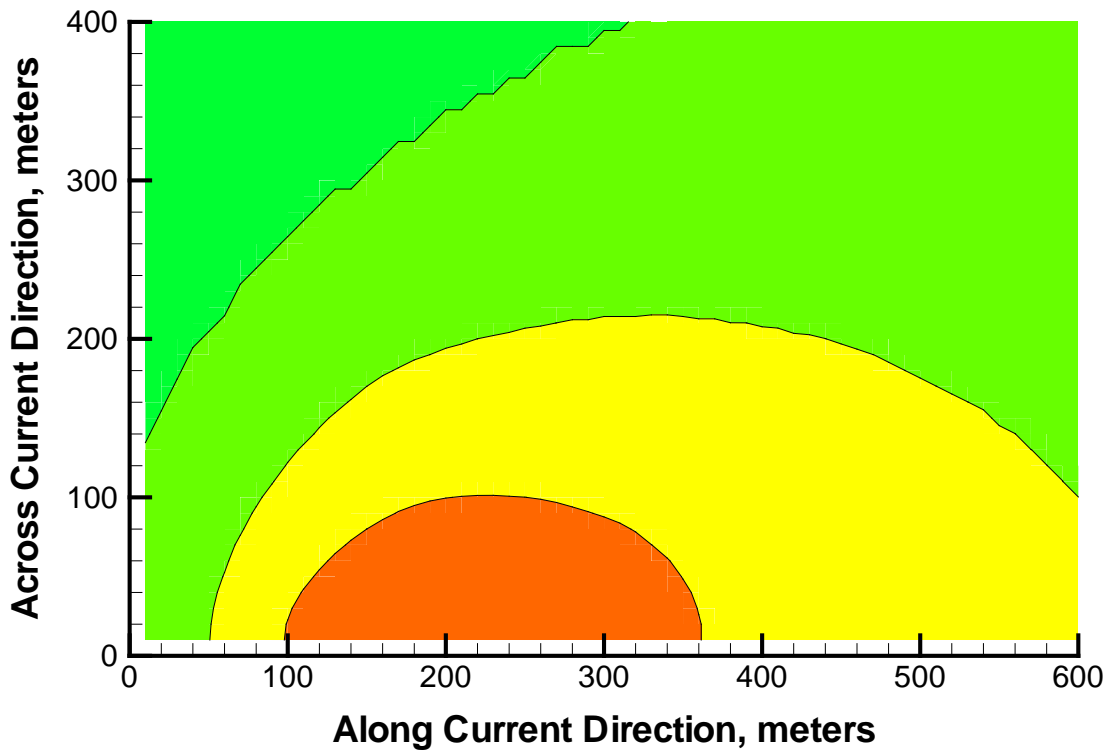

Case 48 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-49 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

Case 49 Depositional Thickness, cm

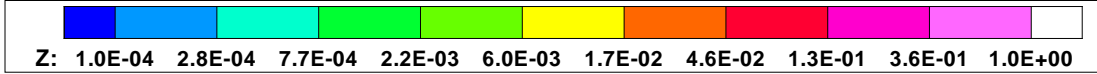CASE-50 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 40 m, Current Speed= 10 cm/sec)
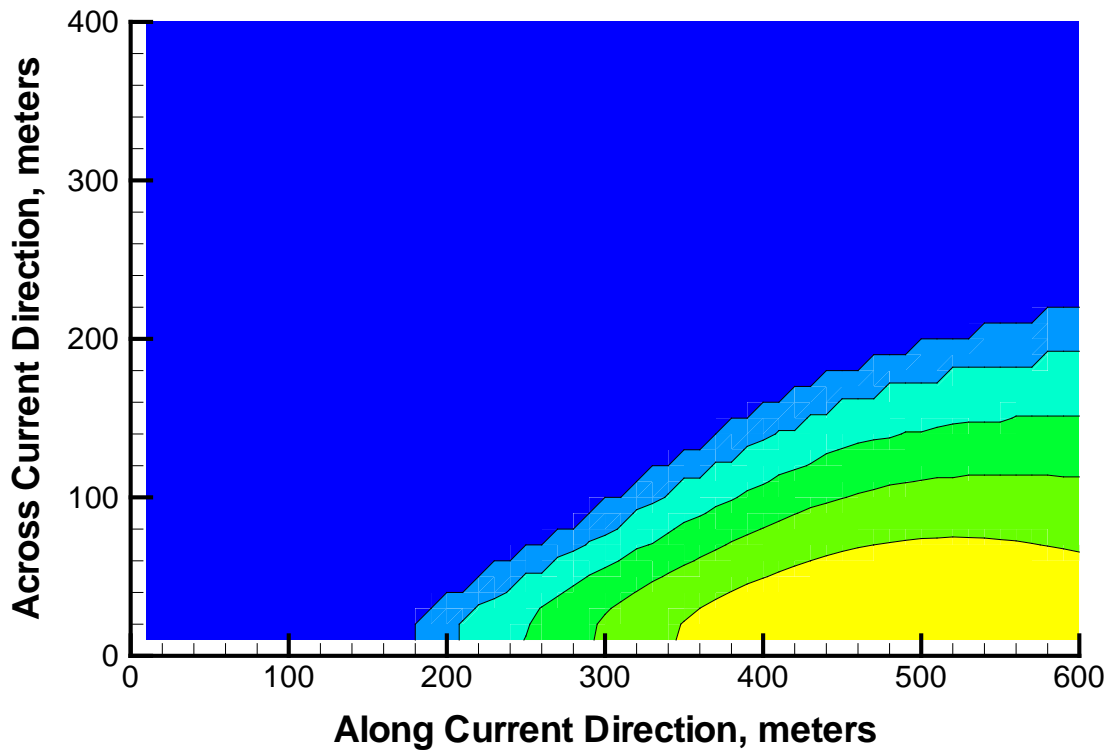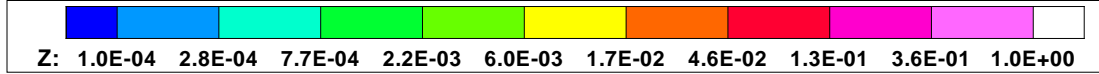Discharge (Depth= 20.3 m, Rate= 1000 bbl/hr)

CASE-51 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 2 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

Case 51 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00
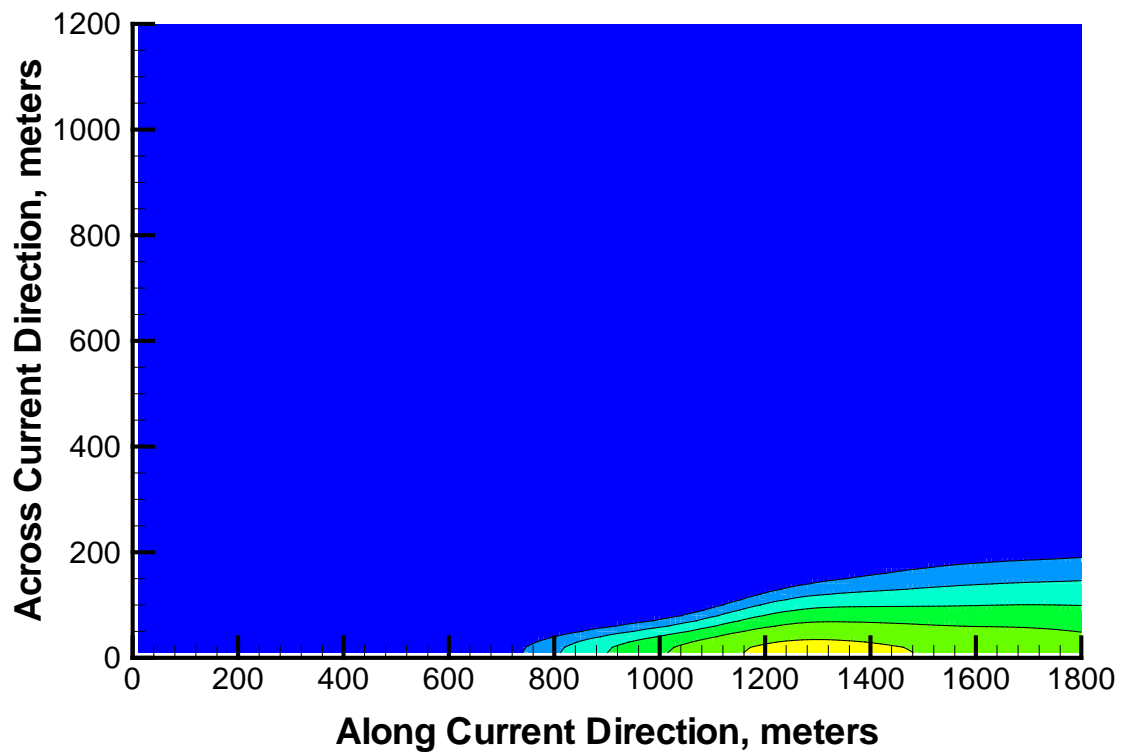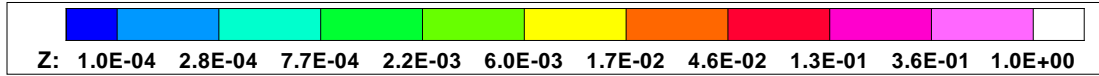
CASE-52 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

Case 52 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

Across Current Direction, meters
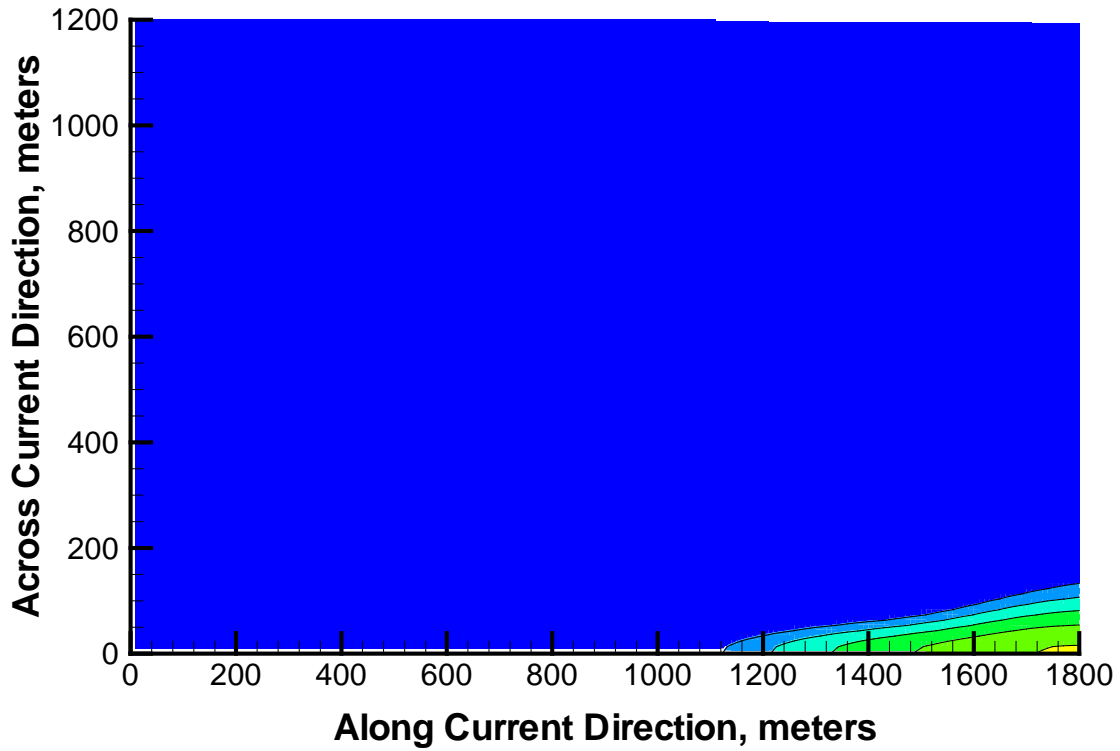
Along Current Direction, meters

CASE-53 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 30 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

Case 53 Depositional Thickness, cm

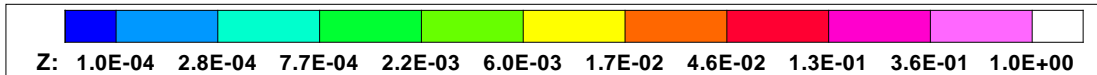Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00

CASE-54 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 40 cm/sec)
Discharge (Depth= 0.3 m, Rate= 1000 bbl/hr)

CASE-55 (Bottom Accumulation (lb/cell)[10m x 10m cell]
Ambient (Water Depth= 50 m, Current Speed= 10 cm/sec)
Discharge (Depth= 20.3 m, Rate= 1000 bbl/hr)

Case 55 Depositional Thickness, cm

Z: 1.0E-04 2.8E-04 7.7E-04 2.2E-03 6.0E-03 1.7E-02 4.6E-02 1.3E-01 3.6E-01 1.0E+00