Results of Time-Domain Electromagnetic Soundings in Miami-Dade and Southern Broward Counties, Florida

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U.S. Department of the Interior
U.S. Geological Survey

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By David V. Fitterman and Scott T. Prinos

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**U.S. Department of the Interior
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Conversion Factors, Datum, Abbreviations, and Acronyms

SI to Inch/Pound

Multiply	By	To obtain
Length		
centimeter (cm)	0.3937	inch (in.)
millimeter (mm)	0.03937	inch (in.)
meter (m)	3.281	foot (ft)
kilometer (km)	0.6214	mile (mi)
kilometer (km)	0.5400	mile, nautical (nmi)
meter (m)	1.094	yard (yd)

Inch/Pound to SI

Multiply	By	To obtain
million gallons per day (Mgal/d)	0.04381	cubic meters per second

Electrical Conductivity and Electrical Resistivity

Multiply	By	To obtain
Electrical conductivity		
siemens per meter (S/m)	1,000	millisiemens per meter (mS/m)
siemens per meter (S/m)	10,000	microsiemens per centimeter ($\mu\text{S/cm}$)
Electrical resistivity		
ohm-meters (ohm-m)	0.001	kiloohm-meters (kohm-m)

Electrical conductivity σ in siemens per meter [S/m] can be converted to electrical resistivity ρ in ohm-meters [ohm-m] as follows: $\rho = 1/\sigma$.

Electrical conductivity σ in millisiemens per meter [mS/m] can be converted to electrical resistivity ρ in ohm-meters [ohm-m] as follows: $\rho = 1,000/\sigma$.

Electrical conductivity σ in microsiemens per centimeter [$\mu\text{S/cm}$] can be converted to electrical resistivity ρ in ohm-meters [ohm-m] as follows: $\rho = 10,000/\sigma$.

Electrical resistivity ρ in ohm-meters [ohm-m] can be converted to electrical conductivity σ in siemens per meter [S/m] as follows: $\sigma = 1/\rho$.

Electrical resistivity ρ in ohm-meters [ohm-m] can be converted to electrical conductivity σ in millisiemens per meter [mS/m] as follows: $\sigma = 1,000/\rho$.

Electrical resistivity ρ in ohm-meters [ohm-m] can be converted to electrical conductivity σ in microsiemens per centimeter [$\mu\text{S/cm}$] as follows: $\sigma = 10,000/\rho$.

Specific conductance SC refers to fluid electrical conductivity corrected to a temperature of 25°C. The units of specific conductance are usually in microsiemens per centimeter [$\mu\text{S/cm}$]. The above conversions apply.

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

ABBREVIATIONS USED IN THIS REPORT:

A	ampere
ft	feet
H/m	henry per meter
Hz	hertz
km	kilometer
m	meter
mi	mile
mg/L	milligram per liter
m ²	meter squared
msec	millisecond
mV	millivolt
nV/m ²	nanovolt per meter squared
ohm-m	ohm-meter
ppt	parts per thousand
μs	microsecond
μS/cm	microsiemen per centimeter
Wb/m ²	weber per meter squared

ACRONYMS USED IN THIS REPORT:

GPS	global positioning system
HEM	helicopter electromagnetic
HI	high
NAD	North American datum
SC	specific conductance
TEM	time-domain electromagnetic
UH	ultra high
USGS	U.S. Geological Survey

Results of Time-Domain Electromagnetic Soundings in Miami-Dade and Southern Broward Counties, Florida

By David V. Fitterman¹ and Scott T. Prinos²

Abstract

Time-domain electromagnetic (TEM) soundings were made in Miami-Dade and southern Broward Counties to aid in mapping the landward extent of saltwater in the Biscayne aquifer. A total of 79 soundings were collected in settings ranging from urban to undeveloped land, with some of the former posing problems of land access and interference from anthropogenic features. TEM soundings combined with monitoring-well data were used to determine if the saltwater front had moved since the last time it was mapped, to provide additional spatial coverage where existing monitoring wells were insufficient, and to help interpret a previously collected helicopter electromagnetic (HEM) survey flown in the southernmost portion of the study area.

TEM soundings were interpreted as layered resistivity-depth models. Using information from well logs and water-quality data, the resistivity of the freshwater saturated Biscayne aquifer is expected to be above 30 ohm-meters, and the saltwater-saturated aquifer will have resistivities of less than 10 ohm-meters allowing determination of water quality from the TEM interpretations. TEM models from 29 soundings were compared to electromagnetic induction logs collected in nearby monitoring wells. In general, the agreement of these results was very good, giving confidence in the use of the TEM data for mapping saltwater encroachment.

Introduction

The Biscayne aquifer in southeastern Florida is the principal source of drinking water for the residents of Miami-Dade (formerly Dade) and Broward Counties (Miller, 1990). In addition, the Biscayne aquifer is the sole source of potable water for all residents living in the Florida Keys, Monroe County delivered by an aqueduct that extends from a well field west of Florida City south to Key West. As the population of southeastern Florida has increased so have water withdrawals from the Biscayne aquifer (Prinos and others, 2002). As of 1990, 573 Mgal/d or 34 percent of all the groundwater withdrawn in Florida came from the Biscayne aquifer (Marella, 1993). Because of its proximity to the coast this aquifer is vulnerable to contamination by seawater.

Prior to widespread development of southeastern Florida, water levels in the Biscayne aquifer were generally sufficient to minimize the landward extent of saltwater³ in the Biscayne

¹ U.S. Geological Survey, emeritus

² U.S. Geological Survey

³ The term seawater is used herein to refer only to water whose source is the ocean and has the same chemical composition as ocean water. Seawater that has mixed with freshwater in the canals or in the aquifer is considered to be saltwater because of dilution and chemical interaction with the rock matrix.

aquifer. Wells 15 to 18 m (50 to 60 ft) deep near the mouth of the Miami River yielded freshwater, and freshwater springs flowed from the low ridges of Miami Limestone near Biscayne Bay (Parker and others, 1955). The installation of drainage canals in 1907 in the New River Basin at Ft. Lauderdale and the Miami Canal in 1909 (Parker and others, 1955) began to allow saltwater (1) to encroach along the base of the aquifer, and (2) to flow long distances up these unregulated canals and into the aquifers, especially during periods of low rainfall and low canal flow.

Canal dredging operations were greatly expanded during the periods 1910 to 1918 and 1925 to 1927 as numerous major canals were added to aid in drainage of the area to create land for agricultural development (Parker, 1945). The addition of canals led to saltwater contamination in 1925 of the first well field of the city of Miami. This well field was 2.5 km (1.6 mi) inland from Biscayne Bay near the Miami River. By 1939, reduced aquifer water levels resulting from groundwater withdrawals combined with the effects of the drainage canals caused saltwater contamination of some of the wells at Miami's newer well field 10.5 km (6.5 mi) inland from Biscayne Bay near the Miami River.

To prevent the movement of saltwater up the canals during high tides and to reduce the drainage of the Biscayne aquifer, which was allowing saltwater to encroach at its base, water managers began to install salinity-control structures (Sonenshein, 1997). By 1946, steel sheet-pile dams had been installed in most of the canals in the Miami area (Leach and Grantham, 1966). Salinity-control structures helped to reduce saltwater encroachment in some areas.

In 1949, the Central and Southern Florida Flood Control Project and District was established. The District developed a comprehensive plan (1) to remove flood water rapidly, (2) to provide surface-water storage for regional water supply, (3) to prevent canal over drainage and saltwater encroachment, (4) to supply water to Everglades National Park, (5) to help preserve fish and wildlife, and (6) to serve recreational and navigational needs (Renken and others, 2005). During the 1950s and 1960s, an extensive drainage canal and water-control structure network was created under the auspices of this plan. Additional salinity-control structures were added throughout southeastern Florida. The original steel sheet-pile dams were eventually replaced by permanent automated control structures.

Despite these improvements, the drought of 1970 to 1971 reduced water levels in the aquifer resulting in increased saltwater encroachment (Sonenshein, 1997). As a result, additional changes to the water-management system were made. By 1995, Sonenshein (1997) found that the location of the saltwater interface in much of Miami-Dade County had remained approximately the same between 1984 and 1995.

Although there are now salinity-control structures on most canals in southeastern Florida that have proven useful in retarding or reversing saltwater encroachment, portions of some canals still remain uncontrolled for up to 8 km (5 mi) inland to allow navigation and dockage. As of December 2009 there was still no salinity-control structure on the Card Sound Road Canal south of Florida City.

To continually monitor saltwater encroachment in Miami-Dade and Broward Counties the U.S. Geological Survey (USGS) has operated a groundwater sampling network since 1939. Sampled chloride content is declining along the Miami River west of the salinity-control structure, which indicates that saltwater encroachment in this area has been halted and previous contamination is dissipating. In some areas chloride concentrations continue to increase indicating that encroachment continues. For this reason the extent of saltwater is periodically reevaluated.

Time-domain electromagnetic (TEM) sounding is a geophysical method that can provide subsurface electrical conductivity information relating to the occurrence and depth of conductive

fluids, such as saltwater, in an aquifer. The advantage of this method is that it is not necessary to install monitoring wells in order to detect the presence of the saltwater interface and estimate its depth. These measurements were made in open fields large enough to accommodate a 40 by 40 m square transmitter loop. Smaller loops can be used, however, they usually do not provide the depth of exploration required. Combining TEM soundings with data from monitoring wells can greatly improve our understanding of the extent of saltwater encroachment.

Another geophysical method for mapping saltwater encroachment is helicopter electromagnetic (HEM) surveying. Where urban development is minimal this technique can provide very detailed information about the resistivity structure of the ground throughout the survey area. In 2001, an HEM survey was flown in southeastern Miami-Dade County south of Palm Drive and from U.S. Highway 1 eastward to Levee L31E. At the time the survey was flown there were insufficient resources to interpret the results and compare them to ground-based TEM soundings and well data. The HEM survey is the subject of a companion report (Fitterman and others⁴, written commun., 2011).

The USGS in cooperation with Miami-Dade County recently undertook an investigation to (1) remap the landward extent of saltwater in the Biscayne aquifer, (2) augment the information provided by monitoring wells with time-domain electromagnetic (TEM) soundings, (3) collect additional TEM soundings in the vicinity of the 2001 HEM survey, which will aid in the interpretation of this survey and the evaluation of changes that have occurred since 2001, and (4) determine where additional monitoring would add to ongoing assessments of saltwater encroachment.

Purpose and Scope

This report (1) documents the collection, processing, and modeling procedures used to obtain TEM soundings in coastal Miami-Dade County and southern Broward County in southeastern Florida, (2) summarizes the results, and (3) describes the implications of these results for estimating the landward extent of saltwater in the Biscayne aquifer. The measurements and findings described in this report will be used in subsequent phases of an ongoing investigation.

Description of Study Area

The study area is primarily the of portion Miami-Dade County, Fla. within approximately 15 km of the coast in the southern part of the county and within approximately 5 km of the coast in the northern part (fig. 1). The study area also includes a portion of southern Broward County as far north as Hallandale Beach. The extension of this work into Broward County was done so that future saltwater-encroachment studies to the north can be seamlessly tied to the work done in Miami-Dade County, thereby avoiding artifacts associated with the boundary between the counties.

⁴ This report is in preparation as a USGS Open-File Report. The tentative authorship and title are: Fitterman, D.V., Deszcz-Pan, M., and Prinos, S.T.: Helicopter electromagnetic survey of the Model Land area, southeastern Miami-Dade County, Florida.

4

Time-Domain Electromagnetic Sounding Locations

A total of 79 TEM soundings were made during 2008 and 2009. The 2008 field season focused on gathering information from the Broward County line south to Florida City in southern Miami-Dade County to fill gaps in the spatial coverage of existing monitoring wells and to determine if the extent of saltwater encroachment had changed since the work of Sonenshein (1997). The locations of TEM soundings made in 2008 and 2009 are shown in figure 2. Most of these soundings are in Miami-Dade County. The 2009 field season extended the TEM coverage from the previous year further south in Miami-Dade County into the Model Land⁵ and north into Broward County near Hallandale Beach, Fla. (fig. 3). The soundings collected in the Model Land were located to help interpret the HEM survey flown in 2001 to map saltwater encroachment.

The locations of the TEM soundings were determined by global positioning system (GPS) measurements (tables 1 and 2). Horizontal positions are referenced to NAD 83. Positioning errors are 4 to 5 m.

Hydrogeologic Setting and Borehole Geophysical Information

The surficial aquifer system in Miami-Dade and Broward Counties includes the Biscayne and the gray limestone aquifers. The Biscayne aquifer consists of the Pleistocene- and Holocene-age Satilla Formation, Pleistocene Miami and Key Largo Limestones, as well as the Anastasia and Fort Thompson Formations, and in some areas the Pliocene-age Tamiami formation (Fish and Stewart, 1991). The Biscayne aquifer is wedge-shaped and thinnest in western Miami-Dade and Broward Counties. It is approximately 98 m (320 ft) deep in eastern Broward County and approximately 55 m (180 ft) deep in northeastern Miami-Dade County (Fish and Stewart, 1991). The depth of the base of the Biscayne aquifer in the area of the HEM survey in southern Miami-Dade County varies from about 17 to 30 m (55 to 100 ft) (Fish and Stewart, 1991).

Induction logs collected in Miami-Dade County indicate that the freshwater-saturated materials of the Biscayne aquifer have a resistivity of approximately 80 ohm-m on average and range from about 35 to 220 ohm-m. Much of this variation is related to extreme changes in porosity. A digital borehole image showing the porosity variability observed in a core hole in the Fort Thompson Formation of the Biscayne aquifer is shown in figure 4 (Cunningham and others, 2009). The image shows an approximately 0.4-m thick solution cavity below a 0.2 m layer of very dense cycle-capping limestone. Variations in porosity like this are common in the Biscayne aquifer and are described in detail in previous investigations (Cunningham and others, 2006, 2009). Some of the changes in bulk conductivity with depth observed in inductions logs, such as those shown in figures 5 and 6, are most likely the result of abrupt changes in porosity similar to those illustrated in figure 4.

Electromagnetic induction logs repeated annually or semiannually, like those depicted in figures 5 and 6, are being used to evaluate changes in the bulk conductivity through time. The bulk conductivity measured is a function of the water conductivity and the porosity of the rocks and sediments that form the aquifer. Changes in formation resistivity are caused only by changes in the water conductivity. Because the induction log can measure the bulk conductivity through the PVC casing used in monitoring wells, changes in water conductivity can be detected without

⁵ The term Model Land refers to all the wetlands in the area on both sides of Card Sound Road and south of SW 344 Street (Palm Drive) (C.K. Grossenbacher, Miami-Dade County DERM, written commun., 2010).

Figure 2. Location of the time-domain electromagnetic soundings collected in 2008 and 2009 to supplement the well network used to monitor saltwater encroachment. Extent of saltwater intrusion from Sonenshein (1997) and Prinos (2011).

Figure 3. Location of the time-domain electromagnetic soundings collected in 2009 near the 2001 helicopter electromagnetic survey. Extent of saltwater intrusion from Sonenshein (1997) and Prinos (2011).

Table 1. Location of TEM soundings made in 2008 and selected nearby wells

Sounding ⁶		Easting ⁷ [m]	Northing ⁷ [m]	Nearby Wells ⁸	Sounding	Easting [m]	Northing [m]	Nearby Wells
MIA101		558727	2814504	G-3699, G-3856	MIA120	574171	2854246	G-3604
MIA102	F	558246	2814508	G-3699, G-3856	MIA121	574249	2854232	G-3604
MIA103		557942	2814507	G-3699, G-3856	MIA122	580001	2862347	
MIA104		557486	2814401	G-3855, G-3856	MIA123	580041	2862354	
MIA105		571727	2839900	G3608, G-3609	MIA124	579604	2862625	
MIA106		571608	2839907	G3608, G-3609	MIA125	571943	2842057	
MIA107		571420	2846074		MIA126	572116	2842097	
MIA108		568118	2832157		MIA127	569155	2837769	
MIA109		568218	2831666		MIA128	569186	2837983	
MIA110		568251	2831672		MIA129	566788	2830662	
MIA111		568268	2831566		MIA130	u 582639	2868352	
MIA112		582420	2866116		MIA131		582649	2868479
MIA113		581685	2867153		MIA132		579026	2857869
MIA114		584955	2872017	G-2903	MIA133	u 579880	2857273	
MIA115		583794	2873525	G-2903	MIA134		579948	2857286
MIA116		575921	2850911	G-3605	MIA135		583323	2872973
MIA117		575919	2851041	G-3605	MIA136		560837	2823096
MIA118		575880	2851706	G-3604	MIA137		561528	2822700
MIA119		575894	2851685	G-3604				

⁶ F indicates that the preferred model (MIAⁿⁿⁿF) had a conductive layer with resistivity fixed at 3.5 ohm-m. u indicates that the sounding was not usable.

⁷ Coordinates are in UTM Zone 17 R and referenced to NAD83.

⁸ Selected wells are within 2 km of a TEM sounding and have had an electromagnetic induction log run in them.

Table 2. Location of TEM soundings made in 2009 and selected nearby wells.

Sounding ⁹	Easting ¹⁰ [m]	Northing ¹⁰ [m]	Nearby Wells ¹¹	Sounding	Easting [m]	Northing [m]	Nearby Wells
MIA201	557815	2812968	Sec34-MW-02-FS	MIA222	558824	2805659	FKS 4
MIA202	558369	2813097	Sec34-MW-02-FS	MIA223	559876	2807328	
MIA203	559064	2812970	Sec34-MW-03-FS	MIA224	560925	2807316	
MIA204	558907	2811696	Sec34-MW-03-FS	MIA225	554172	2811757	CEMEX-MW-03-FS
MIA205	558086	2811251		MIA226	554719	2810805	CEMEX-MW-03-FS
MIA206	557261	2811712		MIA227	554717	2810623	
MIA207	556572	2811778		MIA228	556179	2810102	
MIA208	555809	2811154		MIA229	557588	2810641	
MIA209	555439	2810949		MIA230	558393	2810648	
MIA210	555420	2810648		MIA231	559404	2809111	
MIA211	555523	2810163		MIA232	558515	2807305	FKS 4
MIA212	F 555558	2809832	FKS 8	MIA233	F 556293	2808246	FKS 8
MIA213	F 556774	2810192	G-3946	MIA234	553764	2809315	
MIA214	556751	2810422	G-3946	MIA235	F 554067	2807176	FKS 7
MIA215	557500	2811056		MIA236	554391	2809645	FKS 8
MIA216	553598	2807227	FKS 7	MIA237	583733	2875167	
MIA217	553577	2806974	FKS 7	MIA238	584560	2875121	G-2478
MIA218	F 554678	2801646		MIA239	584546	2875285	G-2478
MIA219	F 554443	2805290		MIA240	u 584541	2875221	
MIA220	560349	2805662		MIA241	584295	2874643	G-2965
MIA221	559464	2805644		MIA242	u 584221	2875414	

⁹ **F** indicates that the preferred model (MIAⁿⁿⁿF) had a conductive layer with resistivity fixed at 3.5 ohm-m. **u** indicates that the sounding was not usable.

¹⁰ Coordinates are in UTM Zone 17 R and referenced to NAD83.

¹¹ Selected wells are within 2 km of a TEM sounding and have had an electromagnetic induction log run in them.

open intervals of casing, which can potentially allow mixing of water from different depths. It is unlikely that the shallow influxes of conductive water observed in figures 5 and 6 could have been measured using a conventional open borehole because mixing of water from throughout an extensive open interval would have diminished the effect.

Figure 4. Digital borehole image from monitoring well G-3885 prior to its completion, and the electromagnetic induction log from the same depth interval. The water in the well was fresh from the surface to the bottom of the borehole. The increase in bulk conductivity in the depth interval from 14 to 15 m may be caused by the evident increase in porosity or a combination of changes in lithology and porosity. Cavities like the one shown here are evident in many of the borehole image logs collected. Recovery of materials enclosing these cavities is typically poor. The cavities may have been filled with sand prior to drilling.

The resistivity of the Biscayne aquifer decreases as the pore water is replaced by seawater. The relationship between aquifer resistivity and pore-water resistivity, called the formation factor (Archie, 1942), is determined by comparing induction-log data to water-sample resistivities as shown in figure 7. In conjunction with TEM-sounding results, this relation can be used to estimate aquifer-water resistivity. Although these estimates are coarse because of the previously discussed extreme variations in porosity, they nonetheless are quite valuable. The relation between water resistivity and chloride content determined from water samples collected in Miami-Dade County in the spring of 2009 is shown in figure 8. Given these relations, the portions of the aquifer that are saturated with saltwater containing 1,000 mg/L of chloride are estimated to have a resistivity of approximately 10 ohm-m. Accordingly, TEM-derived resistivities of 10 ohm-m or less are generally interpreted to be contaminated with saltwater.

The gray limestone aquifer, which is part of the Tamiami Formation, is separated from the Biscayne aquifer throughout most of southeastern Florida by the semi-confining upper clastic unit of the Tamiami Formation (Fish and Stewart, 1991). The gray limestone aquifer is generally not used for public water supply in Miami-Dade and Broward Counties.

Figure 5. Electromagnetic induction logs from well G-3601 showing short-term changes in bulk conductivity occurring above the base of the Biscayne aquifer. The well is adjacent to a canal. There are temporary increases in bulk conductivity between the depths of 18.3 m and 40 m (60 ft and 131 ft), that do not appear to be related to the steady bulk conductivity increases occurring below 42.7 m (140 ft). There is virtually no change in bulk conductivity at a depth of 41.1 m (135 ft).

Figure 6. Electromagnetic induction logs from well G-3702, which is adjacent to a canal, showing short-term changes in bulk conductivity occurring above the base of the Biscayne aquifer. Some of the conductive water detected in 2007 between the depths of 10.7 m and 15.2 m (35 ft and 50 ft) appears to be settling to the base of the aquifer. This is indicated by the increase in bulk conductivity occurring at 19.8 m (65 ft) in subsequent years.

Figure 7. Relationship between the resistivity of water samples collected in monitoring wells in Miami-Dade County and the bulk aquifer resistivity measured by induction logs in the screened intervals of the same well. The two data points plotted as open circles were not used in the analysis. The equation describing the relationship is shown along with the coefficient of determination R^2 .

Figure 8. Relationship between resistivity and chloride content of water samples collected from monitoring wells in Miami-Dade County. The equation describing the relationship is shown along with the coefficient of determination R^2 .

Previous Studies

In 1939, the USGS in cooperation with the cities of Miami, Miami Beach, and Coral Gables, as well as Dade County, began to investigate the water resources of southeastern Florida with a special emphasis on the hydrogeology of the aquifer near the Miami River. This cooperative effort was expanded to Broward County in 1940. Brown and Parker (1945), Parker (1945), Hoy (1952), Parker and others (1955), and Klein (1957) evaluated the causes of saltwater encroachment and its extent in Miami-Dade County. Leach and Grantham (1966) evaluated the relation of saltwater encroachment to discharge in the Miami River and its tributaries.

The USGS mapped the extent of saltwater in the Biscayne aquifer in Miami-Dade County in 1951, 1978, 1984, and 1995 (Hoy, 1952; Swayze, 1980; Klein and Waller, 1985; Sonenshein, 1997) and in Broward County in 1990 (Koszalka, 1994). Klein and Ratzlaff (1989) and Sonenshein and Koszalka (1996) evaluated changes in the extent of saltwater intrusion in the Biscayne aquifer. At the time of Sonenshein's (1997) examination there was little information in extreme southeastern Miami-Dade County south of Florida City, so in this area the extent of encroachment was not well constrained. Sonenshein (1997) also used the TEM soundings to augment the information provided by monitoring wells.

Kohout and Hoy (1963) evaluated some aspects of sampling salty groundwater in coastal aquifers. This work is crucial because the techniques described improved the quality of chloride-content data collected in the Biscayne aquifer by the USGS. Because some of the data available from various organizations to evaluate saltwater encroachment were not collected using the methods described by Kohout and Hoy (1963), they were of limited value to the current investigation.

Fitterman and Deszcz-Pan (1998) and Fitterman and others (1999) collected and interpreted TEM soundings and an HEM survey to evaluate saltwater encroachment in southwestern Miami-Dade County in Everglades National Park.

Prinos and others (2002) examined chloride content sampled from USGS monitoring wells during the period from 1974 to 1999 in the Biscayne aquifer. They identified statistically significant upward trends in chloride content in data from 40 percent of these wells. Downward trends in chloride content were identified in the data from 28 percent of these wells. Some USGS monitoring wells are farther inland than the current extent of saltwater in the aquifer. Chloride content in samples from these wells should only begin to change if saltwater continues to encroach. It is not surprising, therefore, that data from 32 percent of the monitoring wells exhibited no quantifiable trend for the period evaluated.

In 2008, the USGS monitoring network included 81 monitoring wells in the Biscayne aquifer that were sampled to evaluate chloride content. Thirty-five of these wells also had induction logs run annually to evaluate bulk formation conductivity of the aquifer. The results of this monitoring are provided to the public in several national and local websites and are used in the current investigation (USGS Annual Water Data Reports – <http://wdr.water.usgs.gov>, USGS Water Data for the Nation – <http://waterdata.usgs.gov/nwis>, Groundwater conditions in southern Florida – http://www.sflorida.er.usgs.gov/edl_data/index_qw.html).

Description of Transient Electromagnetic Soundings

TEM soundings, which are well suited for mapping conductive targets such as saltwater intrusion and clay zones, have been used for a number of groundwater studies (Fitterman and Stewart, 1986; Fitterman, 1989; Goldman and others, 1991; Fitterman and others, 1999). The TEM method is described in detail by Kaufman and Keller (1983), McNeill (1990), and Fitterman and Labson (2005).

Soundings are made by passing a current through a large, square transmitter loop. The current flow generates a steady magnetic field. Abruptly cutting off the current flow disrupts the magnetic field and induces a circulating current system in the ground below the transmitter loop. The diffusion of these induced currents is controlled by the electrical conductivity of the ground. Current attenuation is small in conductive regions, and the current passes slowly through such regions. Resistive regions (low conductivity), on the other hand, attenuate the current flow. Current traverses resistive regions more rapidly than conductive regions. The circulating induced current produces a secondary magnetic field that is sensed by a receiver coil located at the middle of the transmitter loop. Because of the relationship between the electrical conductivity structure of the ground, the current diffusion, and the secondary magnetic field, the voltage recorded by the receiver can be used to estimate the bulk conductivity of the subsurface materials. The measured voltage-time curves, or transients, are converted into resistivity-depth functions by a nonlinear parameter estimation process called inversion (Oldenburg and Li, 2005; Fitterman and Labson, 2005).

A Geonics PROTEM-D transient EM system with a digital receiver and a battery-powered EM-47 transmitter were used. The transmitter loop was set up as a square with a nominal side

length of 38.1 m. Transmitter current was typically 2.5 A. The receiver coil was a rigid, multiturn loop about 1 m in diameter with an effective area of 31.4 m². After adjusting receiver gain to an appropriate level, 10 measurements were made using base-frequency repetition rates of 285 Hz and 30 Hz, referred to as ultra high (UH) and high (HI) frequency, respectively. All data from a single base frequency are commonly referred to as a sweep. The base frequency controls the time range over which the transient is recorded. There are 20 logarithmically spaced time gates in the measurement associated with each base frequency. Each measurement represents a stack of several hundred individual transients. Data processing procedures are discussed in appendix 1.

Anthropogenic Factors Affecting Soundings

TEM soundings are adversely affected by noise caused by man-made electromagnetic sources and nearby metallic objects. The most common cause of electromagnetic noise is power lines. Current flowing in power lines produces a time-varying magnetic field, which, in turn, induces a voltage in the receiver coil. Because the TEM receiver must be inherently broadband with virtually no filtering, 60-Hz signals from power lines pose a problem. The PROTEM-D TEM system uses repetition frequencies that are even subharmonics of the power-line frequency to reduce this type of noise. This noise-filtering strategy has limitations, so that measurements cannot be made closer than 300 to 400 m from large, power transmission lines. Power-line noise is recognized by very large variance in the measured data. Sounding MIA133 is a good example of this behavior (see figure 5-42). At times greater than 0.1 ms the measurement noise became very large for this sounding.

Nearby metallic objects, above ground or buried, will produce artifacts in the data. Metallic objects usually produce a very repeatable signal; however, they distort the apparent resistivity-time plots by introducing sharp bends and kinks that cannot be produced by a layered half-space. Small objects tend to influence the curves at the earlier times or in the middle of the curve. Sounding MIA119 (fig. 5-28) is an example of the former situation. The first eight data points have measurement error (not plotted) of 0.5 to 1.5 percent; however, the points do not form a smooth curve. Interpretation of the shallower portion of the resistivity structure is problematic. A similar situation is seen in sounding MIA104 (fig. 5-5). In this instance, the noise is at an intermediate time and only affects a few points, so the sounding can be interpreted with moderate confidence.

Buried conductors, such as metallic pipes, also cause problems. Sounding MIA121 (fig. 5-30) was made on a football field that had a lighting system. The data are very repeatable; however, the sounding curve is far from smooth. The field had conduits running to the light towers to provide electrical power. Specific information on the location and composition of the conduits was not available, but the conduits were most likely metallic. Lighting systems at municipal baseball fields also caused problems, so these sites were avoided.

Sounding MIA240 (figs. 7-57, 7-58, and 7-59) was made in Hallandale Cemetery where metal caskets presumably caused the interference. Moving the receiver coil around inside the transmitter loop did not alleviate the noise problem.

In general, anthropogenic noise was a bigger problem with the 2008 data than with the 2009 data. This is because the first field season was predominantly in an urban environment, and the second field season was in a much less developed part of the county.

Data Quality and Averaging Procedure

Data quality is highly dependent on anthropogenic factors. In areas where these factors were absent, the quality of the recorded data was excellent. At some locations the anthropogenic effects were so great that usable data could not be collected. This is the nature of working in an

urban environment. Averaging of transients can be used to reduce noise from electromagnetic sources. At most sounding locations 10 or more TEM measurements were averaged for each base frequency using program NTEMAVG¹² to reduce random noise and estimate measurement error. Some selective editing of the data was performed manually when it was obvious that a particular datum was significantly different from neighboring points. The average and standard deviation were calculated from the remaining measurements. The standard deviation of the apparent resistivity for the UH base frequency (285 Hz) was as low as 0.1 percent at early times. For most of the soundings the noise only increased to 1 to 3 percent at channel 20. The HI base frequency (30 Hz) data had noise levels of 0.5 percent at channel 1, often increasing to very high levels (greater than 25 percent) at the later channels. The percent standard deviation usually increases with time after transmitter turnoff because the signal produced by the ground becomes small with respect to the background noise level. By the time the noise level reaches 10 percent in apparent resistivity the data are usually behaving discontinuously from one channel to the next and are not usable.

Inversion of Transient Electromagnetic Soundings

The averaged TEM soundings were individually inverted to the simplest model that fit the data using program TEMIXXL¹³. In general, a two- to five-layer model was adequate to provide a good fit. Most models show a decrease in resistivity with depth, sometimes followed by a more resistive layer at depth. After determining a preliminary model for each sounding, the result was compared with nearby soundings and well logs when available. Alternatives to the original model were tried in an attempt to improve the fit between the observed and computed apparent resistivities. Layers that were unresolvable because they were too thin or their resistivity was not significantly different from adjacent layers were eliminated from the final model. Some inversions resulted in a very thin conductive layer with resistivities that were considered to be unrealistically low, even for a saltwater intruded zone. The physics of TEM soundings does not allow both the thickness and resistivity of thin conductive zones to be determined. This phenomenon is termed equivalence. Only the ratio of layer thickness to resistivity can be estimated. In an attempt to resolve the thickness of thin, conductive layers, the resistivity of such layers usually was fixed at 3.5 ohm-m, a value determined from well logs to be typical of saltwater intruded zones. This approach was tried when the conductive layer appeared to be unrealistically thin. A detailed description of each sounding is given in appendices 5 and 7 for the 2008 and 2009 data, respectively.

Interpretation of Results

As described previously, the analysis of water-quality data from the Biscayne aquifer and induction logs indicates that the resistivity of the saltwater-saturated Biscayne aquifer will be less than 10 ohm-m. Using this criterion, the TEM location symbols shown in figures 2 and 3 are color coded to indicate the presence or absence of saltwater within the Biscayne aquifer. The location of the landward extent of saltwater as determined in 1995 (Sonenshein, 1997) and 2011 (Prinos, 2011)

¹² NTEMAVG is an unpublished program developed at the USGS.

¹³ Program TEMIXXL is available from Interprex Limited, Golden, Colo.

is also shown in these figures. The TEM results will be used along with other information in an ongoing study (Prinos and others¹⁴, written commun., 2011) to revise this boundary.

Comparison with Well Logs

Wherever possible TEM soundings were compared to induction logs collected in nearby monitoring wells to evaluate the quality of models and provide additional insights. In all, 33 TEM sounding models (tables 1 and 2) were compared with induction logs. The distance between the compared wells and TEM sites ranged from 36 m to 1.97 km. Comparisons of results from other sites were also evaluated; however, they were not very informative and are not presented. Exact land-surface altitudes were not determined at TEM sounding locations. Land-surface altitudes had been determined at most monitoring-well locations where induction logs were collected. For comparison purposes the altitude of the base of the Biscayne aquifer was interpolated from the structural contour maps of Fish and Stewart (1991) and Fish (1988). These estimates were adjusted using the land-surface altitudes available at monitoring-well locations to approximate the depth to the base of Biscayne aquifer below land surface at TEM sounding and well locations. Because both the altitude of the base of the Biscayne aquifer and the altitude of the land surface vary from location to location, the depth comparisons depicted on these graphs must be considered approximate. In general, the areas where most of the TEM soundings and induction logs were collected tended to be relatively flat, so the comparisons provided are still informative.

Specific well and sounding comparisons are described below.

Well FKS 7 / Soundings MIA235, MIA216, and MIA217

An induction log was collected in monitoring well FKS 7 (fig. 9). This log is compared with the interpreted resistivity-depth functions from soundings MIA235, MIA216, and MIA217, which are 720 m northeast, 710 m north, and 470 m north of well FKS 7, respectively. The estimated depth to the base of the aquifer at the location of well FKS 7 is 22 m; however, the base of the aquifer dips toward the northeast in this area. Monitoring well FKS 7 does not fully penetrate the aquifer. The bulk resistivity of the induction log decreases to 12.3 ohm-m at a depth of 17.4 m; this would not be a full-tool response, however, because the resistivity was still decreasing when the logging tool encountered the bottom of the well, which is above the base of the Biscayne. It is reasonable to expect the resistivity to continue to decrease below the bottom of the well, so the maximum conductivity was probably not measured. This monitoring well is near the northern end of the C-109 Canal. An earthen plug at the southern end of this canal near the C-111 Canal was designed to prevent saltwater from flowing up the C-109 Canal. However, during the drought of 1971 salty water was detected 2 to 3 mi north of this plug (Meyer, 1974). So it is possible the induction log collected at FKS 7 is either detecting saltwater that had once leaked out of this canal near FKS 7, or the reductions in freshwater head caused by this canal led to the encroachment of saltwater at the base of the aquifer near FKS 7. The interpreted TEM model for sounding MIA235F had the second layer resistivity fixed at 3.5 ohm-m. This relatively thin layer is consistent with a thin layer of saltwater at the base of the aquifer. This layer is similar to that interpreted from sounding MIA236 (figs. 11 and 7-51) located 2.49 km (1.5 mi) north of sounding MIA235. Models for soundings MIA216 and MIA217 indicate a 13 to 17 ohm-m layer between the depths of approximately 25.6 and 29.6 m, which is below the estimated base of the aquifer in this area. The

¹⁴ This report is in preparation as a USGS Scientific Investigations Report. The tentative authorship and title are Prinos, S.T., Wacker, M.A., Cunningham, K.J., and Fitterman, D.V.: Examination of the landward extent and sources of saltwater in the Biscayne aquifer, Miami-Dade County, Florida.

30-m depth slice of preliminary HEM data currently being analyzed (Fitterman and others, written commun., 2011) shows a finger of low resistivity material along U.S. Highway 1 and the C-109 Canal that extends farther inland than in the region to the west of the C-109 Canal. The western edge of this low resistivity zone is seen in the HEM data near well FKS 7 and at the approximate depth of the 13 to 17 ohm-m layer identified in soundings MIA216 and MIA217. The low resistivity zone identified in the HEM data and soundings MIA216 and MIA217 could contain residual saltwater that may have traveled inland along the ditch adjacent to U.S. Highway 1 and the C-109 Canal, or that encroached along the base of the aquifer as a result of lowered hydraulic head caused by the canal and ditch.

Well FKS 4 / Soundings MIA222 and MIA232

Interpreted resistivity-depth functions from soundings MIA222 and MIA232 are compared to an induction log from monitoring well FKS 4 (fig. 10). The soundings are approximately 1.97 km southeast and 1.79 km northeast, respectively, of the well (fig. 3). The first layer resistivities of the TEM models are in good agreement with those of the induction log. The induction-log resistivity starts to decrease at a depth of 7.3 m until it reaches a value of 3 ohm-m at the bottom of the well. The TEM models show a decrease in resistivity near a depth of 10 m to values of between 2 and 3 ohm-m, which is in good agreement with the induction-log data. The induction-log resistivity was still decreasing at the bottom of the well, suggesting that the final induction-log resistivity was not the true resistivity of the conductive zone because the well was not deep enough to obtain a full-tool response of the conductive zone resistivity. The depth to the bottom of the second layer indicated by sounding MIA222 is in good agreement with the estimated base of the Biscayne aquifer at this location.

Figure 9. Comparison of TEM soundings MIA216, MIA217, and MIA235 with an induction log from well FKS 7. Well FKS 7 is approximately 720 m southwest of sounding MIA235, 710 m south of sounding MIA216, and 470 m south of sounding MIA217. The base of the aquifer was estimated from Fish and Stewart (1991) and adjusted for the land-surface elevation. The resistivity of the conductive layer that starts at about 20 m depth in sounding MIA235 was fixed in the inversion at 3.5 ohm-m.

Figure 10. Comparison of TEM soundings MIA222 and MIA232 with an induction log from well FKS 4. Well FKS 4 is approximately 1.97 km northwest and 1.79 km southwest of soundings MIA222 and MIA232, respectively. The base of the aquifer was estimated from Fish and Stewart (1991) and adjusted for the land-surface elevation of the area. The base of the aquifer is slightly deeper at the locations of soundings MIA222 and MIA232 than at the well.

Well FKS 8 / Soundings MIA212, MIA233, and MIA236

Models from TEM soundings MIA212, MIA233, and MIA236 are compared to an induction log collected in monitoring well FKS 8 (fig. 11). The soundings are located 880 m north-northeast, 1.17 km southeast, and 1.20 km northwest of the well, respectively (fig. 3). Well FKS 8 is adjacent to the Card Sound Road Canal. Water conductivity measured in the Card Sound Road Canal on December 5, 2008 indicated the canal water at the location of FKS 8 was fresh (salinity 0.3 ppt). Unusually dry conditions in this area during the winter of 2009 led to very low water levels in the Biscayne aquifer by May of 2009. On May 18, 2009, water-conductivity data collected in the Card Sound Road Canal near FKS 8 indicated an average salinity of the water of 38.6 ppt. Water samples collected by the Florida Keys Aqueduct Authority between March 31, 2009 and May 4, 2009 indicated the chloride content of water in well FKS 8 increased from 9,350 to 14,750 mg/L; on May 18, 2009 the chloride content of water in this well was 11,575 mg/L. Preliminary results of an HEM survey collected in this area in 2001 (Fitterman and others, written commun., 2011) depict a finger of low resistivity extending farther inland along Card Sound Road and U.S. Highway 1 than elsewhere in the general area. This finger of low resistivity material extends about 16 km (10 mi) inland and is also evidenced by the interpreted resistivity-depth functions of TEM soundings MIA211 (fig. 7-13), MIA225 (fig. 7-33), MIA226 (fig. 7-34), MIA227 (fig. 7-35), and the induction logs collected from monitoring well CEMEX-MW-03-FS (fig. 12). Given this information, the origin of the low resistivity zone is likely (1) leakage of saltwater into the aquifer from the Card Sound Road Canal during unusually dry periods, such as in May 2009, and (2) increased saltwater encroachment at the base of the Biscayne aquifer caused by unregulated drainage by the Card Sound Road Canal, which lowers the freshwater head in the aquifer.

The first layer resistivity of model MIA236 agrees moderately well with the peak resistivity of the induction log (fig. 11), whereas the first layer resistivities of models MIA212F and MIA233F are higher than the induction-log values. However, the uncertainty in the estimated first layer resistivity for the latter two models is large enough to explain this discrepancy. Some of the difference in resistivity values can also be explained by leakage and mixing of salty water from the canal with fresh groundwater in the aquifer at the location of the well, thereby lowering the near-surface induction-log resistivity. The very low resistivity observed in the induction log near the land surface is probably caused by the metal surface casing. The resistivity of the second layer was fixed at 3.5 ohm-m in models MIA212F and MIA233F to reduce the effect of equivalence on the interpretation. This resistivity value is in good agreement with the resistivity measured in well FKS 8. The estimated depth to the top of the second layer is shallower for model MIA233F than for models MIA212F and MIA236. This is consistent with sounding MIA233 being the closest of the three soundings to the main mass of encroaching saltwater. Given that the TEM soundings are about 1 km (0.6 mi) from well

Figure 11. Comparison of TEM soundings MIA212, MIA233, and MIA236 with an induction log from well FKS 8. Well FKS 8 is approximately 880 m south-southwest of sounding MIA212, 1.17 km northwest of sounding MIA233, and 1.20 km southeast of sounding MIA236. The base of the aquifer at the well was estimated from Fish and Stewart (1991) and adjusted for the land-surface elevation of the area. The resistivity of the second layer of models MIA212F and MIA233F was constrained at 3.5 ohm-m.

FKS 8 the discrepancy in the depth to the top of the conductive layer for soundings MIA212 and MIA233 is not unreasonable. The model for sounding MIA236, the most landward of these three soundings, suggests that the saltwater that occasionally leaks from the Card Sound Road Canal produces a thin layer of saltwater at the base of the Biscayne aquifer in this area. Sounding MIA236 is upgradient from the canal and the other soundings. Model MIA235F (fig. 7-50), which is also upgradient of the Card Sound Road Canal in this area, has an almost identical thin layer of saltwater at the base of the Biscayne aquifer.

Well CEMEX-MW-03-FS / Soundings MIA225 and MIA226

Comparison of models from TEM soundings MIA225 and MIA226 and an induction log collected in monitoring well CEMEX-MW-03-FS are shown in figure 12. The sounding sites are 360 m northwest and 760 m southeast of the well, respectively (fig. 3). The TEM models suggest a first layer resistivity higher than measured by the induction log. While there is some uncertainty in the interpreted TEM first layer resistivities, the interpretation does not support values as low as those seen in the induction log. The transition from the first to second layer in the TEM models agrees quite well with the decrease in resistivity between 18 and 22 m seen in the well log. The resistivity of the second layer is in relatively good agreement with the induction log considering that the sounding and log are separated by several hundred meters. The top of the second layer of TEM model MIA226 is at a shallower depth than that of model MIA225. This is consistent with the location of sounding MIA226 being closer than sounding MIA225 to the main body of the encroaching seawater. The depth to the bottom of the second layer of sounding MIA226 is in good agreement with the estimated base of the Biscayne aquifer; for sounding MIA225 the bottom of the second layer is deeper than the base of the aquifer. This may be caused by seepage of moderately salty water into the basal confining unit or by variations in the depth to the top of the confining unit.

Well G-3946 / Soundings MIA213 and MIA214

Models from TEM soundings MIA213 and MIA214 are compared to an induction log collected in monitoring well G-3946 (fig. 13), which is 100 m northwest and 150 m southwest of the soundings, respectively (fig. 3). The interpreted first layer resistivity of the two sounding models is in good agreement with the measured resistivity from the induction log. The resistivities of the second layer bracket the induction-log values. The resistivity of the second layer for model MIA213F was fixed at 3.5 ohm-m. The transition from the resistive surface layer to the saltwater interface evident in the induction log occurs at a shallower depth than determined by the TEM sounding. Sounding MIA213 has a thicker second layer than sounding MIA214, which is consistent with sounding MIA213 being closer to the main body of the encroaching saltwater than sounding MIA214. The bottom of the conductive zone determined by sounding MIA213 is in good agreement with the estimated base of the Biscayne aquifer.

Figure 12. Comparison of TEM soundings MIA225 and MIA226 with an induction log from well CEMEX-MW-03-FS. Well CEMEX-MW-03-FS is approximately 360 m south-southeast of sounding MIA225 and 760 m northwest of sounding MIA226. The base of the aquifer at the well was estimated from Fish and Stewart (1991) and adjusted for the land-surface elevation of the area.

Figure 13. Comparison of TEM soundings MIA213 and MIA214 with an induction log from well G-3946. Well G-3946 is approximately 100 m northwest of sounding MIA213 and 150 m southwest of sounding MIA214. The base of the aquifer at the well was estimated from Fish and Stewart (1991) and adjusted for the land-surface elevation of the area. The resistivity of the second layer of model MIA213F was constrained at 3.5 ohm-m.

Well Sec34-MW-03-FS / Soundings MIA203 and MIA204

TEM models for soundings MIA203 and MIA204 are compared to an induction log collected in monitoring well Sec34-MW-03-FS (fig. 14), which is 670 m south and 630 m north-northeast of the soundings, respectively (fig. 3). The resistivity of the first three layers of model MIA204 agrees quite well with the induction log. The resistivity of the first two layers of model MIA203 are higher than the induction-log values. The resistivity minimum of the two models brackets the induction-log resistivity values. The depth to the bottom of the third layer is in fair agreement with the estimated depth of the base of the Biscayne aquifer in this area.

Well Sec34-MW-02-FS / Soundings MIA201 and MIA202

Models of data from TEM soundings MIA201 and MIA202 are compared to an induction log collected in monitoring well Sec34-MW-02-FS (fig. 15), which is 590 m northeast and 110 m north of the soundings, respectively (fig. 3). The first layer resistivity of both models agrees well with the induction log. The decrease in the induction-log resistivity starting around a depth of 20 m corresponds to the bottom of the first layer of model MIA202. Although the well was not deep enough for the induction tool to accurately determine the resistivity of the saltwater intruded zone, the resistivity of the second layer of model MIA202 is in relatively good agreement with the induction-log resistivity. It is reasonable to assume the conductive zone seen in the induction log extends to greater depth similar to the conductive second layer of TEM model MIA202. TEM sounding MIA 201, which is closer to the edge of the saltwater front, indicates that the water in the Biscayne aquifer is fresh. The decrease in interpreted resistivity of sounding MIA201 just below the estimated base of the Biscayne aquifer may be the result of lithologic, rather than water quality, changes.

Wells G-3699, G-3856, and G-3855 / Soundings MIA101, MIA102, MIA103, and MIA104

TEM soundings MIA101, MIA102, MIA103, and MIA104 were measured along an east-west transect across the saltwater interface going from east to west (fig. 3). Wells G-3699, G-3856, and G-3855 are aligned along the same transect from east to west. Chloride content and specific conductance of samples from well G-3699 on April 30, 2008 were 8,500 mg/L and 24,300 $\mu\text{S}/\text{cm}$ respectively. Chloride content and bulk formation conductivity measured in induction logs have steadily increased since this well was installed in 2000. The induction logs and TEM interpretations indicate that the top of the saltwater interface deepens in the landward direction (westward).

The three-layer TEM models MIA101 and MIA102F indicate that the first layer consists of freshwater-saturated sediments underlain by a layer of saltwater-saturated sediments (fig. 16). Below the saltwater zone the resistivity is not as low, suggesting the deeper material is not saltwater saturated. TEM soundings MIA103 and MIA104 also indicate that the first layer consists of freshwater-saturated sediments. The resistivity of the second layer of these two soundings is lower than the surface layer, but not so low as to suggest the presence of saltwater. The interpreted TEM resistivities of the first layer for models MIA101, MIA102F, and MIA104 are similar to each other and correspond to the average induction-log resistivity in the first 15 m below land surface. Model MIA103 indicates a considerably more resistive first layer; however, the resistivity of this layer is not well constrained and a lower value would not appreciably change the misfit error.

Figure 14. Comparison of TEM soundings MIA203 and MIA204 with an induction log from well Sec34-MW-03-FS. Well Sec34-MW-03-FS is approximately 670 m south of sounding MIA203, and 630 m north-northeast of sounding MIA204. The base of the aquifer at the well was estimated from Fish and Stewart (1991) and adjusted for the land-surface elevation of the area.

Figure 15. Comparison of TEM soundings MIA201 and MIA202 with an induction log from well Sec34-MW-02-FS. Well Sec34-MW-02-FS is approximately 110 m north of sounding MIA202 and 590 m north-northeast of sounding MIA201. The base of the aquifer at the well was estimated from Fish and Stewart (1991) and adjusted for the land-surface elevation of the area.

Figure 16. Comparison of TEM soundings MIA101, MIA102, MIA103, and MIA104 with induction logs from wells G-3699, G-3856, and G-3855. Well G-3699 is approximately 460 m east-northeast of sounding MIA101. Well G-3856 is 300 m west-northwest of sounding MIA102. Well G-3855 is 116 m northwest of sounding MIA103. The specific conductance of a water sample from well G-3699 on April 30, 2008 was 24,300 $\mu\text{S}/\text{cm}$. The base of the aquifer at the well was estimated from Fish and Stewart (1991) and adjusted for the land-surface elevation of the area. The second layer resistivity of model MIA102F was constrained at 3.5 ohm-m.

The second layer resistivity of models MIA101 and MIA102 were 3.14 and 3.5 ohm-m, respectively, with the latter being fixed for the inversion. In the depth interval 21.9 to 25.7 m, the bulk resistivity measured in well G-3699 decreased from 10.1 to 2.3 ohm-m. The saltwater-saturated second layer of MIA101 begins at a depth of 24.8 m, is 8.6 m thick, and extends below the estimated depth of the base of the Biscayne aquifer. The second layer of model MIA102 is saltwater saturated. It begins at a depth of 26.3 m, has a thickness of 3.3 m, and ends at almost the estimated depth of the Biscayne aquifer. These findings suggest that (1) the slope of the saltwater interface is approximately 3 to 6 m/km deepening (0.17 to 0.34°) to the west; and (2) either the base of the Biscayne aquifer at sounding MIA101 is deeper than estimated from the contours of Fish and Stewart (1991), or that saltwater is able to diffuse downward into the basal sediments.

Model MIA104 indicates the Biscayne aquifer at this location is freshwater saturated throughout its thickness, and the bulk resistivity below the Biscayne aquifer is lower, but not low enough to be considered saltwater saturated. The interpreted thickness of the first layer for sounding MIA104 is nearly identical to the estimated depth to the base of the Biscayne aquifer in this area.

The third layer resistivity of models MIA101 and MIA102F and the second layer resistivity of models MIA103 and MIA104 are all between 30 and 40 ohm-m. These layers appear to represent the sediments below the base of the Biscayne aquifer. The resistivities are not low enough to suggest saltwater contamination. However, the top of the second layer for model MIA103 is about 12.2 m shallower than the estimated base of the Biscayne aquifer for this area. This finding suggests there may be a paleotopographic high in the base of the Biscayne aquifer near sounding MIA103.

The bulk formation resistivity measured in all three wells was still decreasing when the probe reached the bottom of the well. The modeled TEM results suggest all three wells penetrated only the uppermost portion of the saltwater invaded zone. Therefore, a full tool response could not be measured because the induction tool was only partially in the saltwater invaded zone, suggesting the formation resistivity near the bottom of these wells is lower than the deepest measured value.

Well G-3609 and G-3608 / Soundings MIA105 and MIA106

Models from TEM soundings MIA105 and MIA106 are compared to an induction log collected in monitoring well G-3609 (fig. 17), which is 780 m south of the sounding locations (fig. 2). Monitoring well G-3608 is 1.0 km north of soundings MIA105 and MIA106. Four-layer models MIA105 and MIA106 indicate decreasing resistivity with depth. The first two layers are freshwater saturated. Model MIA105 indicates the Biscayne aquifer is contaminated with saltwater from a depth of 23.4 m to at least its base at 39.5 m. Sounding MIA106, however, which was collected only 120 m west of sounding MIA105, indicates the Biscayne aquifer is fresh throughout its thickness, and sediments below the base of the aquifer are saltwater saturated. These measurements suggest the saltwater interface is very steeply dipping (146 m/km or about 8°) toward the west. This steep slope may be related to periodic leakage of saltwater from the Snapper Creek Canal (C-2) which is only 103 m east of the center of sounding MIA105.

Induction logs and geochemical sampling in groundwater monitoring well G-3608, which is adjacent to the Snapper Creek Canal, support the hypothesis of periodic saltwater leakage from Snapper Creek Canal. An induction log measured on April 30, 2003 in well G-3608 indicates an abrupt influx of saltwater in the depth interval of 8.5 to

Figure 17. Comparison of TEM soundings MIA105 and MIA106 with induction logs from wells G-3609 and G-3608. Well G-3609 is approximately 780 m south of soundings MIA105 and MIA106. Well G-3608 is 1.0 km north of soundings MIA105 and MIA106. The specific conductance of water sampled from well G-3609 at a depth of 23 m on April 30, 2008 was 4,040 mS/cm. The base of the aquifer at the well was estimated from Fish and Stewart (1991) and adjusted for the land-surface elevation of the area.

25 m. The chloride content of water samples collected from this well at a depth of 30 m increased from 78 mg/L on July 25, 2003 to a maximum of 240 mg/L on August 4, 2004. An induction log measured on April 26, 2005 (not shown) revealed that the salty water had dissipated in the depth range of 8.5 to 25 m, but the water conductivity had increased in the interval 26 to 30 m. This information suggests at least some of the salty water first detected on April 30, 2003 sank to the base of the aquifer at this location. Samples of this water collected on July 29, 2009 indicated the $\delta^{18}\text{O}$ and $\delta^2\text{H}$ signatures of water sampled from well G-3608 more closely resembled that of the Snapper Creek Canal than other nearby groundwater monitoring wells (Prinos and others, written commun., 2011). This information suggests the Snapper Creek Canal may occasionally leak saltwater into the aquifer. This would also help explain why the slope of the saltwater interface detected by soundings MIA105 and MIA106 is so steep.

The second layer resistivities of models MIA105 and MIA106 are in good agreement with the resistivities measured at the corresponding depths of the induction logs from wells G-3608 and G-3609 (fig. 17). The induction log from G-3609 indicates that the top of the saltwater interface begins at a depth of about 19 m. The water sampled from this well at a depth of 23 m on April 30, 2008 had a specific conductance of 4,050 $\mu\text{S}/\text{cm}$ and a chloride content of 1,140 mg/L. Chloride content sampled from this well has gradually increased since 1995 when the well was installed. Well G-3609 does not fully penetrate the aquifer, and the bulk resistivity logged was still decreasing when the induction probe reached the bottom of the well. Sounding MIA105 indicates a deeper top of the saltwater interface than determined at the monitoring well. The depth to the top of the third layer of model MIA106 is in very good agreement with the estimated depth to the base of the Biscayne aquifer. Models MIA105 and MIA106 indicate the sediments are saturated with saltwater even below the base of the Biscayne aquifer.

Well G-3605 / Soundings MIA116 and MIA117

Models of soundings MIA116 and MIA117 are compared to an induction log collected in monitoring well G-3605 (fig. 18), which is 130 m northeast and 140 m southeast of the soundings, respectively (fig. 2). Two-layer model MIA116 consists of freshwater-saturated sediments underlain by sediments saturated with brackish water. The first layer of this model is more resistive than the uppermost 25 m of the induction log. The second layer resistivity of model MIA116 is in very good agreement with that of the induction log at a depth of 31 m. Water samples collected from well G-3605 on May 2, 2008 indicated a specific conductance of 4,790 $\mu\text{S}/\text{cm}$ and a chloride content of 1,320 mg/L. Chloride content sampled from this well has gradually increased since 1995 when the well was installed. Three-layer model MIA117 indicates freshwater sediments are underlain by saltwater-saturated sediments. At greater depth, the interpreted resistivity increases to a value intermediate between the first and second layer resistivities. The depth to the top of the second layer of model MIA117 is greater than for model MIA116.

Well G-3604 / Soundings MIA118, MIA119, MIA120, and MIA121

Models of soundings MIA118, MIA119, MIA120, and MIA121 are compared to an induction log collected in monitoring well G-3604 (fig. 19). Well G-3604 is 1.63 km northwest of soundings MIA118 and MIA119, and 1.63 km south of soundings MIA120 and MIA121 (fig. 2). Two-layer models MIA118, MIA119, and MIA121 indicate that freshwater-saturated sediments are underlain by saltwater-saturated sediments. Model MIA121 agrees quite well with

Figure 18. Comparison of TEM sounding MIA116 and MIA117 with an induction log from well G-3605. Well G-3605 is approximately 130 m northeast of sounding MIA116, and 140 m southeast of sounding MIA117. The specific conductance of water sampled from well G-3605 on May 2, 2008 was 4,790 $\mu\text{S}/\text{cm}$. The base of the aquifer at the well was estimated from Fish and Stewart (1991) and adjusted for the land-surface elevation of the area.

Figure 19. Comparison of TEM soundings MIA118, MIA119, MIA120, and MIA121 with an induction log from well G-3604. Well G-3604 is approximately 1.63 km northwest of soundings MIA118 and MIA119, and 1.63 km south of soundings MIA120 and MIA121. The specific conductance of water sampled from well G-3604 on May 2, 2008 was 12,800 $\mu\text{S}/\text{cm}$. The base of the aquifer at the well was estimated from Fish and Stewart (1991) and adjusted for the land-surface elevation of the area.

the induction log from well G-3604 even though the sites are separated by 1.63 km. The only significant difference between the model MIA121 and the G-3604 induction log is that the modeled depth to the saltwater interface is 5 m shallower than in the well log. This is reasonable because sounding MIA121 is much closer to the Miami Canal (C-8), which is one of the main sources of the saltwater found in the aquifer in this area. Model MIA120 has three layers, of which the second and third layers show good agreement with the induction log in terms of locating the top of the saltwater zone. The third layer resistivity of model MIA120 agrees quite well with the induction-log values below 31 m depth. The first layers of models MIA118, MIA119, and MIA120 are more resistive than the uppermost 29 m of the induction log. For models MIA119 and MIA120, the difference is close to an order of magnitude. Water samples collected from well G-3604 on May 2, 2008 indicated a specific conductance of 12,800 $\mu\text{S}/\text{cm}$ and a chloride content of 4,100 mg/L.

Well G-2903 / Soundings MIA114 and MIA115

Models of TEM soundings MIA114 and MIA115 are compared to an induction log collected in monitoring well G-2903 (fig. 20), which is 1.6 km north and 1.1 km east, respectively, of the sounding locations (fig. 2). Models MIA114 and MIA115 indicate freshwater-saturated sediments underlain by saltwater-saturated sediments. For model MIA114 the transition to saltwater saturation is more gradual requiring an intermediate layer; for model MIA115 the transition is made in one step. The TEM models do not agree very well with the G-2903 induction log; however, the distance between them is rather large. The shallow conductive zone seen in model MIA114 may be the result of saltwater leakage from the Oleta River, which is only 36 m away. The minimum resistivity of both models is similar to the resistivity seen near the bottom of the well log. Water samples collected from well G-2903 on May 15, 2008 indicated a specific conductance of 26,500 $\mu\text{S}/\text{cm}$ and a chloride content of 9,100 mg/L.

The conductive water inferred from the second layer of model MIA115 is much shallower and farther inland than would be expected on the basis of the G-2903 induction log, which is closer to the saltwater front. The source of this shallow conductive water is unknown. TEM sounding MIA135, which is 450 m west of sounding MIA115, indicates freshwater for the full thickness of the Biscayne aquifer.

Well G-2965 / Sounding MIA241

The model for TEM sounding MIA241 is compared to the induction log collected in monitoring well G-2965 (fig. 21), which is 310 m east-northeast of sounding MIA241 (fig. 2). Between the year 2005, when well G-2965 was installed, and 2010, the sampled chloride content in the well increased from 410 to 1,190 mg/L. The saltwater front is currently passing under the local, water-supply well field immediately east of sounding MIA241. On May 1, 2009, when the induction log was collected in well G-2965, the sampled specific conductance in the well was 2,440 $\mu\text{S}/\text{cm}$, and the chloride content was 620 mg/L. Sounding MIA241 was collected in a field just west of the well field. The high resistivity of the first two layers of model MIA241 indicates the Biscayne aquifer is fresh throughout its full thickness. The resistivity of the second of these layers is in pretty good agreement with the well log. The low resistivity third layer indicates saltwater-saturated sediments are present about 12.1 m below the base of the Biscayne aquifer.

Figure 20. Comparison of TEM sounding MIA114 and MIA115 with an induction log from well G-2903. Well G-2903 is approximately 1.6 km north of sounding MIA114, and 1.1 km east of MIA115. The specific conductance of water sampled from well G-2903 on May 2, 2008 was 26,500 $\mu\text{S}/\text{cm}$. The base of the aquifer at the well was estimated from Fish and Stewart (1991) and adjusted for the land-surface elevation of the area.

Figure 21. Comparison of TEM sounding MIA241 with an induction log from well G-2965. Well G-2965 is approximately 310 m east-northeast of sounding MIA241. The specific conductance of water sampled from well G-2965 on May 1, 2009 was 2,440 mS/cm. The base of the aquifer at the well was estimated from Fish (1988) and adjusted for land-surface elevation of the area.

Well G-2478 / Soundings MIA238 and MIA239

The modeled soundings MIA238, MIA239, and MIA239X are compared to an induction log collected in monitoring well G-2478 (fig. 22), which is 142 m north of sounding MIA238 and 36 m southeast of sounding MIA239. Two models are shown for sounding MIA239: The first is a three-layer model (MIA239), for which the last nine data points were masked, and the second is a four-layer model (MIA239X) that used all data points. The resistivities of the first layer of models MIA239 and MIA239X are higher than the induction-log values. The resistivity of the second layer of model MIA239X is a bit lower than the average induction-log resistivity in the depth range of 48 to 57 m; it is also lower than the second layer resistivity for model MIA239. The depth to the top of the third layer of model MIA239X is very close to the estimated depth of the Biscayne aquifer in this area, while the third layer of model MIA239 is a few meters below the base of the aquifer. Given these comparisons either model is reasonable. One of the reasons for preferring model MIA239 is that the resistivity of the fourth layer of model MIA239X is unusually conductive and could possibly be caused by interference from a metallic object, such as a pipe or a nearby fence. The fourth layer of model MIA241X, which is nearby, was also very conductive. The MIA241 site appeared to be free of fences and buried objects. The depths to the top of the conductive fourth layer for both models MIA239X and MIA241X are in close agreement with the depth of the green clay, silt, limestone, and fine sand sediments of the undifferentiated Tamiami and Hawthorn Formations (Fish, 1988). These dense marine clays may also account for the unusually low resistivities at depth at this location.

Sounding MIA238 was farther away from well G-2478 than sounding MIA239. The depth to the top of the third layer of model MIA238 agrees fairly well with the depth at which the bulk resistivity in well G-2478 decreases from 90 to about 30 ohm-m. The resistivities of the first and second layer of model MIA238 are higher and lower, respectively, than the corresponding induction-log values.

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Figure 22. Comparison of TEM soundings MIA238 and MIA239 with an induction log from well G-2478. Well G-2478 is approximately 142 m north of sounding MIA238, and 36 m southeast of MIA239. Model MIA239X is an alternative model which uses all later time data that were masked for model MIA239. The specific conductance of water sampled from well G-2478 on July 8, 2009 was 2,640 mS/cm. The base of the aquifer at the well was estimated from Fish (1988) and adjusted for land-surface elevation of the area.

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Appendix 1 Description of TEM Data Processing

Processing TEM data includes the following steps: (1) downloading, (2) averaging, (3) inversion, (4) extracting results, (5) plotting results, and (6) report generation. Figure 1-1 summarizes the data flow and processing programs used.

The data in the Geonics PROTEM receiver are downloaded to a PC using program PROTEM, which is supplied by Geonics. Typically, data from one sounding location are downloaded into a single raw data file (filename extension .TEM). The format of this file is referred to as Geonics TEM File (GTF) format. Following downloading, selected data records from the raw data file are averaged using program NTEMAVG¹⁵. Data are usually selected to include measurements made with the same receiver gain and integration time, though this is not mandatory. The averaged data files (filename extension .TAV) are saved in GTF format. In addition to the averaged data file, a file containing a summary of the averaging process is saved (filename extension .PRV).

Both the raw and averaged data files can be read into TEMIXXL, a program commercially available from Interpex Ltd., that was used for data interpretation. TEMIXXL stores a copy of the data, the model, and the calculated response of the model in a proprietary, binary database file (filename extension .TX3). The database can hold a large number of soundings, so one database is usually enough for an entire survey. Sometimes it is helpful to retain several alternative models for a given data set. These are stored as separate soundings in the TEMIXXL database. Alternative models are given the original sounding name with up to three characters added at the end. For example a sounding called ABC101 might have variants ABC101L4 and ABC101L5 to indicate models with four and five layers, respectively. Soundings that had a layer resistivity fixed were given names with an F in them, such as ABC101F3. There are no restrictions on the extra characters added to the sounding name other than that the total number of characters in the sounding name cannot exceed eight. The results of the inversion are reported in an inversion output file (filename extension .INV).

Program TEM_EXTRACT is used to extract apparent-resistivity-time (filename extension .ROT) and interpreted-resistivity-depth (filename extension .ROZ) files for plotting. After the interpretation process is completed, a report file (filename extension .RPT) is generated using program TEM_REPORT. This file contains all of the information about the sounding parameters, the data values, the model parameters, and the model response. There is adequate information in this file to replicate and verify the results using another TEM modeling program.

¹⁵ Unpublished programs NTEMAVG, TEM_EXTRACT, and TEM_REPORT were developed at the USGS.

Figure 1–1. Data processing programs, files, and flow. Functions of the programs are described above. A description of the file formats is given in Appendix 2. Solid lines show processing flow. The dashed line shows an alternative processing path. Program PROTEM is available from Geonics Limited. Program TEMIXXL is available from Interpex Limited. Programs NTEMAVG, TEM_EXTRACT, and TEM_REPORT were developed at the USGS.

Appendix 2 Description of TEM Data Files

The file naming conventions and formats of files generated during downloading, processing, inversion, and extraction are described below.

File Naming Conventions

The downloaded GTF format files are typically given a name of the form *aaannn.TEM*, where *aaa* is a three-character identifier, typically associated the survey and *nnn* is a three-digit number. The sounding "name" would be considered *aaannn*. Geonics and some software vendors give the GTF files an extension of .RED.

Averaged data files are named *aaannn.TAV*. These files are also in GTF format. The printed summary of the averaging process is written to a file named *aaannn.PR*

TEMIXXL database files are binary files in a proprietary format. These files have a filename extension of .TX3. Data sets include observed data, measurement parameters, calculated model response, and inversion model parameters. A data set is identified by a name of up to 8 characters. The data-set identifiers are the same as the sounding names, unless it is an alternative model, in which case additional letters are added after the sounding name. The additional letters usually indicate the number of layers in the model (for example, L3, for a three-layer model, or F4 for a four-layer model with a layer parameter fixed).

A summary of the inversion is written to a file name *aaannn[xx].INV*, where [xx] represents optional characters added to the sounding name in TEMIXXL to identify alternative models.

Extracted apparent-resistivity-time and interpreted-resistivity-depth files suitable for plotting are named *aaannn[xx].ROT* and *aaannn[xx].ROZ*, respectively.

File Formats and Contents

Geonics TEM File Format

The raw data collected in the field are written in Geonics TEM file (GTF) format. GTF files consist of 256-character long records containing a 50-character header field followed by 25 eight-character data fields. The last two characters of the record are a carriage return and a line feed. Two types of records are created during PROTEM receiver downloading. The record type is indicated by characters 19–21 of the header field: "HDR" for a header record and "OPR" for a data record. A header record is created every time a change is made in certain measurement parameters in the PROTEM-D receiver. For example, changes in the sounding name, transmitter current, transmitter loop size, turnoff time, or receiver moment will produce a new header record.

The raw data files from this survey can be found in directory *raw_data_files* with the accompanying data.

Digital PROTEM-D File Format

Figure 2–1 shows the structure of the digital PROTEM-D receiver header fields for header (HDR) and data (OPR) records; descriptions for these two types of header fields are given in tables 2–1 and 2–2, respectively.

The data fields of header and data records contain 25 eight-character data fields. Geonics' documentation refers to these data fields as gates. The contents of the gates is given in tables 2–3 and 2–4 for header and data records, respectively.

Figure 2–1. Diagram showing contents of the digital PROTEM-D receiver header fields. A, Header record (HDR) header fields. B, Data record (OPR) header fields. The contents of shaded cells are ignored in further processing.

Table 2–1. Description of the digital PROTEM-D receiver header record (HDR) header fields.

Field	Columns	Description
date	1–4	date of measurement; usually [ddmm], but format depends on particular receiver used
line number	5–9	set by operator; often equal to the sounding number
sounding number	10–15	set by operator to identify the sounding
header indicator	16	<i>H</i> to indicate header record
record type	19–21	<i>HDR</i> to indicate header record
RX moment	31–41	RX coil moment [turn-m ²]

Table 2–2. Description of the digital PROTEM-D receiver *data record* (OPR) header fields.

Field	Columns	Description
date	1–4	date of measurement; usually [ddmm], but format depends on particular receiver used
line number	5–9	set by operator; often equal to the sounding number
sounding number	10–15	sequence number of sounding; requires operator to manually update otherwise values will not be significant
component	16	indicates measured component: <i>X</i> , <i>Y</i> , or <i>Z</i>
record type	19–21	<i>OPR</i> to indicate data record
sync	23–25	synchronization method: <i>REF</i> indicates reference cable, <i>XTL</i> indicates crystal oscillators
freq	27	transmitter repetition frequency; determines measurement times: <i>u</i> = ultra high, <i>v</i> = very high, <i>h</i> = high, <i>m</i> = medium, <i>l</i> = low
gain	29	coded PROTEM adjustable gain <i>G</i> (gain factor is 2^G)
reduction	30	value of <i>a</i> indicates that receiver 4x and 10x gain factors have been removed
integrations	32	PROTEM coded integration time setting
sequence number	43–48	sequence number of data record [#nnnnn]

Table 2–3. Description of the digital PROTEM-D receiver *header record* (HDR) data fields (gates).

Field (Gate)	Contents
0	date of measurement [mmdd]
2	time of measurement [hhmm]
4	TX current [A]
5	TX turnoff time [μ s]
6, 7	TX loop side length <i>LX</i> [m] and <i>LY</i> [m]
8, 9	RX coil position <i>XR</i> [m] and <i>YR</i> [m] relative to center of TX loop
10	RX coil moment <i>RXA</i> [turn-m ²]
11	TX number (37, 47, or 57)
22	logger record number for this header record

Table 2–4. Description of the digital PROTEM-D *data record* (OPR) data fields (gates).

Field (Gate)	Contents
0	primary field value
1–20	channels 1–20 TEM data [mV]
21	TX turnoff time [ms]
22	first RX gate time [ms]
23	TX current [A]
24	TX moment [turn-m ²], may include trailing "/"
25	time of measurement [hhmm]

PRV Files

Printed voltage summaries from the data averaging process are found in the PRV files. The first page of the file consists of a summary of all of the header record (HDR) and data record (OPR) header fields. The first line is a descriptive header indicating that the data came from a PROTEM logger ("*Data from Geonics TEM58 RX*"). The second line usually contains HDR header fields. Subsequent lines are OPR header fields associated with the recorded data. Additional HDR header fields will be present whenever the operator made a change in the header information on the PROTEM receiver. The output concludes with a record whose header field starts with "XXXXXX" to indicate the end of the data processing.

Following the summary page, a separate page is devoted to data records that were averaged together. There is usually one page for each transmitter repetition frequency used for the sounding. The first line of these pages indicates the program version used to average the data, the averaged-output file name, the record number of the averaged-output file to which this page corresponds, and the GTF format input file name.

Each data page of the PRV file contains a summary of all of the data recorded by the PROTEM-D receiver for a single frequency. For each measurement there is a data record number (*DRN*), frequency (*FREQ*), transmitter current (*CUR*), receiver gain (*GAIN*), integrations value (*NSTK*), transmitter turnoff time (*T/O*), and a time shift (*SHIFT*). The time shift is applied during data averaging to adjust for incorrect turnoff time settings during data recording. If no adjustment was made this value will be zero. This part of the output is followed by a list of the SI units of the various reported quantities, the TEM system used, the receiver coil moment (*RXA*), the transmitter loop dimensions (*LX* and *LY*), and the location of the receiver coil with respect to the center of the transmitter loop (*XR* and *YR*).

The next section of the data page gives the channel number and the voltage induced in the receiver coil in units of $[\mu\text{V}/\text{m}^2]$. The average of these voltages is computed and expressed as PROTEM-D receiver units $[\text{mV}]$. The standard deviation as a percentage of the average data value is also reported.

The last section of the data page presents the voltages after they have been transformed to apparent resistivity. The printout includes the channel number, the receiver channel time, the square root of the time in seconds $[\text{s}^{1/2}]$, the late stage apparent resistivity, the average of the resistivity values, and the percentage deviation of the apparent resistivity.

The PRV files from this survey can be found in directory `averaged_report_files` with the accompanying data.

TAV Files

The averaged data are contained in TAV files and use the GTF format described above. The header of the first record indicates the type of instrument the data came from and whether the data have been averaged ("*Data from Geonics TEM58 RX. -- AVERAGED*"). The data fields of this record are all set to zero. The second record is an HDR record with header fields and data fields as described in tables 2-1 and 2-3. Next is an OPR record for each frequency average computed by program NTEMAVG. If different groups of data records were averaged, there will be multiple output records—one for each group. A record whose header field starts with "XXXXXX" follows the last OPR record. The numbers in the data fields are meaningless.

The averaged data files from this survey can be found in directory `averaged_data_files` with the accompanying data.

INV Files

This file is a report generated by TEM inversion program TEMIXXL. It provides information on the sounding location, the measurement geometry, the model misfit error, the model parameter estimates, the measured apparent resistivity and calculated model response, and usually a resolution matrix.

Misfit error reported by the TEM inversion program (TEMIXXL) is given as the percentage RMS misfit for voltage data. The apparent resistivity misfit is approximately 2/3 of this value.

The inversion output files from this survey can be found in directory `inversion_files` with the accompanying data.

ROT and ROZ Files

The ROZ and ROT files are text files that contain data and models in a form for plotting. The ROT file contains the following information:

The sounding name.

Tab delimited column headings for the data that follow.

Tab delimited time and apparent resistivity data consisting of 6, 9, or 12 columns corresponding to 1, 2, or 3 transmitter repetition frequencies, respectively. Typically the data are given in order of decreasing repetition frequency corresponding to later time. The contents of the columns are specified in table 2–5.

The ROZ files contain the following information:

1. The sounding name.
2. Tab delimited titles for the data that follow: "*Depth (m) Resistivity (ohm-m)*".
3. Tab delimited data for plotting a resistivity-depth plot. Depths are given as positive values below the surface. The depth sequence will be: 0, z_1 , z_1 , z_2 , z_2 , . . . , z_{n-1} , z_{n-1} , z_{n-1} + $\max(10, 1.2 \cdot z_{n-1})$. The resistivity sequence will be ρ_1 , ρ_1 , ρ_2 , ρ_2 , . . . ρ_{n-1} , ρ_{n-1} , ρ_n , ρ_n .

The extracted data files (ROT and ROZ) from this survey can be found in directory `extracted_data_files` with the accompanying data.

Table 2–5. Description of plottable data in ROT files.

Column ¹⁶	Contents	Description
1	time	time of data point after TX turnoff [msec]
2	freq1_avg	averaged apparent resistivity [ohm-m] for FREQ1
3	freq1_std	standard error in FREQ1 averaged apparent resistivity
4	freq1_cal	calculated apparent resistivity [ohm-m] for FREQ1
5	freq2_avg	averaged apparent resistivity [ohm-m] for FREQ2
6	freq2_std	standard error in FREQ2 averaged apparent resistivity
7	freq2_cal	calculated apparent resistivity [ohm-m] for FREQ2
8	freq3_avg	averaged apparent resistivity [ohm-m] for FREQ3
9	freq3_std	standard error in FREQ3 averaged apparent resistivity
10	freq3_cal	calculated apparent resistivity [ohm-m] for FREQ3
11	masked	apparent resistivity of a masked data point
12	m_err	standard error of a masked data point

¹⁶When a sounding has fewer than three base frequencies (or sweeps), the unnecessary columns are removed. The masked and m_err data follow immediately after the last sweep.

RPT Files

The sounding report files are presented in Appendices D and F. The report file contains all relevant information for the sounding and its interpretation summarized on a single sheet. The report files can be found in directory `sounding_report_files` with the accompanying data.

TEMIXXL Database File

The TEMIXXL database files `MIAMI08.TX3` and `MIAMI09.TX3` used for interpretation of the 2008 and 2009 TEM soundings, respectively, can be found in directory `TEMIXXL_database_files` with the accompanying data.

Appendix 3 Voltage Units and Apparent Resistivity

Measured electromagnetic transients can be reported in two different ways: either as the voltage recorded in the receiver itself, or the voltage at the receiver coil normalized by the receiver-coil moment (number of coil turns times the coil area). The voltage at the receiver coil can be determined using Faraday's Law

$$V_{coil} = -M_{RX} \frac{d\mathbf{B} \cdot \hat{\mathbf{n}}}{dt} = -M_{RX} \frac{dB}{dt}, \quad (3-1)$$

where $\mathbf{B}$ is the magnetic induction in units of weber per meter squared [Wb/m^2], $\hat{\mathbf{n}}$ is the unit normal to the receiver coil (assumed to be vertical), and M_{RX} is the receiver-coil moment.

Rearranging (3-1) gives

$$V_{coil}/M_{RX} = -\frac{dB}{dt}. \quad (3-2)$$

This representation of the data is convenient for comparison against background electromagnetic noise levels, which are typically $0.1\text{--}1 \text{ nV}/\text{m}^2$ (Fitterman, 1989).

For the PROTEM receiver used in this study the voltage at the coil V_{coil} and the voltage recorded at the receiver V_{RX} are related by

$$V_{coil}[\text{nV}] = \frac{10^{-6} V_{RX}[\text{mV}]}{52.1 \cdot 2^G}, \quad (3-3)$$

where G is the receiver gain setting (see table 2–2), and the factor 52.1 accounts for additional fixed receiver gain. The magnitude of the time derivative of the magnetic induction is then

$$\frac{dB}{dt}[\text{nV}/\text{m}^2] = \frac{V_{coil}[\text{nV}]}{M_{RX}[\text{m}^2]} = \frac{10^{-6} V_{RX}[\text{mV}]}{52.1 \cdot 2^G M_{RX}[\text{m}^2]}. \quad (3-4)$$

The late stage apparent resistivity (Kaufman and Keller, 1983; Fitterman and Labson, 2005) is computed from the voltage induced in the receiver coil

$$\rho_a^{LS} = \frac{\mu_o}{4\pi t} \left[\frac{2\mu_o L^2 M_{RX} I_{TX}}{5t V_{coil}} \right]^{2/3}, \quad (3-5)$$

where t is the time after current turn off, L is the square transmitter loop side length, I_{TX} is the transmitter current, $\mu_o = 4\pi \cdot 10^{-7} [\text{H}/\text{m}]$ is the magnetic permeability of free space, and all units are SI. Recasting equation (3-5) into typical field units and incorporating the PROTEM gain constants gives

$$\rho_a^{LS}[\text{ohm-m}] = \frac{10^{-4}}{t[\text{ms}]} \left\{ \frac{0.16 \cdot \pi \cdot 52.1 \cdot 2^G L^2[\text{m}^2] M_{RX}[\text{m}^2] I_{TX}[\text{A}]}{t[\text{ms}] V_{RX}[\text{mV}]} \right\}^{2/3} \quad (3-6)$$

and

$$\rho_a^{LS}[\text{ohm-m}] = \frac{10}{t[\mu\text{s}]} \left\{ \frac{0.16 \cdot \pi \cdot 52.1 \cdot 2^G L^2[\text{m}^2] M_{RX}[\text{m}^2] I_{TX}[\text{A}]}{t[\mu\text{s}] V_{RX}[\text{mV}]} \right\}^{2/3}. \quad (3-7)$$

Appendix 4 TEM Sounding Report Files: 2008

Sounding: MIA101 Client: US Geological Survey
 Location: Homestead Speedway ovrflow lot
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 28-APR-08
 UTM Coord: E[m] 558727.0 N[m] 2814504.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	130.800	24.8	0.0
2	3.140	8.6	-24.8
3	39.560	--	-33.4

Fit Error[%]: 3.095

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	165.7	0.4	u	163.3
2	0.00860	144.5	0.4	u	148.0
3	0.01110	123.1	0.5	u	125.2
4	0.01410	100.0	0.4	u	99.9
5	0.01800	78.5	0.4	u	77.2
6	0.02300	60.4	0.4	u	59.2
7	0.02940	46.6	0.4	u	45.7
8	0.03750	36.5	0.4	u	36.1
9	0.04790	29.3	0.4	u	29.2
10	0.06110	24.3	0.4	u	24.4
11	0.07790	20.8	0.3	u	21.1
12	0.09930	18.4	0.4	u	18.8
13	0.12670	16.8	0.4	u	17.2
14	0.16640	16.0	0.3	u	16.2
15	0.20600	15.6	0.5	u	15.9
16	0.26280	15.8	0.7	u	15.9
17	0.33520	16.2	1.1	u	16.2
18	0.42770	17.2	2.1	u	17.0
19	0.54560	18.2	4.0	u	18.1
20	0.69590	19.8	8.5	u	19.6

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	19.4	0.5	u	19.7
2	0.10600	18.0	0.5	u	18.2
3	0.13100	16.9	0.7	u	17.0
4	0.16100	16.1	0.9	u	16.2
5	0.20000	15.8	1.2	u	15.8
6	0.25000	15.8	1.9	u	15.6
7	0.31400	16.1	2.9	u	15.8
8	0.39500	16.8	4.0	u	16.2
9	0.49900	17.5	3.6	u	16.9
10	0.63100	18.4	5.5	u	17.7
11	0.79900	18.7	29.0	u	18.8
12	1.01000	18.6	73.5	u	19.9
13	1.28000	21.2	100.0	u	21.2
14	1.63000	72.4	100.0	d	-
15	2.08000	17.2	100.0	d	-
16	2.64000	23.0	100.0	d	-
17	3.37000	13.7	100.0	d	-
18	4.29000	17.7	100.0	d	-
19	5.47000	12.8	100.0	d	-
20	6.97000	4.4	100.0	d	-

Sounding: MIA102 Client: US Geological Survey
 Location: Homestead Speedway ovrflow lot
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 28-APR-08
 UTM Coord: E[m] 558246.0 N[m] 2814508.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	141.400	27.0	0.0
2	1.570	1.3	-27.0
3	29.810	--	-28.4

Fit Error[%]: 3.659

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	161.0	0.3	u	160.2
2	0.00860	134.0	0.2	u	136.3
3	0.01110	110.7	0.3	u	110.0
4	0.01410	89.3	0.2	u	87.9
5	0.01800	72.4	0.2	u	70.9
6	0.02300	59.2	0.2	u	58.5
7	0.02940	49.4	0.2	u	49.5
8	0.03750	42.4	0.2	u	43.1
9	0.04790	37.5	0.2	u	38.5
10	0.06110	34.2	0.2	u	35.2
11	0.07790	32.2	0.2	u	32.9
12	0.09930	30.9	0.2	u	31.3
13	0.12670	30.4	0.3	u	30.3
14	0.16640	30.4	0.4	u	29.6
15	0.20600	30.4	0.4	u	29.3
16	0.26280	30.7	1.0	u	29.3
17	0.33520	30.6	1.6	u	29.5
18	0.42770	30.2	2.6	u	29.9
19	0.54560	30.0	5.1	u	30.7
20	0.69590	30.6	7.5	u	31.8

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	30.7	1.0	m	32.0
2	0.10600	29.8	0.5	m	30.9
3	0.13100	30.9	0.3	m	30.0
4	0.16100	32.0	0.8	m	29.4
5	0.20000	29.8	0.7	m	29.0
6	0.25000	30.1	1.7	m	28.7
7	0.31400	29.4	1.7	m	28.6
8	0.39500	28.6	2.2	m	28.5
9	0.49900	27.9	4.6	m	28.5
10	0.63100	26.4	4.9	m	28.5
11	0.79900	25.5	9.6	m	28.6
12	1.01000	23.4	14.5	m	28.7
13	1.28000	24.3	39.8	m	28.8
14	1.63000	31.4	70.1	m	29.0
15	2.08000	30.0	100.0	m	29.2
16	2.64000	12.7	77.8	d	-
17	3.37000	36.1	100.0	d	-
18	4.29000	16.0	100.0	d	-
19	5.47000	34.8	100.0	d	-
20	6.97000	17.2	100.0	d	-

Sounding: MIA102F Client: US Geological Survey
 Location: Homestead Speedway ovrflow lot
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 28-APR-08
 UTM Coord: E[m] 558246.0 N[m] 2814508.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	143.200	26.3	0.0
2	3.500	3.2	-26.3
3	30.910	--	-29.6

Fit Error[%]: 3.701

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	161.0	0.3	u	160.0
2	0.00860	134.0	0.2	u	136.0
3	0.01110	110.7	0.3	u	110.1
4	0.01410	89.3	0.2	u	88.0
5	0.01800	72.4	0.2	u	71.0
6	0.02300	59.2	0.2	u	58.6
7	0.02940	49.4	0.2	u	49.5
8	0.03750	42.4	0.2	u	43.1
9	0.04790	37.5	0.2	u	38.4
10	0.06110	34.2	0.2	u	35.1
11	0.07790	32.2	0.2	u	32.8
12	0.09930	30.9	0.2	u	31.3
13	0.12670	30.4	0.3	u	30.2
14	0.16640	30.4	0.4	u	29.6
15	0.20600	30.4	0.4	u	29.4
16	0.26280	30.7	1.0	u	29.4
17	0.33520	30.6	1.6	u	29.6
18	0.42770	30.2	2.6	u	30.2
19	0.54560	30.0	5.1	u	31.0
20	0.69590	30.6	7.5	u	32.2

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	30.7	1.0	m	31.9
2	0.10600	29.8	0.5	m	30.8
3	0.13100	30.9	0.3	m	30.0
4	0.16100	32.0	0.8	m	29.4
5	0.20000	29.8	0.7	m	29.0
6	0.25000	30.1	1.7	m	28.8
7	0.31400	29.4	1.7	m	28.7
8	0.39500	28.6	2.2	m	28.8
9	0.49900	27.9	4.6	m	28.8
10	0.63100	26.4	4.9	m	28.9
11	0.79900	25.5	9.6	m	29.0
12	1.01000	23.4	14.5	m	29.2
13	1.28000	24.3	39.8	m	29.4
14	1.63000	31.4	70.1	m	29.6
15	2.08000	30.0	100.0	m	29.8
16	2.64000	12.7	77.8	d	-
17	3.37000	36.1	100.0	d	-
18	4.29000	16.0	100.0	d	-
19	5.47000	34.8	100.0	d	-
20	6.97000	17.2	100.0	d	-

Sounding: MIA103 Client: US Geological Survey
 Location: Homestead Speedway ovrflow lot
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 28-APR-08
 UTM Coord: E[m] 557942.0 N[m] 2814507.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	708.800	16.8	0.0
2	34.280	68.7	-16.8
3	8.390	--	-85.5

Fit Error[%]: 2.645

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 3

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	149.3	0.4	u	148.0
2	0.00860	128.2	0.3	u	126.1
3	0.01110	113.4	0.4	u	111.0
4	0.01410	99.4	0.4	u	99.2
5	0.01800	88.5	0.3	u	89.2
6	0.02300	79.4	0.3	u	80.9
7	0.02940	72.1	0.3	u	74.0
8	0.03750	66.6	0.3	u	68.5
9	0.04790	62.7	0.3	u	64.2
10	0.06110	60.2	0.3	u	61.1
11	0.07790	59.1	0.3	u	58.9
12	0.09930	56.7	0.3	u	57.1
13	0.12670	55.1	0.4	u	55.2
14	0.16640	52.0	0.6	u	52.5
15	0.20600	49.1	1.1	u	49.7
16	0.26280	45.8	2.3	u	46.2
17	0.33520	42.1	3.5	u	42.5
18	0.42770	38.2	6.0	u	39.1
19	0.54560	35.9	7.5	u	36.3
20	0.69590	35.1	8.7	u	34.0

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	58.3	1.5	u	57.5
2	0.10600	57.4	1.4	u	55.9
3	0.13100	55.6	1.7	u	54.0
4	0.16100	53.0	3.4	u	51.5
5	0.20000	48.9	2.9	u	48.3
6	0.25000	44.8	4.7	u	44.5
7	0.31400	40.4	4.6	u	40.4
8	0.39500	36.7	6.5	u	36.4
9	0.49900	32.4	14.5	m	32.6
10	0.63100	30.6	23.8	m	29.2
11	0.79900	29.4	57.1	m	26.3
12	1.01000	31.9	83.6	m	23.8
13	1.28000	31.3	100.0	m	21.7
14	1.63000	18.0	100.0	d	-
15	2.08000	17.3	69.5	d	-
16	2.64000	10.7	100.0	d	-
17	3.37000	6.6	76.6	d	-
18	4.29000	6.4	100.0	d	-
19	5.47000	15.7	100.0	d	-
20	6.97000	15.5	100.0	d	-

Sounding: MIA104 Client: US Geological Survey
 Location: Homestead Speedway ovrflow lot
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 28-APR-08
 UTM Coord: E[m] 557486.0 N[m] 2814401.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	164.900	28.8	0.0
2	37.670	45.9	-28.8
3	10.800	--	-74.8

Fit Error[%]: 7.260

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	158.3	0.4	u	154.7
2	0.00860	142.0	0.2	u	146.1
3	0.01110	135.5	0.3	u	137.7
4	0.01410	126.0	0.3	u	127.5
5	0.01800	117.5	0.3	u	116.6
6	0.02300	108.8	0.2	u	106.8
7	0.02940	100.8	0.2	u	98.6
8	0.03750	93.5	0.2	u	92.0
9	0.04790	87.2	0.3	u	86.6
10	0.06110	81.9	0.2	u	81.7
11	0.07790	78.3	0.3	u	76.6
12	0.09930	71.1	0.3	u	71.0
13	0.12670	65.4	0.3	u	64.8
14	0.16640	58.5	0.6	u	57.9
15	0.20600	52.9	0.5	u	52.7
16	0.26280	47.4	0.7	u	47.4
17	0.33520	42.3	0.6	u	42.9
18	0.42770	38.5	0.7	u	39.3
19	0.54560	35.7	2.1	u	36.5
20	0.69590	33.6	3.2	u	34.4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	65.7	2.6	u	73.1
2	0.10600	61.1	0.8	u	68.2
3	0.13100	66.4	0.7	u	62.7
4	0.16100	68.4	2.1	u	57.0
5	0.20000	50.5	1.0	u	51.4
6	0.25000	46.8	6.2	u	46.0
7	0.31400	40.9	3.0	u	41.1
8	0.39500	36.3	2.5	u	36.9
9	0.49900	32.4	3.1	u	33.1
10	0.63100	28.7	4.7	u	29.9
11	0.79900	26.4	4.9	u	27.2
12	1.01000	25.0	12.2	u	24.9
13	1.28000	24.5	28.1	u	23.0
14	1.63000	22.0	28.4	u	21.4
15	2.08000	29.2	77.2	d	-
16	2.64000	68.1	100.0	d	-
17	3.37000	23.2	100.0	d	-
18	4.29000	54.7	100.0	d	-
19	5.47000	39.7	100.0	d	-
20	6.97000	24.5	100.0	d	-

Sounding: MIA104L4 Client: US Geological Survey
 Location: Homestead Speedway overflow lot
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 28-APR-08
 UTM Coord: E[m] 557486.0 N[m] 2814401.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	563.200	9.8	0.0
2	92.960	23.9	-9.8
3	35.430	42.1	-33.7
4	10.690	--	-75.8

Fit Error[%]: 7.177

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	158.3	0.4	u	155.0
2	0.00860	142.0	0.2	u	144.5
3	0.01110	135.5	0.3	u	136.6
4	0.01410	126.0	0.3	u	127.5
5	0.01800	117.5	0.3	u	117.4
6	0.02300	108.8	0.2	u	107.8
7	0.02940	100.8	0.2	u	99.4
8	0.03750	93.5	0.2	u	92.4
9	0.04790	87.2	0.3	u	86.7
10	0.06110	81.9	0.2	u	81.5
11	0.07790	78.3	0.3	u	76.3
12	0.09930	71.1	0.3	u	70.7
13	0.12670	65.4	0.3	u	64.7
14	0.16640	58.5	0.6	u	57.9
15	0.20600	52.9	0.5	u	52.7
16	0.26280	47.4	0.7	u	47.5
17	0.33520	42.3	0.6	u	43.0
18	0.42770	38.5	0.7	u	39.4
19	0.54560	35.7	2.1	u	36.5
20	0.69590	33.6	3.2	u	34.4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	65.7	2.6	u	72.8
2	0.10600	61.1	0.8	u	68.0
3	0.13100	66.4	0.7	u	62.6
4	0.16100	68.4	2.1	u	57.0
5	0.20000	50.5	1.0	u	51.4
6	0.25000	46.8	6.2	u	46.1
7	0.31400	40.9	3.0	u	41.2
8	0.39500	36.3	2.5	u	36.9
9	0.49900	32.4	3.1	u	33.1
10	0.63100	28.7	4.7	u	29.9
11	0.79900	26.4	4.9	u	27.2
12	1.01000	25.0	12.2	u	24.9
13	1.28000	24.5	28.1	u	23.0
14	1.63000	22.0	28.4	u	21.4
15	2.08000	29.2	77.2	d	-
16	2.64000	68.1	100.0	d	-
17	3.37000	23.2	100.0	d	-
18	4.29000	54.7	100.0	d	-
19	5.47000	39.7	100.0	d	-
20	6.97000	24.5	100.0	d	-

Sounding: MIA105 Client: US Geological Survey
 Location: Pine Crest School East
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 29-APR-08
 UTM Coord: E[m] 571727.0 N[m] 2839900.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	123.900	1.9	0.0
2	93.430	21.5	-1.9
3	9.740	32.7	-23.4
4	1.390	--	-56.2

Fit Error[%]: 6.526

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	107.3	0.3	u	105.7
2	0.00860	102.4	0.3	u	99.3
3	0.01110	87.6	0.4	u	91.1
4	0.01410	75.6	0.3	u	80.4
5	0.01800	65.2	0.4	u	69.5
6	0.02300	60.4	0.4	u	59.6
7	0.02940	53.8	0.3	u	51.3
8	0.03750	47.6	0.4	u	44.6
9	0.04790	41.9	0.4	u	39.6
10	0.06110	38.8	0.5	u	35.9
11	0.07790	33.0	0.4	u	33.2
12	0.09930	29.2	0.9	u	31.2
13	0.12670	30.1	1.1	u	29.3
14	0.16640	25.5	1.6	u	27.0
15	0.20600	24.5	2.3	u	24.9
16	0.26280	21.8	3.6	u	22.2
17	0.33520	19.7	5.8	u	19.5
18	0.42770	17.4	8.2	u	17.1
19	0.54560	15.7	8.8	u	15.1
20	0.69590	13.3	11.2	u	13.4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	29.0	2.0	u	31.6
2	0.10600	29.7	1.4	u	30.0
3	0.13100	30.0	1.8	u	28.1
4	0.16100	25.7	3.7	u	26.0
5	0.20000	24.4	4.3	u	23.5
6	0.25000	20.4	2.7	u	20.7
7	0.31400	18.4	6.7	u	17.9
8	0.39500	15.2	5.0	u	15.3
9	0.49900	12.8	8.1	u	13.0
10	0.63100	10.6	11.1	u	11.0
11	0.79900	8.9	18.6	m	9.4
12	1.01000	7.0	16.2	m	8.0
13	1.28000	6.9	15.7	m	6.9
14	1.63000	4.5	37.0	m	6.1
15	2.08000	3.2	40.1	m	5.3
16	2.64000	3.0	32.0	m	4.8
17	3.37000	6.3	100.0	d	-
18	4.29000	2.0	100.0	d	-
19	5.47000	5.0	100.0	d	-
20	6.97000	1.8	100.0	d	-

Sounding: MIA105L5 Client: US Geological Survey
 Location: Pine Crest School East
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 29-APR-08
 UTM Coord: E[m] 571727.0 N[m] 2839900.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	124.700	2.1	0.0
2	105.900	19.1	-2.1
3	12.590	16.4	-21.2
4	5.850	20.1	-37.6
5	.930	--	-57.8

Fit Error[%]: 5.187

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	107.3	0.3	u	109.5
2	0.00860	102.4	0.3	u	98.0
3	0.01110	87.6	0.4	u	87.3
4	0.01410	75.6	0.3	u	77.0
5	0.01800	65.2	0.4	u	67.8
6	0.02300	60.4	0.4	u	59.9
7	0.02940	53.8	0.3	u	53.0
8	0.03750	47.6	0.4	u	46.9
9	0.04790	41.9	0.4	u	41.5
10	0.06110	38.8	0.5	u	37.1
11	0.07790	33.0	0.4	u	33.6
12	0.09930	29.2	0.9	u	30.9
13	0.12670	30.1	1.1	u	28.8
14	0.16640	25.5	1.6	u	26.6
15	0.20600	24.5	2.3	u	24.7
16	0.26280	21.8	3.6	u	22.3
17	0.33520	19.7	5.8	u	19.8
18	0.42770	17.4	8.2	u	17.4
19	0.54560	15.7	8.8	u	15.3
20	0.69590	13.3	11.2	u	13.5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	29.0	2.0	u	31.6
2	0.10600	29.7	1.4	u	29.6
3	0.13100	30.0	1.8	u	27.6
4	0.16100	25.7	3.7	u	25.5
5	0.20000	24.4	4.3	u	23.3
6	0.25000	20.4	2.7	u	20.7
7	0.31400	18.4	6.7	u	17.9
8	0.39500	15.2	5.0	u	15.3
9	0.49900	12.8	8.1	u	12.8
10	0.63100	10.6	11.1	u	10.8
11	0.79900	8.9	18.6	m	9.0
12	1.01000	7.0	16.2	m	7.6
13	1.28000	6.9	15.7	m	6.5
14	1.63000	4.5	37.0	m	5.5
15	2.08000	3.2	40.1	m	4.8
16	2.64000	3.0	32.0	m	4.2
17	3.37000	6.3	100.0	d	-
18	4.29000	2.0	100.0	d	-
19	5.47000	5.0	100.0	d	-
20	6.97000	1.8	100.0	d	-

Sounding: MIA106 Client: US Geological Survey
 Location: Pine Crest School West
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 29-APR-08
 UTM Coord: E[m] 571608.0 N[m] 2839907.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	510.400	4.2	0.0
2	50.700	36.5	-4.2
3	6.360	23.2	-40.7
4	.656	--	-64.0

Fit Error[%]: 8.598

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 3

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	75.9	0.2	u	73.1
2	0.00860	69.6	0.1	u	68.8
3	0.01110	64.8	0.1	u	68.2
4	0.01410	65.2	0.1	u	68.5
5	0.01800	67.7	0.1	u	69.2
6	0.02300	72.2	0.1	u	69.2
7	0.02940	73.6	0.1	u	67.6
8	0.03750	64.0	0.1	u	63.8
9	0.04790	52.5	0.2	u	58.7
10	0.06110	59.4	0.1	u	53.4
11	0.07790	45.1	0.2	u	49.1
12	0.09930	47.1	0.5	u	45.8
13	0.12670	43.3	1.1	u	43.1
14	0.16640	38.3	1.3	u	40.0
15	0.20600	35.6	2.6	u	36.9
16	0.26280	31.9	2.5	u	32.8
17	0.33520	27.7	4.3	u	28.5
18	0.42770	24.1	7.2	u	24.4
19	0.54560	20.7	13.6	u	20.9
20	0.69590	17.6	19.8	u	18.1

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	42.6	1.6	u	46.3
2	0.10600	48.1	2.2	u	43.6
3	0.13100	43.3	3.9	u	40.8
4	0.16100	36.1	2.8	u	37.7
5	0.20000	35.7	5.6	u	33.9
6	0.25000	30.1	4.6	u	29.5
7	0.31400	25.7	11.4	u	24.9
8	0.39500	20.5	9.3	u	20.6
9	0.49900	17.9	19.3	u	16.9
10	0.63100	14.8	13.4	u	13.8
11	0.79900	11.8	23.1	u	11.2
12	1.01000	8.9	29.6	u	9.2
13	1.28000	7.0	42.1	u	7.6
14	1.63000	7.3	52.9	m	6.3
15	2.08000	5.3	64.7	m	5.3
16	2.64000	2.9	56.6	m	4.5
17	3.37000	3.4	100.0	m	4.0
18	4.29000	3.3	100.0	m	3.5
19	5.47000	1.4	100.0	m	3.1
20	6.97000	2.2	100.0	m	2.9

Sounding: MIA107 Client: US Geological Survey
 Location: Fairchild School
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 29-APR-08
 UTM Coord: E[m] 571420.0 N[m] 2846074.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	443.600	7.3	0.0
2	39.120	34.4	-7.3
3	1.130	--	-41.7

Fit Error[%]: 4.096

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	77.3	0.4	u	78.6
2	0.00860	73.7	0.3	u	71.6
3	0.01110	68.9	0.6	u	68.6
4	0.01410	68.1	0.6	u	67.9
5	0.01800	66.8	0.7	u	68.9
6	0.02300	72.2	0.9	u	71.3
7	0.02940	75.9	1.8	u	73.7
8	0.03750	73.8	1.1	u	73.6
9	0.04790	65.8	3.0	u	68.8
10	0.06110	58.7	3.2	u	60.2
11	0.07790	52.1	4.6	u	50.1
12	0.09930	41.4	8.4	u	40.7
13	0.12670	31.6	5.2	u	32.9
14	0.16640	26.5	8.8	u	26.0
15	0.20600	21.9	14.2	u	21.7
16	0.26280	18.4	20.0	u	17.9
17	0.33520	15.4	22.8	u	14.9
18	0.42770	12.2	30.7	u	12.7
19	0.54560	10.7	31.5	u	10.9
20	0.69590	24.7	100.0	d	-

Sounding: MIA108 Client: US Geological Survey
 Location: Palmer Trinity School Ball Field
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 30-APR-08
 UTM Coord: E[m] 568118.0 N[m] 2832157.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	679.000	5.6	0.0
2	87.160	28.3	-5.6
3	42.800	53.5	-34.0
4	480.800	--	-87.5

Fit Error[%]: 4.802

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	118.3	0.2	u	118.6
2	0.00860	113.2	0.2	u	113.2
3	0.01110	109.1	0.2	u	110.6
4	0.01410	109.4	0.2	u	107.2
5	0.01800	107.4	0.2	u	102.1
6	0.02300	90.2	0.2	u	96.5
7	0.02940	86.9	0.2	u	90.3
8	0.03750	90.1	0.3	u	84.0
9	0.04790	76.3	0.2	u	77.9
10	0.06110	71.6	0.3	u	72.4
11	0.07790	70.4	0.5	u	68.0
12	0.09930	65.5	0.6	u	65.1
13	0.12670	62.1	0.8	u	63.5
14	0.16640	63.1	1.1	u	63.3
15	0.20600	63.5	2.6	u	64.5
16	0.26280	67.1	8.4	u	67.0
17	0.33520	70.3	27.6	u	71.3
18	0.42770	79.7	74.4	u	77.2
19	0.54560	95.4	100.0	m	85.3
20	0.69590	76.1	96.0	m	95.9

Sounding: MIA108L3 Client: US Geological Survey
 Location: Palmer Trinity School Ball Field
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 30-APR-08
 UTM Coord: E[m] 568118.0 N[m] 2832157.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	581.900	4.3	0.0
2	98.330	23.6	-4.3
3	47.430	--	-28.0

Fit Error[%]: 7.174

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	118.3	0.2	u	120.3
2	0.00860	113.2	0.2	u	114.2
3	0.01110	109.1	0.2	u	110.2
4	0.01410	109.4	0.2	u	105.5
5	0.01800	107.4	0.2	u	99.8
6	0.02300	90.2	0.2	u	94.0
7	0.02940	86.9	0.2	u	88.5
8	0.03750	90.1	0.3	u	83.4
9	0.04790	76.3	0.2	u	78.9
10	0.06110	71.6	0.3	u	75.0
11	0.07790	70.4	0.5	u	71.5
12	0.09930	65.5	0.6	u	68.5
13	0.12670	62.1	0.8	u	65.9
14	0.16640	63.1	1.1	u	63.6
15	0.20600	63.5	2.6	u	62.1
16	0.26280	67.1	8.4	u	60.9
17	0.33520	70.3	27.6	m	60.1
18	0.42770	79.7	74.4	m	59.7
19	0.54560	95.4	100.0	m	60.1
20	0.69590	76.1	96.0	m	61.3

Sounding: MIA109 Client: US Geological Survey
 Location: Palmer Trinity School Orchard West
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 30-APR-08
 UTM Coord: E[m] 568218.0 N[m] 2831666.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	651.400	7.0	0.0
2	123.700	29.0	-7.0
3	48.350	--	-36.1

Fit Error[%]: 2.367

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	166.3	0.1	u	164.6
2	0.00860	155.8	0.3	u	157.1
3	0.01110	149.9	0.2	u	151.8
4	0.01410	144.1	0.4	u	144.6
5	0.01800	136.4	0.3	u	135.3
6	0.02300	127.6	0.3	u	125.5
7	0.02940	117.7	0.3	u	116.1
8	0.03750	108.3	0.3	u	107.5
9	0.04790	99.7	0.4	u	99.8
10	0.06110	92.3	0.4	u	93.0
11	0.07790	87.7	0.7	u	87.2
12	0.09930	80.0	0.7	u	82.2
13	0.12670	76.4	1.3	u	77.9
14	0.16640	73.1	1.9	u	74.0
15	0.20600	70.3	3.6	u	71.4
16	0.26280	69.8	8.8	u	69.2
17	0.33520	70.2	17.9	u	67.5
18	0.42770	72.1	31.8	m	66.6
19	0.54560	68.7	56.3	m	66.4
20	0.69590	57.5	57.8	m	67.2

Sounding: MIA110 Client: US Geological Survey
 Location: Palmer Trinity School Orchard East
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 30-APR-08
 UTM Coord: E[m] 568251.0 N[m] 2831672.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	829.900	13.2	0.0
2	62.790	21.5	-13.2
3	29.920	--	-34.8

Fit Error[%]: 1.954

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.30 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	157.3	0.8	u	155.2
2	0.00860	137.5	0.3	u	140.2
3	0.01110	129.5	0.4	u	129.4
4	0.01410	118.8	0.5	u	119.2
5	0.01800	108.8	0.5	u	108.7
6	0.02300	99.7	0.5	u	98.7
7	0.02940	90.4	0.5	u	89.4
8	0.03750	82.0	0.5	u	81.2
9	0.04790	74.8	0.6	u	74.0
10	0.06110	68.0	0.6	u	67.9
11	0.07790	62.6	0.6	u	62.6
12	0.09930	56.5	0.7	u	58.2
13	0.12670	53.2	0.8	u	54.5
14	0.16640	50.5	1.2	u	51.0
15	0.20600	48.5	1.6	u	48.8
16	0.26280	47.5	2.7	u	46.8
17	0.33520	45.1	2.8	u	45.3
18	0.42770	45.4	5.4	u	44.3
19	0.54560	43.8	15.1	u	43.9
20	0.69590	44.4	29.9	u	44.1

Sounding: MIA111 Client: US Geological Survey
 Location: Palmer Trinity School Orchard SE
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 30-APR-08
 UTM Coord: E[m] 568268.0 N[m] 2831566.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	271.600	21.9	0.0
2	28.490	--	-21.9

Fit Error[%]: 2.118

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.30 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	168.3	0.2	u	167.2
2	0.00860	140.5	0.9	u	142.3
3	0.01110	124.8	0.7	u	124.0
4	0.01410	109.2	0.7	u	109.1
5	0.01800	96.1	0.8	u	96.4
6	0.02300	85.3	0.8	u	85.8
7	0.02940	76.7	0.8	u	76.9
8	0.03750	69.5	0.8	u	69.6
9	0.04790	63.2	0.8	u	63.4
10	0.06110	58.4	1.0	u	58.3
11	0.07790	56.1	1.4	u	54.1
12	0.09930	51.2	2.2	u	50.6
13	0.12670	48.2	4.0	u	47.6
14	0.16640	44.4	7.4	u	44.9
15	0.20600	41.9	10.1	u	43.2
16	0.26280	41.7	15.0	u	41.7
17	0.33520	46.0	19.0	m	40.6
18	0.42770	45.8	60.2	m	39.9
19	0.54560	38.6	98.0	m	39.7
20	0.69590	26.7	58.1	m	40.1

Sounding: MIA112 Client: US Geological Survey
 Location: Holy Family Church
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 01-MAY-08
 UTM Coord: E[m] 582420.0 N[m] 2866116.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	85.910	32.1	0.0
2	5.410	--	-32.1

Fit Error[%]: 9.278

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 6

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	97.9	0.3	u	90.1
2	0.00860	95.9	0.2	u	93.0
3	0.01110	96.1	0.2	u	98.7
4	0.01410	100.3	0.2	u	99.3
5	0.01800	92.0	0.3	u	93.8
6	0.02300	69.9	0.3	u	83.1
7	0.02940	60.7	0.2	u	71.1
8	0.03750	59.5	0.3	u	59.7
9	0.04790	46.9	0.3	u	50.0
10	0.06110	42.1	0.3	u	41.9
11	0.07790	36.3	0.3	u	35.4
12	0.09930	31.5	0.3	u	30.2
13	0.12670	27.4	0.3	u	26.0
14	0.16640	23.6	0.2	u	22.3
15	0.20600	20.8	0.3	u	19.9
16	0.26280	18.3	0.4	u	17.8
17	0.33520	16.2	0.3	u	16.2
18	0.42770	14.5	0.4	u	14.9
19	0.54560	13.5	0.5	u	14.0
20	0.69590	12.8	0.6	u	13.4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	34.0	0.4	u	32.2
2	0.10600	30.4	0.2	u	28.4
3	0.13100	27.0	0.3	u	25.0
4	0.16100	23.8	0.4	u	22.0
5	0.20000	20.7	0.3	u	19.6
6	0.25000	18.1	0.5	u	17.4
7	0.31400	15.9	0.4	u	15.6
8	0.39500	14.0	0.5	u	14.1
9	0.49900	12.4	0.8	u	12.8
10	0.63100	11.3	0.8	u	11.8
11	0.79900	10.4	1.5	u	10.9
12	1.01000	9.7	1.9	u	10.1
13	1.28000	9.2	4.7	u	9.5
14	1.63000	8.5	4.3	u	9.0
15	2.08000	10.9	16.4	m	8.6
16	2.64000	13.2	33.0	m	8.2
17	3.37000	7.0	25.8	m	8.0
18	4.29000	5.3	27.6	m	7.8
19	5.47000	5.3	35.1	m	7.8
20	6.97000	8.0	100.0	m	7.9

Sounding: MIA112L3 Client: US Geological Survey
 Location: Holy Family Church
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 01-MAY-08
 UTM Coord: E[m] 582420.0 N[m] 2866116.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	1105.900	7.7	0.0
2	49.540	26.1	-7.7
3	5.110	--	-33.9

Fit Error[%]: 7.815

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 6

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	97.9	0.3	u	99.8
2	0.00860	95.9	0.2	u	94.3
3	0.01110	96.1	0.2	u	93.7
4	0.01410	100.3	0.2	u	92.2
5	0.01800	92.0	0.3	u	87.8
6	0.02300	69.9	0.3	u	80.2
7	0.02940	60.7	0.2	u	70.4
8	0.03750	59.5	0.3	u	60.2
9	0.04790	46.9	0.3	u	50.8
10	0.06110	42.1	0.3	u	42.8
11	0.07790	36.3	0.3	u	36.2
12	0.09930	31.5	0.3	u	30.8
13	0.12670	27.4	0.3	u	26.4
14	0.16640	23.6	0.2	u	22.6
15	0.20600	20.8	0.3	u	20.1
16	0.26280	18.3	0.4	u	17.9
17	0.33520	16.2	0.3	u	16.2
18	0.42770	14.5	0.4	u	14.9
19	0.54560	13.5	0.5	u	13.9
20	0.69590	12.8	0.6	u	13.3

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	34.0	0.4	u	32.9
2	0.10600	30.4	0.2	u	28.9
3	0.13100	27.0	0.3	u	25.4
4	0.16100	23.8	0.4	u	22.3
5	0.20000	20.7	0.3	u	19.7
6	0.25000	18.1	0.5	u	17.5
7	0.31400	15.9	0.4	u	15.6
8	0.39500	14.0	0.5	u	14.1
9	0.49900	12.4	0.8	u	12.7
10	0.63100	11.3	0.8	u	11.6
11	0.79900	10.4	1.5	u	10.7
12	1.01000	9.7	1.9	u	9.9
13	1.28000	9.2	4.7	u	9.3
14	1.63000	8.5	4.3	u	8.8
15	2.08000	10.9	16.4	m	8.3
16	2.64000	13.2	33.0	m	8.0
17	3.37000	7.0	25.8	m	7.7
18	4.29000	5.3	27.6	m	7.6
19	5.47000	5.3	35.1	m	7.5
20	6.97000	8.0	100.0	m	7.5

Sounding: MIA113 Client: US Geological Survey
 Location: Oak Grove Park
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 01-MAY-08
 UTM Coord: E[m] 581685.0 N[m] 2867153.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	790.200	7.7	0.0
2	73.980	50.5	-7.7
3	5.300	--	-58.2

Fit Error[%]: 6.967

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	116.8	0.3	u	117.6
2	0.00860	107.9	0.3	u	109.6
3	0.01110	107.2	0.3	u	107.2
4	0.01410	107.5	0.3	u	106.5
5	0.01800	110.4	0.3	u	107.4
6	0.02300	126.4	0.3	u	109.4
7	0.02940	102.0	0.3	u	111.1
8	0.03750	100.7	0.3	u	109.9
9	0.04790	104.3	0.4	u	103.9
10	0.06110	90.6	0.3	u	93.5
11	0.07790	82.0	0.4	u	81.1
12	0.09930	68.8	0.4	u	68.8
13	0.12670	58.5	0.5	u	57.9
14	0.16640	48.5	0.4	u	47.9
15	0.20600	41.9	0.6	u	41.6
16	0.26280	36.9	0.4	u	35.7
17	0.33520	31.4	1.0	u	31.1
18	0.42770	27.6	2.3	u	27.5
19	0.54560	24.4	3.2	u	24.8
20	0.69590	22.2	3.1	u	22.8

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	68.3	0.0	m	73.2
2	0.10600	57.2	0.0	m	63.7
3	0.13100	49.0	0.0	m	54.7
4	0.16100	47.0	0.0	m	46.8
5	0.20000	36.6	0.0	m	40.1
6	0.25000	29.2	0.0	m	34.3
7	0.31400	22.2	0.0	m	29.5
8	0.39500	18.0	0.0	m	25.5
9	0.49900	14.6	0.0	m	22.2
10	0.63100	15.4	0.0	m	19.5
11	0.79900	9.5	0.0	m	17.3
12	1.01000	12.4	0.0	m	15.5
13	1.28000	4.2	0.0	m	14.0
14	1.63000	2.7	0.0	m	12.7
15	2.08000	2.3	0.0	m	11.8
16	2.64000	3.3	0.0	m	11.0
17	3.37000	2.2	0.0	m	10.4
18	4.29000	1.4	0.0	m	9.9
19	5.47000	1.6	0.0	m	9.6
20	6.97000	.6	0.0	m	9.5

Sounding: MIA114 Client: US Geological Survey
 Location: Highland Oaks Park
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 01-MAY-08
 UTM Coord: E[m] 584955.0 N[m] 2872017.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	921.900	8.1	0.0
2	6.240	8.2	-8.1
3	2.460	59.3	-16.3
4	27.000	--	-75.6

Fit Error[%]: 3.249

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	55.6	0.1	u	57.0
2	0.00860	47.1	0.1	u	45.8
3	0.01110	39.1	0.1	u	38.3
4	0.01410	32.6	0.1	u	32.5
5	0.01800	27.2	0.1	u	27.5
6	0.02300	22.9	0.1	u	23.3
7	0.02940	19.3	0.1	u	19.6
8	0.03750	16.4	0.1	u	16.6
9	0.04790	14.0	0.1	u	14.1
10	0.06110	12.0	0.1	u	12.0
11	0.07790	10.4	0.1	u	10.3
12	0.09930	9.0	0.1	u	9.0
13	0.12670	7.9	0.1	u	7.9
14	0.16640	6.9	0.1	u	7.0
15	0.20600	6.3	0.1	u	6.4
16	0.26280	5.7	0.1	u	5.8
17	0.33520	5.3	0.1	u	5.4
18	0.42770	4.9	0.1	u	5.1
19	0.54560	4.7	0.6	u	4.8
20	0.69590	4.6	1.1	u	4.6

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	9.7	0.3	u	9.5
2	0.10600	8.8	0.3	u	8.6
3	0.13100	7.9	0.4	u	7.7
4	0.16100	7.1	0.3	u	6.9
5	0.20000	6.4	0.3	u	6.3
6	0.25000	5.8	0.3	u	5.7
7	0.31400	5.2	0.3	u	5.2
8	0.39500	4.8	0.4	u	4.8
9	0.49900	4.4	0.5	u	4.4
10	0.63100	4.1	0.6	u	4.1
11	0.79900	3.9	1.6	u	3.8
12	1.01000	3.6	2.2	u	3.6
13	1.28000	3.4	4.2	u	3.5
14	1.63000	3.4	4.3	u	3.4
15	2.08000	3.4	6.1	u	3.4
16	2.64000	3.6	12.0	u	3.4
17	3.37000	3.7	35.9	u	3.5
18	4.29000	6.2	71.7	m	3.8
19	5.47000	3.9	84.2	u	4.1
20	6.97000	8.7	100.0	m	4.5

Sounding: MIA114L3 Client: US Geological Survey
 Location: Highland Oaks Park
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 01-MAY-08
 UTM Coord: E[m] 584955.0 N[m] 2872017.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	34.750	13.0	0.0
2	2.610	68.3	-13.0
3	29.230	--	-81.3

Fit Error[%]: 5.378

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	55.6	0.1	u	52.3
2	0.00860	47.1	0.1	u	47.2
3	0.01110	39.1	0.1	u	41.5
4	0.01410	32.6	0.1	u	35.0
5	0.01800	27.2	0.1	u	28.9
6	0.02300	22.9	0.1	u	23.8
7	0.02940	19.3	0.1	u	19.6
8	0.03750	16.4	0.1	u	16.3
9	0.04790	14.0	0.1	u	13.7
10	0.06110	12.0	0.1	u	11.7
11	0.07790	10.4	0.1	u	10.0
12	0.09930	9.0	0.1	u	8.8
13	0.12670	7.9	0.1	u	7.7
14	0.16640	6.9	0.1	u	6.8
15	0.20600	6.3	0.1	u	6.3
16	0.26280	5.7	0.1	u	5.8
17	0.33520	5.3	0.1	u	5.4
18	0.42770	4.9	0.1	u	5.1
19	0.54560	4.7	0.6	u	4.9
20	0.69590	4.6	1.1	u	4.7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	9.7	0.3	u	9.3
2	0.10600	8.8	0.3	u	8.3
3	0.13100	7.9	0.4	u	7.5
4	0.16100	7.1	0.3	u	6.8
5	0.20000	6.4	0.3	u	6.2
6	0.25000	5.8	0.3	u	5.7
7	0.31400	5.2	0.3	u	5.2
8	0.39500	4.8	0.4	u	4.8
9	0.49900	4.4	0.5	u	4.5
10	0.63100	4.1	0.6	u	4.2
11	0.79900	3.9	1.6	u	3.9
12	1.01000	3.6	2.2	u	3.7
13	1.28000	3.4	4.2	u	3.5
14	1.63000	3.4	4.3	u	3.4
15	2.08000	3.4	6.1	u	3.4
16	2.64000	3.6	12.0	u	3.4
17	3.37000	3.7	35.9	u	3.6
18	4.29000	6.2	71.7	m	3.8
19	5.47000	3.9	84.2	u	4.1
20	6.97000	8.7	100.0	m	4.5

Sounding: MIA115 Client: US Geological Survey
 Location: Hallandale Elementary School
 Project: Saltwater Intrusion
 County: Broward County

Date: 01-MAY-08
 UTM Coord: E[m] 583794.0 N[m] 2873525.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	189.200	14.7	0.0
2	4.140	16.8	-14.7
3	27.270	--	-31.5

Fit Error[%]: 6.620

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	100.8	0.4	u	100.7
2	0.00860	78.7	0.2	u	78.0
3	0.01110	62.3	0.2	u	61.9
4	0.01410	49.3	0.2	u	49.7
5	0.01800	39.5	0.2	u	40.1
6	0.02300	31.6	0.2	u	32.5
7	0.02940	26.3	0.2	u	26.4
8	0.03750	22.4	0.2	u	21.6
9	0.04790	18.6	0.2	u	17.9
10	0.06110	16.0	0.2	u	15.2
11	0.07790	13.7	0.3	u	13.2
12	0.09930	11.9	0.2	u	11.8
13	0.12670	10.8	0.3	u	10.8
14	0.16640	10.5	0.6	u	10.2
15	0.20600	10.8	0.8	u	9.9
16	0.26280	12.3	1.2	m	9.9
17	0.33520	15.9	1.3	m	10.1
18	0.42770	23.5	2.3	m	10.5
19	0.54560	42.2	10.6	m	11.2
20	0.69590	353.1	100.0	m	12.1

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	11.6	1.5	u	12.4
2	0.10600	10.6	1.1	u	11.4
3	0.13100	9.9	2.5	u	10.7
4	0.16100	9.7	5.0	u	10.2
5	0.20000	10.4	11.3	u	9.9
6	0.25000	12.0	23.2	m	9.8
7	0.31400	19.0	100.0	m	9.8
8	0.39500	55.3	100.0	m	10.1
9	0.49900	18.8	100.0	m	10.4
10	0.63100	10.9	100.0	m	10.9
11	0.79900	6.9	100.0	m	11.6
12	1.01000	8.1	100.0	m	12.3
13	1.28000	4.0	100.0	m	13.2
14	1.63000	2.6	100.0	m	14.1
15	2.08000	49.2	100.0	m	15.1
16	2.64000	.9	100.0	m	16.1
17	3.37000	1.3	100.0	m	17.2
18	4.29000	4.1	100.0	m	18.3
19	5.47000	1.0	100.0	m	19.9
20	6.97000	.2	79.8	m	21.5

Sounding: MIA115L2 Client: US Geological Survey
 Location: Hallandale Elementary School
 Project: Saltwater Intrusion
 County: Broward County

Date: 01-MAY-08
 UTM Coord: E[m] 583794.0 N[m] 2873525.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	707.300	13.9	0.0
2	4.240	--	-13.9

Fit Error[%]: 10.254

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	100.8	0.4	u	100.1
2	0.00860	78.7	0.2	u	76.7
3	0.01110	62.3	0.2	u	60.5
4	0.01410	49.3	0.2	u	48.4
5	0.01800	39.5	0.2	u	39.1
6	0.02300	31.6	0.2	u	31.9
7	0.02940	26.3	0.2	u	26.4
8	0.03750	22.4	0.2	u	22.1
9	0.04790	18.6	0.2	u	18.7
10	0.06110	16.0	0.2	u	16.1
11	0.07790	13.7	0.3	u	14.0
12	0.09930	11.9	0.2	u	12.4
13	0.12670	10.8	0.3	u	11.1
14	0.16640	10.5	0.6	u	9.9
15	0.20600	10.8	0.8	u	9.2
16	0.26280	12.3	1.2	m	8.5
17	0.33520	15.9	1.3	m	8.0
18	0.42770	23.5	2.3	m	7.7
19	0.54560	42.2	10.6	m	7.5
20	0.69590	353.1	100.0	m	7.3

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	11.6	1.5	u	13.0
2	0.10600	10.6	1.1	u	11.8
3	0.13100	9.9	2.5	u	10.8
4	0.16100	9.7	5.0	u	9.8
5	0.20000	10.4	11.3	u	9.1
6	0.25000	12.0	23.2	m	8.4
7	0.31400	19.0	100.0	m	7.8
8	0.39500	55.3	100.0	m	7.3
9	0.49900	18.8	100.0	m	6.9
10	0.63100	10.9	100.0	m	6.5
11	0.79900	6.9	100.0	m	6.2
12	1.01000	8.1	100.0	m	6.0
13	1.28000	4.0	100.0	m	5.8
14	1.63000	2.6	100.0	m	5.6
15	2.08000	49.2	100.0	m	5.4
16	2.64000	.9	100.0	m	5.3
17	3.37000	1.3	100.0	m	5.3
18	4.29000	4.1	100.0	m	5.3
19	5.47000	1.0	100.0	m	5.3
20	6.97000	.2	79.8	m	5.4

Sounding: MIA116 Client: US Geological Survey
 Location: St. Michael School South
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 02-MAY-08
 UTM Coord: E[m] 575921.0 N[m] 2850911.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	173.600	30.5	0.0
2	13.310	--	-30.5

Fit Error[%]: 8.888

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	184.3	0.4	u	180.6
2	0.00860	163.2	0.2	u	168.5
3	0.01110	151.4	0.3	u	152.6
4	0.01410	132.1	0.3	u	132.8
5	0.01800	115.6	0.3	u	113.2
6	0.02300	102.5	0.3	u	96.1
7	0.02940	87.8	0.3	u	81.6
8	0.03750	70.9	0.2	u	69.8
9	0.04790	53.5	0.2	u	60.2
10	0.06110	49.4	0.2	u	52.3
11	0.07790	44.8	0.2	u	46.0
12	0.09930	36.4	0.2	u	40.8
13	0.12670	38.0	0.5	u	36.7
14	0.16640	34.5	0.8	u	32.9
15	0.20600	31.1	1.2	u	30.5
16	0.26280	28.3	2.1	u	28.3
17	0.33520	27.4	5.0	u	26.6
18	0.42770	24.0	8.2	u	25.4
19	0.54560	24.8	16.1	u	24.6
20	0.69590	23.2	24.6	u	24.2

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	44.4	0.0	u	43.0
2	0.10600	35.2	0.0	u	39.2
3	0.13100	37.5	0.0	u	35.7
4	0.16100	34.0	0.0	u	32.7
5	0.20000	33.5	0.0	u	30.1
6	0.25000	35.5	0.0	m	27.8
7	0.31400	47.5	0.0	m	25.8
8	0.39500	31.7	0.0	m	24.1
9	0.49900	45.7	0.0	m	22.7
10	0.63100	42.3	0.0	m	21.4
11	0.79900	23.3	0.0	m	20.4
12	1.01000	11.8	0.0	m	19.5
13	1.28000	9.0	0.0	m	18.7
14	1.63000	16.3	0.0	m	18.1
15	2.08000	5.4	0.0	m	17.6
16	2.64000	1.9	0.0	m	17.2
17	3.37000	1.7	0.0	m	17.0
18	4.29000	2.1	0.0	m	16.9
19	5.47000	.7	0.0	m	17.0
20	6.97000	.7	0.0	m	17.4

Sounding: MIA117 Client: US Geological Survey
 Location: St. Michael School North
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 02-MAY-08
 UTM Coord: E[m] 575919.0 N[m] 2851041.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	122.100	35.7	0.0
2	3.320	3.7	-35.7
3	19.390	--	-39.5

Fit Error[%]: 3.520

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	135.3	0.5	u	130.5
2	0.00860	132.4	0.2	u	136.9
3	0.01110	140.1	0.3	u	141.9
4	0.01410	133.6	0.4	u	132.7
5	0.01800	114.7	0.2	u	113.5
6	0.02300	94.8	0.2	u	92.9
7	0.02940	76.8	0.2	u	75.6
8	0.03750	62.1	0.2	u	62.3
9	0.04790	51.2	0.1	u	52.4
10	0.06110	43.8	0.2	u	45.0
11	0.07790	38.8	0.1	u	39.5
12	0.09930	34.3	0.2	u	35.4
13	0.12670	32.2	0.1	u	32.3
14	0.16640	31.3	0.2	u	29.7
15	0.20600	29.0	0.4	u	28.2
16	0.26280	28.0	0.9	u	27.0
17	0.33520	26.5	1.6	u	26.2
18	0.42770	25.4	2.9	u	25.7
19	0.54560	25.2	4.7	u	25.6
20	0.69590	25.7	9.1	u	25.8

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	36.9	1.0	u	37.1
2	0.10600	33.2	1.0	u	34.1
3	0.13100	31.7	1.2	u	31.6
4	0.16100	30.5	2.0	u	29.6
5	0.20000	28.3	2.6	u	27.9
6	0.25000	26.6	4.8	u	26.5
7	0.31400	24.4	5.9	u	25.4
8	0.39500	22.5	10.1	m	24.5
9	0.49900	20.1	18.2	m	23.7
10	0.63100	18.4	25.7	m	23.1
11	0.79900	14.7	24.7	m	22.6
12	1.01000	11.3	60.0	m	22.2
13	1.28000	8.4	73.6	m	21.9
14	1.63000	7.9	71.8	m	21.6
15	2.08000	7.1	74.0	m	21.4
16	2.64000	4.7	100.0	m	21.4
17	3.37000	3.0	59.3	m	21.4
18	4.29000	2.2	82.0	m	21.6
19	5.47000	2.2	100.0	m	22.1
20	6.97000	1.0	20.3	m	22.8

Sounding: MIA117F3 Client: US Geological Survey
 Location: St. Michael School North
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 02-MAY-08
 UTM Coord: E[m] 575919.0 N[m] 2851041.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	122.200	35.7	0.0
2	3.500	4.0	-35.7
3	19.660	--	-39.7

Fit Error[%]: 3.517

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	135.3	0.5	u	130.5
2	0.00860	132.4	0.2	u	136.8
3	0.01110	140.1	0.3	u	141.9
4	0.01410	133.6	0.4	u	132.8
5	0.01800	114.7	0.2	u	113.6
6	0.02300	94.8	0.2	u	92.9
7	0.02940	76.8	0.2	u	75.6
8	0.03750	62.1	0.2	u	62.2
9	0.04790	51.2	0.1	u	52.3
10	0.06110	43.8	0.2	u	44.9
11	0.07790	38.8	0.1	u	39.5
12	0.09930	34.3	0.2	u	35.3
13	0.12670	32.2	0.1	u	32.2
14	0.16640	31.3	0.2	u	29.7
15	0.20600	29.0	0.4	u	28.2
16	0.26280	28.0	0.9	u	27.0
17	0.33520	26.5	1.6	u	26.2
18	0.42770	25.4	2.9	u	25.8
19	0.54560	25.2	4.7	u	25.7
20	0.69590	25.7	9.1	u	26.0

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	36.9	1.0	u	37.0
2	0.10600	33.2	1.0	u	34.1
3	0.13100	31.7	1.2	u	31.6
4	0.16100	30.5	2.0	u	29.6
5	0.20000	28.3	2.6	u	27.9
6	0.25000	26.6	4.8	u	26.6
7	0.31400	24.4	5.9	u	25.5
8	0.39500	22.5	10.1	m	24.6
9	0.49900	20.1	18.2	m	23.8
10	0.63100	18.4	25.7	m	23.2
11	0.79900	14.7	24.7	m	22.7
12	1.01000	11.3	60.0	m	22.3
13	1.28000	8.4	73.6	m	22.0
14	1.63000	7.9	71.8	m	21.8
15	2.08000	7.1	74.0	m	21.6
16	2.64000	4.7	100.0	m	21.5
17	3.37000	3.0	59.3	m	21.6
18	4.29000	2.2	82.0	m	21.8
19	5.47000	2.2	100.0	m	22.3
20	6.97000	1.0	20.3	m	23.0

Sounding: MIA117L4 Client: US Geological Survey
 Location: St. Michael School North
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 02-MAY-08
 UTM Coord: E[m] 575919.0 N[m] 2851041.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	125.300	28.1	0.0
2	49.760	8.9	-28.1
3	1.970	1.9	-37.0
4	19.050	--	-39.0

Fit Error[%]: 3.478

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	135.3	0.5	u	131.7
2	0.00860	132.4	0.2	u	136.6
3	0.01110	140.1	0.3	u	141.0
4	0.01410	133.6	0.4	u	132.0
5	0.01800	114.7	0.2	u	113.2
6	0.02300	94.8	0.2	u	93.0
7	0.02940	76.8	0.2	u	75.7
8	0.03750	62.1	0.2	u	62.4
9	0.04790	51.2	0.1	u	52.5
10	0.06110	43.8	0.2	u	45.1
11	0.07790	38.8	0.1	u	39.6
12	0.09930	34.3	0.2	u	35.4
13	0.12670	32.2	0.1	u	32.3
14	0.16640	31.3	0.2	u	29.7
15	0.20600	29.0	0.4	u	28.2
16	0.26280	28.0	0.9	u	26.9
17	0.33520	26.5	1.6	u	26.1
18	0.42770	25.4	2.9	u	25.6
19	0.54560	25.2	4.7	u	25.4
20	0.69590	25.7	9.1	u	25.7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	36.9	1.0	u	37.1
2	0.10600	33.2	1.0	u	34.2
3	0.13100	31.7	1.2	u	31.6
4	0.16100	30.5	2.0	u	29.6
5	0.20000	28.3	2.6	u	27.9
6	0.25000	26.6	4.8	u	26.5
7	0.31400	24.4	5.9	u	25.3
8	0.39500	22.5	10.1	m	24.4
9	0.49900	20.1	18.2	m	23.6
10	0.63100	18.4	25.7	m	22.9
11	0.79900	14.7	24.7	m	22.4
12	1.01000	11.3	60.0	m	22.0
13	1.28000	8.4	73.6	m	21.6
14	1.63000	7.9	71.8	m	21.4
15	2.08000	7.1	74.0	m	21.2
16	2.64000	4.7	100.0	m	21.1
17	3.37000	3.0	59.3	m	21.1
18	4.29000	2.2	82.0	m	21.4
19	5.47000	2.2	100.0	m	21.8
20	6.97000	1.0	20.3	m	22.4

Sounding: MIA118 Client: US Geological Survey
 Location: Kensington Park School NW
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 02-MAY-08
 UTM Coord: E[m] 575880.0 N[m] 2851706.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	123.000	22.9	0.0
2	2.090	--	-22.9

Fit Error[%]: 9.609

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	102.6	0.9	m	163.0
2	0.00860	104.2	0.9	m	144.6
3	0.01110	178.8	1.6	m	120.8
4	0.01410	2323.0	29.8	m	97.0
5	0.01800	90.2	0.7	m	76.8
6	0.02300	39.5	0.6	m	60.5
7	0.02940	54.0	0.9	u	47.7
8	0.03750	42.6	0.5	u	37.9
9	0.04790	28.1	0.6	u	30.3
10	0.06110	22.5	0.6	u	24.5
11	0.07790	19.6	0.5	u	20.0
12	0.09930	15.9	0.5	u	16.5
13	0.12670	13.2	0.6	u	13.8
14	0.16640	11.1	1.1	u	11.5
15	0.20600	9.8	0.9	u	10.1
16	0.26280	8.7	1.3	u	8.8
17	0.33520	7.9	1.3	u	7.8
18	0.42770	7.3	3.2	u	7.1
19	0.54560	6.8	4.4	u	6.5
20	0.69590	6.3	6.2	u	6.1

Sounding: MIA119 Client: US Geological Survey
 Location: Kensington Park School SE
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 02-MAY-08
 UTM Coord: E[m] 575894.0 N[m] 2851685.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	748.900	16.0	0.0
2	7.580	--	-16.0

Fit Error[%]: 4.860

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	167.8	1.2	m	118.4
2	0.00860	174.6	1.6	m	92.9
3	0.01110	334.7	1.6	m	74.8
4	0.01410	127.6	0.6	m	61.4
5	0.01800	145.3	0.9	m	50.8
6	0.02300	29.5	0.6	m	42.5
7	0.02940	70.6	0.8	m	35.9
8	0.03750	44.5	0.8	m	30.8
9	0.04790	27.7	0.5	u	26.7
10	0.06110	22.0	0.6	u	23.5
11	0.07790	22.0	0.6	u	20.9
12	0.09930	19.1	0.6	u	18.8
13	0.12670	16.7	0.7	u	17.1
14	0.16640	15.3	1.0	u	15.6
15	0.20600	14.3	1.3	u	14.6
16	0.26280	13.5	2.0	u	13.8
17	0.33520	12.9	3.2	u	13.1
18	0.42770	12.7	3.7	u	12.6
19	0.54560	12.8	4.3	u	12.4
20	0.69590	12.5	15.4	u	12.3

Sounding: MIA120 Client: US Geological Survey
 Location: Alamo Rental (vacant lot) West
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 02-MAY-08
 UTM Coord: E[m] 574171.0 N[m] 2854246.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	651.800	12.8	0.0
2	26.370	15.0	-12.8
3	4.700	--	-27.9

Fit Error[%]: 5.453

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	115.4	0.6	u	116.1
2	0.00860	104.8	0.4	u	103.0
3	0.01110	95.3	0.4	u	94.1
4	0.01410	82.5	0.4	u	84.5
5	0.01800	71.7	0.4	u	74.0
6	0.02300	62.1	0.4	u	63.3
7	0.02940	54.1	0.4	u	53.3
8	0.03750	47.5	0.4	u	44.7
9	0.04790	40.8	0.4	u	37.5
10	0.06110	33.0	0.4	u	31.6
11	0.07790	26.5	0.3	u	26.9
12	0.09930	21.8	0.5	u	23.1
13	0.12670	20.0	0.3	u	20.0
14	0.16640	16.7	0.6	u	17.3
15	0.20600	14.6	0.8	u	15.6
16	0.26280	13.3	1.1	u	14.0
17	0.33520	12.7	1.7	u	12.8
18	0.42770	12.3	3.1	u	11.9
19	0.54560	11.1	4.1	u	11.2
20	0.69590	11.2	5.4	u	10.8

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	23.8	0.0	u	24.6
2	0.10600	22.2	0.0	u	21.8
3	0.13100	19.5	0.0	u	19.3
4	0.16100	16.7	0.0	u	17.1
5	0.20000	14.7	0.0	u	15.3
6	0.25000	14.2	0.0	u	13.7
7	0.31400	12.4	0.0	u	12.4
8	0.39500	11.1	0.0	u	11.3
9	0.49900	10.9	0.0	u	10.3
10	0.63100	9.8	0.0	u	9.5
11	0.79900	11.6	0.0	m	8.8
12	1.01000	9.5	0.0	m	8.3
13	1.28000	3.8	0.0	m	7.8
14	1.63000	3.5	0.0	m	7.4
15	2.08000	7.8	0.0	m	7.1
16	2.64000	2.5	0.0	m	6.9
17	3.37000	31.2	0.0	m	6.7
18	4.29000	1.8	0.0	m	6.6
19	5.47000	.7	0.0	m	6.6
20	6.97000	.6	0.0	m	6.6

Sounding: MIA121 Client: US Geological Survey
 Location: Alamo Rental (vacant lot) East
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 02-MAY-08
 UTM Coord: E[m] 574249.0 N[m] 2854232.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	83.790	25.1	0.0
2	5.020	--	-25.1

Fit Error[%]: 24.840

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	103.4	1.2	u	96.7
2	0.00860	104.4	0.5	u	96.8
3	0.01110	82.6	0.6	u	94.0
4	0.01410	77.9	0.6	u	85.2
5	0.01800	63.1	0.6	u	73.3
6	0.02300	57.0	0.5	u	61.4
7	0.02940	55.4	0.5	u	51.0
8	0.03750	54.8	0.6	u	42.5
9	0.04790	45.1	0.4	u	35.6
10	0.06110	28.7	0.6	u	30.1
11	0.07790	22.7	0.6	u	25.6
12	0.09930	19.0	0.9	u	22.1
13	0.12670	20.6	1.6	u	19.3
14	0.16640	21.4	2.6	u	16.8
15	0.20600	12.0	1.6	u	15.2
16	0.26280	11.1	2.4	u	13.8
17	0.33520	12.8	6.5	u	12.7
18	0.42770	14.4	15.8	u	11.8
19	0.54560	10.7	10.7	u	11.2
20	0.69590	10.9	29.4	u	10.8

Sounding: MIA122 Client: US Geological Survey
 Location: Barry University Field SW
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 05-MAY-08
 UTM Coord: E[m] 580001.0 N[m] 2862347.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	345.800	6.6	0.0
2	67.670	45.1	-6.6
3	4.030	14.1	-51.8
4	.935	--	-65.9

Fit Error[%]: 4.756

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m²]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	95.7	1.1	u	99.3
2	0.00860	95.3	0.3	u	93.8
3	0.01110	96.3	0.2	u	92.7
4	0.01410	96.2	0.2	u	93.7
5	0.01800	96.6	0.4	u	95.8
6	0.02300	96.5	0.4	u	98.7
7	0.02940	96.7	0.5	u	100.5
8	0.03750	97.2	0.8	u	99.3
9	0.04790	98.1	1.4	u	94.5
10	0.06110	91.7	1.3	u	87.1
11	0.07790	75.8	1.9	u	78.7
12	0.09930	67.5	3.2	u	70.0
13	0.12670	60.9	3.6	u	61.2
14	0.16640	53.6	4.8	u	51.5
15	0.20600	43.5	3.8	u	44.3
16	0.26280	38.5	9.4	u	37.1
17	0.33520	30.8	10.4	u	31.0
18	0.42770	25.5	21.0	u	26.1
19	0.54560	22.8	21.7	u	22.1
20	0.69590	18.4	35.8	u	19.0

Sounding: MIA123 Client: US Geological Survey
 Location: Barry University Field SE
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 05-MAY-08
 UTM Coord: E[m] 580041.0 N[m] 2862354.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	312.600	7.4	0.0
2	69.080	75.8	-7.4
3	15.760	--	-83.3

Fit Error[%]: 4.726

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m²]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	97.6	1.0	u	103.0
2	0.00860	95.8	0.6	u	96.5
3	0.01110	95.5	0.2	u	93.4
4	0.01410	96.4	0.2	u	91.0
5	0.01800	91.4	0.2	u	88.5
6	0.02300	85.4	0.1	u	86.6
7	0.02940	86.4	0.2	u	85.4
8	0.03750	84.8	0.2	u	84.8
9	0.04790	87.3	0.2	u	84.8
10	0.06110	85.6	0.3	u	84.8
11	0.07790	78.9	0.2	u	83.8
12	0.09930	77.6	0.3	u	81.3
13	0.12670	75.6	0.4	u	77.2
14	0.16640	73.7	5.2	u	71.2
15	0.20600	66.0	4.7	u	66.0
16	0.26280	62.5	1.6	u	60.5
17	0.33520	56.2	3.3	u	55.5
18	0.42770	51.5	8.5	u	51.4
19	0.54560	46.7	6.3	u	48.1
20	0.69590	44.9	5.3	u	45.8

Sounding: MIA124 Client: US Geological Survey
 Location: Barry University Vacant Lot NW
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 05-MAY-08
 UTM Coord: E[m] 579604.0 N[m] 2862625.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	327.000	12.0	0.0
2	48.990	19.4	-12.0
3	261.000	40.7	-31.5
4	6.070	22.7	-72.3
5	1.470	--	-95.0

Fit Error[%]: 1.587

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	107.4	0.4	u	108.4
2	0.00860	97.0	0.4	u	97.0
3	0.01110	93.1	0.4	u	91.4
4	0.01410	89.3	0.4	u	89.1
5	0.01800	89.4	0.3	u	89.0
6	0.02300	90.8	0.4	u	91.6
7	0.02940	96.2	0.4	u	96.4
8	0.03750	102.9	0.4	u	102.7
9	0.04790	108.3	0.4	u	108.8
10	0.06110	111.1	0.3	u	111.9
11	0.07790	113.5	0.7	u	110.5
12	0.09930	103.3	0.3	u	104.7
13	0.12670	95.8	1.1	u	96.6
14	0.16640	86.3	0.8	u	86.1
15	0.20600	76.4	1.0	u	77.3
16	0.26280	68.3	1.7	u	67.5
17	0.33520	58.8	1.8	u	58.1
18	0.42770	50.1	3.1	u	49.8
19	0.54560	42.6	4.4	u	42.7
20	0.69590	36.5	4.8	u	37.0

Sounding: MIA125 Client: US Geological Survey
 Location: Epiphany Parish Baseball Field
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 05-MAY-08
 UTM Coord: E[m] 571943.0 N[m] 2842057.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	279.800	12.0	0.0
2	50.510	37.6	-12.0
3	3.300	--	-49.6

Fit Error[%]: 3.469

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	108.3	0.3	u	112.3
2	0.00860	102.8	0.1	u	102.0
3	0.01110	99.9	0.1	u	97.0
4	0.01410	96.8	0.1	u	94.6
5	0.01800	96.5	0.1	u	94.0
6	0.02300	95.4	0.0	u	94.3
7	0.02940	91.7	0.1	u	94.1
8	0.03750	87.8	0.1	u	90.7
9	0.04790	80.7	0.2	u	83.5
10	0.06110	72.6	0.2	u	73.2
11	0.07790	63.4	0.3	u	62.1
12	0.09930	53.4	0.3	u	51.8
13	0.12670	44.4	0.4	u	43.1
14	0.16640	35.8	0.6	u	35.2
15	0.20600	30.0	0.5	u	30.3
16	0.26280	25.3	0.8	u	25.8
17	0.33520	21.8	1.1	u	22.2
18	0.42770	19.2	1.9	u	19.5
19	0.54560	17.3	3.3	u	17.4
20	0.69590	16.0	4.6	u	15.9

Sounding: MIA126 Client: US Geological Survey
 Location: Lourdes Academy Baseball Field
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 05-MAY-08
 UTM Coord: E[m] 572116.0 N[m] 2842097.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	118.100	31.9	0.0
2	11.140	5.3	-31.9
3	390.300	47.6	-37.2
4	11.060	--	-84.9

Fit Error[%]: 1.844

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m²]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	119.2	0.2	u	118.8
2	0.00860	114.4	0.2	u	114.5
3	0.01110	106.5	0.2	u	107.2
4	0.01410	97.1	0.2	u	97.0
5	0.01800	88.3	0.2	u	87.0
6	0.02300	80.4	0.2	u	79.8
7	0.02940	75.0	0.2	u	75.3
8	0.03750	72.2	0.1	u	73.6
9	0.04790	72.3	0.1	u	73.8
10	0.06110	75.1	0.1	u	75.6
11	0.07790	80.4	0.1	u	78.0
12	0.09930	80.3	0.3	u	79.3
13	0.12670	78.7	0.4	u	78.5
14	0.16640	73.5	0.8	u	74.1
15	0.20600	68.0	1.0	u	69.1
16	0.26280	62.6	1.7	u	62.4
17	0.33520	56.6	3.6	u	56.5
18	0.42770	51.5	9.9	u	51.1
19	0.54560	49.0	23.5	m	46.9
20	0.69590	51.8	64.1	m	43.7

Sounding: MIA127 Client: US Geological Survey
 Location: Morning Star Renewal Center
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 06-MAY-08
 UTM Coord: E[m] 569155.0 N[m] 2837769.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	133.400	42.6	0.0
2	10.230	28.7	-42.6
3	.711	--	-71.4

Fit Error[%]: 20.904

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	126.7	0.2	u	129.5
2	0.00860	120.4	0.1	u	134.5
3	0.01110	132.8	0.1	u	143.5
4	0.01410	168.6	0.1	u	147.9
5	0.01800	201.2	0.2	u	143.4
6	0.02300	112.3	0.3	u	131.5
7	0.02940	84.8	0.2	u	115.8
8	0.03750	121.8	0.1	u	101.0
9	0.04790	86.9	0.3	u	88.9
10	0.06110	85.6	0.1	u	80.4
11	0.07790	77.7	0.4	u	74.5
12	0.09930	68.4	0.5	u	70.3
13	0.12670	65.1	1.3	u	66.2
14	0.16640	57.9	2.8	u	60.3
15	0.20600	56.0	5.0	u	54.2
16	0.26280	45.1	7.4	u	46.8
17	0.33520	40.3	11.1	u	39.5
18	0.42770	34.0	11.1	u	33.3
19	0.54560	28.5	4.9	u	28.0
20	0.69590	23.7	24.3	u	23.9

Sounding: MIA128 Client: US Geological Survey
 Location: St. Luke School
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 06-MAY-08
 UTM Coord: E[m] 569186.0 N[m] 2837983.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	123.000	44.9	0.0
2	24.500	53.2	-44.9
3	4.300	--	-98.1

Fit Error[%]: 13.520

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	119.7	0.2	u	115.7
2	0.00860	110.0	0.5	u	117.2
3	0.01110	106.1	0.3	u	122.5
4	0.01410	125.4	0.6	u	126.3
5	0.01800	154.5	1.3	u	125.6
6	0.02300	146.0	1.4	u	121.0
7	0.02940	98.3	1.5	u	112.9
8	0.03750	90.7	0.5	u	103.3
9	0.04790	95.8	1.5	u	94.0
10	0.06110	85.2	2.4	u	86.0
11	0.07790	81.8	1.4	u	79.8
12	0.09930	76.3	0.3	u	75.0
13	0.12670	72.2	0.7	u	71.3
14	0.16640	67.2	0.7	u	67.0
15	0.20600	62.7	1.2	u	63.2
16	0.26280	58.0	1.8	u	57.9
17	0.33520	51.9	2.4	u	52.4
18	0.42770	46.3	4.0	u	46.9
19	0.54560	42.3	5.8	u	42.0
20	0.69590	38.8	9.3	u	37.9

Sounding: MIA129 Client: US Geological Survey
 Location: Whispering Pines School
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 06-MAY-08
 UTM Coord: E[m] 566788.0 N[m] 2830662.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	133.000	34.4	0.0
2	36.330	--	-34.4

Fit Error[%]: 2.594

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	130.4	0.4	u	127.9
2	0.00860	129.0	0.2	u	127.5
3	0.01110	126.9	0.3	u	127.7
4	0.01410	121.1	0.4	u	124.5
5	0.01800	114.5	0.4	u	117.4
6	0.02300	108.0	0.3	u	109.1
7	0.02940	101.3	0.4	u	100.4
8	0.03750	93.4	0.4	u	92.3
9	0.04790	86.5	1.2	u	84.9
10	0.06110	80.2	0.9	u	78.4
11	0.07790	74.6	1.9	u	72.8
12	0.09930	67.6	2.7	u	68.0
13	0.12670	63.8	3.4	u	63.9
14	0.16640	59.0	8.9	u	60.1
15	0.20600	56.7	17.6	u	57.7
16	0.26280	47.5	21.2	m	55.4
17	0.33520	46.3	40.8	m	53.8
18	0.42770	47.1	62.6	m	52.8
19	0.54560	53.4	100.0	m	52.3
20	0.69590	49.8	100.0	m	52.7

Sounding: MIA130 Client: US Geological Survey
 Location: N Miami Beach HS East Field S
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 07-MAY-08
 UTM Coord: E[m] 582639.0 N[m] 2868352.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	668.900	6.7	0.0
2	137.600	8.6	-6.7
3	.032	.1	-15.3
4	95.210	8.5	-15.4
5	.004	--	-24.0

Fit Error[%]: 8.211

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m²]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	72.7	0.2	m	144.8
2	0.00860	71.4	0.4	m	99.5
3	0.01110	71.1	0.9	u	70.1
4	0.01410	52.4	0.6	u	50.8
5	0.01800	37.7	0.4	u	37.6
6	0.02300	29.2	0.7	u	28.6
7	0.02940	22.6	0.6	u	22.5
8	0.03750	18.1	0.4	u	18.4
9	0.04790	15.5	0.9	u	15.9
10	0.06110	13.9	0.7	u	14.6
11	0.07790	13.4	1.9	u	14.3
12	0.09930	14.1	2.0	u	15.1
13	0.12670	16.7	6.9	u	16.8
14	0.16640	21.0	21.2	u	19.2
15	0.20600	22.6	51.6	u	19.9
16	0.26280	18.6	53.1	u	18.3
17	0.33520	14.3	58.7	u	15.3
18	0.42770	12.4	65.2	u	12.5
19	0.54560	7.8	27.4	m	10.2
20	0.69590	5.9	100.0	m	8.3

Sounding: MIA131 Client: US Geological Survey
 Location: N Miami Beach HS East Field N
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 07-MAY-08
 UTM Coord: E[m] 582649.0 N[m] 2868479.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	91.360	25.4	0.0
2	26.900	--	-25.4

Fit Error[%]: 3.234

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	96.1	0.3	d	-
2	0.00860	91.1	0.3	u	89.1
3	0.01110	85.7	0.4	u	87.0
4	0.01410	80.3	0.4	u	82.9
5	0.01800	77.6	0.6	u	77.4
6	0.02300	72.5	1.0	u	71.5
7	0.02940	66.7	1.3	u	65.8
8	0.03750	60.0	1.1	u	60.7
9	0.04790	58.4	1.3	u	56.1
10	0.06110	50.9	2.4	u	52.2
11	0.07790	48.5	1.2	u	48.8
12	0.09930	51.6	2.8	m	46.0
13	0.12670	65.6	10.1	m	43.5
14	0.16640	69.4	31.4	m	41.2
15	0.20600	79.4	53.2	m	39.8
16	0.26280	80.5	100.0	m	38.5
17	0.33520	48.7	70.2	m	37.6
18	0.42770	19.7	29.3	m	37.0
19	0.54560	12.2	24.2	m	37.0
20	0.69590	7.1	23.0	m	37.3

Sounding: MIA132 Client: US Geological Survey
 Location: Miami-Dade WASA Water Tank 68
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 07-MAY-08
 UTM Coord: E[m] 579026.0 N[m] 2857869.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	187.400	14.7	0.0
2	61.520	36.4	-14.7
3	5.380	22.4	-51.1
4	35.240	--	-73.6

Fit Error[%]: 2.355

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m²]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	121.8	0.4	u	122.1
2	0.00860	114.6	0.1	u	113.5
3	0.01110	109.2	0.1	u	110.1
4	0.01410	109.6	0.1	u	109.2
5	0.01800	128.2	0.1	m	109.2
6	0.02300	158.2	0.2	m	109.1
7	0.02940	161.0	0.5	m	106.6
8	0.03750	101.1	0.3	u	100.0
9	0.04790	86.8	0.2	u	89.1
10	0.06110	76.1	0.4	u	75.8
11	0.07790	63.2	0.5	u	62.5
12	0.09930	52.7	0.5	u	51.0
13	0.12670	41.0	0.4	u	41.9
14	0.16640	33.6	0.9	u	34.3
15	0.20600	29.7	1.1	u	30.0
16	0.26280	27.3	1.8	u	26.5
17	0.33520	24.1	2.9	u	24.1
18	0.42770	22.6	4.7	u	22.6
19	0.54560	21.8	7.8	u	21.8
20	0.69590	21.7	15.1	u	21.7

Sounding: MIA133 Client: US Geological Survey
 Location: Edison HS Football Field West
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 07-MAY-08
 UTM Coord: E[m] 579880.0 N[m] 2857273.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	39.810	28.1	0.0
2	.077	--	-28.1

Fit Error[%]: 29.140

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 3

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	44.5	0.1	u	46.1
2	0.00860	47.1	0.4	u	46.2
3	0.01110	50.2	0.3	u	50.3
4	0.01410	53.4	0.6	u	57.9
5	0.01800	72.1	1.3	u	68.6
6	0.02300	87.8	2.4	u	81.3
7	0.02940	71.1	3.3	u	90.5
8	0.03750	134.6	13.8	u	86.1
9	0.04790	55.6	5.0	u	73.0
10	0.06110	52.3	11.6	u	57.3
11	0.07790	41.4	21.1	u	44.2
12	0.09930	35.1	26.1	u	34.0
13	0.12670	29.8	39.7	u	26.1
14	0.16640	20.1	32.6	m	19.6
15	0.20600	22.6	75.9	m	15.7
16	0.26280	45.9	100.0	m	12.3
17	0.33520	67.0	100.0	m	9.7
18	0.42770	81.8	100.0	m	7.8
19	0.54560	17.9	100.0	m	6.3
20	0.69590	6.8	100.0	m	5.2

Sounding: MIA134 Client: US Geological Survey
 Location: Edison HS Ball Field East
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 07-MAY-08
 UTM Coord: E[m] 579948.0 N[m] 2857286.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	96.390	35.0	0.0
2	2.060	--	-35.0

Fit Error[%]: 9.724

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 3

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	100.7	0.2	d	-
2	0.00860	114.9	0.3	u	108.3
3	0.01110	119.6	0.4	u	120.2
4	0.01410	120.6	0.9	u	128.1
5	0.01800	119.4	1.3	u	125.3
6	0.02300	116.1	2.0	u	111.6
7	0.02940	105.0	3.6	u	93.2
8	0.03750	74.8	3.4	u	75.4
9	0.04790	54.4	1.4	u	60.2
10	0.06110	46.3	4.4	u	48.1
11	0.07790	38.3	2.9	u	38.6
12	0.09930	30.0	7.6	u	31.2
13	0.12670	25.5	9.7	u	25.4
14	0.16640	21.3	9.7	u	20.5
15	0.20600	17.3	19.1	u	17.6
16	0.26280	16.2	27.0	u	14.9
17	0.33520	13.7	37.4	u	12.8
18	0.42770	11.9	52.5	u	11.3
19	0.54560	10.0	69.7	u	10.1
20	0.69590	8.0	81.8	u	9.2

Sounding: MIA135 Client: US Geological Survey
 Location: Ives Estates Park
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 08-MAY-08
 UTM Coord: E[m] 583323.0 N[m] 2872973.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	353.700	8.7	0.0
2	63.860	72.8	-8.7
3	13.850	--	-81.5

Fit Error[%]: 2.055

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 3

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	109.0	0.1	u	107.3
2	0.00860	99.7	0.1	u	99.3
3	0.01110	93.8	0.2	u	94.9
4	0.01410	90.3	0.2	u	91.5
5	0.01800	87.3	0.2	u	88.3
6	0.02300	86.0	0.2	u	85.6
7	0.02940	84.7	0.2	u	83.8
8	0.03750	81.8	0.2	u	82.8
9	0.04790	83.5	0.3	u	82.5
10	0.06110	80.8	0.5	u	82.1
11	0.07790	83.0	0.6	u	80.9
12	0.09930	76.9	0.9	u	78.3
13	0.12670	75.7	2.1	u	74.1
14	0.16640	87.8	4.0	m	67.9
15	0.20600	62.0	5.9	u	62.8
16	0.26280	57.1	4.8	u	57.1
17	0.33520	52.3	10.3	u	52.2
18	0.42770	41.0	8.8	m	48.1
19	0.54560	41.7	20.3	m	44.8
20	0.69590	33.5	17.9	m	42.5

Sounding: MIA136 Client: US Geological Survey
 Location: Kevin Broils Park
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 08-MAY-08
 UTM Coord: E[m] 560837.0 N[m] 2823096.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	492.200	14.1	0.0
2	79.410	69.9	-14.1
3	21.800	--	-84.0

Fit Error[%]: 16.531

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 3

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	171.0	0.5	u	163.4
2	0.00860	146.2	0.4	u	148.9
3	0.01110	139.4	0.3	u	140.2
4	0.01410	131.2	0.3	u	133.3
5	0.01800	125.7	0.3	u	127.0
6	0.02300	120.7	0.3	u	122.2
7	0.02940	115.4	0.4	u	118.7
8	0.03750	111.8	0.5	u	116.1
9	0.04790	107.8	0.7	u	113.6
10	0.06110	106.9	1.1	u	110.3
11	0.07790	123.1	2.5	u	105.6
12	0.09930	118.9	4.5	u	99.3
13	0.12670	83.6	3.9	u	91.9
14	0.16640	73.4	5.7	u	83.3
15	0.20600	95.1	12.0	u	77.0
16	0.26280	57.0	6.5	u	70.4
17	0.33520	61.6	12.6	u	65.0
18	0.42770	56.9	37.1	u	60.5
19	0.54560	66.3	100.0	u	57.3
20	0.69590	56.4	100.0	u	54.9

Sounding: MIA137 Client: US Geological Survey
 Location: SW 122 Ave & Moody Drive
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 08-MAY-08
 UTM Coord: E[m] 561528.0 N[m] 2822700.0
 Elevation[m]: 0.0

TX loop size: X[m] 38.1 Y[m] 38.1

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	529.500	15.4	0.0
2	58.820	77.6	-15.4
3	26.050	--	-93.1

Fit Error[%]: 2.841

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 1.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	161.7	0.4	u	156.6
2	0.00860	136.1	0.3	u	139.2
3	0.01110	127.7	0.3	u	127.9
4	0.01410	118.1	0.3	u	118.8
5	0.01800	109.2	0.3	u	110.6
6	0.02300	102.9	0.2	u	103.6
7	0.02940	97.7	0.3	u	97.9
8	0.03750	93.8	0.2	u	93.2
9	0.04790	90.9	0.3	u	89.5
10	0.06110	87.3	0.4	u	86.5
11	0.07790	86.2	0.4	u	83.8
12	0.09930	79.7	0.4	u	81.0
13	0.12670	75.5	0.7	u	77.9
14	0.16640	72.6	0.9	u	73.8
15	0.20600	70.1	1.1	u	70.4
16	0.26280	67.1	2.0	u	66.6
17	0.33520	64.9	5.1	u	63.2
18	0.42770	62.0	13.1	u	60.3
19	0.54560	58.0	25.2	u	58.0
20	0.69590	54.8	24.6	u	56.7

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Appendix 5 TEM Sounding Descriptions and Plots: 2008

Descriptions of the sounding results are given below, along with plots of the measured apparent resistivity, calculated apparent resistivity for the inversion model, and the inversion estimated resistivity-depth function. The TEM data were measured at two transmitter repetition frequencies. The 285-Hz data (UH) are plotted as open circles ($\bigcirc$), and the 30-Hz data (HI) are plotted as open squares ($\square$). The apparent resistivity measurement error bars are plotted as vertical lines through the data points. In most cases, the error bars are smaller than the plotting symbol. The calculated 285-Hz model response is plotted as a solid line, and the 30-Hz model response is plotted as a dashed line. Some plots show only the 285-Hz data because the lower repetition rate data were too noisy to be of value. Masked data points are plotted as solid diamonds ($\blacklozenge$) and were not used in the inversion. All soundings were made with a square transmitter loop with a side length of 38.1 m. Unusable soundings are noted in table 1.

Geoelectrical models can be classified by the variation of resistivity with depth (Keller and Frischknecht, 1966, p. 135). A three-layer model with a resistivity minimum ($\rho_1 > \rho_2 < \rho_3$) is called a type-H curve. A model with a resistivity maximum ($\rho_1 < \rho_2 > \rho_3$) is called a type-K curve. A model with a monotonic increase in resistivity ($\rho_1 < \rho_2 < \rho_3$) is called a type-A curve. A model with a monotonic decrease in resistivity ($\rho_1 > \rho_2 > \rho_3$) is called a type-Q curve. For curves with more than three layers, this classification is applied to the first through third layer, the second through fourth layer, and so on. For example, a curve with ($\rho_1 > \rho_2 < \rho_3 > \rho_4$) is classified as type HK.

The resistivity-depth models determined by inversion are usually not unique; that is, there is uncertainty in the estimated model parameters caused by observation and parameterization errors. The latter is due to naturally occurring variations in geology that are not describable by the one-dimensional (layered earth) model used for the inversion. A qualitative estimate of the parameter uncertainty is given in the descriptions below. Another issue in the inversion is the resolution of the model parameters. To understand model resolution, assume that there is an actual set of model parameters that we can only view through a set of glasses. If the glasses give a good image of the actual parameters, then the resolution is good. If, on the other hand, the glasses distort the viewing of the actual parameters, then the resolution is poor. When a descriptive resolution is given for a sequence of layer resistivities or thicknesses, such as "good, very good, poor," the order is from the first layer downward.

Sounding MIA101

A three-layer model with a less resistive (more conductive) second layer (type H) fits the data with a misfit error of 3.10 percent. The first layer resistivity and thickness are well constrained. The conductive second and third layer resistivities are moderately well constrained. The second layer thickness is not as well constrained as the first layer thickness.

Sounding MIA102

A three-layer model with a less resistive second layer (type H) fits the data with a misfit error of 3.66 percent. The conductive second layer is thin compared to the depth of burial resulting in an S-equivalence. This means that the measurement can only resolve the layer conductance (the

ratio of the layer thickness to layer resistivity), not the individual layer parameters. The first and third layer resistivities are well constrained, as is the thickness of the first layer.

An alternative model using a fixed resistivity for the conductive second layer was investigated (MIA102F). The resistivity of the thin, second layer, which is a saltwater-intruded zone, was set to 3.5 ohm-m. This value was determined from induction logs. This model has a misfit error of 3.70 percent. The resolutions of the unconstrained parameters are similar to model MIA102. The constrained model MIA102F is the preferred one.

Sounding MIA103

The data are well fit with a three-layer model whose resistivities decrease with depth (type Q). The resistive surface layer is not well constrained, while the second layer resistivity and depth are well resolved. The resistivity and thickness of the third layer are moderately well resolved. Misfit error is 2.65 percent.

Sounding MIA104

The data quality is pretty good, except around 0.70 ms where there are some sharp breaks in the apparent resistivity curve, which are mostly likely due to metallic objects near the sounding site. A three-layer model with decreasing resistivity with depth (type Q) does a reasonable job of fitting the data. Resolutions of all layer resistivities are moderately good, while the resolution of the layer thicknesses is not as good. Resolution of the first two layer resistivities is very poor, while the third layer resistivity resolution is poor to good. Misfit error is 7.26 percent. An alternative four-layer model (MIA104L4) was also tried. While the misfit error is slightly smaller (7.18 percent), the parameter resolution is worse. The three-layer model is preferred.

Sounding MIA105

A four-layer model fits the data with a misfit of 6.53 percent. There is some noise in the data near 0.5 ms, possibly due to nearby metallic objects that contribute to the misfit error. The resolution of the layer resistivities is good for all but the first layer. The resolution of layer thicknesses is good. A five-layer model (MIA105L5) does a slightly better job of fitting the data in the 0.01–0.08 ms time range, however, the resolution of layers three and four is not good. The five-layer model misfit is 5.19 percent. The four-layer model is preferred.

Sounding MIA106

The data are moderately noisy, particularly in the time range of 0.03 to 0.1 ms due to the presence of a non-geologic conductor. Nonetheless, a four-layer model with resistivity decreasing with depth (type QQ) does a reasonable job of fitting the data. Because of the noisy data, resolution of some model parameters is not very good. The first layer thickness and resistivity are very poorly resolved. The resistive second layer is well resolved, while its thickness is only moderately well determined. Deeper layer resistivities and thicknesses are even more poorly resolved. Misfit error is 8.60 percent.

Sounding MIA107

The UH frequency data are of very good quality. Using only the UH data, a very good inversion is obtained with a misfit error of 4.10 percent for a three-layer type-Q model. All model

parameters, with the exception of the first layer resistivity, are well resolved, especially the second layer resistivity.

The HI frequency data (not shown) were offset from the UH data in the region where their times overlap, suggesting a gain, current, or turnoff time problem. The cause could not be determined, so the HI data were not used.

Sounding MIA108

These data are fit with a four-layer model that has a more conductive zone separating two resistive zones (type QH). The misfit error is 4.80 percent. The bottom of the conductive zone and the deepest layer resistivity are not well resolved.

A three-layer model (MIA108L3) does a very poor job of fitting the data. This model has a monotonically decreasing resistivity with depth (type Q). Misfit error is 7.17 percent.

Sounding MIA109

The data are modeled with a three-layer model with decreasing resistivity with depth (type Q). The high first layer resistivity is not well resolved. The second layer resistivity is well resolved. The third layer resistivity is moderately well resolved. All layer thicknesses are moderately well resolved. Misfit error is 2.37 percent.

Sounding MIA110

The three-layer model has decreasing layer resistivity with depth (type Q). The very resistive first layer parameters are not well resolved. Successively deeper layers have improved resolution. The misfit error is 1.95 percent.

Sounding MIA111

A two-layer model does a very good job of fitting the data. The layer resistivity decreases with depth. The first layer resistivity and thickness are moderately well determined. The second layer resistivity is very well constrained. The misfit error is 2.12 percent. A three-model (not shown) did not improve the misfit error, and none of the resistivities and thicknesses of the first two layers were resolvable.

Sounding MIA112

The data exhibit cultural noise in the 0.014–0.048 ms time range. A three-layer, type-Q model (MIA112L3) has poor resolution of the first layer parameters. The second and third layer resistivities are pretty well constrained, and the second layer thickness is moderately well constrained. The misfit error is 4.29 percent.

Even though the two-layer model (MIA112) has a misfit error of 9.28 percent, the resolution of all of the layers was very good. Considering that most of the misfit is in the time range where the data are noisy, the two-layer model is a better choice.

Sounding MIA113

Only the UH data were used in the inversion of this sounding because of the noise in the HI data and an offset between the two sweeps. A three-layer, type-Q model produces a very good fit (6.97 percent misfit error), and the resolution of all but the first layer resistivity is very good.

Sounding MIA114

A four-layer model with a low resistivity third layer (type QH) does the best job of fitting the data. The high-resistivity first layer is not well resolved, while the conductive third layer is well resolved. A moderately good job is done in resolving the transition between the first and third layer. The transition to the slightly more resistive fourth layer is not well resolved. The misfit error is 3.25 percent.

A three-layer, type-H model (MIA114L3) appears to do a better job of resolving the resistive first layer. However, looking in detail at the model response and data values in the time range 0.0068-0.099 ms it is apparent that the three-layer model does not adequately conform to the shape of the data. The misfit error of the three-layer model is larger (5.39 percent). The four-layer model is preferred.

Sounding MIA115

The data suffer from noise produced by nearby buried metallic objects. The initial 0.1 ms of the data look good, but then there are obvious departures from the usual shape of a sounding with a maximum in the data around 0.7 ms. Using the data up to this point, the resistive first layer is moderately well resolved, and the conductive second-layer resistivity is well resolved. The depth to the bottom of the conductive layer is not well constrained. The transition to a more resistive third layer is suggested by the minimum in the apparent resistivity data. The resistivity of the third layer is not well constrained. The misfit error is 6.62 percent.

A two-layer model (MIA115L2) gave a similar fit to the first 13 points. The total misfit error was 10.3 percent. Both the two- and three-layer models require a resistive first layer that is about 14 m thick which is underlain by a 4 ohm-m conductor. The conductive second layer is again well resolved. The three-layer model is preferred.

Sounding MIA116

The data quality is not very good after the first eight channels (at times greater than 0.04 ms) probably because of a buried metallic object. A two-layer model with decreasing resistivity does a reasonable job of fitting the data in spite of their noisy character. The layer resistivities are well constrained, while the thickness of the first layer is only moderately well constrained. The misfit error is 8.89 percent.

Sounding MIA117

The data quality of the UH sweep is very good, while the quality of the HI sweep quality is poorer at later times. A three-layer model (MIA117) with a conductive middle layer (type H) results in a misfit of 3.52 percent; however, the thin, conductive second layer means that there is an S-equivalence. To assess the equivalence, the data were reinverted with a model having a fixed second layer resistivity (MIA117F3). The second layer, which is saltwater intruded, was assigned a resistivity of 3.5 ohm-m based on well logs. The misfit of this model is also 3.52 percent. Comparison of the models shows that they are essentially the same. A four-layer, type-QH model (MIA117L4) has only a moderately better fit (3.48 percent), however, the resolution of the transition layers from the surface resistor to the conductive layer is much worse. In addition, the conductive layer becomes much thinner making the equivalence even more severe. The initial unconstrained model MIA117 is preferred.

Sounding MIA118

The early time data are very noisy. The best fit was achieved with a two-layer model with decreasing resistivity. All model parameters are moderately well constrained. The misfit error is 9.61 percent.

Sounding MIA119

The early time data are very noisy. A two-layer model with decreasing resistivity does the best job of fitting the data. The first layer resistivity is very poorly constrained because the early time channels are not usable. The second layer resistivity is well constrained, while the depth to the second layer is moderately well constrained. The misfit error is 4.86 percent.

Sounding MIA120

The best fit model has three layers with resistivity decreasing with depth (type Q). The first layer resistivity and thickness are not well resolved. The second layer resistivity and thickness are resolved better. The misfit error is 5.45 percent.

Sounding MIA121

The data quality is very poor because of noise from nearby conductors. A two-layer model with decreasing layer resistivity fits the general trend of the data. While the first and second layer resistivities are moderately well determined, the first layer thickness is poorly determined. For the purposes of this study, the sounding is adequate to determine that saltwater is present. The misfit error is 24.8 percent.

Sounding MIA122

A four-layer model provides the best fit of the data. Layer resistivities decrease with depth (type QQ). The very resistive first layer is not well constrained, while the resistive second layer is. The depth to the bottom of the second layer is well constrained. The conductive third layer is reasonable well constrained, while the resolution of the very conductive fourth layer is not as well constrained. The misfit error is 4.76 percent.

Sounding MIA123

While the data are very repeatable up to times of 0.3335 ms, there are channel-to-channel undulations that cannot be fit with a layered earth model suggesting that there are buried anthropogenic conductors nearby. The model is type Q. In spite of the anthropogenic effects, the resistivity of the second layer is very well constrained. The very resistive surface layer is the least well constrained resistivity of the model. The transition to the third layer is moderately well constrained. The third layer resistivity is the second best determined resistivity. The misfit error is 4.73 percent.

Sounding MIA124

This sounding is very different from the other soundings in that the second layer is a moderate conductor sandwiched between two high-resistivity layers, all of which is underlain by two increasingly conductive layers (type HKQ). The resolution of the resistive first and third layers

is poor. The conductive fourth layer is well constrained, while the last layer is not as well constrained. The misfit error is 1.59 percent.

Sounding MIA125

This is a very high quality three-layer inversion with layer resistivities decreasing with depth (type Q). The first layer resistivity and thickness are poorly determined, while the more conductive second and third layer parameters are well determined. The misfit error is 3.47 percent.

Sounding MIA126

A four-layer, type-HK model does a very good job of fitting the data. The model consists of a resistive surface layer, underlain by a thin conductive layer, and then a thick, very resistive layer. At depth there is another conductive layer. The first two layers are well determined. The resistivity of the third layer is poorly determined, as would be expected for a resistive target. The fourth layer resistivity is moderately well determined. The thickness of all layers is well resolved. The misfit error is 1.84 percent.

Sounding MIA127

While repeatable with low measurement error, the data are of very poor quality with severe noise in the first eight channels. The noise is probably due to nearby anthropogenic conductors. The model becomes less resistive with depth (type Q). Only the first layer resistivity is well resolved. The thickness of the first layer is poorly resolved. The misfit error is 20.9 percent.

Sounding MIA128

The data quality is very poor through the first eight channels. The measurement error is small, but there are large variations of apparent resistivity from channel to channel suggesting the presence of anthropogenic conductors. Interpreted resistivity decreases with depth (type Q). Only the first layer resistivity is well determined. The misfit error is 13.5 percent.

Sounding MIA129

The first 15 channels exhibit very good data quality. A two-layer model with decreasing resistivity fits the data very well. All model parameters are well resolved. The misfit error is 2.59 percent.

Sounding MIA130

The data are characterized by very steep slopes on the apparent resistivity-time plots. Attempts to fit the data lead to models with very wild variations in resistivity between layers. The very thin (0.1 m) and unrealistically conductive second layer (0.032 ohm-m) is a sure sign of a metallic object in the subsurface or near the receiver coil. The inversion model has no resolution. The results are essentially unusable even though the misfit error is 8.21 percent.

Sounding MIA131

The first 10 channels are usable, while the subsequent channels are very noisy. This is due to noise from electrical lines. Using just the first 10 channels, the data are fit pretty well with a two-

layer model. The layer resistivities are very well resolved, and the first layer thickness is well resolved. The misfit error is 3.23 percent.

Sounding MIA132

Data quality is very good except for channels 5, 6, and 7, which appear to be influenced by a nearby metallic conductor. Masking these channels results in a very good fit. The interpreted resistivity decreases with successive layers until the fourth layer, where the resistivity increases (type QH). Resolution of all layers except the last is very good to good. The misfit error is 2.36 percent.

Sounding MIA133

These data, while very repeatable in the earlier channels, are strongly influenced by an anthropogenic conductor—probably a pipe under the football field. An attempt to fit a two-layer model to the first 13 data points resulted in a two-layer model with an abnormally conductive second layer. All of the model parameters have very large uncertainties. These data are not usable.

Sounding MIA134

These data were collected at another location in the same football field as sounding MIA133. The effect of the anthropogenic conductor appears to be absent. A two-layer model resolved the model parameters very well; however, the misfit is large (9.72 percent).

Sounding MIA135

After masking data in channel 14 and late-time channels, a very good fit was obtained with a three-layer model. Interpreted resistivity decreases with depth (type Q). The very resistive first layer is not well resolved, while the second layer is very well resolved. The basement resistivity is moderately well resolved. The misfit error is 2.06 percent.

Sounding MIA136

The data quality of the first 10 channels is very good. Starting with channel 11, the apparent resistivity curve starts undulating indicative of the presence of metallic conductors. A three-layer model with resistivity decreasing with depth can be found that goes through the middle of the data points. The misfit error is 16.5 percent. With the exception of the second layer resistivity, all model parameters are not well resolved. The second layer resistivity is moderately well resolved. Masking the data after channel 10, a two-layer model (not shown), that is essentially the same as the first two layers of the three-layer model, fits the data with a misfit error of 2.84 percent.

Sounding MIA137

Data quality is very good. A three-layer model with resistivity decreasing (type Q) with depth provides a very good fit with a misfit error of 2.84 percent. The first layer resistivity is poorly resolved. The second layer resistivity is well resolved, and the third layer resistivity is moderately well resolved. The thicknesses of the first and second layers are well resolved.

Figure 5-1. Sounding MIA101

Figure 5-2. Sounding MIA102

Figure 5-3. Sounding MIA102F

Figure 5-4. Sounding MIA103

Figure 5-5. Sounding MIA104

Figure 5-6. Sounding MIA104L4

Figure 5-7. Sounding MIA105

Figure 5-8. Sounding MIA105L5

Figure 5-9. Sounding MIA106

Figure 5–10. Sounding MIA107

Figure 5-11. Sounding MIA108

Figure 5-12. Sounding MIA108L3

Figure 5–13. Sounding MIA109

Figure 5-14. Sounding MIA110

Figure 5–15. Sounding MIA111

Figure 5-16. Sounding MIA112

Figure 5-17. Sounding MIA112L3

Figure 5–18. Sounding MIA113

Figure 5–19. Sounding MIA114

Figure 5–20. Sounding MIA114L3

Figure 5–21. Sounding MIA115

Figure 5–22. Sounding MIA115L2

Figure 5-23. Sounding MIA116

Figure 5-24. Sounding MIA117

Figure 5–25. Sounding MIA117F3

Figure 5-26. Sounding MIA117L4

Figure 5-27. Sounding MIA118

Figure 5–28. Sounding MIA119

Figure 5–29. Sounding MIA120

Figure 5-30. Sounding MIA121

Figure 5-31. Sounding MIA122

Figure 5–32. Sounding MIA123

Figure 5-33. Sounding MIA124

Figure 5-34. Sounding MIA125

Figure 5–35. Sounding MIA126

Figure 5–36. Sounding MIA127

Figure 5-37. Sounding MIA128

Figure 5–38. Sounding MIA129

Figure 5-39. Sounding MIA130

Figure 5-40. Sounding MIA131

Figure 5-41. Sounding MIA132

Figure 5-42. Sounding MIA133

Figure 5-43. Sounding MIA134

Figure 5-44. Sounding MIA135

Figure 5-45. Sounding MIA136

Figure 5-46. Sounding MIA137

Appendix 6 TEM Sounding Report Files: 2009

Sounding: MIA201 Client: US Geological Survey
 Location: SW 360th Street (west side)
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 23-FEB-09
 UTM Coord: E[m] 557815.0 N[m] 2812968.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	132.200	30.6	0.0
2	28.680	53.4	-30.6
3	6.030	--	-84.0

Fit Error[%]: 1.829

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.55 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.40 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	133.9	0.4	u	129.7
2	0.00860	124.5	0.2	u	126.8
3	0.01110	120.6	0.1	u	123.5
4	0.01410	115.1	0.2	u	116.3
5	0.01800	105.8	0.1	u	106.9
6	0.02300	97.9	0.2	u	97.1
7	0.02940	89.0	0.2	u	88.0
8	0.03750	81.4	0.2	u	80.3
9	0.04790	75.0	0.2	u	74.1
10	0.06110	69.9	0.2	u	69.5
11	0.07790	66.0	0.2	u	65.9
12	0.09930	61.9	0.3	u	62.9
13	0.12670	58.7	0.4	u	59.8
14	0.16640	54.9	0.6	u	55.5
15	0.20600	50.8	0.9	u	51.6
16	0.26280	47.0	1.4	u	46.8
17	0.33520	42.3	2.0	u	42.1
18	0.42770	38.3	3.1	u	37.9
19	0.54560	34.6	5.0	u	34.5
20	0.69590	32.3	7.8	u	31.7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	64.5	0.6	u	63.7
2	0.10600	61.5	0.6	u	61.1
3	0.13100	58.1	0.6	u	57.9
4	0.16100	54.3	0.6	u	54.2
5	0.20000	49.6	0.7	u	49.7
6	0.25000	44.6	0.5	u	44.7
7	0.31400	39.6	0.6	u	39.7
8	0.39500	34.7	0.8	u	34.9
9	0.49900	30.3	1.5	u	30.6
10	0.63100	26.9	1.5	u	26.9
11	0.79900	23.8	2.2	u	23.8
12	1.01000	21.2	3.3	u	21.1
13	1.28000	18.9	3.6	u	18.9
14	1.63000	16.8	7.0	u	17.0
15	2.08000	14.5	11.5	m	15.6
16	2.64000	12.0	16.8	d	-
17	3.37000	9.5	17.4	d	-
18	4.29000	7.3	16.3	d	-
19	5.47000	5.3	25.2	d	-
20	6.97000	3.7	20.1	d	-

Sounding: MIA202 Client: US Geological Survey
 Location: SW 360th Street
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 23-FEB-09
 UTM Coord: E[m] 558369.0 N[m] 2813097.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	161.500	21.5	0.0
2	11.380	14.2	-21.5
3	114.800	39.8	-35.8
4	7.930	--	-75.7

Fit Error[%]: 1.473

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.55 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	140.2	0.3	u	139.4
2	0.00860	114.1	0.2	u	115.8
3	0.01110	96.6	0.3	u	95.7
4	0.01410	79.0	0.3	u	78.7
5	0.01800	64.7	0.3	u	65.0
6	0.02300	54.5	0.3	u	54.7
7	0.02940	47.3	0.3	u	47.2
8	0.03750	42.4	0.3	u	42.2
9	0.04790	39.1	0.3	u	39.0
10	0.06110	37.1	0.3	u	37.1
11	0.07790	36.2	0.3	u	36.4
12	0.09930	36.0	0.3	u	36.4
13	0.12670	36.3	0.3	u	36.9
14	0.16640	37.1	0.4	u	37.3
15	0.20600	36.8	0.4	u	37.1
16	0.26280	36.4	0.8	u	36.2
17	0.33520	34.9	1.2	u	34.6
18	0.42770	33.0	2.1	u	32.7
19	0.54560	30.9	3.7	u	30.8
20	0.69590	29.4	3.8	u	29.2

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	36.6	0.4	u	36.2
2	0.10600	36.6	0.4	u	36.3
3	0.13100	36.8	0.3	u	36.5
4	0.16100	36.8	0.3	u	36.6
5	0.20000	36.3	0.4	u	36.2
6	0.25000	35.0	0.3	u	34.9
7	0.31400	33.0	0.5	u	32.9
8	0.39500	30.3	1.3	u	30.4
9	0.49900	27.6	1.2	u	27.8
10	0.63100	24.8	1.7	u	25.2
11	0.79900	22.3	2.3	u	22.9
12	1.01000	21.0	5.8	u	20.9
13	1.28000	19.6	11.1	u	19.2
14	1.63000	19.0	17.5	m	17.7
15	2.08000	17.2	15.1	m	16.5
16	2.64000	21.1	34.0	d	-
17	3.37000	28.6	35.0	d	-
18	4.29000	11.1	51.7	d	-
19	5.47000	10.0	66.2	d	-
20	6.97000	17.8	100.0	d	-

Sounding: MIA203 Client: US Geological Survey
 Location: SW 360th Street [east]
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 23-FEB-09
 UTM Coord: E[m] 559064.0 N[m] 2812970.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	1782.500	9.6	0.0
2	78.770	9.3	-9.6
3	5.770	9.9	-18.9
4	112.800	41.6	-28.8
5	10.590	--	-70.4

Fit Error[%]: 1.667

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	137.0	0.4	u	135.9
2	0.00860	102.9	0.4	u	104.4
3	0.01110	81.7	0.5	u	81.0
4	0.01410	63.7	0.4	u	63.3
5	0.01800	50.2	0.5	u	50.1
6	0.02300	40.7	0.4	u	40.6
7	0.02940	33.9	0.4	u	33.9
8	0.03750	29.2	0.4	u	29.3
9	0.04790	26.0	0.4	u	26.2
10	0.06110	24.0	0.4	u	24.2
11	0.07790	22.9	0.4	u	23.1
12	0.09930	22.5	0.4	u	22.8
13	0.12670	22.7	0.5	u	23.0
14	0.16640	23.7	0.4	u	23.6
15	0.20600	24.2	0.5	u	24.3
16	0.26280	25.2	0.7	u	25.0
17	0.33520	25.6	1.0	u	25.4
18	0.42770	25.9	1.6	u	25.5
19	0.54560	25.7	2.7	u	25.5
20	0.69590	25.5	4.6	u	25.3

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	22.9	0.3	u	22.8
2	0.10600	22.8	0.3	u	22.7
3	0.13100	23.0	0.3	u	22.9
4	0.16100	23.5	0.3	u	23.3
5	0.20000	24.0	0.3	u	23.9
6	0.25000	24.4	0.4	u	24.2
7	0.31400	24.4	0.4	u	24.3
8	0.39500	24.0	0.6	u	24.0
9	0.49900	23.0	0.5	u	23.2
10	0.63100	21.8	0.8	u	22.3
11	0.79900	20.6	0.9	u	21.1
12	1.01000	19.7	1.4	u	20.0
13	1.28000	19.0	3.0	u	19.0
14	1.63000	18.2	4.2	u	18.1
15	2.08000	17.8	7.7	u	17.3
16	2.64000	16.5	7.7	u	16.6
17	3.37000	15.8	24.1	m	16.2
18	4.29000	16.2	58.5	d	-
19	5.47000	15.4	98.6	d	-
20	6.97000	9.5	43.8	d	-

Sounding: MIA203L4 Client: US Geological Survey
 Location: SW 360th Street [east]
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 23-FEB-09
 UTM Coord: E[m] 559064.0 N[m] 2812970.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	1809.700	17.6	0.0
2	6.270	11.4	-17.6
3	109.700	41.5	-29.1
4	10.570	--	-70.6

Fit Error[%]: 1.716

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	137.0	0.4	u	137.9
2	0.00860	102.9	0.4	u	104.5
3	0.01110	81.7	0.5	u	80.6
4	0.01410	63.7	0.4	u	63.0
5	0.01800	50.2	0.5	u	50.0
6	0.02300	40.7	0.4	u	40.5
7	0.02940	33.9	0.4	u	33.9
8	0.03750	29.2	0.4	u	29.2
9	0.04790	26.0	0.4	u	26.1
10	0.06110	24.0	0.4	u	24.2
11	0.07790	22.9	0.4	u	23.1
12	0.09930	22.5	0.4	u	22.8
13	0.12670	22.7	0.5	u	23.0
14	0.16640	23.7	0.4	u	23.6
15	0.20600	24.2	0.5	u	24.3
16	0.26280	25.2	0.7	u	25.0
17	0.33520	25.6	1.0	u	25.4
18	0.42770	25.9	1.6	u	25.6
19	0.54560	25.7	2.7	u	25.5
20	0.69590	25.5	4.6	u	25.3

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	22.9	0.3	u	22.8
2	0.10600	22.8	0.3	u	22.7
3	0.13100	23.0	0.3	u	22.9
4	0.16100	23.5	0.3	u	23.3
5	0.20000	24.0	0.3	u	23.9
6	0.25000	24.4	0.4	u	24.3
7	0.31400	24.4	0.4	u	24.3
8	0.39500	24.0	0.6	u	24.0
9	0.49900	23.0	0.5	u	23.3
10	0.63100	21.8	0.8	u	22.3
11	0.79900	20.6	0.9	u	21.2
12	1.01000	19.7	1.4	u	20.0
13	1.28000	19.0	3.0	u	19.0
14	1.63000	18.2	4.2	u	18.1
15	2.08000	17.8	7.7	u	17.3
16	2.64000	16.5	7.7	u	16.6
17	3.37000	15.8	24.1	m	16.2
18	4.29000	16.2	58.5	d	-
19	5.47000	15.4	98.6	d	-
20	6.97000	9.5	43.8	d	-

Sounding: MIA204 Client: US Geological Survey
 Location: SW 360th Street [north side]
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 24-FEB-09
 UTM Coord: E[m] 558907.0 N[m] 2811696.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	117.500	10.7	0.0
2	21.760	3.7	-10.7
3	3.720	11.2	-14.4
4	21.240	56.2	-25.7
5	7.860	--	-81.9

Fit Error[%]: 1.077

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	84.4	0.3	u	84.4
2	0.00860	67.8	0.3	u	67.2
3	0.01110	53.8	0.3	u	54.0
4	0.01410	43.2	0.3	u	43.5
5	0.01800	34.7	0.3	u	34.9
6	0.02300	28.0	0.3	u	27.9
7	0.02940	22.6	0.3	u	22.6
8	0.03750	18.6	0.3	u	18.6
9	0.04790	15.7	0.3	u	15.7
10	0.06110	13.6	0.3	u	13.6
11	0.07790	12.1	0.3	u	12.2
12	0.09930	11.1	0.3	u	11.2
13	0.12670	10.5	0.3	u	10.6
14	0.16640	10.3	0.3	u	10.3
15	0.20600	10.2	0.3	u	10.3
16	0.26280	10.4	0.2	u	10.5
17	0.33520	10.9	0.3	u	10.9
18	0.42770	11.5	0.3	u	11.5
19	0.54560	12.2	0.4	u	12.2
20	0.69590	13.1	0.5	u	13.0

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	11.8	0.4	u	11.6
2	0.10600	11.1	0.4	u	11.0
3	0.13100	10.6	0.4	u	10.5
4	0.16100	10.3	0.4	u	10.3
5	0.20000	10.3	0.4	u	10.2
6	0.25000	10.4	0.4	u	10.3
7	0.31400	10.6	0.4	u	10.5
8	0.39500	10.9	0.4	u	10.8
9	0.49900	11.2	0.4	u	11.2
10	0.63100	11.5	0.5	u	11.5
11	0.79900	11.7	0.6	u	11.7
12	1.01000	11.7	1.3	u	11.8
13	1.28000	11.8	1.8	u	11.8
14	1.63000	11.7	2.7	u	11.7
15	2.08000	11.5	3.6	u	11.5
16	2.64000	10.6	5.3	d	-
17	3.37000	10.0	9.0	d	-
18	4.29000	8.0	13.6	d	-
19	5.47000	6.4	18.6	d	-
20	6.97000	5.0	24.1	d	-

Sounding: MIA204L4 Client: US Geological Survey
 Location: SW 360th Street [north side]
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 24-FEB-09
 UTM Coord: E[m] 558907.0 N[m] 2811696.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	91.190	13.9	0.0
2	3.780	11.8	-13.9
3	21.130	56.8	-25.8
4	7.730	--	-82.7

Fit Error[%]: 1.069

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	84.4	0.3	u	84.5
2	0.00860	67.8	0.3	u	67.2
3	0.01110	53.8	0.3	u	54.0
4	0.01410	43.2	0.3	u	43.4
5	0.01800	34.7	0.3	u	34.8
6	0.02300	28.0	0.3	u	27.9
7	0.02940	22.6	0.3	u	22.6
8	0.03750	18.6	0.3	u	18.6
9	0.04790	15.7	0.3	u	15.7
10	0.06110	13.6	0.3	u	13.6
11	0.07790	12.1	0.3	u	12.2
12	0.09930	11.1	0.3	u	11.2
13	0.12670	10.5	0.3	u	10.6
14	0.16640	10.3	0.3	u	10.3
15	0.20600	10.2	0.3	u	10.3
16	0.26280	10.4	0.2	u	10.5
17	0.33520	10.9	0.3	u	10.9
18	0.42770	11.5	0.3	u	11.5
19	0.54560	12.2	0.4	u	12.2
20	0.69590	13.1	0.5	u	13.0

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	11.8	0.4	u	11.6
2	0.10600	11.1	0.4	u	11.0
3	0.13100	10.6	0.4	u	10.5
4	0.16100	10.3	0.4	u	10.3
5	0.20000	10.3	0.4	u	10.2
6	0.25000	10.4	0.4	u	10.3
7	0.31400	10.6	0.4	u	10.5
8	0.39500	10.9	0.4	u	10.8
9	0.49900	11.2	0.4	u	11.2
10	0.63100	11.5	0.5	u	11.5
11	0.79900	11.7	0.6	u	11.7
12	1.01000	11.7	1.3	u	11.8
13	1.28000	11.8	1.8	u	11.8
14	1.63000	11.7	2.7	u	11.6
15	2.08000	11.5	3.6	u	11.4
16	2.64000	10.6	5.3	d	-
17	3.37000	10.0	9.0	d	-
18	4.29000	8.0	13.6	d	-
19	5.47000	6.4	18.6	d	-
20	6.97000	5.0	24.1	d	-

Sounding: MIA205 Client: US Geological Survey
 Location: SW 360th Street (south side)
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 24-FEB-09
 UTM Coord: E[m] 558086.0 N[m] 2811251.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	125.000	15.7	0.0
2	6.000	10.3	-15.7
3	50.930	28.1	-26.0
4	12.860	--	-54.1

Fit Error[%]: 1.047

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	97.3	0.5	u	96.8
2	0.00860	76.1	0.3	u	76.6
3	0.01110	60.7	0.4	u	61.0
4	0.01410	48.6	0.4	u	48.8
5	0.01800	39.4	0.4	u	39.4
6	0.02300	32.7	0.4	u	32.5
7	0.02940	27.8	0.4	u	27.6
8	0.03750	24.4	0.4	u	24.3
9	0.04790	22.0	0.4	u	22.0
10	0.06110	20.5	0.4	u	20.5
11	0.07790	19.6	0.4	u	19.7
12	0.09930	19.1	0.4	u	19.4
13	0.12670	19.1	0.4	u	19.3
14	0.16640	19.5	0.4	u	19.5
15	0.20600	19.6	0.4	u	19.6
16	0.26280	19.9	0.5	u	19.8
17	0.33520	20.1	0.6	u	19.9
18	0.42770	20.1	0.7	u	20.0
19	0.54560	20.3	0.9	u	20.2
20	0.69590	20.5	1.3	u	20.5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	19.6	0.1	u	19.4
2	0.10600	19.3	0.1	u	19.3
3	0.13100	19.3	0.1	u	19.2
4	0.16100	19.4	0.1	u	19.3
5	0.20000	19.5	0.1	u	19.4
6	0.25000	19.5	0.2	u	19.4
7	0.31400	19.4	0.2	u	19.2
8	0.39500	19.0	0.1	u	19.0
9	0.49900	18.5	0.5	u	18.6
10	0.63100	17.9	0.8	u	18.2
11	0.79900	17.4	1.3	u	17.7
12	1.01000	17.3	1.9	u	17.3
13	1.28000	16.9	2.5	u	16.9
14	1.63000	16.7	4.5	u	16.5
15	2.08000	15.6	6.8	m	16.2
16	2.64000	15.3	10.2	m	15.9
17	3.37000	15.0	24.3	d	-
18	4.29000	13.9	36.8	d	-
19	5.47000	12.4	40.8	d	-
20	6.97000	12.4	75.4	d	-

Sounding: MIA206 Client: US Geological Survey
 Location: SW 360th Street (north side)
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 24-FEB-09
 UTM Coord: E[m] 557261.0 N[m] 2811712.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	132.400	26.8	0.0
2	46.850	43.5	-26.8
3	10.240	54.0	-70.4
4	28.930	--	-124.4

Fit Error[%]: 1.703

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.65 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	126.3	0.5	u	124.5
2	0.00860	117.7	0.2	u	119.8
3	0.01110	115.6	0.2	u	116.1
4	0.01410	111.4	0.2	u	111.1
5	0.01800	104.9	0.2	u	105.2
6	0.02300	100.9	0.1	u	99.9
7	0.02940	96.5	0.1	u	95.7
8	0.03750	92.7	0.1	u	92.3
9	0.04790	88.5	0.2	u	89.1
10	0.06110	84.0	0.2	u	85.1
11	0.07790	78.9	0.2	u	79.7
12	0.09930	71.8	0.3	u	73.0
13	0.12670	64.8	0.5	u	65.6
14	0.16640	56.5	0.5	u	57.1
15	0.20600	50.3	0.5	u	50.9
16	0.26280	44.7	0.9	u	44.6
17	0.33520	39.6	1.2	u	39.5
18	0.42770	35.9	2.2	u	35.5
19	0.54560	33.0	3.2	u	32.8
20	0.69590	31.6	4.0	u	31.0

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	76.9	0.7	u	75.6
2	0.10600	71.1	0.9	u	69.8
3	0.13100	64.1	0.9	u	63.1
4	0.16100	57.1	1.0	u	56.4
5	0.20000	50.1	0.9	u	49.8
6	0.25000	43.6	0.9	u	43.7
7	0.31400	38.1	1.0	u	38.3
8	0.39500	33.5	0.8	u	33.9
9	0.49900	30.0	0.7	u	30.4
10	0.63100	27.4	0.9	u	27.7
11	0.79900	25.4	1.9	u	25.7
12	1.01000	24.5	2.1	u	24.3
13	1.28000	23.7	5.0	u	23.4
14	1.63000	22.5	10.1	u	22.8
15	2.08000	20.8	11.4	m	22.6
16	2.64000	19.6	12.7	d	-
17	3.37000	17.6	28.2	d	-
18	4.29000	14.4	26.6	d	-
19	5.47000	11.5	46.3	d	-
20	6.97000	8.2	44.6	d	-

Sounding: MIA207 Client: US Geological Survey
 Location: SW 360th Street (north side)
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 24-FEB-09
 UTM Coord: E[m] 556572.0 N[m] 2811778.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	213.200	18.9	0.0
2	54.160	54.0	-18.9
3	12.270	46.0	-73.0
4	36.670	--	-119.0

Fit Error[%]: 1.789

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.65 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	146.6	0.2	u	144.5
2	0.00860	126.0	0.2	u	130.4
3	0.01110	122.4	0.3	u	120.9
4	0.01410	114.3	0.3	u	113.0
5	0.01800	106.1	0.3	u	105.9
6	0.02300	100.4	0.3	u	100.3
7	0.02940	96.1	0.3	u	96.1
8	0.03750	93.0	0.3	u	93.1
9	0.04790	89.8	0.2	u	90.3
10	0.06110	86.5	0.3	u	86.9
11	0.07790	82.2	0.3	u	82.1
12	0.09930	74.7	0.4	u	75.8
13	0.12670	67.4	0.2	u	68.4
14	0.16640	59.0	0.4	u	59.6
15	0.20600	53.2	0.6	u	53.3
16	0.26280	47.7	0.6	u	47.2
17	0.33520	43.0	1.8	u	42.5
18	0.42770	39.3	1.4	u	39.0
19	0.54560	37.0	1.4	u	36.8
20	0.69590	36.8	1.9	u	35.7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	79.9	0.4	u	78.4
2	0.10600	73.6	0.4	u	72.8
3	0.13100	66.6	0.4	u	66.1
4	0.16100	59.4	0.5	u	59.2
5	0.20000	52.5	0.6	u	52.5
6	0.25000	46.4	0.5	u	46.5
7	0.31400	41.2	0.7	u	41.5
8	0.39500	37.1	0.8	u	37.4
9	0.49900	33.9	0.8	u	34.4
10	0.63100	31.5	1.1	u	32.1
11	0.79900	30.1	1.9	u	30.4
12	1.01000	29.4	2.5	u	29.4
13	1.28000	28.8	3.7	u	28.7
14	1.63000	28.3	6.0	u	28.5
15	2.08000	28.8	9.9	u	28.5
16	2.64000	28.5	22.4	m	28.9
17	3.37000	23.8	42.3	d	-
18	4.29000	27.8	59.3	d	-
19	5.47000	17.5	33.6	d	-
20	6.97000	19.2	100.0	d	-

Sounding: MIA208 Client: US Geological Survey
 Location: SW 360th Street (south side)
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 24-FEB-09
 UTM Coord: E[m] 555809.0 N[m] 2811154.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	561.300	16.6	0.0
2	55.060	59.4	-16.6
3	20.880	38.0	-76.1
4	41.440	--	-114.1

Fit Error[%]: 2.269

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.65 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	171.0	0.4	u	164.3
2	0.00860	140.2	0.1	u	144.6
3	0.01110	132.7	0.1	u	131.6
4	0.01410	120.4	0.1	u	121.3
5	0.01800	110.3	0.1	u	112.3
6	0.02300	103.5	0.2	u	105.0
7	0.02940	99.0	0.2	u	99.3
8	0.03750	95.6	0.2	u	94.6
9	0.04790	91.6	0.2	u	90.6
10	0.06110	86.9	0.2	u	86.5
11	0.07790	81.6	0.2	u	81.7
12	0.09930	74.7	0.3	u	76.1
13	0.12670	69.0	0.3	u	70.1
14	0.16640	63.2	0.4	u	63.6
15	0.20600	57.9	6.1	u	59.1
16	0.26280	56.0	0.5	u	55.0
17	0.33520	51.6	8.5	u	51.9
18	0.42770	50.7	12.6	u	49.9
19	0.54560	48.7	5.1	u	48.8
20	0.69590	50.3	6.6	u	48.8

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	79.5	0.6	u	78.5
2	0.10600	74.4	0.6	u	73.8
3	0.13100	69.3	0.9	u	68.5
4	0.16100	63.9	0.5	u	63.3
5	0.20000	59.2	0.9	u	58.5
6	0.25000	54.3	0.6	u	54.2
7	0.31400	50.5	1.3	u	50.6
8	0.39500	46.8	0.9	u	47.7
9	0.49900	45.1	0.9	u	45.5
10	0.63100	43.3	3.3	u	43.8
11	0.79900	42.0	2.6	u	42.5
12	1.01000	41.8	5.8	u	41.7
13	1.28000	40.6	9.7	u	41.0
14	1.63000	41.3	15.5	u	40.8
15	2.08000	43.3	26.2	m	40.8
16	2.64000	43.1	67.2	d	-
17	3.37000	48.8	96.3	d	-
18	4.29000	45.3	100.0	d	-
19	5.47000	126.9	100.0	d	-
20	6.97000	43.2	100.0	d	-

Sounding: MIA209 Client: US Geological Survey
 Location: E of SW162nd Ave & S of SW380nd
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 25-FEB-09
 UTM Coord: E[m] 555439.0 N[m] 2810949.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	580.200	15.5	0.0
2	54.680	82.2	-15.5
3	14.310	14.9	-97.8
4	45.520	--	-112.7

Fit Error[%]: 2.422

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	171.9	0.3	m	154.7
2	0.00860	137.7	0.2	u	136.6
3	0.01110	126.2	0.2	u	124.8
4	0.01410	114.9	0.3	u	115.3
5	0.01800	104.4	0.3	u	106.9
6	0.02300	98.3	0.2	u	99.7
7	0.02940	93.4	0.2	u	93.7
8	0.03750	89.8	0.2	u	88.9
9	0.04790	86.4	0.3	u	85.3
10	0.06110	83.0	0.2	u	82.4
11	0.07790	79.7	0.3	u	79.7
12	0.09930	75.1	0.2	u	76.5
13	0.12670	71.3	0.2	u	72.6
14	0.16640	67.2	0.3	u	67.7
15	0.20600	63.6	0.4	u	63.9
16	0.26280	61.4	0.5	u	60.1
17	0.33520	57.4	0.7	u	57.2
18	0.42770	55.7	0.8	u	55.2
19	0.54560	54.8	1.4	u	54.3
20	0.69590	57.1	1.8	u	54.4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	78.5	0.6	u	77.8
2	0.10600	75.2	0.7	u	75.0
3	0.13100	71.6	0.7	u	71.3
4	0.16100	67.9	0.8	u	67.3
5	0.20000	63.5	0.8	u	63.1
6	0.25000	59.2	0.8	u	59.1
7	0.31400	55.4	0.9	u	55.7
8	0.39500	52.1	0.9	u	52.8
9	0.49900	48.7	1.7	u	50.5
10	0.63100	47.4	2.4	u	48.7
11	0.79900	46.6	3.5	u	47.4
12	1.01000	45.8	6.5	u	46.4
13	1.28000	46.8	10.3	u	45.9
14	1.63000	45.7	13.5	u	45.5
15	2.08000	43.4	14.8	m	45.4
16	2.64000	45.6	27.9	d	-
17	3.37000	41.2	64.3	d	-
18	4.29000	95.6	100.0	d	-
19	5.47000	32.5	100.0	d	-
20	6.97000	82.7	100.0	d	-

Sounding: MIA210 Client: US Geological Survey
 Location: E SW 162 Ave & S SW 380 St
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 25-FEB-09
 UTM Coord: E[m] 555420.0 N[m] 2810648.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	442.400	11.8	0.0
2	60.000	84.6	-11.8
3	16.110	14.0	-96.4
4	44.200	--	-110.4

Fit Error[%]: 2.367

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.65 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	136.7	0.3	m	126.6
2	0.00860	116.2	0.3	u	114.7
3	0.01110	109.2	0.4	u	107.4
4	0.01410	101.2	0.4	u	101.6
5	0.01800	93.6	0.5	u	96.3
6	0.02300	89.7	0.4	u	91.6
7	0.02940	86.7	0.4	u	87.7
8	0.03750	84.8	0.4	u	84.6
9	0.04790	83.0	0.4	u	82.3
10	0.06110	81.1	0.4	u	80.5
11	0.07790	79.0	0.4	u	78.6
12	0.09930	75.3	0.4	u	76.1
13	0.12670	72.2	0.4	u	72.8
14	0.16640	68.8	0.5	u	68.5
15	0.20600	65.2	0.5	u	65.3
16	0.26280	63.0	0.9	u	61.9
17	0.33520	59.6	1.3	u	59.4
18	0.42770	57.8	1.6	u	57.7
19	0.54560	58.0	4.9	u	56.9
20	0.69590	60.1	2.0	u	57.1

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	77.5	0.3	u	77.1
2	0.10600	75.0	0.4	u	74.8
3	0.13100	71.9	0.4	u	71.7
4	0.16100	68.6	0.4	u	68.1
5	0.20000	64.6	0.5	u	64.5
6	0.25000	60.7	0.7	u	60.9
7	0.31400	57.0	0.8	u	57.8
8	0.39500	53.7	1.0	u	55.0
9	0.49900	51.0	2.1	u	52.9
10	0.63100	50.3	1.8	u	51.1
11	0.79900	49.2	6.2	u	49.7
12	1.01000	48.5	6.3	u	48.6
13	1.28000	48.0	10.2	u	47.8
14	1.63000	44.2	11.5	d	-
15	2.08000	37.6	27.3	d	-
16	2.64000	33.6	47.2	d	-
17	3.37000	28.6	44.8	d	-
18	4.29000	31.4	77.4	d	-
19	5.47000	100.9	100.0	d	-
20	6.97000	58.3	100.0	d	-

Sounding: MIA211 Client: US Geological Survey
 Location: E SW 162 Ave & S SW 380 St
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 25-FEB-09
 UTM Coord: E[m] 555523.0 N[m] 2810163.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	176.100	20.0	0.0
2	9.770	4.1	-20.0
3	82.010	50.2	-24.1
4	34.660	--	-74.3

Fit Error[%]: 1.314

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.4
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	110.8	0.2	u	110.6
2	0.00860	89.7	0.2	u	90.9
3	0.01110	79.0	0.3	u	78.3
4	0.01410	70.4	0.2	u	69.9
5	0.01800	63.9	0.2	u	64.0
6	0.02300	60.1	0.2	u	60.1
7	0.02940	57.8	0.2	u	58.0
8	0.03750	56.9	0.2	u	56.9
9	0.04790	56.8	0.2	u	56.9
10	0.06110	57.2	0.2	u	57.4
11	0.07790	58.0	0.2	u	58.1
12	0.09930	58.2	0.2	u	58.6
13	0.12670	58.5	0.3	u	58.8
14	0.16640	58.7	0.4	u	58.4
15	0.20600	57.4	0.4	u	57.5
16	0.26280	57.6	0.4	u	56.7
17	0.33520	55.5	0.7	u	55.5
18	0.42770	55.1	1.4	u	54.9
19	0.54560	55.2	1.9	u	54.4
20	0.69590	58.1	3.9	m	54.8

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	58.3	0.3	u	58.2
2	0.10600	58.6	0.3	u	58.6
3	0.13100	58.7	0.4	u	58.3
4	0.16100	58.3	0.3	u	57.8
5	0.20000	57.0	0.7	u	56.7
6	0.25000	55.1	0.6	u	55.4
7	0.31400	52.9	1.1	u	53.7
8	0.39500	51.0	1.2	u	52.1
9	0.49900	49.4	0.8	u	50.3
10	0.63100	49.2	1.7	u	48.7
11	0.79900	48.1	4.0	m	47.1
12	1.01000	48.5	4.7	m	45.9
13	1.28000	48.0	9.9	m	44.5
14	1.63000	43.6	13.6	m	43.7
15	2.08000	41.1	9.9	m	42.7
16	2.64000	43.4	29.3	d	-
17	3.37000	91.0	100.0	d	-
18	4.29000	55.9	100.0	d	-
19	5.47000	30.5	65.8	d	-
20	6.97000	35.0	100.0	d	-

Sounding: MIA212 Client: US Geological Survey
 Location: 0.34km S of SW 388 St & 0.31km W of SW 157 Ave
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 25-FEB-09
 UTM Coord: E[m] 555558.0 N[m] 2809832.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	274.700	19.6	0.0
2	.931	.8	-19.6
3	116.600	31.2	-20.5
4	44.930	--	-51.7

Fit Error[%]: 1.767

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	114.7	0.3	u	115.9
2	0.00860	84.8	0.3	u	86.0
3	0.01110	67.4	0.3	u	66.8
4	0.01410	54.5	0.3	u	53.9
5	0.01800	45.4	0.3	u	45.1
6	0.02300	39.3	0.3	u	39.0
7	0.02940	35.3	0.3	u	35.1
8	0.03750	32.8	0.3	u	32.7
9	0.04790	31.5	0.3	u	31.5
10	0.06110	31.1	0.3	u	31.3
11	0.07790	31.5	0.3	u	31.7
12	0.09930	32.3	0.3	u	32.7
13	0.12670	33.7	0.3	u	34.0
14	0.16640	35.9	0.4	u	35.7
15	0.20600	37.1	0.5	u	37.0
16	0.26280	39.2	0.6	u	38.6
17	0.33520	40.4	0.8	u	40.1
18	0.42770	41.9	1.8	u	41.7
19	0.54560	43.8	3.0	u	43.6
20	0.69590	47.3	5.6	u	45.8

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	32.0	0.5	u	32.1
2	0.10600	32.9	0.5	u	33.0
3	0.13100	34.0	0.5	u	34.1
4	0.16100	35.5	0.4	u	35.3
5	0.20000	36.7	0.6	u	36.5
6	0.25000	37.9	0.5	u	37.7
7	0.31400	38.5	0.5	u	38.7
8	0.39500	39.0	0.4	u	39.6
9	0.49900	39.5	0.8	u	40.4
10	0.63100	39.9	1.3	u	41.0
11	0.79900	41.4	2.8	u	41.6
12	1.01000	42.5	3.8	u	42.0
13	1.28000	43.1	8.4	u	42.5
14	1.63000	42.1	8.6	u	42.8
15	2.08000	47.0	22.0	m	43.3
16	2.64000	60.9	66.5	d	-
17	3.37000	96.1	100.0	d	-
18	4.29000	90.7	100.0	d	-
19	5.47000	79.4	100.0	d	-
20	6.97000	13.9	54.8	d	-

Sounding: MIA212F Client: US Geological Survey
 Location: 0.34km S of SW 388 St & 0.31km W of SW 157 Ave
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 25-FEB-09
 UTM Coord: E[m] 555558.0 N[m] 2809832.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	257.400	18.7	0.0
2	3.500	3.4	-18.7
3	126.500	32.7	-22.2
4	44.220	--	-55.0

Fit Error[%]: 1.653

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	114.7	0.3	u	115.1
2	0.00860	84.8	0.3	u	85.7
3	0.01110	67.4	0.3	u	66.8
4	0.01410	54.5	0.3	u	54.1
5	0.01800	45.4	0.3	u	45.3
6	0.02300	39.3	0.3	u	39.2
7	0.02940	35.3	0.3	u	35.3
8	0.03750	32.8	0.3	u	32.8
9	0.04790	31.5	0.3	u	31.6
10	0.06110	31.1	0.3	u	31.3
11	0.07790	31.5	0.3	u	31.7
12	0.09930	32.3	0.3	u	32.6
13	0.12670	33.7	0.3	u	33.9
14	0.16640	35.9	0.4	u	35.6
15	0.20600	37.1	0.5	u	37.0
16	0.26280	39.2	0.6	u	38.6
17	0.33520	40.4	0.8	u	40.2
18	0.42770	41.9	1.8	u	41.8
19	0.54560	43.8	3.0	u	43.7
20	0.69590	47.3	5.6	u	45.9

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	32.0	0.5	u	32.0
2	0.10600	32.9	0.5	u	32.9
3	0.13100	34.0	0.5	u	34.0
4	0.16100	35.5	0.4	u	35.2
5	0.20000	36.7	0.6	u	36.5
6	0.25000	37.9	0.5	u	37.7
7	0.31400	38.5	0.5	u	38.8
8	0.39500	39.0	0.4	u	39.7
9	0.49900	39.5	0.8	u	40.5
10	0.63100	39.9	1.3	u	41.0
11	0.79900	41.4	2.8	u	41.6
12	1.01000	42.5	3.8	u	41.9
13	1.28000	43.1	8.4	u	42.5
14	1.63000	42.1	8.6	u	42.6
15	2.08000	47.0	22.0	m	43.1
16	2.64000	60.9	66.5	d	-
17	3.37000	96.1	100.0	d	-
18	4.29000	90.7	100.0	d	-
19	5.47000	79.4	100.0	d	-
20	6.97000	13.9	54.8	d	-

Sounding: MIA213 Client: US Geological Survey
 Location: 0.06 km N of SW 388 & 0.06 km E of Kingman Rd
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 25-FEB-09
 UTM Coord: E[m] 556774.0 N[m] 2810192.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	102.300	21.4	0.0
2	.541	.7	-21.4
3	44.420	97.8	-22.1
4	13.970	--	-119.9

Fit Error[%]: 2.353

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	124.2	0.3	u	122.6
2	0.00860	94.1	0.2	u	97.9
3	0.01110	74.7	0.2	u	75.3
4	0.01410	58.7	0.2	u	58.1
5	0.01800	46.5	0.2	u	45.8
6	0.02300	37.7	0.2	u	37.2
7	0.02940	31.4	0.2	u	31.1
8	0.03750	27.1	0.2	u	26.9
9	0.04790	24.1	0.2	u	24.1
10	0.06110	22.2	0.2	u	22.4
11	0.07790	21.2	0.2	u	21.4
12	0.09930	20.8	0.2	u	21.0
13	0.12670	21.0	0.2	u	21.1
14	0.16640	22.2	0.1	u	21.8
15	0.20600	23.0	0.1	u	22.7
16	0.26280	24.5	0.2	u	24.0
17	0.33520	25.8	0.2	u	25.6
18	0.42770	27.5	0.4	u	27.4
19	0.54560	29.2	0.4	u	29.3
20	0.69590	32.1	1.1	u	31.0

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	20.8	0.2	u	21.1
2	0.10600	20.7	0.2	u	20.9
3	0.13100	21.0	0.2	u	21.1
4	0.16100	21.7	0.2	u	21.6
5	0.20000	22.5	0.2	u	22.4
6	0.25000	23.5	0.4	u	23.4
7	0.31400	24.4	0.3	u	24.5
8	0.39500	25.2	0.5	u	25.7
9	0.49900	25.9	1.3	u	26.7
10	0.63100	26.5	1.2	u	27.3
11	0.79900	27.3	4.4	u	27.4
12	1.01000	27.6	4.7	u	27.1
13	1.28000	26.7	6.9	u	26.4
14	1.63000	25.2	11.9	u	25.5
15	2.08000	22.1	17.6	d	-
16	2.64000	17.9	26.8	d	-
17	3.37000	13.4	29.1	d	-
18	4.29000	10.6	38.7	d	-
19	5.47000	7.1	33.5	d	-
20	6.97000	5.1	30.1	d	-

Sounding: MIA213F Client: US Geological Survey
 Location: 0.06 km N of SW 388 & 0.06 km E of Kingman Rd
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 25-FEB-09
 UTM Coord: E[m] 556774.0 N[m] 2810192.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	118.100	19.5	0.0
2	3.500	5.1	-19.5
3	49.430	90.1	-24.7
4	14.390	--	-114.9

Fit Error[%]: 2.282

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	124.2	0.3	u	123.4
2	0.00860	94.1	0.2	u	97.0
3	0.01110	74.7	0.2	u	74.7
4	0.01410	58.7	0.2	u	58.0
5	0.01800	46.5	0.2	u	45.9
6	0.02300	37.7	0.2	u	37.3
7	0.02940	31.4	0.2	u	31.3
8	0.03750	27.1	0.2	u	27.1
9	0.04790	24.1	0.2	u	24.3
10	0.06110	22.2	0.2	u	22.4
11	0.07790	21.2	0.2	u	21.4
12	0.09930	20.8	0.2	u	21.0
13	0.12670	21.0	0.2	u	21.1
14	0.16640	22.2	0.1	u	21.7
15	0.20600	23.0	0.1	u	22.6
16	0.26280	24.5	0.2	u	24.0
17	0.33520	25.8	0.2	u	25.6
18	0.42770	27.5	0.4	u	27.4
19	0.54560	29.2	0.4	u	29.3
20	0.69590	32.1	1.1	u	31.0

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	20.8	0.2	u	21.1
2	0.10600	20.7	0.2	u	20.9
3	0.13100	21.0	0.2	u	21.1
4	0.16100	21.7	0.2	u	21.5
5	0.20000	22.5	0.2	u	22.3
6	0.25000	23.5	0.4	u	23.3
7	0.31400	24.4	0.3	u	24.5
8	0.39500	25.2	0.5	u	25.8
9	0.49900	25.9	1.3	u	26.7
10	0.63100	26.5	1.2	u	27.4
11	0.79900	27.3	4.4	u	27.4
12	1.01000	27.6	4.7	u	27.1
13	1.28000	26.7	6.9	u	26.4
14	1.63000	25.2	11.9	u	25.5
15	2.08000	22.1	17.6	d	-
16	2.64000	17.9	26.8	d	-
17	3.37000	13.4	29.1	d	-
18	4.29000	10.6	38.7	d	-
19	5.47000	7.1	33.5	d	-
20	6.97000	5.1	30.1	d	-

Sounding: MIA214 Client: US Geological Survey
 Location: 0.29 km N of SW 388 & 0.03 km E of Kingman Rd
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 25-FEB-09
 UTM Coord: E[m] 556751.0 N[m] 2810422.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	147.600	19.9	0.0
2	7.720	2.6	-19.9
3	43.760	56.2	-22.5
4	10.230	11.0	-78.7
5	32.900	--	-89.8

Fit Error[%]: 1.817

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	107.1	0.2	u	105.9
2	0.00860	87.0	0.2	u	88.4
3	0.01110	77.1	0.2	u	76.7
4	0.01410	68.5	0.2	u	68.4
5	0.01800	61.9	0.2	u	62.1
6	0.02300	57.5	0.2	u	57.5
7	0.02940	54.2	0.2	u	54.1
8	0.03750	52.0	0.2	u	51.8
9	0.04790	50.4	0.2	u	50.4
10	0.06110	49.3	0.2	u	49.5
11	0.07790	48.4	0.2	u	48.7
12	0.09930	47.0	0.2	u	47.7
13	0.12670	45.6	0.3	u	46.2
14	0.16640	43.9	0.1	u	44.0
15	0.20600	41.9	0.3	u	42.2
16	0.26280	40.6	0.1	u	40.4
17	0.33520	38.9	0.4	u	39.0
18	0.42770	38.0	0.7	u	38.1
19	0.54560	37.8	1.5	u	37.9
20	0.69590	39.9	1.5	u	38.3

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	48.5	0.2	u	48.1
2	0.10600	47.4	0.2	u	47.0
3	0.13100	45.9	0.3	u	45.6
4	0.16100	44.2	0.3	u	43.7
5	0.20000	42.1	0.2	u	41.7
6	0.25000	39.8	0.4	u	39.7
7	0.31400	37.7	0.5	u	38.0
8	0.39500	35.8	0.9	u	36.4
9	0.49900	34.7	1.1	u	35.3
10	0.63100	33.9	1.8	u	34.3
11	0.79900	33.4	3.1	u	33.6
12	1.01000	33.4	2.8	u	33.1
13	1.28000	33.5	6.3	u	32.9
14	1.63000	31.9	8.4	u	32.6
15	2.08000	29.7	12.4	d	-
16	2.64000	28.2	22.0	d	-
17	3.37000	28.6	38.0	d	-
18	4.29000	18.9	36.0	d	-
19	5.47000	12.7	38.6	d	-
20	6.97000	9.0	28.5	d	-

Sounding: MIA215 Client: US Geological Survey
 Location: 0.60 km N of SW 380 & 0.03 km W of 3 Mile Rd
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 25-FEB-09
 UTM Coord: E[m] 557500.0 N[m] 2811056.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	166.400	20.2	0.0
2	7.110	2.8	-20.2
3	37.330	53.9	-23.1
4	7.440	13.7	-77.0
5	21.730	--	-90.8

Fit Error[%]: 1.444

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	115.1	0.5	u	113.9
2	0.00860	91.3	0.5	u	93.1
3	0.01110	79.7	0.5	u	79.2
4	0.01410	69.6	0.5	u	69.1
5	0.01800	61.5	0.5	u	61.6
6	0.02300	56.0	0.5	u	56.0
7	0.02940	51.9	0.5	u	51.9
8	0.03750	49.0	0.5	u	49.0
9	0.04790	47.0	0.5	u	47.1
10	0.06110	45.8	0.5	u	45.9
11	0.07790	44.9	0.5	u	45.3
12	0.09930	43.7	0.5	u	44.4
13	0.12670	42.4	0.4	u	43.1
14	0.16640	40.4	0.5	u	40.7
15	0.20600	38.1	0.5	u	38.4
16	0.26280	35.9	0.5	u	35.9
17	0.33520	33.6	0.4	u	33.7
18	0.42770	31.9	0.6	u	32.0
19	0.54560	30.9	0.6	u	30.9
20	0.69590	31.1	1.1	u	30.5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	45.3	0.2	u	44.6
2	0.10600	44.3	0.2	u	43.8
3	0.13100	42.8	0.2	u	42.3
4	0.16100	40.8	0.2	u	40.3
5	0.20000	38.2	0.2	u	37.9
6	0.25000	35.4	0.3	u	35.2
7	0.31400	32.7	0.4	u	32.7
8	0.39500	30.2	0.4	u	30.5
9	0.49900	28.5	1.0	u	28.7
10	0.63100	27.0	1.2	u	27.3
11	0.79900	26.2	1.8	u	26.1
12	1.01000	25.7	2.6	u	25.2
13	1.28000	24.2	4.4	u	24.5
14	1.63000	23.9	8.8	u	24.1
15	2.08000	23.8	5.9	u	23.7
16	2.64000	20.9	19.4	d	-
17	3.37000	17.5	25.9	d	-
18	4.29000	14.3	22.0	d	-
19	5.47000	9.3	44.5	d	-
20	6.97000	7.2	56.7	d	-

Sounding: MIA216 Client: US Geological Survey
 Location: E - US 1
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 26-FEB-09
 UTM Coord: E[m] 553598.0 N[m] 2807227.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	224.400	25.6	0.0
2	16.820	4.0	-25.6
3	92.860	95.5	-29.6
4	35.370	--	-125.2

Fit Error[%]: 2.167

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	159.9	0.4	u	158.4
2	0.00860	132.6	0.3	u	136.4
3	0.01110	122.6	0.3	u	122.2
4	0.01410	113.6	0.3	u	112.2
5	0.01800	104.5	0.3	u	104.4
6	0.02300	99.4	0.3	u	99.1
7	0.02940	95.1	0.3	u	95.1
8	0.03750	92.3	0.3	u	92.6
9	0.04790	90.7	0.3	u	91.1
10	0.06110	90.2	0.3	u	90.7
11	0.07790	91.1	0.3	u	90.8
12	0.09930	90.9	0.5	u	91.5
13	0.12670	91.6	0.4	u	92.1
14	0.16640	92.4	0.7	u	92.1
15	0.20600	90.6	1.3	u	91.2
16	0.26280	92.0	1.8	u	89.5
17	0.33520	87.8	2.2	u	87.1
18	0.42770	85.6	6.1	u	84.5
19	0.54560	83.4	11.2	u	82.4
20	0.69590	90.8	15.0	m	80.9

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	91.2	0.4	u	90.8
2	0.10600	91.8	0.5	u	91.3
3	0.13100	92.4	0.7	u	91.3
4	0.16100	91.3	0.5	u	90.9
5	0.20000	89.3	1.1	u	89.5
6	0.25000	86.4	1.9	u	87.2
7	0.31400	81.5	2.0	u	83.8
8	0.39500	78.0	2.7	u	79.7
9	0.49900	74.3	5.6	u	75.5
10	0.63100	73.7	6.4	u	71.2
11	0.79900	68.1	6.3	u	67.2
12	1.01000	61.7	16.6	u	63.4
13	1.28000	58.0	17.5	m	60.3
14	1.63000	50.9	26.8	d	-
15	2.08000	42.9	38.0	d	-
16	2.64000	34.2	41.7	d	-
17	3.37000	25.6	51.2	d	-
18	4.29000	25.8	62.9	d	-
19	5.47000	20.1	100.0	d	-
20	6.97000	14.7	74.3	d	-

Sounding: MIA217 Client: US Geological Survey
 Location: W - US 1 N - 424 St
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 26-FEB-09
 UTM Coord: E[m] 553577.0 N[m] 2806974.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	192.900	26.0	0.0
2	13.500	3.5	-26.0
3	100.300	98.0	-29.5
4	47.630	--	-127.5

Fit Error[%]: 2.230

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	149.5	0.3	u	148.7
2	0.00860	124.6	0.2	u	128.2
3	0.01110	115.5	0.3	u	114.4
4	0.01410	106.1	0.3	u	104.5
5	0.01800	97.2	0.3	u	97.4
6	0.02300	92.3	0.3	u	92.2
7	0.02940	88.4	0.3	u	89.0
8	0.03750	86.1	0.3	u	86.8
9	0.04790	85.0	0.3	u	86.0
10	0.06110	85.2	0.3	u	86.0
11	0.07790	86.8	0.3	u	86.8
12	0.09930	87.2	0.2	u	87.8
13	0.12670	88.5	0.3	u	89.1
14	0.16640	90.0	0.5	u	90.1
15	0.20600	89.1	0.6	u	90.3
16	0.26280	91.6	1.0	u	90.0
17	0.33520	87.8	0.9	u	89.3
18	0.42770	88.5	2.4	u	88.4
19	0.54560	89.4	3.5	u	87.7
20	0.69590	99.4	7.0	m	87.7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	88.0	0.3	u	87.0
2	0.10600	89.1	0.4	u	87.9
3	0.13100	90.3	0.5	u	88.7
4	0.16100	90.4	0.6	u	89.1
5	0.20000	88.8	0.9	u	88.9
6	0.25000	86.6	0.9	u	87.9
7	0.31400	83.9	2.4	u	86.0
8	0.39500	81.3	1.7	u	83.6
9	0.49900	83.3	5.1	u	80.7
10	0.63100	78.8	8.3	u	77.7
11	0.79900	74.7	12.0	u	74.7
12	1.01000	70.7	15.4	u	71.9
13	1.28000	70.4	23.3	d	-
14	1.63000	58.8	21.5	d	-
15	2.08000	66.7	67.2	d	-
16	2.64000	41.6	55.8	d	-
17	3.37000	44.0	66.0	d	-
18	4.29000	30.9	64.1	d	-
19	5.47000	36.1	100.0	d	-
20	6.97000	22.1	100.0	d	-

Sounding: MIA218 Client: US Geological Survey
 Location: W - US 1
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 26-FEB-09
 UTM Coord: E[m] 554678.0 N[m] 2801646.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	61.920	15.4	0.0
2	.950	1.6	-15.4
3	19.880	--	-17.1

Fit Error[%]: 1.756

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	85.1	0.3	u	84.2
2	0.00860	64.4	0.3	u	66.1
3	0.01110	49.5	0.3	u	50.1
4	0.01410	38.3	0.3	u	38.1
5	0.01800	30.0	0.3	u	29.6
6	0.02300	23.9	0.3	u	23.6
7	0.02940	19.6	0.3	u	19.4
8	0.03750	16.6	0.3	u	16.5
9	0.04790	14.5	0.3	u	14.5
10	0.06110	13.1	0.3	u	13.1
11	0.07790	12.2	0.3	u	12.3
12	0.09930	11.7	0.3	u	11.9
13	0.12670	11.5	0.3	u	11.7
14	0.16640	11.7	0.3	u	11.8
15	0.20600	11.8	0.3	u	12.0
16	0.26280	12.4	0.3	u	12.4
17	0.33520	13.0	0.4	u	12.9
18	0.42770	13.7	0.3	u	13.6
19	0.54560	14.6	0.7	u	14.4
20	0.69590	15.7	0.7	u	15.5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	12.1	0.2	u	12.0
2	0.10600	11.8	0.2	u	11.8
3	0.13100	11.7	0.2	u	11.7
4	0.16100	11.7	0.2	u	11.7
5	0.20000	11.9	0.2	u	11.9
6	0.25000	12.2	0.2	u	12.1
7	0.31400	12.6	0.2	u	12.5
8	0.39500	13.1	0.2	u	12.9
9	0.49900	13.5	0.2	u	13.4
10	0.63100	13.9	0.7	u	13.9
11	0.79900	14.3	1.0	u	14.4
12	1.01000	14.7	1.6	u	14.8
13	1.28000	15.0	1.3	u	15.3
14	1.63000	14.5	3.9	m	15.8
15	2.08000	13.3	2.6	m	16.3
16	2.64000	12.5	5.6	m	16.8
17	3.37000	9.8	9.0	d	-
18	4.29000	7.8	16.5	d	-
19	5.47000	5.2	12.7	d	-
20	6.97000	3.7	10.2	d	-

Sounding: MIA218F Client: US Geological Survey
 Location: W - US 1
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 26-FEB-09
 UTM Coord: E[m] 554678.0 N[m] 2801646.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	184.900	12.7	0.0
2	3.500	7.8	-12.7
3	21.150	--	-20.5

Fit Error[%]: 2.239

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	85.1	0.3	u	84.0
2	0.00860	64.4	0.3	u	63.6
3	0.01110	49.5	0.3	u	48.8
4	0.01410	38.3	0.3	u	37.9
5	0.01800	30.0	0.3	u	29.8
6	0.02300	23.9	0.3	u	23.9
7	0.02940	19.6	0.3	u	19.8
8	0.03750	16.6	0.3	u	16.8
9	0.04790	14.5	0.3	u	14.8
10	0.06110	13.1	0.3	u	13.4
11	0.07790	12.2	0.3	u	12.5
12	0.09930	11.7	0.3	u	11.9
13	0.12670	11.5	0.3	u	11.7
14	0.16640	11.7	0.3	u	11.7
15	0.20600	11.8	0.3	u	11.9
16	0.26280	12.4	0.3	u	12.3
17	0.33520	13.0	0.4	u	12.8
18	0.42770	13.7	0.3	u	13.5
19	0.54560	14.6	0.7	u	14.4
20	0.69590	15.7	0.7	u	15.5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	12.1	0.2	u	12.1
2	0.10600	11.8	0.2	u	11.8
3	0.13100	11.7	0.2	u	11.7
4	0.16100	11.7	0.2	u	11.7
5	0.20000	11.9	0.2	u	11.8
6	0.25000	12.2	0.2	u	12.1
7	0.31400	12.6	0.2	u	12.4
8	0.39500	13.1	0.2	u	12.9
9	0.49900	13.5	0.2	u	13.4
10	0.63100	13.9	0.7	u	13.9
11	0.79900	14.3	1.0	u	14.4
12	1.01000	14.7	1.6	u	15.0
13	1.28000	15.0	1.3	u	15.5
14	1.63000	14.5	3.9	m	16.1
15	2.08000	13.3	2.6	m	16.7
16	2.64000	12.5	5.6	m	17.2
17	3.37000	9.8	9.0	d	-
18	4.29000	7.8	16.5	d	-
19	5.47000	5.2	12.7	d	-
20	6.97000	3.7	10.2	d	-

Sounding: MIA219 Client: US Geological Survey
 Location: E - US 1
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 26-FEB-09
 UTM Coord: E[m] 554443.0 N[m] 2805290.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	89.180	18.7	0.0
2	.887	.8	-18.7
3	84.440	--	-19.5

Fit Error[%]: 3.406

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	91.5	0.4	u	90.3
2	0.00860	69.3	0.4	u	70.7
3	0.01110	55.3	0.5	u	55.8
4	0.01410	45.2	0.5	u	45.3
5	0.01800	38.0	0.5	u	38.0
6	0.02300	33.2	0.5	u	32.9
7	0.02940	29.9	0.5	u	29.6
8	0.03750	27.9	0.5	u	27.5
9	0.04790	26.8	0.5	u	26.5
10	0.06110	26.5	0.5	u	26.3
11	0.07790	26.8	0.5	u	26.8
12	0.09930	27.6	0.5	u	27.8
13	0.12670	28.9	0.5	u	29.3
14	0.16640	31.3	0.5	u	31.6
15	0.20600	33.1	0.5	u	33.8
16	0.26280	36.7	0.5	u	36.5
17	0.33520	40.3	0.5	u	39.8
18	0.42770	44.9	0.8	u	43.4
19	0.54560	49.8	1.7	u	47.5
20	0.69590	56.6	3.4	u	52.5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	27.3	0.2	u	27.2
2	0.10600	28.1	0.2	u	28.1
3	0.13100	29.2	0.2	u	29.5
4	0.16100	30.9	0.2	u	31.2
5	0.20000	32.8	0.3	u	33.3
6	0.25000	35.3	0.3	u	35.5
7	0.31400	38.1	0.6	u	38.4
8	0.39500	41.0	1.2	u	40.9
9	0.49900	43.9	1.4	u	44.2
10	0.63100	44.8	3.2	u	46.9
11	0.79900	48.0	4.6	u	50.0
12	1.01000	46.8	8.5	m	52.7
13	1.28000	44.8	16.9	d	-
14	1.63000	44.0	38.5	d	-
15	2.08000	42.3	41.9	d	-
16	2.64000	24.4	31.7	d	-
17	3.37000	20.0	22.4	d	-
18	4.29000	32.9	100.0	d	-
19	5.47000	13.8	37.2	d	-
20	6.97000	31.6	100.0	d	-

Sounding: MIA219F Client: US Geological Survey
 Location: E - US 1
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 26-FEB-09
 UTM Coord: E[m] 554443.0 N[m] 2805290.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	104.100	17.3	0.0
2	3.500	3.4	-17.3
3	86.760	--	-20.7

Fit Error[%]: 3.331

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	91.5	0.4	u	91.6
2	0.00860	69.3	0.4	u	70.4
3	0.01110	55.3	0.5	u	55.4
4	0.01410	45.2	0.5	u	45.2
5	0.01800	38.0	0.5	u	37.9
6	0.02300	33.2	0.5	u	33.0
7	0.02940	29.9	0.5	u	29.7
8	0.03750	27.9	0.5	u	27.6
9	0.04790	26.8	0.5	u	26.6
10	0.06110	26.5	0.5	u	26.3
11	0.07790	26.8	0.5	u	26.8
12	0.09930	27.6	0.5	u	27.8
13	0.12670	28.9	0.5	u	29.3
14	0.16640	31.3	0.5	u	31.5
15	0.20600	33.1	0.5	u	33.7
16	0.26280	36.7	0.5	u	36.5
17	0.33520	40.3	0.5	u	39.8
18	0.42770	44.9	0.8	u	43.5
19	0.54560	49.8	1.7	u	47.7
20	0.69590	56.6	3.4	u	52.7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	27.3	0.2	u	27.2
2	0.10600	28.1	0.2	u	28.1
3	0.13100	29.2	0.2	u	29.5
4	0.16100	30.9	0.2	u	31.2
5	0.20000	32.8	0.3	u	33.2
6	0.25000	35.3	0.3	u	35.5
7	0.31400	38.1	0.6	u	38.3
8	0.39500	41.0	1.2	u	41.1
9	0.49900	43.9	1.4	u	44.2
10	0.63100	44.8	3.2	u	47.1
11	0.79900	48.0	4.6	u	50.5
12	1.01000	46.8	8.5	m	53.2
13	1.28000	44.8	16.9	d	-
14	1.63000	44.0	38.5	d	-
15	2.08000	42.3	41.9	d	-
16	2.64000	24.4	31.7	d	-
17	3.37000	20.0	22.4	d	-
18	4.29000	32.9	100.0	d	-
19	5.47000	13.8	37.2	d	-
20	6.97000	31.6	100.0	d	-

Sounding: MIA220 Client: US Geological Survey
 Location: Far east turn around
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 26-FEB-09
 UTM Coord: E[m] 560349.0 N[m] 2805662.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	22.190	6.8	0.0
2	2.260	22.1	-6.8
3	45.900	--	-29.0

Fit Error[%]: 1.864

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 1

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	41.2	0.4	u	40.8
2	0.00860	32.1	0.4	u	32.1
3	0.01110	24.8	0.4	u	25.4
4	0.01410	19.8	0.4	u	20.3
5	0.01800	16.0	0.4	u	16.3
6	0.02300	13.2	0.4	u	13.2
7	0.02940	11.0	0.4	u	10.8
8	0.03750	9.2	0.4	u	9.0
9	0.04790	7.8	0.4	u	7.7
10	0.06110	6.6	0.4	u	6.6
11	0.07790	5.7	0.4	u	5.7
12	0.09930	4.9	0.4	u	5.0
13	0.12670	4.4	0.4	u	4.4
14	0.16640	3.9	0.4	u	4.0
15	0.20600	3.7	0.4	u	3.8
16	0.26280	3.5	0.4	u	3.6
17	0.33520	3.5	0.4	u	3.5
18	0.42770	3.6	0.4	u	3.6
19	0.54560	3.7	0.4	u	3.8
20	0.69590	4.0	0.4	u	4.0

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	5.4	0.2	u	5.3
2	0.10600	4.9	0.2	u	4.8
3	0.13100	4.4	0.2	u	4.3
4	0.16100	4.0	0.2	u	4.0
5	0.20000	3.8	0.2	u	3.7
6	0.25000	3.6	0.2	u	3.6
7	0.31400	3.5	0.2	u	3.5
8	0.39500	3.5	0.2	u	3.5
9	0.49900	3.6	0.2	u	3.5
10	0.63100	3.7	0.2	u	3.7
11	0.79900	3.9	0.2	u	3.9
12	1.01000	4.2	0.3	u	4.3
13	1.28000	4.7	0.5	u	4.7
14	1.63000	5.3	0.8	u	5.3
15	2.08000	6.0	2.2	u	5.9
16	2.64000	6.9	1.5	u	6.8
17	3.37000	7.8	6.1	u	7.8
18	4.29000	8.8	10.0	d	-
19	5.47000	9.4	18.5	d	-
20	6.97000	9.5	26.4	d	-

Sounding: MIA221 Client: US Geological Survey
 Location: 4.07 km S of SW 392 & 0.28 km E Tallahassee Rd
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 27-FEB-09
 UTM Coord: E[m] 559464.0 N[m] 2805644.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	37.060	8.3	0.0
2	2.330	16.9	-8.3
3	29.700	--	-25.2

Fit Error[%]: 1.373

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 1

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	49.2	0.2	u	49.7
2	0.00860	39.2	0.3	u	38.9
3	0.01110	30.9	0.3	u	30.8
4	0.01410	24.7	0.3	u	24.6
5	0.01800	19.9	0.3	u	19.7
6	0.02300	16.0	0.3	u	15.9
7	0.02940	13.0	0.3	u	13.0
8	0.03750	10.6	0.3	u	10.7
9	0.04790	8.8	0.3	u	8.9
10	0.06110	7.4	0.3	u	7.5
11	0.07790	6.3	0.3	u	6.4
12	0.09930	5.5	0.3	u	5.6
13	0.12670	5.0	0.3	u	5.0
14	0.16640	4.6	0.3	u	4.6
15	0.20600	4.4	0.3	u	4.4
16	0.26280	4.4	0.3	u	4.4
17	0.33520	4.4	0.3	u	4.4
18	0.42770	4.6	0.3	u	4.6
19	0.54560	4.9	0.3	u	4.9
20	0.69590	5.4	0.2	u	5.4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	6.0	0.5	u	6.0
2	0.10600	5.4	0.5	u	5.4
3	0.13100	5.0	0.4	u	5.0
4	0.16100	4.7	0.5	u	4.6
5	0.20000	4.5	0.5	u	4.4
6	0.25000	4.4	0.5	u	4.3
7	0.31400	4.4	0.4	u	4.3
8	0.39500	4.4	0.5	u	4.4
9	0.49900	4.6	0.4	u	4.6
10	0.63100	4.9	0.4	u	4.9
11	0.79900	5.2	0.5	u	5.3
12	1.01000	5.7	0.6	u	5.8
13	1.28000	6.3	0.8	u	6.4
14	1.63000	7.0	1.2	u	7.1
15	2.08000	7.9	1.6	u	8.0
16	2.64000	9.0	3.4	u	8.9
17	3.37000	10.2	12.2	u	10.1
18	4.29000	12.3	18.5	d	-
19	5.47000	15.5	47.8	d	-
20	6.97000	39.6	100.0	d	-

Sounding: MIA222 Client: US Geological Survey
 Location: 4.07 km S of SW 392 & 0.28 km W Tallahassee Rd
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 27-FEB-09
 UTM Coord: E[m] 558824.0 N[m] 2805659.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	30.500	9.3	0.0
2	2.050	15.7	-9.3
3	19.820	--	-25.1

Fit Error[%]: 1.137

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 1

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	49.9	0.4	u	49.7
2	0.00860	40.5	0.4	u	40.4
3	0.01110	32.4	0.4	u	32.8
4	0.01410	26.1	0.4	u	26.4
5	0.01800	21.1	0.4	u	21.2
6	0.02300	17.1	0.4	u	17.1
7	0.02940	13.9	0.4	u	13.9
8	0.03750	11.4	0.4	u	11.4
9	0.04790	9.4	0.4	u	9.4
10	0.06110	7.9	0.4	u	7.8
11	0.07790	6.6	0.4	u	6.6
12	0.09930	5.7	0.4	u	5.7
13	0.12670	5.0	0.4	u	5.0
14	0.16640	4.5	0.4	u	4.5
15	0.20600	4.2	0.4	u	4.3
16	0.26280	4.1	0.4	u	4.2
17	0.33520	4.1	0.4	u	4.1
18	0.42770	4.2	0.4	u	4.3
19	0.54560	4.5	0.4	u	4.5
20	0.69590	4.9	0.4	u	4.8

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	6.2	0.4	u	6.1
2	0.10600	5.5	0.4	u	5.4
3	0.13100	4.9	0.4	u	4.9
4	0.16100	4.5	0.4	u	4.5
5	0.20000	4.3	0.4	u	4.3
6	0.25000	4.1	0.4	u	4.1
7	0.31400	4.0	0.4	u	4.1
8	0.39500	4.1	0.4	u	4.1
9	0.49900	4.2	0.4	u	4.2
10	0.63100	4.4	0.4	u	4.4
11	0.79900	4.7	0.4	u	4.7
12	1.01000	5.1	0.5	u	5.0
13	1.28000	5.6	0.6	u	5.5
14	1.63000	6.1	0.8	u	6.0
15	2.08000	6.6	1.6	u	6.7
16	2.64000	6.9	1.9	m	7.4
17	3.37000	6.7	5.6	m	8.2
18	4.29000	6.4	6.5	m	9.1
19	5.47000	5.5	6.0	d	-
20	6.97000	4.3	10.8	d	-

Sounding: MIA222L4 Client: US Geological Survey
 Location: 4.07 km S of SW 392 & 0.28 km W Tallahassee Rd
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 27-FEB-09
 UTM Coord: E[m] 558824.0 N[m] 2805659.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	31.990	9.2	0.0
2	2.130	18.6	-9.2
3	235.300	65.9	-27.9
4	2.660	--	-93.8

Fit Error[%]: 1.726

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 1

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	49.9	0.4	u	50.1
2	0.00860	40.5	0.4	u	40.4
3	0.01110	32.4	0.4	u	32.5
4	0.01410	26.1	0.4	u	26.1
5	0.01800	21.1	0.4	u	21.0
6	0.02300	17.1	0.4	u	16.9
7	0.02940	13.9	0.4	u	13.8
8	0.03750	11.4	0.4	u	11.4
9	0.04790	9.4	0.4	u	9.5
10	0.06110	7.9	0.4	u	7.9
11	0.07790	6.6	0.4	u	6.7
12	0.09930	5.7	0.4	u	5.8
13	0.12670	5.0	0.4	u	5.0
14	0.16640	4.5	0.4	u	4.5
15	0.20600	4.2	0.4	u	4.3
16	0.26280	4.1	0.4	u	4.1
17	0.33520	4.1	0.4	u	4.1
18	0.42770	4.2	0.4	u	4.2
19	0.54560	4.5	0.4	u	4.4
20	0.69590	4.9	0.4	u	4.9

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	6.2	0.4	u	6.2
2	0.10600	5.5	0.4	u	5.5
3	0.13100	4.9	0.4	u	4.9
4	0.16100	4.5	0.4	u	4.5
5	0.20000	4.3	0.4	u	4.2
6	0.25000	4.1	0.4	u	4.1
7	0.31400	4.0	0.4	u	4.0
8	0.39500	4.1	0.4	u	4.0
9	0.49900	4.2	0.4	u	4.2
10	0.63100	4.4	0.4	u	4.4
11	0.79900	4.7	0.4	u	4.8
12	1.01000	5.1	0.5	u	5.2
13	1.28000	5.6	0.6	u	5.7
14	1.63000	6.1	0.8	u	6.2
15	2.08000	6.6	1.6	u	6.5
16	2.64000	6.9	1.9	u	6.7
17	3.37000	6.7	5.6	u	6.7
18	4.29000	6.4	6.5	u	6.5
19	5.47000	5.5	6.0	d	-
20	6.97000	4.3	10.8	d	-

Sounding: MIA223 Client: US Geological Survey Date: 27-FEB-09
 Location: 2.45 km S of SW 392 St & 0.82 km E Tallahassee Rd UTM Coord: E[m] 559876.0 N[m] 2807328.0
 Project: Saltwater Intrusion Elevation[m]: 0.0
 County: Miami-Dade County

TX loop size: X[m] 37.9 Y[m] 37.9 RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	20.350	7.9	0.0
2	2.180	17.1	-7.9
3	27.610	--	-25.0

Fit Error[%]: 2.316

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 1

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	41.0	0.3	u	40.0
2	0.00860	32.7	0.3	u	32.8
3	0.01110	25.9	0.3	u	26.8
4	0.01410	21.0	0.3	u	21.8
5	0.01800	17.4	0.3	u	17.6
6	0.02300	14.5	0.3	u	14.4
7	0.02940	12.1	0.3	u	11.8
8	0.03750	10.1	0.3	u	9.8
9	0.04790	8.4	0.3	u	8.2
10	0.06110	7.0	0.3	u	6.9
11	0.07790	5.9	0.3	u	5.9
12	0.09930	5.1	0.3	u	5.1
13	0.12670	4.6	0.3	u	4.6
14	0.16640	4.2	0.3	u	4.2
15	0.20600	4.0	0.3	u	4.0
16	0.26280	3.9	0.3	u	3.9
17	0.33520	3.9	0.3	u	3.9
18	0.42770	4.1	0.3	u	4.1
19	0.54560	4.4	0.3	u	4.3
20	0.69590	4.8	0.3	u	4.7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	5.5	0.2	u	5.5
2	0.10600	4.9	0.2	u	4.9
3	0.13100	4.5	0.2	u	4.5
4	0.16100	4.2	0.2	u	4.2
5	0.20000	3.9	0.2	u	4.0
6	0.25000	3.8	0.2	u	3.9
7	0.31400	3.8	0.2	u	3.9
8	0.39500	3.9	0.3	u	3.9
9	0.49900	4.0	0.3	u	4.0
10	0.63100	4.3	0.3	u	4.3
11	0.79900	4.6	0.2	u	4.6
12	1.01000	5.0	0.3	u	5.0
13	1.28000	5.6	0.7	u	5.6
14	1.63000	6.3	1.3	u	6.2
15	2.08000	7.0	1.6	u	7.0
16	2.64000	7.9	3.6	u	7.8
17	3.37000	8.6	6.1	u	8.8
18	4.29000	9.0	15.2	d	-
19	5.47000	9.5	18.9	d	-
20	6.97000	9.0	36.4	d	-

Sounding: MIA223L4 Client: US Geological Survey Date: 27-FEB-09
 Location: 2.45 km S of SW 392 St & 0.82 km E Tallahassee Rd UTM Coord: E[m] 559876.0 N[m] 2807328.0
 Project: Saltwater Intrusion Elevation[m]: 0.0
 County: Miami-Dade County

TX loop size: X[m] 37.9 Y[m] 37.9 RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	19.590	7.6	0.0
2	2.230	18.4	-7.6
3	50.290	93.3	-26.1
4	9.180	--	-119.5

Fit Error[%]: 1.958

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 1

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	40.0	0.3	u	39.2
2	0.00860	31.9	0.3	u	32.0
3	0.01110	25.2	0.3	u	26.1
4	0.01410	20.5	0.3	u	21.1
5	0.01800	16.9	0.3	u	17.1
6	0.02300	14.1	0.3	u	13.9
7	0.02940	11.8	0.3	u	11.5
8	0.03750	9.8	0.3	u	9.5
9	0.04790	8.2	0.3	u	8.0
10	0.06110	6.8	0.3	u	6.8
11	0.07790	5.8	0.3	u	5.8
12	0.09930	5.0	0.3	u	5.1
13	0.12670	4.5	0.3	u	4.5
14	0.16640	4.1	0.3	u	4.1
15	0.20600	3.9	0.3	u	3.9
16	0.26280	3.8	0.3	u	3.8
17	0.33520	3.8	0.3	u	3.9
18	0.42770	4.0	0.3	u	4.0
19	0.54560	4.3	0.3	u	4.3
20	0.69590	4.7	0.3	u	4.7

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	5.5	0.2	u	5.4
2	0.10600	4.9	0.2	u	4.9
3	0.13100	4.5	0.2	u	4.5
4	0.16100	4.2	0.2	u	4.1
5	0.20000	3.9	0.2	u	3.9
6	0.25000	3.8	0.2	u	3.8
7	0.31400	3.8	0.2	u	3.8
8	0.39500	3.9	0.3	u	3.8
9	0.49900	4.0	0.3	u	4.0
10	0.63100	4.3	0.3	u	4.2
11	0.79900	4.6	0.2	u	4.6
12	1.01000	5.0	0.3	u	5.1
13	1.28000	5.6	0.7	u	5.6
14	1.63000	6.3	1.3	u	6.3
15	2.08000	7.0	1.6	u	7.1
16	2.64000	7.9	3.6	u	7.8
17	3.37000	8.6	6.1	u	8.6
18	4.29000	9.0	15.2	d	-
19	5.47000	9.5	18.9	d	-
20	6.97000	9.0	36.4	d	-

Sounding: MIA224 Client: US Geological Survey
 Location: 2.45 km S of SW 392 & 1.88 km E Tallahassee Rd
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 27-FEB-09
 UTM Coord: E[m] 560925.0 N[m] 2807316.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	26.100	6.1	0.0
2	1.960	22.3	-6.1
3	61.540	--	-28.5

Fit Error[%]: 1.246

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 1

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	43.2	0.1	u	43.1
2	0.00860	33.3	0.2	u	32.8
3	0.01110	25.2	0.2	u	25.4
4	0.01410	19.5	0.2	u	19.9
5	0.01800	15.4	0.2	u	15.7
6	0.02300	12.4	0.2	u	12.5
7	0.02940	10.2	0.2	u	10.2
8	0.03750	8.5	0.2	u	8.4
9	0.04790	7.1	0.2	u	7.0
10	0.06110	6.1	0.2	u	6.0
11	0.07790	5.2	0.2	u	5.2
12	0.09930	4.5	0.2	u	4.5
13	0.12670	3.9	0.2	u	4.0
14	0.16640	3.5	0.2	u	3.5
15	0.20600	3.3	0.2	u	3.3
16	0.26280	3.1	0.2	u	3.1
17	0.33520	3.0	0.2	u	3.0
18	0.42770	3.0	0.2	u	3.0
19	0.54560	3.2	0.2	u	3.2
20	0.69590	3.4	0.2	u	3.4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	4.9	0.2	u	4.8
2	0.10600	4.4	0.2	u	4.3
3	0.13100	3.9	0.2	u	3.9
4	0.16100	3.6	0.2	u	3.5
5	0.20000	3.3	0.2	u	3.3
6	0.25000	3.1	0.2	u	3.1
7	0.31400	3.0	0.2	u	3.0
8	0.39500	2.9	0.2	u	3.0
9	0.49900	3.0	0.2	u	3.0
10	0.63100	3.1	0.2	u	3.1
11	0.79900	3.3	0.2	u	3.3
12	1.01000	3.5	0.2	u	3.5
13	1.28000	3.9	0.5	u	3.9
14	1.63000	4.3	0.6	u	4.3
15	2.08000	4.9	0.7	u	4.9
16	2.64000	5.7	1.8	u	5.7
17	3.37000	6.6	4.2	u	6.6
18	4.29000	7.8	9.1	u	7.7
19	5.47000	9.0	12.8	u	9.2
20	6.97000	16.2	46.3	d	-

Sounding: MIA225 Client: US Geological Survey
 Location: 0.05 km W of SW 167 & 0.84 km N Card Sound Rd
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 02-MAR-09
 UTM Coord: E[m] 554172.0 N[m] 2811757.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	311.400	20.3	0.0
2	24.750	10.8	-20.3
3	70.910	97.1	-31.1
4	25.490	--	-128.2

Fit Error[%]: 1.735

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	150.8	0.3	u	146.3
2	0.00860	120.8	0.2	u	121.7
3	0.01110	108.4	0.2	u	105.4
4	0.01410	97.0	0.3	u	94.0
5	0.01800	86.7	0.3	u	85.3
6	0.02300	80.2	0.2	u	78.9
7	0.02940	75.2	0.2	u	74.4
8	0.03750	71.9	0.2	u	71.2
9	0.04790	70.4	0.2	u	69.1
10	0.06110	69.5	0.3	u	67.9
11	0.07790	69.3	0.3	u	67.5
12	0.09930	68.5	0.3	u	67.7
13	0.12670	70.8	0.6	u	68.4
14	0.16640	69.1	1.2	u	69.3
15	0.20600	69.5	1.4	u	69.9
16	0.26280	70.4	2.5	u	70.0
17	0.33520	65.7	3.4	u	69.4
18	0.42770	63.8	5.7	u	68.3
19	0.54560	58.3	11.9	u	67.2
20	0.69590	60.4	28.4	d	-

Sounding: MIA226 Client: US Geological Survey Date: 02-MAR-09
 Location: 0.18 km S of SW 380 St & 0.32 km W of SW 162 Ave UTM Coord: E[m] 554719.0 N[m] 2810805.0
 Project: Saltwater Intrusion Elevation[m]: 0.0
 County: Miami-Dade County

TX loop size: X[m] 37.9 Y[m] 37.9 RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	304.200	18.1	0.0
2	14.490	8.5	-18.1
3	68.290	77.6	-26.6
4	29.720	--	-104.2

Fit Error[%]: 2.441

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.65 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	119.7	0.6	u	118.9
2	0.00860	94.3	0.4	u	95.6
3	0.01110	80.6	0.5	u	80.4
4	0.01410	70.2	0.5	u	70.0
5	0.01800	62.4	0.5	u	62.4
6	0.02300	57.3	0.5	u	57.1
7	0.02940	53.7	0.5	u	53.5
8	0.03750	51.5	0.5	u	51.3
9	0.04790	50.2	0.5	u	50.1
10	0.06110	49.7	0.5	u	49.8
11	0.07790	50.0	0.5	u	50.2
12	0.09930	50.5	0.5	u	51.1
13	0.12670	51.7	0.5	u	52.2
14	0.16640	54.0	0.7	u	53.6
15	0.20600	54.5	0.7	u	54.3
16	0.26280	56.4	1.0	u	54.9
17	0.33520	55.2	1.5	u	55.0
18	0.42770	55.0	2.1	u	55.0
19	0.54560	55.0	3.9	u	54.8
20	0.69590	57.7	7.7	u	55.1

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	50.3	0.5	u	50.5
2	0.10600	51.1	0.4	u	51.3
3	0.13100	52.2	0.5	u	52.1
4	0.16100	53.2	0.5	u	52.9
5	0.20000	54.0	0.4	u	53.4
6	0.25000	53.7	0.8	u	53.5
7	0.31400	52.6	0.7	u	53.0
8	0.39500	50.5	1.1	u	52.0
9	0.49900	48.4	1.3	u	50.5
10	0.63100	47.1	2.1	u	48.8
11	0.79900	47.8	5.0	u	47.0
12	1.01000	46.2	6.0	u	45.4
13	1.28000	47.6	12.1	m	43.6
14	1.63000	49.7	27.3	d	-
15	2.08000	65.7	82.9	d	-
16	2.64000	48.6	100.0	d	-
17	3.37000	32.8	70.2	d	-
18	4.29000	23.3	100.0	d	-
19	5.47000	63.3	100.0	d	-
20	6.97000	19.1	100.0	d	-

Sounding: MIA227 Client: US Geological Survey Date: 02-MAR-09
 Location: 0.35 km S of SW 380 St & 0.32 km W of SW 162 Ave UTM Coord: E[m] 554717.0 N[m] 2810623.0
 Project: Saltwater Intrusion Elevation[m]: 0.0
 County: Miami-Dade County

TX loop size: X[m] 37.9 Y[m] 37.9 RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	184.200	15.4	0.0
2	21.080	17.2	-15.4
3	84.420	58.9	-32.6
4	31.600	--	-91.6

Fit Error[%]: 1.336

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	100.3	2.8	u	101.8
2	0.00860	87.7	0.2	u	85.4
3	0.01110	73.3	0.1	u	73.4
4	0.01410	63.6	0.1	u	64.2
5	0.01800	56.4	0.1	u	57.0
6	0.02300	51.5	0.1	u	51.7
7	0.02940	48.2	0.2	u	48.1
8	0.03750	46.2	0.2	u	45.8
9	0.04790	45.1	0.2	u	44.7
10	0.06110	44.7	0.3	u	44.4
11	0.07790	45.0	0.3	u	44.9
12	0.09930	45.6	0.3	u	46.0
13	0.12670	47.0	0.3	u	47.3
14	0.16640	49.1	0.4	u	48.9
15	0.20600	49.8	0.4	u	49.9
16	0.26280	51.7	0.6	u	50.7
17	0.33520	51.0	0.9	u	51.2
18	0.42770	51.0	1.3	u	51.4
19	0.54560	51.2	1.5	u	51.8
20	0.69590	52.5	6.7	u	52.4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	45.1	0.6	u	45.3
2	0.10600	45.9	0.7	u	46.2
3	0.13100	47.1	0.8	u	47.3
4	0.16100	48.3	1.4	u	48.3
5	0.20000	49.3	2.2	u	49.1
6	0.25000	49.5	4.0	u	49.4
7	0.31400	49.3	7.0	u	49.4
8	0.39500	48.8	13.3	u	48.7
9	0.49900	48.2	23.8	u	47.8
10	0.63100	51.0	45.7	d	-
11	0.79900	55.5	90.0	d	-
12	1.01000	66.7	100.0	d	-
13	1.28000	70.5	100.0	d	-
14	1.63000	56.3	100.0	d	-
15	2.08000	26.9	56.8	d	-
16	2.64000	16.4	94.3	d	-
17	3.37000	20.0	100.0	d	-
18	4.29000	27.8	100.0	d	-
19	5.47000	9.2	100.0	d	-
20	6.97000	11.6	100.0	d	-

Sounding: MIA228 Client: US Geological Survey Date: 02-MAR-09
 Location: 0.05 km S of SW 388 St & 0.31 km E of SW 157 Ave UTM Coord: E[m] 556179.0 N[m] 2810102.0
 Project: Saltwater Intrusion Elevation[m]: 0.0
 County: Miami-Dade County

TX loop size: X[m] 37.9 Y[m] 37.9 RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	266.400	18.0	0.0
2	7.230	6.1	-18.0
3	100.700	23.0	-24.1
4	35.180	--	-47.2

Fit Error[%]: 2.080

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	111.8	0.3	u	111.7
2	0.00860	85.0	0.3	u	85.8
3	0.01110	69.3	0.3	u	68.9
4	0.01410	58.0	0.3	u	57.6
5	0.01800	49.7	0.3	u	49.6
6	0.02300	44.3	0.3	u	44.2
7	0.02940	40.5	0.3	u	40.6
8	0.03750	38.2	0.3	u	38.5
9	0.04790	37.0	0.3	u	37.3
10	0.06110	36.6	0.3	u	36.8
11	0.07790	36.8	0.3	u	36.8
12	0.09930	37.1	0.3	u	37.1
13	0.12670	37.7	0.3	u	37.5
14	0.16640	38.6	0.4	u	37.8
15	0.20600	38.5	0.2	u	38.2
16	0.26280	39.1	0.4	u	38.5
17	0.33520	39.0	0.5	u	38.9
18	0.42770	39.4	0.7	u	39.5
19	0.54560	40.2	0.7	u	40.4
20	0.69590	42.8	1.0	u	41.6

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	36.8	0.4	u	36.9
2	0.10600	37.1	0.4	u	37.1
3	0.13100	37.6	0.4	u	37.3
4	0.16100	37.8	0.3	u	37.5
5	0.20000	37.9	0.5	u	37.7
6	0.25000	37.5	0.4	u	37.7
7	0.31400	36.9	0.5	u	37.7
8	0.39500	36.4	0.9	u	37.5
9	0.49900	36.3	1.3	u	37.5
10	0.63100	36.2	2.6	u	37.2
11	0.79900	36.9	2.2	u	37.1
12	1.01000	37.8	7.2	u	36.9
13	1.28000	37.6	10.0	u	36.9
14	1.63000	37.0	13.4	d	-
15	2.08000	37.9	23.4	d	-
16	2.64000	39.2	34.5	d	-
17	3.37000	43.4	78.8	d	-
18	4.29000	34.7	74.0	d	-
19	5.47000	41.6	100.0	d	-
20	6.97000	33.0	100.0	d	-

Sounding: MIA229 Client: US Geological Survey
 Location: 0.05 km N of SW 384 St & 0.08 E of 3 Mile Rd
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 02-MAR-09
 UTM Coord: E[m] 557588.0 N[m] 2810641.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	264.100	16.8	0.0
2	7.210	9.1	-16.8
3	43.980	35.6	-25.9
4	16.400	--	-61.6

Fit Error[%]: 1.072

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	114.9	0.1	u	114.0
2	0.00860	86.6	0.1	u	87.5
3	0.01110	68.8	0.2	u	68.8
4	0.01410	55.3	0.2	u	55.3
5	0.01800	45.4	0.2	u	45.5
6	0.02300	38.5	0.2	u	38.5
7	0.02940	33.6	0.2	u	33.6
8	0.03750	30.3	0.2	u	30.2
9	0.04790	28.0	0.2	u	27.9
10	0.06110	26.7	0.2	u	26.6
11	0.07790	25.9	0.2	u	25.9
12	0.09930	25.6	0.2	u	25.7
13	0.12670	25.7	0.2	u	25.7
14	0.16640	26.1	0.2	u	25.9
15	0.20600	26.1	0.2	u	26.0
16	0.26280	26.3	0.1	u	26.1
17	0.33520	26.2	0.2	u	26.1
18	0.42770	26.3	0.3	u	26.0
19	0.54560	26.6	0.3	u	26.1
20	0.69590	27.9	0.6	m	26.4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	25.6	0.4	u	25.7
2	0.10600	25.5	0.4	u	25.6
3	0.13100	25.5	0.4	u	25.6
4	0.16100	25.6	0.4	u	25.6
5	0.20000	25.6	0.4	u	25.6
6	0.25000	25.4	0.4	u	25.5
7	0.31400	24.9	0.6	u	25.1
8	0.39500	24.3	0.4	u	24.7
9	0.49900	23.8	1.2	u	24.1
10	0.63100	23.4	1.3	u	23.5
11	0.79900	23.4	1.2	m	22.8
12	1.01000	23.1	1.5	m	22.2
13	1.28000	22.3	4.3	m	21.6
14	1.63000	21.0	5.1	m	21.1
15	2.08000	18.5	7.6	m	20.7
16	2.64000	17.1	10.8	d	-
17	3.37000	14.1	7.9	d	-
18	4.29000	11.5	22.3	d	-
19	5.47000	8.2	13.6	d	-
20	6.97000	6.1	9.2	d	-

Sounding: MIA230 Client: US Geological Survey
 Location: 0.05 km N of SW 384 St & 087 km E of 3 Mile Rd
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 02-MAR-09
 UTM Coord: E[m] 558393.0 N[m] 2810648.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	81.830	8.1	0.0
2	44.710	6.4	-8.1
3	2.660	8.1	-14.5
4	22.870	--	-22.7

Fit Error[%]: 2.601

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	84.6	0.3	u	83.9
2	0.00860	67.2	0.2	u	68.2
3	0.01110	53.6	0.2	u	54.7
4	0.01410	42.8	0.2	u	43.1
5	0.01800	34.0	0.2	u	33.7
6	0.02300	27.0	0.2	u	26.4
7	0.02940	21.5	0.2	u	20.9
8	0.03750	17.4	0.2	u	17.0
9	0.04790	14.4	0.2	u	14.2
10	0.06110	12.3	0.2	u	12.3
11	0.07790	10.8	0.2	u	11.0
12	0.09930	9.9	0.2	u	10.1
13	0.12670	9.4	0.2	u	9.6
14	0.16640	9.2	0.2	u	9.4
15	0.20600	9.2	0.2	u	9.4
16	0.26280	9.6	0.2	u	9.6
17	0.33520	10.1	0.2	u	10.0
18	0.42770	10.8	0.3	u	10.6
19	0.54560	11.7	0.2	u	11.4
20	0.69590	13.0	0.3	u	12.4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	10.5	0.3	u	10.5
2	0.10600	9.8	0.3	u	9.9
3	0.13100	9.4	0.3	u	9.6
4	0.16100	9.3	0.3	u	9.4
5	0.20000	9.3	0.3	u	9.3
6	0.25000	9.5	0.3	u	9.4
7	0.31400	9.8	0.3	u	9.7
8	0.39500	10.3	0.3	u	10.1
9	0.49900	10.8	0.4	u	10.6
10	0.63100	11.4	0.6	u	11.2
11	0.79900	11.9	0.9	u	11.9
12	1.01000	12.5	1.0	u	12.6
13	1.28000	13.3	1.9	u	13.3
14	1.63000	14.0	2.4	u	14.1
15	2.08000	15.0	4.8	u	14.9
16	2.64000	15.2	9.9	u	15.6
17	3.37000	17.9	16.8	m	16.6
18	4.29000	24.7	48.0	d	-
19	5.47000	26.3	58.1	d	-
20	6.97000	83.0	100.0	d	-

Sounding: MIA230L3 Client: US Geological Survey
 Location: 0.05 km N of SW 384 St & 087 km E of 3 Mile Rd
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 02-MAR-09
 UTM Coord: E[m] 558393.0 N[m] 2810648.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	202.700	13.0	0.0
2	3.280	11.0	-13.0
3	23.490	--	-24.0

Fit Error[%]: 3.365

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	84.6	0.3	u	89.1
2	0.00860	67.2	0.2	u	68.2
3	0.01110	53.6	0.2	u	53.3
4	0.01410	42.8	0.2	u	41.9
5	0.01800	34.0	0.2	u	33.0
6	0.02300	27.0	0.2	u	26.1
7	0.02940	21.5	0.2	u	20.8
8	0.03750	17.4	0.2	u	17.0
9	0.04790	14.4	0.2	u	14.3
10	0.06110	12.3	0.2	u	12.4
11	0.07790	10.8	0.2	u	11.1
12	0.09930	9.9	0.2	u	10.2
13	0.12670	9.4	0.2	u	9.7
14	0.16640	9.2	0.2	u	9.4
15	0.20600	9.2	0.2	u	9.4
16	0.26280	9.6	0.2	u	9.6
17	0.33520	10.1	0.2	u	10.0
18	0.42770	10.8	0.3	u	10.6
19	0.54560	11.7	0.2	u	11.4
20	0.69590	13.0	0.3	u	12.4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	10.5	0.3	u	10.6
2	0.10600	9.8	0.3	u	10.0
3	0.13100	9.4	0.3	u	9.6
4	0.16100	9.3	0.3	u	9.4
5	0.20000	9.3	0.3	u	9.3
6	0.25000	9.5	0.3	u	9.4
7	0.31400	9.8	0.3	u	9.7
8	0.39500	10.3	0.3	u	10.1
9	0.49900	10.8	0.4	u	10.6
10	0.63100	11.4	0.6	u	11.2
11	0.79900	11.9	0.9	u	11.8
12	1.01000	12.5	1.0	u	12.6
13	1.28000	13.3	1.9	u	13.3
14	1.63000	14.0	2.4	u	14.2
15	2.08000	15.0	4.8	u	15.0
16	2.64000	15.2	9.9	u	15.8
17	3.37000	17.9	16.8	m	16.8
18	4.29000	24.7	48.0	d	-
19	5.47000	26.3	58.1	d	-
20	6.97000	83.0	100.0	d	-

Sounding: MIA231 Client: US Geological Survey
 Location: East of SW 137th St
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 03-MAR-09
 UTM Coord: E[m] 559404.0 N[m] 2809111.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	99.070	10.2	0.0
2	1.900	16.6	-10.2
3	383.600	--	-26.8

Fit Error[%]: 3.275

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.65 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 1

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	69.7	0.5	u	70.4
2	0.00860	53.7	0.4	u	53.3
3	0.01110	41.2	0.5	u	41.3
4	0.01410	32.1	0.5	u	32.3
5	0.01800	25.2	0.4	u	25.4
6	0.02300	20.0	0.5	u	20.2
7	0.02940	16.0	0.5	u	16.1
8	0.03750	13.0	0.4	u	13.0
9	0.04790	10.7	0.5	u	10.6
10	0.06110	8.8	0.5	u	8.7
11	0.07790	7.4	0.4	u	7.2
12	0.09930	6.2	0.5	u	6.1
13	0.12670	5.3	0.5	u	5.3
14	0.16640	4.7	0.4	u	4.7
15	0.20600	4.3	0.5	u	4.3
16	0.26280	4.1	0.5	u	4.2
17	0.33520	4.1	0.4	u	4.1
18	0.42770	4.2	0.4	u	4.2
19	0.54560	4.5	0.4	u	4.4
20	0.69590	5.0	0.4	u	4.8

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	6.7	0.4	u	6.6
2	0.10600	5.9	0.4	u	5.8
3	0.13100	5.2	0.4	u	5.1
4	0.16100	4.7	0.4	u	4.7
5	0.20000	4.3	0.4	u	4.3
6	0.25000	4.1	0.4	u	4.1
7	0.31400	3.9	0.4	u	4.0
8	0.39500	4.0	0.4	u	4.1
9	0.49900	4.1	0.4	u	4.2
10	0.63100	4.4	0.4	u	4.4
11	0.79900	4.8	0.4	u	4.8
12	1.01000	5.3	0.5	u	5.3
13	1.28000	5.9	0.9	u	6.0
14	1.63000	6.7	1.0	u	6.9
15	2.08000	7.9	2.0	u	8.1
16	2.64000	9.4	3.1	u	9.6
17	3.37000	12.6	9.1	u	11.5
18	4.29000	20.3	24.8	d	-
19	5.47000	12.5	24.0	d	-
20	6.97000	6.4	13.6	d	-

Sounding: MIA232 Client: US Geological Survey
 Location: Machette Trail
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 03-MAR-09
 UTM Coord: E[m] 558515.0 N[m] 2807305.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	67.120	11.0	0.0
2	2.900	19.4	-11.0
3	228.000	100.5	-30.4
4	1.690	--	-130.9

Fit Error[%]: 2.116

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.65 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 1

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	64.1	0.5	u	65.7
2	0.00860	52.2	0.3	u	51.5
3	0.01110	41.9	0.4	u	41.0
4	0.01410	33.6	0.4	u	32.9
5	0.01800	26.9	0.4	u	26.6
6	0.02300	21.7	0.4	u	21.6
7	0.02940	17.5	0.4	u	17.7
8	0.03750	14.3	0.4	u	14.7
9	0.04790	11.9	0.4	u	12.2
10	0.06110	10.1	0.4	u	10.3
11	0.07790	8.7	0.4	u	8.7
12	0.09930	7.6	0.4	u	7.6
13	0.12670	6.9	0.4	u	6.8
14	0.16640	6.3	0.4	u	6.2
15	0.20600	6.0	0.4	u	5.9
16	0.26280	5.8	0.4	u	5.8
17	0.33520	5.9	0.3	u	5.9
18	0.42770	6.1	0.3	u	6.2
19	0.54560	6.7	0.3	u	6.7
20	0.69590	7.7	0.4	u	7.5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	8.1	0.3	u	8.1
2	0.10600	7.4	0.3	u	7.3
3	0.13100	6.8	0.3	u	6.7
4	0.16100	6.3	0.3	u	6.2
5	0.20000	6.0	0.3	u	5.9
6	0.25000	5.8	0.3	u	5.8
7	0.31400	5.7	0.3	u	5.8
8	0.39500	5.8	0.3	u	5.9
9	0.49900	6.2	0.3	u	6.3
10	0.63100	6.7	0.3	u	6.8
11	0.79900	7.5	0.2	u	7.5
12	1.01000	8.4	0.6	u	8.4
13	1.28000	9.4	0.8	u	9.4
14	1.63000	10.4	2.0	u	10.4
15	2.08000	11.1	3.1	u	11.1
16	2.64000	11.3	4.8	u	11.3
17	3.37000	10.3	14.3	d	-
18	4.29000	9.4	12.6	d	-
19	5.47000	8.0	14.9	d	-
20	6.97000	6.6	17.3	d	-

Sounding: MIA232L3 Client: US Geological Survey
 Location: Machette Trail
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 03-MAR-09
 UTM Coord: E[m] 558515.0 N[m] 2807305.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	67.590	11.0	0.0
2	2.890	18.8	-11.0
3	149.100	--	-29.8

Fit Error[%]: 2.510

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.65 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 1

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	64.1	0.5	u	65.8
2	0.00860	52.2	0.3	u	51.6
3	0.01110	41.9	0.4	u	41.0
4	0.01410	33.6	0.4	u	33.0
5	0.01800	26.9	0.4	u	26.6
6	0.02300	21.7	0.4	u	21.6
7	0.02940	17.5	0.4	u	17.7
8	0.03750	14.3	0.4	u	14.7
9	0.04790	11.9	0.4	u	12.2
10	0.06110	10.1	0.4	u	10.2
11	0.07790	8.7	0.4	u	8.7
12	0.09930	7.6	0.4	u	7.6
13	0.12670	6.9	0.4	u	6.8
14	0.16640	6.3	0.4	u	6.2
15	0.20600	6.0	0.4	u	6.0
16	0.26280	5.8	0.4	u	5.9
17	0.33520	5.9	0.3	u	5.9
18	0.42770	6.1	0.3	u	6.2
19	0.54560	6.7	0.3	u	6.7
20	0.69590	7.7	0.4	u	7.4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	8.1	0.3	u	8.1
2	0.10600	7.4	0.3	u	7.3
3	0.13100	6.8	0.3	u	6.7
4	0.16100	6.3	0.3	u	6.2
5	0.20000	6.0	0.3	u	5.9
6	0.25000	5.8	0.3	u	5.8
7	0.31400	5.7	0.3	u	5.8
8	0.39500	5.8	0.3	u	6.0
9	0.49900	6.2	0.3	u	6.3
10	0.63100	6.7	0.3	u	6.7
11	0.79900	7.5	0.2	u	7.4
12	1.01000	8.4	0.6	u	8.2
13	1.28000	9.4	0.8	u	9.4
14	1.63000	10.4	2.0	u	10.7
15	2.08000	11.1	3.1	m	12.5
16	2.64000	11.3	4.8	m	14.7
17	3.37000	10.3	14.3	d	-
18	4.29000	9.4	12.6	d	-
19	5.47000	8.0	14.9	d	-
20	6.97000	6.6	17.3	d	-

Sounding: MIA233 Client: US Geological Survey Date: 03-MAR-09
 Location: 0.11 km N of SW 408 St & 0.50 km E Card Sound Rd UTM Coord: E[m] 556293.0 N[m] 2808246.0
 Project: Saltwater Intrusion Elevation[m]: 0.0
 County: Miami-Dade County

TX loop size: X[m] 37.9 Y[m] 37.9 RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	194.100	16.1	0.0
2	1.870	2.1	-16.1
3	59.580	106.4	-18.2
4	25.240	--	-124.7

Fit Error[%]: 1.913

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 1

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	91.7	0.3	u	92.1
2	0.00860	67.6	0.3	u	67.8
3	0.01110	52.4	0.3	u	52.1
4	0.01410	41.8	0.3	u	41.6
5	0.01800	34.3	0.3	u	34.3
6	0.02300	29.3	0.3	u	29.2
7	0.02940	25.9	0.3	u	25.9
8	0.03750	23.7	0.3	u	23.7
9	0.04790	22.4	0.3	u	22.5
10	0.06110	21.9	0.3	u	22.0
11	0.07790	22.0	0.3	u	22.1
12	0.09930	22.6	0.3	u	22.7
13	0.12670	23.7	0.3	u	23.8
14	0.16640	25.6	0.3	u	25.4
15	0.20600	26.9	0.3	u	27.1
16	0.26280	29.4	0.3	u	29.2
17	0.33520	31.5	0.5	u	31.6
18	0.42770	34.1	0.4	u	34.0
19	0.54560	36.5	1.1	u	36.5
20	0.69590	41.3	2.5	u	39.1

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	44.0	78.3	d	-
2	0.10600	23.2	0.7	u	23.0
3	0.13100	24.2	0.6	u	23.9
4	0.16100	25.4	0.7	u	25.2
5	0.20000	26.8	0.4	u	26.7
6	0.25000	28.4	0.7	u	28.4
7	0.31400	29.9	0.8	u	30.2
8	0.39500	31.5	0.8	u	31.9
9	0.49900	32.8	1.2	u	33.5
10	0.63100	33.8	1.1	u	34.5
11	0.79900	34.8	2.2	u	35.2
12	1.01000	35.2	3.8	u	35.1
13	1.28000	35.1	3.7	u	35.1
14	1.63000	32.1	10.7	m	34.5
15	2.08000	31.7	16.1	d	-
16	2.64000	30.7	18.2	d	-
17	3.37000	25.1	19.4	d	-
18	4.29000	27.2	48.8	d	-
19	5.47000	17.8	35.1	d	-
20	6.97000	17.3	47.5	d	-

Sounding: MIA233F Client: US Geological Survey Date: 03-MAR-09
 Location: 0.11 km N of SW 408 St & 0.50 km E Card Sound Rd UTM Coord: E[m] 556293.0 N[m] 2808246.0
 Project: Saltwater Intrusion Elevation[m]: 0.0
 County: Miami-Dade County

TX loop size: X[m] 37.9 Y[m] 37.9 RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	178.300	15.4	0.0
2	3.500	4.1	-15.4
3	62.070	106.0	-19.6
4	23.350	--	-125.6

Fit Error[%]: 1.992

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 1

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	91.7	0.3	u	91.0
2	0.00860	67.6	0.3	u	67.5
3	0.01110	52.4	0.3	u	52.1
4	0.01410	41.8	0.3	u	41.7
5	0.01800	34.3	0.3	u	34.5
6	0.02300	29.3	0.3	u	29.4
7	0.02940	25.9	0.3	u	26.0
8	0.03750	23.7	0.3	u	23.9
9	0.04790	22.4	0.3	u	22.6
10	0.06110	21.9	0.3	u	22.1
11	0.07790	22.0	0.3	u	22.1
12	0.09930	22.6	0.3	u	22.7
13	0.12670	23.7	0.3	u	23.7
14	0.16640	25.6	0.3	u	25.4
15	0.20600	26.9	0.3	u	27.0
16	0.26280	29.4	0.3	u	29.2
17	0.33520	31.5	0.5	u	31.6
18	0.42770	34.1	0.4	u	34.1
19	0.54560	36.5	1.1	u	36.7
20	0.69590	41.3	2.5	u	39.3

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	44.0	78.3	d	-
2	0.10600	23.2	0.7	u	22.9
3	0.13100	24.2	0.6	u	23.8
4	0.16100	25.4	0.7	u	25.0
5	0.20000	26.8	0.4	u	26.6
6	0.25000	28.4	0.7	u	28.3
7	0.31400	29.9	0.8	u	30.3
8	0.39500	31.5	0.8	u	32.0
9	0.49900	32.8	1.2	u	33.6
10	0.63100	33.8	1.1	u	34.6
11	0.79900	34.8	2.2	u	35.2
12	1.01000	35.2	3.8	u	35.0
13	1.28000	35.1	3.7	u	34.8
14	1.63000	32.1	10.7	m	34.0
15	2.08000	31.7	16.1	d	-
16	2.64000	30.7	18.2	d	-
17	3.37000	25.1	19.4	d	-
18	4.29000	27.2	48.8	d	-
19	5.47000	17.8	35.1	d	-
20	6.97000	17.3	47.5	d	-

Sounding: MIA233L3 Client: US Geological Survey Date: 03-MAR-09
 Location: 0.11 km N of SW 408 St & 0.50 km E Card Sound Rd UTM Coord: E[m] 556293.0 N[m] 2808246.0
 Project: Saltwater Intrusion Elevation[m]: 0.0
 County: Miami-Dade County

TX loop size: X[m] 37.9 Y[m] 37.9 RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	239.400	16.2	0.0
2	1.140	1.2	-16.2
3	54.570	--	-17.5

Fit Error[%]: 2.482

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 1

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	91.7	0.3	u	91.5
2	0.00860	67.6	0.3	u	67.4
3	0.01110	52.4	0.3	u	51.9
4	0.01410	41.8	0.3	u	41.5
5	0.01800	34.3	0.3	u	34.3
6	0.02300	29.3	0.3	u	29.3
7	0.02940	25.9	0.3	u	26.0
8	0.03750	23.7	0.3	u	23.9
9	0.04790	22.4	0.3	u	22.7
10	0.06110	21.9	0.3	u	22.3
11	0.07790	22.0	0.3	u	22.4
12	0.09930	22.6	0.3	u	23.0
13	0.12670	23.7	0.3	u	24.0
14	0.16640	25.6	0.3	u	25.4
15	0.20600	26.9	0.3	u	26.8
16	0.26280	29.4	0.3	u	28.7
17	0.33520	31.5	0.5	u	30.7
18	0.42770	34.1	0.4	u	33.1
19	0.54560	36.5	1.1	u	35.7
20	0.69590	39.3	2.5	d	-

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	44.0	78.3	d	-
2	0.10600	23.2	0.7	u	23.2
3	0.13100	24.2	0.6	u	24.1
4	0.16100	25.4	0.7	u	25.2
5	0.20000	26.8	0.4	u	26.5
6	0.25000	28.4	0.7	u	28.0
7	0.31400	29.9	0.8	u	29.6
8	0.39500	31.5	0.8	u	31.4
9	0.49900	32.8	1.2	u	33.1
10	0.63100	33.8	1.1	u	34.9
11	0.79900	34.8	2.2	u	36.4
12	1.01000	35.2	3.8	m	38.4
13	1.28000	35.1	3.7	m	39.6
14	1.63000	32.1	10.7	d	-
15	2.08000	31.7	16.1	d	-
16	2.64000	30.7	18.2	d	-
17	3.37000	25.1	19.4	d	-
18	4.29000	27.2	48.8	d	-
19	5.47000	17.8	35.1	d	-
20	6.97000	17.3	47.5	d	-

Sounding: MIA233F3 Client: US Geological Survey Date: 03-MAR-09
 Location: 0.11 km N of SW 408 St & 0.50 km E Card Sound Rd UTM Coord: E[m] 556293.0 N[m] 2808246.0
 Project: Saltwater Intrusion Elevation[m]: 0.0
 County: Miami-Dade County

TX loop size: X[m] 37.9 Y[m] 37.9 RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	218.500	15.2	0.0
2	3.500	4.0	-15.2
3	57.860	--	-19.3

Fit Error[%]: 3.330

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 1

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	91.7	0.3	u	90.2
2	0.00860	67.6	0.3	u	66.9
3	0.01110	52.4	0.3	u	51.8
4	0.01410	41.8	0.3	u	41.6
5	0.01800	34.3	0.3	u	34.5
6	0.02300	29.3	0.3	u	29.6
7	0.02940	25.9	0.3	u	26.2
8	0.03750	23.7	0.3	u	24.1
9	0.04790	22.4	0.3	u	22.9
10	0.06110	21.9	0.3	u	22.3
11	0.07790	22.0	0.3	u	22.4
12	0.09930	22.6	0.3	u	22.9
13	0.12670	23.7	0.3	u	23.9
14	0.16640	25.6	0.3	u	25.4
15	0.20600	26.9	0.3	u	26.8
16	0.26280	29.4	0.3	u	28.7
17	0.33520	31.5	0.5	u	30.8
18	0.42770	34.1	0.4	u	33.3
19	0.54560	36.5	1.1	u	36.0
20	0.69590	41.3	2.5	u	39.2

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	44.0	78.3	d	-
2	0.10600	23.2	0.7	u	23.1
3	0.13100	24.2	0.6	u	24.0
4	0.16100	25.4	0.7	u	25.1
5	0.20000	26.8	0.4	u	26.4
6	0.25000	28.4	0.7	u	28.0
7	0.31400	29.9	0.8	u	29.6
8	0.39500	31.5	0.8	u	31.6
9	0.49900	32.8	1.2	u	33.3
10	0.63100	33.8	1.1	u	35.4
11	0.79900	34.8	2.2	u	37.1
12	1.01000	35.2	3.8	m	39.1
13	1.28000	35.1	3.7	m	40.6
14	1.63000	32.1	10.7	m	42.7
15	2.08000	31.7	16.1	d	-
16	2.64000	30.7	18.2	d	-
17	3.37000	25.1	19.4	d	-
18	4.29000	27.2	48.8	d	-
19	5.47000	17.8	35.1	d	-
20	6.97000	17.3	47.5	d	-

Sounding: MIA234 Client: US Geological Survey
 Location: 2.83 km N of SW 424 St & 0.40 km E of US Hwy 1
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 03-MAR-09
 UTM Coord: E[m] 553764.0 N[m] 2809315.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	161.700	29.3	0.0
2	5.470	1.3	-29.3
3	101.400	72.6	-30.6
4	31.040	--	-103.3

Fit Error[%]: 3.215

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	147.3	0.3	u	144.5
2	0.00860	123.5	0.4	u	128.8
3	0.01110	116.4	0.5	u	116.0
4	0.01410	107.6	0.5	u	106.0
5	0.01800	99.2	0.5	u	98.2
6	0.02300	93.7	0.5	u	92.7
7	0.02940	89.6	0.4	u	89.2
8	0.03750	87.1	0.4	u	87.2
9	0.04790	85.7	0.4	u	86.8
10	0.06110	85.7	0.4	u	87.2
11	0.07790	86.9	0.4	u	88.2
12	0.09930	87.2	0.6	u	88.8
13	0.12670	88.0	0.4	u	88.7
14	0.16640	88.3	0.4	u	87.0
15	0.20600	85.8	0.7	u	84.6
16	0.26280	83.7	0.9	u	81.3
17	0.33520	77.1	1.1	u	77.7
18	0.42770	71.9	2.3	u	74.4
19	0.54560	69.1	2.6	u	71.8
20	0.69590	70.2	6.0	u	70.2

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	87.5	0.3	u	88.1
2	0.10600	88.3	0.2	u	88.4
3	0.13100	88.9	0.2	u	87.6
4	0.16100	88.2	0.8	u	85.9
5	0.20000	84.9	0.6	u	83.1
6	0.25000	79.9	1.2	u	79.2
7	0.31400	73.5	1.0	u	74.9
8	0.39500	68.2	1.2	u	70.3
9	0.49900	64.7	2.3	u	65.9
10	0.63100	62.8	3.1	u	61.8
11	0.79900	61.2	4.3	u	58.1
12	1.01000	63.1	14.3	d	-
13	1.28000	67.6	11.4	d	-
14	1.63000	70.4	21.5	d	-
15	2.08000	101.2	100.0	d	-
16	2.64000	192.0	100.0	d	-
17	3.37000	113.9	100.0	d	-
18	4.29000	31.2	77.9	d	-
19	5.47000	14.3	56.5	d	-
20	6.97000	8.7	31.8	d	-

Sounding: MIA234F Client: US Geological Survey
 Location: 2.83 km N of SW 424 St & 0.40 km E of US Hwy 1
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 03-MAR-09
 UTM Coord: E[m] 553764.0 N[m] 2809315.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	159.200	29.8	0.0
2	3.500	.8	-29.8
3	101.800	72.6	-30.7
4	30.960	--	-103.3

Fit Error[%]: 3.241

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	147.3	0.3	u	143.9
2	0.00860	123.5	0.4	u	128.8
3	0.01110	116.4	0.5	u	116.2
4	0.01410	107.6	0.5	u	106.1
5	0.01800	99.2	0.5	u	98.3
6	0.02300	93.7	0.5	u	92.6
7	0.02940	89.6	0.4	u	89.2
8	0.03750	87.1	0.4	u	87.1
9	0.04790	85.7	0.4	u	86.8
10	0.06110	85.7	0.4	u	87.1
11	0.07790	86.9	0.4	u	88.1
12	0.09930	87.2	0.6	u	88.7
13	0.12670	88.0	0.4	u	88.7
14	0.16640	88.3	0.4	u	86.9
15	0.20600	85.8	0.7	u	84.7
16	0.26280	83.7	0.9	u	81.2
17	0.33520	77.1	1.1	u	77.8
18	0.42770	71.9	2.3	u	74.4
19	0.54560	69.1	2.6	u	71.8
20	0.69590	70.2	6.0	u	70.1

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	87.5	0.3	u	88.1
2	0.10600	88.3	0.2	u	88.3
3	0.13100	88.9	0.2	u	87.7
4	0.16100	88.2	0.8	u	85.8
5	0.20000	84.9	0.6	u	83.1
6	0.25000	79.9	1.2	u	79.1
7	0.31400	73.5	1.0	u	75.0
8	0.39500	68.2	1.2	u	70.2
9	0.49900	64.7	2.3	u	65.9
10	0.63100	62.8	3.1	u	61.7
11	0.79900	61.2	4.3	u	58.1
12	1.01000	63.1	14.3	d	-
13	1.28000	67.6	11.4	d	-
14	1.63000	70.4	21.5	d	-
15	2.08000	101.2	100.0	d	-
16	2.64000	192.0	100.0	d	-
17	3.37000	113.9	100.0	d	-
18	4.29000	31.2	77.9	d	-
19	5.47000	14.3	56.5	d	-
20	6.97000	8.7	31.8	d	-

Sounding: MIA235 Client: US Geological Survey
 Location: S CEMEX quarry E of US1
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 04-MAR-09
 UTM Coord: E[m] 554067.0 N[m] 2807176.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	276.000	20.8	0.0
2	3.430	1.7	-20.8
3	106.700	95.7	-22.5
4	27.570	--	-118.2

Fit Error[%]: 1.903

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	118.4	0.5	u	118.5
2	0.00860	93.3	0.5	u	94.2
3	0.01110	79.2	0.5	u	78.9
4	0.01410	69.3	0.5	u	68.9
5	0.01800	61.9	0.5	u	62.0
6	0.02300	57.7	0.5	u	57.6
7	0.02940	55.0	0.5	u	55.1
8	0.03750	54.1	0.5	u	54.2
9	0.04790	54.4	0.5	u	54.4
10	0.06110	55.8	0.5	u	55.7
11	0.07790	58.1	0.5	u	58.0
12	0.09930	60.6	0.4	u	60.9
13	0.12670	63.9	0.5	u	64.2
14	0.16640	68.1	0.6	u	67.8
15	0.20600	69.5	0.6	u	69.8
16	0.26280	73.2	1.6	u	71.3
17	0.33520	72.5	1.1	u	71.3
18	0.42770	72.9	2.2	u	70.6
19	0.54560	75.0	3.4	m	69.2
20	0.69590	81.6	7.4	m	68.4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	59.3	0.8	u	59.2
2	0.10600	61.7	0.6	u	61.6
3	0.13100	64.2	0.7	u	64.2
4	0.16100	66.7	0.8	u	66.7
5	0.20000	67.8	0.6	u	68.4
6	0.25000	68.0	1.2	u	69.1
7	0.31400	66.5	2.3	u	68.2
8	0.39500	64.7	1.8	u	66.3
9	0.49900	62.3	4.5	u	63.2
10	0.63100	61.3	5.0	u	60.0
11	0.79900	55.7	7.7	u	56.4
12	1.01000	54.2	6.2	u	53.5
13	1.28000	49.7	12.7	u	50.2
14	1.63000	49.4	16.3	d	-
15	2.08000	36.2	16.3	d	-
16	2.64000	36.2	29.6	d	-
17	3.37000	34.6	47.6	d	-
18	4.29000	24.9	38.0	d	-
19	5.47000	18.9	43.3	d	-
20	6.97000	28.2	100.0	d	-

Sounding: MIA235F Client: US Geological Survey
 Location: S CEMEX quarry E of US1
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 04-MAR-09
 UTM Coord: E[m] 554067.0 N[m] 2807176.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	274.500	20.8	0.0
2	3.500	1.7	-20.8
3	105.900	96.3	-22.5
4	27.460	--	-118.8

Fit Error[%]: 1.897

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	118.4	0.5	u	118.2
2	0.00860	93.3	0.5	u	94.0
3	0.01110	79.2	0.5	u	78.8
4	0.01410	69.3	0.5	u	68.8
5	0.01800	61.9	0.5	u	62.0
6	0.02300	57.7	0.5	u	57.7
7	0.02940	55.0	0.5	u	55.2
8	0.03750	54.1	0.5	u	54.2
9	0.04790	54.4	0.5	u	54.5
10	0.06110	55.8	0.5	u	55.8
11	0.07790	58.1	0.5	u	58.0
12	0.09930	60.6	0.4	u	60.8
13	0.12670	63.9	0.5	u	64.1
14	0.16640	68.1	0.6	u	67.8
15	0.20600	69.5	0.6	u	69.8
16	0.26280	73.2	1.6	u	71.3
17	0.33520	72.5	1.1	u	71.3
18	0.42770	72.9	2.2	u	70.7
19	0.54560	75.0	3.4	m	69.3
20	0.69590	81.6	7.4	m	68.5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	59.3	0.8	u	59.2
2	0.10600	61.7	0.6	u	61.6
3	0.13100	64.2	0.7	u	64.2
4	0.16100	66.7	0.8	u	66.7
5	0.20000	67.8	0.6	u	68.4
6	0.25000	68.0	1.2	u	69.1
7	0.31400	66.5	2.3	u	68.3
8	0.39500	64.7	1.8	u	66.3
9	0.49900	62.3	4.5	u	63.3
10	0.63100	61.3	5.0	u	60.1
11	0.79900	55.7	7.7	u	56.5
12	1.01000	54.2	6.2	u	53.4
13	1.28000	49.7	12.7	u	50.1
14	1.63000	49.4	16.3	d	-
15	2.08000	36.2	16.3	d	-
16	2.64000	36.2	29.6	d	-
17	3.37000	34.6	47.6	d	-
18	4.29000	24.9	38.0	d	-
19	5.47000	18.9	43.3	d	-
20	6.97000	28.2	100.0	d	-

Sounding: MIA236 Client: US Geological Survey
 Location: Power line RD N & E CEMEX Quarry
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 04-MAR-09
 UTM Coord: E[m] 554391.0 N[m] 2809645.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	130.500	24.0	0.0
2	2.920	1.4	-24.0
3	116.300	64.2	-25.5
4	40.530	--	-89.7

Fit Error[%]: 2.855

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	119.9	0.5	u	118.1
2	0.00860	95.1	0.4	u	98.0
3	0.01110	82.3	0.5	u	82.6
4	0.01410	71.9	0.5	u	71.3
5	0.01800	64.0	0.5	u	63.4
6	0.02300	58.8	0.5	u	58.1
7	0.02940	55.4	0.5	u	54.9
8	0.03750	53.6	0.5	u	53.4
9	0.04790	53.0	0.5	u	53.1
10	0.06110	53.5	0.5	u	54.1
11	0.07790	55.1	0.5	u	55.6
12	0.09930	56.9	0.5	u	57.8
13	0.12670	59.6	0.5	u	59.8
14	0.16640	62.9	0.6	u	61.9
15	0.20600	63.9	0.7	u	62.8
16	0.26280	66.5	1.3	u	63.5
17	0.33520	64.5	2.5	u	63.5
18	0.42770	63.4	5.2	u	63.6
19	0.54560	61.9	5.7	u	63.8
20	0.69590	69.8	16.5	m	64.4

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	55.7	0.3	u	56.6
2	0.10600	57.6	0.2	u	58.2
3	0.13100	59.8	0.4	u	59.8
4	0.16100	61.8	0.5	u	61.1
5	0.20000	62.6	1.1	u	61.8
6	0.25000	62.5	1.3	u	62.0
7	0.31400	60.5	2.4	u	61.3
8	0.39500	58.8	2.9	u	60.3
9	0.49900	56.1	5.1	u	58.8
10	0.63100	56.1	10.1	u	57.3
11	0.79900	57.2	7.8	u	55.8
12	1.01000	54.6	9.4	u	54.2
13	1.28000	54.1	15.9	u	52.9
14	1.63000	51.0	45.2	d	-
15	2.08000	50.4	92.0	d	-
16	2.64000	32.8	69.3	d	-
17	3.37000	29.2	64.3	d	-
18	4.29000	26.2	100.0	d	-
19	5.47000	24.3	82.9	d	-
20	6.97000	95.5	100.0	d	-

Sounding: MIA236F Client: US Geological Survey
 Location: Power line RD N & E CEMEX Quarry
 Project: Saltwater Intrusion
 County: Miami-Dade County

Date: 04-MAR-09
 UTM Coord: E[m] 554391.0 N[m] 2809645.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	132.400	23.8	0.0
2	3.500	1.6	-23.8
3	112.300	65.7	-25.5
4	40.290	--	-91.2

Fit Error[%]: 2.861

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.70 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	119.9	0.5	u	118.2
2	0.00860	95.1	0.4	u	97.8
3	0.01110	82.3	0.5	u	82.5
4	0.01410	71.9	0.5	u	71.3
5	0.01800	64.0	0.5	u	63.5
6	0.02300	58.8	0.5	u	58.2
7	0.02940	55.4	0.5	u	55.0
8	0.03750	53.6	0.5	u	53.5
9	0.04790	53.0	0.5	u	53.2
10	0.06110	53.5	0.5	u	54.1
11	0.07790	55.1	0.5	u	55.7
12	0.09930	56.9	0.5	u	57.7
13	0.12670	59.6	0.5	u	59.8
14	0.16640	62.9	0.6	u	61.8
15	0.20600	63.9	0.7	u	62.9
16	0.26280	66.5	1.3	u	63.4
17	0.33520	64.5	2.5	u	63.6
18	0.42770	63.4	5.2	u	63.6
19	0.54560	61.9	5.7	u	63.9
20	0.69590	69.8	16.5	m	64.5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	55.7	0.3	u	56.6
2	0.10600	57.6	0.2	u	58.2
3	0.13100	59.8	0.4	u	59.8
4	0.16100	61.8	0.5	u	61.0
5	0.20000	62.6	1.1	u	61.9
6	0.25000	62.5	1.3	u	61.9
7	0.31400	60.5	2.4	u	61.4
8	0.39500	58.8	2.9	u	60.3
9	0.49900	56.1	5.1	u	58.9
10	0.63100	56.1	10.1	u	57.3
11	0.79900	57.2	7.8	u	55.8
12	1.01000	54.6	9.4	u	54.1
13	1.28000	54.1	15.9	u	52.9
14	1.63000	51.0	45.2	d	-
15	2.08000	50.4	92.0	d	-
16	2.64000	32.8	69.3	d	-
17	3.37000	29.2	64.3	d	-
18	4.29000	26.2	100.0	d	-
19	5.47000	24.3	82.9	d	-
20	6.97000	95.5	100.0	d	-

Sounding: MIA237 Client: US Geological Survey
 Location: Hallandale High School field
 Project: Saltwater Intrusion
 County: Broward County

Date: 04-MAR-09
 UTM Coord: E[m] 583733.0 N[m] 2875167.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	149.800	11.4	0.0
2	49.210	37.2	-11.4
3	14.060	--	-48.6

Fit Error[%]: 3.479

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.60 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	93.5	0.1	u	93.2
2	0.00860	86.8	0.1	u	85.7
3	0.01110	80.6	0.2	u	81.7
4	0.01410	77.9	0.2	u	79.0
5	0.01800	76.3	0.2	u	76.8
6	0.02300	75.2	0.1	u	74.8
7	0.02940	73.4	0.2	u	72.6
8	0.03750	70.5	0.2	u	69.6
9	0.04790	66.0	0.2	u	65.5
10	0.06110	60.4	0.3	u	60.6
11	0.07790	54.7	0.3	u	55.4
12	0.09930	49.0	0.3	u	50.2
13	0.12670	44.7	0.4	u	45.5
14	0.16640	41.3	0.5	u	40.9
15	0.20600	38.7	0.6	u	37.9
16	0.26280	36.5	0.7	u	34.9
17	0.33520	34.0	1.1	u	32.6
18	0.42770	31.8	1.3	u	30.8
19	0.54560	30.0	1.8	u	29.5
20	0.69590	28.6	3.6	u	28.8

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	52.0	0.6	u	52.3
2	0.10600	47.8	0.3	u	48.3
3	0.13100	44.0	0.4	u	44.3
4	0.16100	40.7	0.3	u	40.6
5	0.20000	37.6	0.6	u	37.2
6	0.25000	34.5	0.9	u	34.2
7	0.31400	31.3	1.2	u	31.5
8	0.39500	28.0	2.1	u	29.2
9	0.49900	25.2	2.3	u	27.2
10	0.63100	22.0	4.4	m	25.4
11	0.79900	19.5	4.3	m	24.0
12	1.01000	16.9	4.6	m	22.7
13	1.28000	14.7	9.6	m	21.6
14	1.63000	12.7	15.4	m	20.7
15	2.08000	11.6	27.0	d	-
16	2.64000	9.6	30.9	d	-
17	3.37000	10.3	49.7	d	-
18	4.29000	9.7	72.8	d	-
19	5.47000	8.4	100.0	d	-
20	6.97000	7.9	100.0	d	-

Sounding: MIA238 Client: US Geological Survey
 Location: South of Hallandale Cemetery
 Project: Saltwater Intrusion
 County: Broward County

Date: 04-MAR-09
 UTM Coord: E[m] 584560.0 N[m] 2875121.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	493.700	24.9	0.0
2	24.210	23.0	-24.9
3	6.590	--	-48.0

Fit Error[%]: 5.562

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	232.1	0.3	u	221.7
2	0.00860	169.0	0.2	u	183.4
3	0.01110	164.2	0.4	u	157.2
4	0.01410	134.3	0.2	u	137.8
5	0.01800	122.6	0.2	u	122.2
6	0.02300	112.8	0.2	u	108.9
7	0.02940	98.4	0.2	u	96.9
8	0.03750	82.6	0.2	u	85.4
9	0.04790	74.2	0.2	u	74.3
10	0.06110	62.7	0.2	u	64.0
11	0.07790	54.1	0.4	u	54.8
12	0.09930	48.2	0.3	u	46.9
13	0.12670	38.9	0.3	u	40.3
14	0.16640	33.3	0.6	u	34.3
15	0.20600	31.7	0.7	u	30.5
16	0.26280	28.2	1.1	u	27.0
17	0.33520	25.0	1.1	u	24.2
18	0.42770	22.7	2.0	u	22.0
19	0.54560	20.0	3.5	u	20.4
20	0.69590	18.3	4.6	u	19.3

Sounding: MIA239 Client: US Geological Survey
 Location: Hallandale Cemetery NE
 Project: Saltwater Intrusion
 County: Broward County

Date: 04-MAR-09
 UTM Coord: E[m] 584546.0 N[m] 2875285.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	380.400	21.9	0.0
2	43.390	35.1	-21.9
3	9.300	--	-57.0

Fit Error[%]: 5.629

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	194.4	0.7	u	190.0
2	0.00860	153.7	0.3	u	164.0
3	0.01110	148.0	0.5	u	147.1
4	0.01410	138.1	0.4	u	134.3
5	0.01800	125.4	0.5	u	124.3
6	0.02300	118.0	0.4	u	116.2
7	0.02940	109.4	0.4	u	108.9
8	0.03750	100.0	0.4	u	100.9
9	0.04790	89.3	0.4	u	91.9
10	0.06110	79.1	0.4	u	82.1
11	0.07790	71.0	0.3	u	72.1
12	0.09930	63.4	0.3	u	62.8
13	0.12670	54.6	0.4	u	54.7
14	0.16640	45.5	0.5	u	47.0
15	0.20600	42.9	0.4	u	42.0
16	0.26280	39.6	0.7	u	37.3
17	0.33520	35.9	0.8	u	33.6
18	0.42770	32.5	1.5	u	30.7
19	0.54560	29.1	1.7	u	28.5
20	0.69590	26.1	2.2	u	26.9

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	68.2	0.5	u	66.5
2	0.10600	61.5	0.8	u	59.3
3	0.13100	52.7	0.8	u	52.5
4	0.16100	44.9	1.1	u	46.3
5	0.20000	40.5	1.3	u	41.0
6	0.25000	36.1	1.6	u	36.3
7	0.31400	30.7	1.7	u	32.3
8	0.39500	26.2	2.5	u	28.8
9	0.49900	21.6	2.9	m	26.0
10	0.63100	17.6	2.2	m	23.5
11	0.79900	14.1	3.6	m	21.5
12	1.01000	11.2	5.7	m	19.8
13	1.28000	9.0	6.9	m	18.4
14	1.63000	7.2	11.4	m	17.2
15	2.08000	6.2	11.1	m	16.2
16	2.64000	5.4	9.6	m	15.5
17	3.37000	4.7	11.4	m	14.9
18	4.29000	3.9	13.7	d	-
19	5.47000	3.5	14.9	d	-
20	6.97000	3.1	45.5	d	-

Sounding: MIA239X Client: US Geological Survey
 Location: Hallandale Cemetery NE
 Project: Saltwater Intrusion
 County: Broward County

Date: 04-MAR-09
 UTM Coord: E[m] 584546.0 N[m] 2875285.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	439.200	22.2	0.0
2	34.400	31.0	-22.2
3	3.130	20.0	-53.2
4	.431	--	-73.3

Fit Error[%]: 5.593

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	194.4	0.7	u	193.3
2	0.00860	153.7	0.3	u	164.0
3	0.01110	148.0	0.5	u	145.1
4	0.01410	138.1	0.4	u	131.9
5	0.01800	125.4	0.5	u	122.5
6	0.02300	118.0	0.4	u	116.0
7	0.02940	109.4	0.4	u	110.3
8	0.03750	100.0	0.4	u	103.2
9	0.04790	89.3	0.4	u	93.8
10	0.06110	79.1	0.4	u	82.5
11	0.07790	71.0	0.3	u	71.3
12	0.09930	63.4	0.3	u	61.8
13	0.12670	54.6	0.4	u	54.4
14	0.16640	45.5	0.5	u	48.2
15	0.20600	42.9	0.4	u	44.3
16	0.26280	39.6	0.7	u	40.1
17	0.33520	35.9	0.8	u	36.0
18	0.42770	32.5	1.5	u	31.8
19	0.54560	29.1	1.7	u	27.7
20	0.69590	26.1	2.2	u	24.1

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	68.2	0.5	u	64.6
2	0.10600	61.5	0.8	u	57.5
3	0.13100	52.7	0.8	u	51.1
4	0.16100	44.9	1.1	u	45.8
5	0.20000	40.5	1.3	u	40.9
6	0.25000	36.1	1.6	u	36.1
7	0.31400	30.7	1.7	u	31.2
8	0.39500	26.2	2.5	u	26.3
9	0.49900	21.6	2.9	u	21.7
10	0.63100	17.6	2.2	u	17.7
11	0.79900	14.1	3.6	u	14.3
12	1.01000	11.2	5.7	u	11.6
13	1.28000	9.0	6.9	u	9.4
14	1.63000	7.2	11.4	u	7.7
15	2.08000	6.2	11.1	u	6.3
16	2.64000	5.4	9.6	u	5.3
17	3.37000	4.7	11.4	u	4.5
18	4.29000	3.9	13.7	d	-
19	5.47000	3.5	14.9	d	-
20	6.97000	3.1	45.5	d	-

Sounding: MIA240A Client: US Geological Survey
 Location: Hallandale Cemetery SE #16919
 Project: Saltwater Intrusion
 County: Broward County

Date: 04-MAR-09
 UTM Coord: E[m] 584541.0 N[m] 2875221.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	189.400	72.9	0.0
2	28.690	--	-72.9

Fit Error[%]: 7.796

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	172.2	0.0	m	168.8
2	0.00860	153.5	0.0	u	170.3
3	0.01110	177.0	0.0	u	178.2
4	0.01410	199.0	0.0	u	187.2
5	0.01800	204.1	0.0	u	194.7
6	0.02300	205.5	0.0	u	199.6
7	0.02940	191.9	0.0	u	198.5
8	0.03750	184.0	0.0	u	190.4
9	0.04790	174.4	0.0	u	176.3
10	0.06110	167.2	0.0	u	159.0
11	0.07790	161.0	0.0	m	141.7
12	0.09930	164.7	0.0	m	125.5
13	0.12670	193.5	0.0	m	111.6
14	0.16640	320.2	0.0	m	98.3
15	0.20600	334.8	0.0	m	89.9
16	0.26280	132.2	0.0	m	81.8
17	0.33520	95.1	0.0	m	75.4
18	0.42770	63.6	0.0	m	70.5
19	0.54560	51.8	0.0	m	67.0
20	0.69590	36.9	0.0	m	64.6

Sounding: MIA240B Client: US Geological Survey
 Location: Hallandale Cemetery SE #16919
 Project: Saltwater Intrusion
 County: Broward County

Date: 04-MAR-09
 UTM Coord: E[m] 584541.0 N[m] 2875221.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	146.800	81.2	0.0
2	61.530	--	-81.2

Fit Error[%]: 7.074

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	172.2	0.0	m	132.6
2	0.00860	153.5	0.0	u	132.2
3	0.01110	177.0	0.0	u	135.8
4	0.01410	199.0	0.0	u	139.5
5	0.01800	204.1	0.0	u	142.1
6	0.02300	205.5	0.0	u	144.7
7	0.02940	191.9	0.0	u	146.7
8	0.03750	184.0	0.0	u	147.4
9	0.04790	174.4	0.0	u	146.2
10	0.06110	167.2	0.0	u	143.0
11	0.07790	161.0	0.0	u	138.0
12	0.09930	164.7	0.0	u	131.9
13	0.12670	193.5	0.0	u	125.5
14	0.16640	320.2	0.0	u	118.3
15	0.20600	334.8	0.0	m	113.4
16	0.26280	132.2	0.0	m	108.3
17	0.33520	95.1	0.0	m	104.3
18	0.42770	63.6	0.0	m	101.4
19	0.54560	51.8	0.0	m	99.9
20	0.69590	36.9	0.0	m	99.5

Sounding: MIA240C Client: US Geological Survey
 Location: Hallandale Cemetery SE combo
 Project: Saltwater Intrusion
 County: Broward County

Date: 04-MAR-09
 UTM Coord: E[m] 584541.0 N[m] 2875221.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	168.200	67.3	0.0
2	96.420	--	-67.3

Fit Error[%]: 4.238

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	172.2	0.0	m	150.6
2	0.00860	153.5	0.0	u	150.9
3	0.01110	177.0	0.0	u	155.7
4	0.01410	199.0	0.0	u	160.3
5	0.01800	204.1	0.0	u	163.0
6	0.02300	205.5	0.0	u	164.4
7	0.02940	191.9	0.0	u	164.2
8	0.03750	184.0	0.0	u	162.3
9	0.04790	174.4	0.0	u	158.9
10	0.06110	167.2	0.0	u	154.6
11	0.07790	161.0	0.0	u	149.8
12	0.09930	164.7	0.0	u	144.8
13	0.12670	193.5	0.0	u	140.2
14	0.16640	320.2	0.0	m	135.4
15	0.20600	334.8	0.0	m	132.3
16	0.26280	132.2	0.0	m	129.3
17	0.33520	95.1	0.0	m	127.4
18	0.42770	63.6	0.0	m	126.4
19	0.54560	51.8	0.0	m	126.9
20	0.69590	36.9	0.0	m	128.8

Sounding: MIA241 Client: US Geological Survey
 Location: Hallandale Water Plant west
 Project: Saltwater Intrusion
 County: Broward County

Date: 04-MAR-09
 UTM Coord: E[m] 584295.0 N[m] 2874643.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	740.700	14.4	0.0
2	71.100	50.6	-14.4
3	5.480	23.0	-65.1
4	.789	--	-88.2

Fit Error[%]: 3.997

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	170.6	0.6	u	166.1
2	0.00860	142.1	0.6	u	149.4
3	0.01110	140.4	0.7	u	140.5
4	0.01410	137.5	0.7	u	134.7
5	0.01800	133.2	0.8	u	131.4
6	0.02300	132.8	0.7	u	130.5
7	0.02940	130.4	0.6	u	130.3
8	0.03750	126.6	0.7	u	128.5
9	0.04790	119.7	0.7	u	122.9
10	0.06110	110.8	0.7	u	113.6
11	0.07790	102.2	0.8	u	102.6
12	0.09930	92.0	0.8	u	92.5
13	0.12670	82.9	0.9	u	83.9
14	0.16640	74.3	0.9	u	75.6
15	0.20600	67.0	1.3	u	69.3
16	0.26280	61.6	1.7	u	61.9
17	0.33520	54.1	2.3	u	54.2
18	0.42770	48.8	4.3	u	46.8
19	0.54560	42.3	6.9	u	40.2
20	0.69590	35.9	9.3	u	34.6

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	98.5	0.4	u	94.8
2	0.10600	90.0	0.8	u	86.6
3	0.13100	81.4	1.0	u	78.7
4	0.16100	72.3	1.5	u	71.1
5	0.20000	62.9	2.3	u	63.4
6	0.25000	53.9	3.4	u	55.2
7	0.31400	45.5	3.3	u	46.8
8	0.39500	38.1	3.3	u	38.8
9	0.49900	31.2	3.3	u	31.7
10	0.63100	24.8	7.2	u	25.7
11	0.79900	20.2	8.2	u	20.7
12	1.01000	16.2	12.4	m	16.8
13	1.28000	12.6	13.5	m	13.7
14	1.63000	9.9	17.1	m	11.2
15	2.08000	8.5	17.2	m	9.3
16	2.64000	7.1	24.6	m	7.8
17	3.37000	5.6	33.0	m	6.7
18	4.29000	4.4	60.4	m	5.8
19	5.47000	4.9	60.4	m	5.1
20	6.97000	3.9	71.2	d	-

Sounding: MIA241X Client: US Geological Survey
 Location: Hallandale Water Plant west
 Project: Saltwater Intrusion
 County: Broward County

Date: 04-MAR-09
 UTM Coord: E[m] 584295.0 N[m] 2874643.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	775.600	15.1	0.0
2	65.600	48.4	-15.1
3	3.530	19.2	-63.6
4	.374	--	-82.8

Fit Error[%]: 4.531

System: EM-58 Freq[Hz]: 285 Data Set Code: uh
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

System: EM-58 Freq[Hz]: 30 Data Set Code: hi
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 5

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	170.6	0.6	u	167.5
2	0.00860	142.1	0.6	u	149.5
3	0.01110	140.4	0.7	u	139.7
4	0.01410	137.5	0.7	u	133.4
5	0.01800	133.2	0.8	u	130.1
6	0.02300	132.8	0.7	u	129.6
7	0.02940	130.4	0.6	u	130.4
8	0.03750	126.6	0.7	u	129.8
9	0.04790	119.7	0.7	u	124.8
10	0.06110	110.8	0.7	u	115.0
11	0.07790	102.2	0.8	u	103.1
12	0.09930	92.0	0.8	u	92.1
13	0.12670	82.9	0.9	u	83.1
14	0.16640	74.3	0.9	u	75.2
15	0.20600	67.0	1.3	u	69.6
16	0.26280	61.6	1.7	u	62.8
17	0.33520	54.1	2.3	u	55.6
18	0.42770	48.8	4.3	u	48.2
19	0.54560	42.3	6.9	u	41.2
20	0.69590	35.9	9.3	u	35.2

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.08800	98.5	0.4	u	94.6
2	0.10600	90.0	0.8	u	85.9
3	0.13100	81.4	1.0	u	77.7
4	0.16100	72.3	1.5	u	70.3
5	0.20000	62.9	2.3	u	63.0
6	0.25000	53.9	3.4	u	55.1
7	0.31400	45.5	3.3	u	46.7
8	0.39500	38.1	3.3	u	38.7
9	0.49900	31.2	3.3	u	31.2
10	0.63100	24.8	7.2	u	25.0
11	0.79900	20.2	8.2	u	19.9
12	1.01000	16.2	12.4	u	15.8
13	1.28000	12.6	13.5	u	12.7
14	1.63000	9.9	17.1	u	10.2
15	2.08000	8.5	17.2	u	8.3
16	2.64000	7.1	24.6	u	6.8
17	3.37000	5.6	33.0	u	5.6
18	4.29000	4.4	60.4	u	4.8
19	5.47000	4.9	60.4	m	4.1
20	6.97000	3.9	71.2	d	-

Sounding: MIA242 Client: US Geological Survey
 Location: O.B. Johnson Park
 Project: Saltwater Intrusion
 County: Broward County

Date: 04-MAR-09
 UTM Coord: E[m] 584221.0 N[m] 2875414.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	85.040	76.4	0.0
2	8.920	--	-76.4

Fit Error[%]: 9.798

System: EM-58 Freq[Hz]: 315 Data Set Code: uh
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	109.0	0.5	m	81.2
2	0.00860	195.9	0.6	m	79.9
3	0.01110	106.8	0.3	m	81.1
4	0.01410	190.0	1.2	m	82.5
5	0.01800	64.1	0.5	m	83.6
6	0.02300	260.3	0.5	m	85.2
7	0.02940	57.5	0.5	m	87.7
8	0.03750	176.6	0.7	m	90.9
9	0.04790	70.8	0.5	m	94.0
10	0.06110	105.9	0.9	u	95.4
11	0.07790	89.0	0.8	u	93.5
12	0.09930	78.1	0.9	u	88.2
13	0.12670	81.0	1.4	u	79.9
14	0.16640	67.5	1.5	u	69.9
15	0.20600	64.6	2.1	u	62.4
16	0.26280	58.3	2.4	u	54.9
17	0.33520	51.7	3.4	u	48.8
18	0.42770	44.5	6.3	u	43.8
19	0.54560	39.2	10.3	u	40.0
20	0.69590	34.8	12.7	u	37.2

Sounding: MIA242X Client: US Geological Survey
 Location: O.B. Johnson Park
 Project: Saltwater Intrusion
 County: Broward County

Date: 04-MAR-09
 UTM Coord: E[m] 584221.0 N[m] 2875414.0
 Elevation[m]: 0.0

TX loop size: X[m] 37.9 Y[m] 37.9

RX location: X[m] 0.0 Y[m] 0.0

Model Layer	Resistivity [ohm-m]	Thickness [m]	Elevation [m]
1	158.800	57.8	0.0
2	16.150	--	-57.8

Fit Error[%]: 14.350

System: EM-58 Freq[Hz]: 315 Data Set Code: uh
 TX Cur[A]: 2.50 Turn Off[usec]: 2.5
 RX Moment[turns-m^2]: 31.4 Gain Setting: 2

	Time [ms]	rhoa_obs [ohm-m]	obs_err [%]	mask	rhoa_cal [ohm-m]
1	0.00680	109.0	0.5	m	144.9
2	0.00860	195.9	0.6	m	147.7
3	0.01110	106.8	0.3	m	156.7
4	0.01410	190.0	1.2	m	166.3
5	0.01800	64.1	0.5	m	172.1
6	0.02300	260.3	0.5	m	171.4
7	0.02940	57.5	0.5	m	162.9
8	0.03750	176.6	0.7	m	147.9
9	0.04790	70.8	0.5	m	130.3
10	0.06110	105.9	0.9	u	113.1
11	0.07790	89.0	0.8	u	97.7
12	0.09930	78.1	0.9	u	84.8
13	0.12670	81.0	1.4	u	73.9
14	0.16640	67.5	1.5	u	64.2
15	0.20600	64.6	2.1	u	58.0
16	0.26280	58.3	2.4	u	52.3
17	0.33520	51.7	3.4	u	47.8
18	0.42770	44.5	6.3	u	44.4
19	0.54560	39.2	10.3	u	42.0
20	0.69590	34.8	12.7	u	40.5

Appendix 7 TEM Sounding Descriptions and Plots: 2009

Descriptions of the sounding results are given below, along with plots of the measured apparent resistivity, calculated apparent resistivity for the inversion model, and the inversion estimated resistivity-depth function. The TEM data were measured at two transmitter repetition frequencies. The 285-Hz data (UH) are plotted as open circles ($\bigcirc$), and the 30-Hz data (HI) are plotted as open squares ($\square$). The apparent resistivity measurement error bars are plotted as vertical lines through the data points. In most cases the error bars are smaller than the plotting symbol. The calculated 285-Hz model response is plotted as a solid line, and the 30-Hz model response is plotted as a dashed line. Some plots show only the 285-Hz data because the lower repetition rate data were too noisy to be of value. Masked data points are plotted as solid diamonds ($\blacklozenge$) and were not used in the inversion. All soundings were made with a square transmitter loop with a side length of 38.1 m. Unusable soundings are noted in table 1.

Geoelectrical models can be classified by the variation of resistivity with depth (Keller and Frischknecht, 1966, p. 135). A three-layer model with a resistivity minimum ($\rho_1 > \rho_2 < \rho_3$) is called a type-H curve. A model with a resistivity maximum ($\rho_1 < \rho_2 > \rho_3$) is called a type-K curve. A model with a monotonic increase in resistivity ($\rho_1 < \rho_2 < \rho_3$) is called a type-A curve. A model with a monotonic decrease in resistivity ($\rho_1 > \rho_2 > \rho_3$) is called a type-Q curve. For curves with more than three layers, this classification is applied to the first through third layer, the second through fourth layer, and so on. For example, a curve with ($\rho_1 > \rho_2 < \rho_3 > \rho_4$) is classified as type HK.

The resistivity-depth models determined by inversion are usually not unique; that is, there is uncertainty in the estimated model parameters caused by errors in the observations and parameterization errors. The latter is due to naturally occurring variations in geology that are not describable by the one-dimensional (layered earth) model used for the inversion. A qualitative estimate of the parameter uncertainty is given in the descriptions below. Another issue in the inversion is the resolution of the model parameters. To understand model resolution, assume that there is an actual set of model parameters that we can only view through a set of glasses. If the glasses give a good image of the actual parameters, then the resolution is good. If, on the other hand, the glasses distort the viewing of the actual parameters, then the resolution is poor. When a descriptive resolution is given for a sequence of layer resistivities or thicknesses, such as "good, very good, poor," the order is from the first layer downward.

Sounding MIA201

A three-layer model with decreasing resistivity with depth (type Q) fits the data with a misfit error of 1.83 percent. All model parameters are well resolved. The interpreted resistivity drops to 6.0 ohm-m at a depth of 84 m.

Sounding MIA202

The data are well modeled with a four-layer, type-HK model (conductive second and fourth layers). The second and fourth layer resistivities are very well resolved. The first layer resistivity is moderately resolved, and the third layer resistivity is poorly resolved. The first and third layer

thicknesses are well resolved, while the second layer thickness is moderately well determined. Misfit error is 1.47 percent.

Sounding MIA203

A five-layer, type-QHK type model (MIA203) does a very good job of modeling the data with a misfit error of 1.67 percent. The conductive third layer's resistivity and thickness are very well determined. The resistive first layer is not well determined, while the second layer with a transitional value of resistivity has better parameter estimates. The resistive fourth layer is moderately well determined. Originally a four-layer, type-QK model (MIA203L4) was used. It gives a misfit error of 1.72 percent; however, comparison of the resistivity-depth plot with the induction log from a nearby well (Sec34-MW-03-FS) indicates that a more gradual transition from the surface layer to the conductive layer was appropriate. Thus, the five-layer model is preferred.

Sounding MIA204

A five-layer, type-QHK model (MIA204) fits the data with a misfit of 1.08 percent. Determination of the surface resistivity is moderate, while the resolution of the more conductive second and third layers is much better. The thickness of the fourth layer is not well determined. Initially a four-layer, type-HK model was chosen (misfit error 1.07 percent). As with sounding MIA203, comparison with the induction log from well Sec34-MW-03-FS shows that a more gradual transition to the conductive layer is required. Based on the well log the five-layer model is preferred.

Sounding MIA205

Similar to the previous four soundings, the conductive layers of this four-layer, type-HK model is well resolved, while the other layers are not as well resolved. The misfit error is 1.05 percent.

Sounding MIA206

The data are modeled with a four-layer, type-QH model with layer resistivities decreasing from the resistive surface layer until the fourth (basement) layer whose resistivity is higher. The resistivities of the first three layers and thicknesses of the first two layer are well determined, whereas the thickness of the conductive third layer and the resistivity of the fourth layer are not well constrained. The misfit error is 1.70 percent.

Sounding MIA207

The model is similar to the previous type-QH sounding. The second layer resistivity is well resolved, the third layer resistivity is moderately well resolved, and the resistivities of the first and fourth layers are poorly determined. The thickness of the second layer is well determined. The misfit error is 1.79 percent.

Sounding MIA208

The resistivity decreases with depth down to the fourth layer, where it has a slight increase (type QH). The resistivity of the second layer is well determined. All other resistivities are poorly

to moderately well determined. The thicknesses of the first two layers are well determined. Misfit error is 2.27 percent.

Sounding MIA209

A four-layer, type-QH model gives a good fit to the data (misfit error 2.42 percent). The model is essentially a two-layer model with an additional conductive layer embedded near 100 meters depth. The second layer resistivity is very well constrained, while the resistivities of the other layers are not well determined. The thickness of the first layer is moderately well constrained.

Sounding MIA210

This sounding is similar to MIA209. A four-layer, type-QH model results in a misfit error of 2.37 percent. The second layer resistivity is well determined. The thin, conductive third layer is needed for a good fit, though the layer parameters are poorly constrained.

Sounding MIA211

A four-layer, type-HK model with a thin, conductive second layer fits the data very well (misfit error 1.31 percent). The first layer thickness is well determined. The second layer exhibits an S-equivalence meaning that only the ratio of layer thickness to layer resistivity is well determined—not the individual layer parameters.

Sounding MIA212

The four-layer, type-HK model MIA212 fits the data with a misfit error of 1.77 percent; however, there is a very severe S-equivalence for the second layer. A preferred alternative model (MIA212F) with the second layer resistivity constrained to 3.5 ohm-m based upon well log information for saltwater intruded zones gives a fit of 1.65 percent. The first and second layer thicknesses for this model are very well determined, while the first and third layer resistivities are not well determined. The resistivity of layer four is moderately well determined.

Sounding MIA213

The model is a four-layer type HK. The second layer is very thin and conductive resulting in an S-equivalence. The misfit error is 2.35 percent. The first and third layer resistivities are well determined, whereas the fourth layer resistivity is poorly determined. The second layer parameters are very poorly determined because of the S-equivalence. Resolution of the first layer thickness is good, while that of the third layer is poor.

Model MIA213F is the preferred alternative: also a four-layer, type-HK model, but with the second layer resistivity constrained to a value of 3.5 ohm-m. The misfit error is 2.28 percent. The first and third layer resistivities are moderately well determined, and the fourth layer resistivity is poorly determined. The first layer thickness is very well determined, while the third layer thickness is moderately well determined.

Sounding MIA214

A five-layer, type-HKH model fits the data with a misfit of 1.82 percent. The third and fifth layer resistivities are well determined. The second and fourth layer resistivities are moderately resolved, whereas the first layer resistivity is poorly resolved. The first and third layer thicknesses

are moderately resolved. The second layer thickness is moderately resolved, whereas the fourth layer thickness is poorly resolved.

Sounding MIA215

A five-layer, type-HKH model fits the data with a misfit of 1.44 percent. The resolution results are similar to those of sounding MIA214.

Sounding MIA216

Sounding MIA216 fits the data using a four-layer, type-HK model with a misfit of 2.17 percent. The third and fourth layer resistivities are well resolved. The first and third layer thicknesses are well resolved. All other parameters are moderately resolved.

Sounding MIA217

A four-layer, type-HK model gives a misfit of 2.23 percent. The thin second layer shows an S-equivalence behavior. The third layer resistivity is well resolved, the fourth layer resistivity is moderately resolved, and the first and second layer resistivities are poorly resolved. The first layer thickness is well resolved, the second layer thickness is poorly resolved, and the third layer thickness is moderately resolved.

Sounding MIA218

A three-layer, type-H model (MIA218) fits the data with an error of 1.75 percent. The resistivities of the first and third layers are well determined, as are the thickness of the first layer. The second layer parameters suffer from an S-equivalence. A preferred, alternative model (MIA218F) with the second layer resistivity fixed at 3.5 ohm-m gives a misfit error of 2.24 percent. The first layer resistivity, however, is now poorly determined.

Sounding MIA219

A three-layer, type-H model (MIA219) fits the data with an error of 3.41 percent. Because the second layer is very thin compared to its depth, there is an S-equivalence that does not allow the layer resistivity and thickness to be independently determined. The first layer resistivity is moderately well resolved, while the third layer resistivity is well resolved. Model MIA219F with the second layer resistivity constrained to 3.5 ohm-m is preferred. The misfit error for this model is 3.33 percent. All of the unconstrained model parameters are well resolved with the exception of the first layer resistivity which is poorly resolved.

Sounding MIA220

Sounding MIA220 is fit with a three-layer type-H model. The conductive second layer is thick enough that there is no S-equivalence. The misfit error is 1.86 percent. The first layer resistivity is moderately well determined, the second layer resistivity is well determined, and the third layer resistivity is poorly resolved. All layer thicknesses are well resolved.

Sounding MIA221

A three-layer, type-H model gives a misfit of 1.37 percent. The first and third layer resistivities are moderately resolved. The second layer resistivity is very well resolved. The layer thicknesses are well resolved.

Sounding MIA222

A three-layer type-H model fits the data very well after masking the last three datum (misfit error of 1.14 percent). The layer resistivity resolutions are good, very good, and very good from surface to depth, respectively. The layer thickness resolutions are both very good.

An alternative four-layer, type-HK model (MIA222L4) that uses all of the data points gives a misfit error of 1.73 percent. This model requires a conductive basement layer. The resolutions of the layer resistivities from surface to depth are good, very good, very poor, and very poor, respectively. The resolutions of layer thicknesses are very good, very good, and good, respectively. The three-layer model is preferred because of better resolution.

Sounding MIA223

A three-layer, type-H model gives a misfit error of 2.32 percent. The first and second layer resistivities are very well determined, and the third layer resistivity is moderately well determined. The first and second layer thicknesses are very well determined. An alternative four-layer, type-HK model (MIA223L4) gives a misfit error of 1.96 percent. The resistivities and layer thicknesses of the first two layers are very well determined. The third layer thickness is moderately well determined. The third and fourth layer resistivities are very poorly determined. While the misfit for the four-layer model is smaller, the decreased resolution of the third and fourth layers makes the three-layer model the preferred one.

Sounding MIA224

The misfit error for a three-layer, type-H model is 1.25 percent. The resolution of the first layer resistivity is poor, the second layer resistivity is very good, and the third layer resistivity is very poor. The first and second layer thicknesses are very well determined.

Sounding MIA225

A four-layer, type-HK model was used. Resolution of the layer resistivities from the surface to depth are very poor, moderate, very good, and very poor, respectively. The layer thickness resolutions from the surface to depth are very good, poor, and moderate, respectively. The misfit error is 1.74 percent.

Sounding MIA226

A four-layer, type-HK model has a misfit error of 2.44 percent. The first layer resistivity is very poorly determined, however, the first layer thickness is well determined. The second layer resistivity is moderately well resolved, and the second layer thickness is poorly resolved. The third and fourth layer resistivity resolutions are moderate. The third layer thickness is moderately well resolved.

Sounding MIA227

A four-layer, type-HK model was used. The resolutions of the layer resistivities from the surface to depth are very poor, very good, good, and good, respectively. The layer thickness resolutions from the surface to depth are very good, good, and good, respectively. The misfit error is 1.34 percent.

Sounding MIA228

A four-layer, type-HK model gives a misfit error of 2.08 percent. The resolutions of the layer resistivities from the surface to depth are very poor, good, very poor, and very good, respectively. The layer thickness resolutions from the surface to depth are very good, good, and good, respectively.

Sounding MIA229

The four-layer, type-HK model gives a misfit error of 1.07 percent. The resolutions of the layer resistivities from the surface to depth are very poor, very good, poor, and good, respectively. The layer thickness resolutions from the surface to depth are very good, good, and good, respectively.

Sounding MIA230

The four-layer, type-QH model gives a misfit error of 2.60 percent. The resolutions of the layer resistivities from the surface to depth are good, very poor, very good, and very good, respectively. The layer thickness resolutions from the surface to depth are good, poor, and very good, respectively. An alternative three-layer, type-H model (MIA230L3) give a slightly larger misfit error of 3.37 percent. The resolutions of the layer resistivities from the surface to depth are very poor, very good, and very good, respectively. Both layer thickness resolutions are very good. The four-layer model was chosen over the three-layer model primarily because it is better able to fit the curvature of the data in the first eight channels where the observational errors are very small.

Sounding MIA231

A three-layer, type-H model does a very good job of fitting the data with a misfit error of 3.28 percent. The resolutions of the layer resistivities from the surface to depth are very poor, very good, and very poor, respectively. Both layer thickness resolutions are very good.

Sounding MIA232

A four-layer, type-HK model gives a misfit error of 2.12 percent. The resolutions of the layer resistivities from the surface to depth are poor, very good, very poor, and very poor, respectively. The layer thickness resolutions are all very good. An alternative three-layer, type-H model (MIA232L3) was attempted after masking the last two data points. The misfit error was 2.51 percent. The resolutions of the layer resistivities from the surface to depth are poor, very good, and very poor, respectively. Both layer thickness resolutions are very good. The four-layer model is preferred.

Sounding MIA233

A four-layer, type-HK model gives a misfit error of 3.02 percent. The conductive second layer suffers from S-equivalence, suggesting the need for fixing the second layer resistivity based on well information. This was done in model MIA233F with a misfit error of 1.99 percent. For model MIA233 the resolution of the layer resistivities from the surface to depth are very poor, poor, good, and poor, respectively. The resolutions of the corresponding layer thicknesses are very good, poor, and poor, respectively. For model MIA233F, the resistivity resolutions are very poor, not specified (because of fixed resistivity value), very good, and poor, respectively. The thickness resolutions are very good, very good, and good, respectively.

Alternate three-layer, type-H models were determined by masking some of the data points at the end of the transient. The alternative models are MIA233L3 and MIA233F3, and their misfit errors are 2.48 percent and 3.33 percent, respectively. Model MIA233F is preferred.

Sounding MIA234

A four-layer, type-HK model gives a misfit error of 3.22 percent. The thin, conductive second layer exhibits S-equivalence. The layer resistivity resolutions are good, poor, good, and good, respectively. The thickness resolutions are good, poor, and good, respectively. When the second layer resistivity is constrained (model MIA234F) to 3.5 ohm-m, the resistivity resolutions stay about the same: good, not specified, good, and good, respectively. The thickness resolutions, however, improve slightly: very good, good, and good, respectively. The original model MIA234 is preferred.

Sounding MIA235

This four-layer, type-HK model is very similar to several of the previous soundings. The misfit error is 1.90 percent with a significant S-equivalence for the second layer. The layer resistivity resolutions are very poor, poor, good, and good, respectively. The layer thickness resolutions are very good, poor, and good, respectively. Constraining the second layer resistivity (model MIA235F) to 3.5 ohm-m gives the same misfit error and only slightly improves the second layer, thickness resolution. The constrained model (MIA235F) is preferred.

Sounding MIA236

A four-layer, type-HK model gives a misfit error of 2.86 percent. The layer resistivity resolutions are good, poor, poor, and good, respectively. The layer thickness resolutions are very good, poor, and good, respectively. The thin, conductive second layer exhibits S-equivalence. Fixing the second layer resistivity (MIA236F) at 3.5 ohm-m improves the resolution of the second layer thickness, while all other resolutions remain essentially unchanged. The unconstrained model MIA236 is preferred.

Sounding MIA237

A three-layer, type-Q model does a reasonable job of fitting the data; misfit error is 3.48 percent. The last five data points had to be masked to obtain this fit. This suggests that there may be a buried pipe at this location. The layer resistivity resolutions are poor, very good, and very good, respectively. The thickness resolutions are good and very good, respectively.

Sounding MIA238

A three-layer, type-Q model can only fit the data with a misfit error of 5.56 percent. The resolutions of the layer resistivities are very poor, very good, and very good, respectively. Both layer-thickness resolutions are very good.

Sounding MIA239

This sounding was made in Hallandale Cemetery and appears to be influenced by man-made objects. Even unused grave sites have concrete grave liners in place, so the likelihood of noise in the data is high. The last nine data points were masked before fitting otherwise these apparent resistivity values would have required a model with very low layer resistivities. A three-layer, type-Q model MIA239 gives a misfit error of 5.56 percent. While the first-layer resistivity resolution is very poor, all other model parameters are well resolved.

An inversion was also tried using all of the data (MIA239X). A four-layer, type-QQ model with the layer resistivities decreasing with depth resulted. The fourth layer resistivity was 0.43 ohm-m. The layer resistivity resolutions were: poor, very good, good, and good, respectively. The layer thickness resolutions were very good, very good, and very good, respectively. Because of the very low fourth layer resistivity, which may be due to metal caskets or the chain-link fence that surrounds the cemetery, this model is rejected. While the three-layer model is preferred, it must be used with caution because of the buried anthropogenic features at the site.

Sounding MIA240

This sounding was made in Hallandale Cemetery. The data show the effect of nearby metal objects. Model MIA240A masked many of the data points, retaining only those that were felt could be reasonably modeled. The influence of non-geologic objects in the subsurface should not be under estimated. The misfit error was 7.80 percent. Models MIA240B and MIA240C mask fewer data points, and the misfits errors are larger. Use of these data is very questionable other than for estimating the near surface resistivity.

Sounding MIA241

A four-layer, type-QQ model MIA241 gives a 4.00 percent misfit. Eight data points at the end of the transient were masked in the inversion because retaining them resulted in an abnormally conductive basement. The layer resistivity resolutions are very poor, very good, poor, and good, respectively. The layer thickness resolutions are good, very good, and very good, respectively. Model MIA241X unmasked all but the last time gate. The misfit error for this model was 4.53 percent. The layer resistivity resolutions are very poor, very good, poor, and poor, respectively. The layer thickness resolutions are good, very good, and very good, respectively. The fourth layer resistivity for model MIA241X is 0.37 ohm-m, which is very low, suggesting the presence of a pipe. Model MIA241 is preferred.

Sounding MIA242

The early channel data were very repeatable, but produced a very discontinuous sounding curve, suggesting the presence of metallic objects near the receiver coil. Moving the receiver coil 5 meters did not lessen the noise. The usefulness of these data is questionable. Two attempts at interpretation (MIA242 and MIA242X) resulted in two-layer models whose resistivity decreases

with depth. The misfit error for these models was 9.80 and 14.4 percent, respectively. The variability between these two models is rather large. The reliability of this sounding is questionable.

Figure 7-1. Sounding MIA201

Figure 7-2. Sounding MIA202

Figure 7-3. Sounding MIA203

Figure 7-4. Sounding MIA203L4

Figure 7-5. Sounding MIA204

Figure 7-6. Sounding MIA204L4

Figure 7-7. Sounding MIA205

Figure 7-8. Sounding MIA206

Figure 7-9. Sounding MIA207

Figure 7-10. Sounding MIA208

Figure 7-11. Sounding MIA209

Figure 7-12. Sounding MIA210

Figure 7-13. Sounding MIA211

Figure 7-14. Sounding MIA212

Figure 7-15. Sounding MIA212F

Figure 7-16. Sounding MIA213

Figure 7-17. Sounding MIA213F

Figure 7-18. Sounding MIA214

Figure 7-19. Sounding MIA215

Figure 7-20. Sounding MIA216

Figure 7-21. Sounding MIA217

Figure 7-22. Sounding MIA218

Figure 7-23. Sounding MIA218F

Figure 7-24. Sounding MIA219

Figure 7-25. Sounding MIA219F

Figure 7-26. Sounding MIA220

Figure 7-27. Sounding MIA221

Figure 7-28. Sounding MIA222

Figure 7-29. Sounding MIA222L4

Figure 7-30. Sounding MIA223

Figure 7-31. Sounding MIA223L4

Figure 7-32. Sounding MIA224

Figure 7-33. Sounding MIA225

Figure 7-34. Sounding MIA226

Figure 7-35. Sounding MIA227

Figure 7-36. Sounding MIA228

Figure 7-37. Sounding MIA229

Figure 7-38. Sounding MIA230

Figure 7-39. Sounding MIA230L3

Figure 7-40. Sounding MIA231

Figure 7-41. Sounding MIA232

Figure 7-42. Sounding MIA232L3

Figure 7-43. Sounding MIA233

Figure 7-44. Sounding MIA233F

Figure 7-45. Sounding MIA233L3

Figure 7-46. Sounding MIA233F3

Figure 7-47. Sounding MIA234

Figure 7-48. Sounding MIA234F

Figure 7-49. Sounding MIA235

Figure 7-50. Sounding MIA235F

Figure 7-51. Sounding MIA236

Figure 7-52. Sounding MIA236F

Figure 7-53. Sounding MIA237

Figure 7-54. Sounding MIA238

Figure 7-55. Sounding MIA239

Figure 7-56. Sounding MIA239X

Figure 7-57. Sounding MIA240A

Figure 7-58. Sounding MIA240B

Figure 7-59. Sounding MIA240C

Figure 7-60. Sounding MIA241

Figure 7-61. Sounding MIA241X

Figure 7-62. Sounding MIA242

Figure 7-63. Sounding MIA242X