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2017 Coastal Master Plan

Attachment A3: Project-Specific Attributes by Project Type (Restoration)

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Coastal Protection and Restoration Authority

This document was prepared in support of the 2017 Coastal Master Plan being prepared by the Coastal Protection and Restoration Authority (CPRA). CPRA was established by the Louisiana Legislature in response to Hurricanes Katrina and Rita through Act 8 of the First Extraordinary Session of 2005. Act 8 of the First Extraordinary Session of 2005 expanded the membership, duties, and responsibilities of CPRA and charged the new authority to develop and implement a comprehensive coastal protection plan, consisting of a master plan (revised every five years) and annual plans. CPRA's mandate is to develop, implement, and enforce a comprehensive coastal protection and restoration master plan.

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Attachment A3: Project-Specific Attributes by Project Type (Restoration)

Restoration Projects – Definition by Project Type

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Shoreline Protection				
Crest Elevation	Crest_El	m (NAVD88)	Top of crown elevation.	Crest elevation was taken from typical shoreline protection project template (3.5 ft/1.0668 m NAVD88).
Length	Lngth	m	Total length of the project centerline.	Length was provided through a GIS query to determine each projects length.
Top Width	Top_Wdth	m	Total width at top of project perpendicular to the project centerline.	Top width of 4 ft/1.2192 m taken from typical shoreline protection project template.
Base Width	Bse_Wdth	m	Total width at base of project perpendicular to the project centerline.	Base width was calculated from typical shoreline protection project template crown elevation, side slopes, and local water depth.
Side Slope Water	Sd_Slp_Wtr	Ratio	The slope of the fill expressed as the ratio of horizontal distance to vertical distance on water side of project.	Side slope water of 3H:1V was taken from typical shoreline protection project template.
Side Slope Marsh	Sd_Slp_Mh	Ratio	The slope of the fill expressed as the ratio of horizontal distance to vertical distance on marsh side of project.	Side slope marsh of 3H:1V was taken from typical shoreline protection project template.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Wave Attenuation	Wave_Attn	Percentage	Percent of wave energy deflected away/prevented from contact with the shoreline by the project.	Nomographs from the USACE Coastal Engineering Manual were utilized. Fetch was determined based on an estimate of water depth at project location, to help determine if the wave was depth limited, and the 90 percentile wind, at 40-45 mph, was used to determine if the wave was time limited or fetch limited. The developed wave was then compared to the size and height of the shoreline protection and given a ratio for overtopping plus a factor for run up. Each project was calculated separately.
Volume	Volume	m^3	Total estimated volume of fill material required to construct the project feature using one initial lift based on the template.	Fill volume was calculated in the cost worksheets with a formula utilizing length, side slope, width, and elevations taken from the template.
Bank Stabilization				
Crest Elevation	Crest_El	m (NAVD88)	Top of crown elevation.	Crest elevation was taken from typical bank stabilization project template (4.0 feet NAVD88).
Length	Lngth	m	Total length of the project centerline.	Length was provided through a GIS query to determine each projects length.
Top Width	Top_Wdth	m	Total width at top of project perpendicular to the project centerline.	Top width of 20 ft/6.0960 m was taken from typical bank stabilization project template.
Base Width	Bse_Wdth	m	Total width at base of project perpendicular to the project centerline.	Base width was calculated using the existing average elevation, side slopes, and crown elevation from the typical bank stabilization project template.
Side Slope Water	Sd_Slp_Wtr	Ratio	The slope of the fill expressed as the ratio of horizontal distance to vertical distance on water side of project.	Side slope water of 20H:1V was taken from typical bank stabilization project template.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Side Slope Marsh	Sd_Slp_Mh	Ratio	The slope of the fill expressed as the ratio of horizontal distance to vertical distance on marsh side of project.	Side slope marsh of 10H:1V was taken from typical bank stabilization project template.
Wave Attenuation	Wave_Attn	Percentage	Percent of wave energy deflected away/prevented from contact with the shoreline by the project.	Nomographs from the USACE Coastal Engineering Manual were utilized. Fetch was determined based on an estimate of water depth at project location, to help determine if the wave was depth limited, and the 90 percentile wind, at 40-45 mph, was used to determine if the wave was time limited or fetch limited. The developed wave was then compared to the size and height of the shoreline protection and given a ratio for overtopping plus a factor for run up. Each project was calculated separately.
Armoring Type	Armr_Type	Textual Code	Type of armoring such as turf, concrete, riprap, revetment mats, etc.	Determined by project location and typical bank stabilization template design. Armor types include planted vegetation, riprap, and articulated concrete block mattresses.
Borrow Source	Bor_Src1	Numerical Code	Borrow area required to construct project feature(s).	Due to the typical project locations and access/construction method, in-situ material will be used to construct the Bank Stabilization projects.
Date of Planting	DatePlnt	Date	The implementation date of the planting program.	The date of planting was calculated by adding the Engineering Duration and the Construction Duration and then the addition of one year.
Fraction Vegetation Species	FracSpec	Ratio	The fraction of each 500 m^2 cell within the project footprint covered by each vegetation species identified for planting.	Based on vegetative planting schemes for coastal projects, it was determined that 60% of the project would be planted; therefore, the fraction of vegetation species is calculated by taking 60% divided by the number of species to be planted.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Vegetation Type	VegType	Species Code	Vegetation type(s) to be planted following project construction.	The species to be utilized in the planting scheme was based on project location and salinity levels as well as associated habitat composition to achieve the highest survival rates and species composition typical of the habitat type.
Volume	Volume	m^3	Total estimated volume of fill material required to construct the project feature using one initial lift based on the template.	Fill volume was calculated in the cost worksheets with a formula utilizing the average cross sectional area times the length. The cross sectional area was calculated using the template and the existing average elevation. Source cut volume was calculated in the cost worksheets with a formula that utilized the fill volume times a 1.5 loss factor.
Existing Average Elevation	ExstAvgEl	m (NAVD88)	Elevation of the existing ground calculated as an average for length of project.	The existing average elevation was calculated in GIS and is based on the 2017 Coastal Master Plan DEM.
Oyster Barrier Reef				
Crest Elevation	Crest_El	m (NAVD88)	Top of crown elevation.	Crest elevation of 2 ft/0.6096 m NAVD88 was taken from typical oyster reef project template.
Length	Lngth	m	Total length of the project centerline.	Length was provided through a GIS query to determine each projects length.
Top Width	Top_Wdth	m	Total width at top of project perpendicular to the project centerline.	Top width of 10 ft/3.048 m was taken from typical oyster reef project template.
Base Width	Bse_Wdth	m	Total width at base of project perpendicular to the project centerline.	Base width was calculated from side slopes, local water depth, and crown elevation of typical oyster reef project template.
Side Slope Water	Sd_Slp_Wtr	Ratio	The slope of the fill expressed as the ratio of horizontal distance to vertical distance on water side of project.	Side slope water of 5H:1V was taken from typical oyster reef project template.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Side Slope Marsh	Sd_Slp_Mh	Ratio	The slope of the fill expressed as the ratio of horizontal distance to vertical distance on marsh side of project.	Side slope marsh of 5H:1V was taken from typical oyster reef project template.
Wave Attenuation	Wave_Attn	Percentage	Percent of wave energy deflected away/prevented from contact with the shoreline by the project.	Nomographs from the USACE Coastal Engineering Manual were utilized. Fetch was determined based on an estimate of water depth at project location, to help determine if the wave was depth limited, and the 90 percentile wind, at 40-45 mph, was used to determine if the wave was time limited or fetch limited. The developed wave was then compared to the size and height of the shoreline protection and given a ratio for overtopping plus a factor for run up. Each project was calculated separately.
Barrier Island / Headland Restoration				
Length	Lngth	m	Total length of the project centerline.	Length was provided through a GIS query to determine each projects length.
Side Slope Water	Sd_Slp_Wtr	Ratio	The slope of the fill expressed as the ratio of horizontal distance to vertical distance on water side of project.	Side slope for the dune of 30H:1V on the water side was taken from Barrier Island/Headland project template.
Side Slope Marsh	Sd_Slp_Mh	Ratio	The slope of the fill expressed as the ratio of horizontal distance to vertical distance on marsh side of project.	Side slope for the dune on the marsh of 30H:1V side was taken from Barrier Island/Headland project template.
Side Slope beach	Bch_Slp	Ratio	The slope of the fill expressed as the ratio of horizontal distance to vertical distance on water side of project.	Side slope for the beach of 40H:1V on the water side was taken from Barrier Island/Headland project template.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Borrow Source	Bor_Src1	Numerical Code	Borrow area(s) required to construct project feature(s).	Borrow source was provided through a GIS query of the surficial sand source layer that measured the distance from the project to the nearest borrow source (i.e., Borrow Source 1), and then calculated the second closest (i.e., Borrow Source 2). These were then adjusted based on current scientific understanding and design practice.
Second Borrow Source	Bor_Src2	Numerical Code	Borrow area(s) required to construct project feature(s). Used only once Borrow_Src1 has been depleted.	Borrow source was provided through a GIS query of the surficial sand source layer that measured the distance from the project to the nearest borrow source (i.e., Borrow Source 1), and then calculated the second closest (i.e., Borrow Source 2), and finally the third closest (i.e., Borrow Source 3). These were then adjusted based on current scientific understanding and design practice.
Date of Planting (Dune)	DatePlntDn	Date	The implementation date of the planting program for dune.	The date of planting for dune was calculated by adding the Engineering Duration and the Construction Duration and then the addition of one year.
Date of Planting (Swale)	DatePlntSw	Date	The implementation date of the planting program for swale.	The date of planting for swale was calculated by adding the Engineering Duration and the Construction Duration and then the addition of one year.
Date of Planting (Marsh)	DatePlntMh	Date	The implementation date of the planting program for marsh.	The date of planting for marsh was calculated by adding the Engineering Duration and the Construction Duration and then the addition of one year.
Fraction Vegetation Species (Dune)	FracSpecDn	Ratio	The fraction of each 500 m^2 cell within the project footprint covered by each vegetation species identified for planting dune habitat.	Based on vegetative planting schemes for coastal projects, it was determined that 60% of the project would be planted; therefore, the fraction of vegetation species is calculated by taking 60% divided by the number of species to be planted.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Fraction Vegetation Species (Swale)	FracSpecSw	Ratio	The fraction of each 500 m^2 cell within the project footprint covered by each vegetation species identified for planting swale habitat.	Based on vegetative planting schemes for coastal projects, it was determined that 60% of the project would be planted; therefore, the fraction of vegetation species is calculated by taking 60% divided by the number of species to be planted.
Fraction Vegetation Species (Marsh)	FracSpecMh	Ratio	The fraction of each 500 m^2 cell within the project footprint covered by each vegetation species identified for planting marsh habitat.	Based on vegetative planting schemes for coastal projects, it was determined that 60% of the project would be planted; therefore, the fraction of vegetation species is calculated by taking 60% divided by the number of species to be planted.
Vegetation Type (Dune)	VegTypeDn	Species Code	Vegetation type(s) specific to dune habitat to be planted following project construction.	The species to be utilized in the planting scheme was based on project location and salinity levels as well as associated habitat composition to achieve the highest survival rates and species composition typical of the habitat type.
Vegetation Type (Swale)	VegTypeSw	Species Code	Vegetation type(s) specific to swale habitat to be planted following project construction.	The species to be utilized in the planting scheme was based on project location and salinity levels as well as associated habitat composition to achieve the highest survival rates and species composition typical of the habitat type.
Vegetation Type (Marsh)	VegTypeMh	Species Code	Vegetation type(s) specific to marsh habitat to be planted following project construction.	The species to be utilized in the planting scheme was based on project location and salinity levels as well as associated habitat composition to achieve the highest survival rates and species composition typical of the habitat type.
Beach Area	Bch_Area	km^2	Total area of beach created or nourished by project.	Beach area was calculated by multiplying the width of the beach section and length of project. The beach section is defined as the beach slope plus the berm width.
Beach Width	Bch_Wdth	m	Width of the beach portion created or nourished by the project.	Beach width of 500 ft/152.4 m was taken from typical barrier island/headland project template.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Beach Elevation	Bch_El	m (NAVD88)	Beach crest elevation.	Beach crest elevation of 6.5 ft/1.9812 m NAVD88 was taken from the typical barrier island/headland project template.
Beach Volume	Bch_Vol	m^3	Total estimated volume of fill material required to construct the beach component of the project.	Beach volume was provided by the modeling team.
Dune Area	Dn_Area	km^2	Total area of dune created or nourished by project.	Dune area was calculated by multiplying the width of the dune section and length of project based on the barrier island or headland template. The dune segment of the project is width of dune portions, which is shown on the template as 100 ft.
Dune Elevation	Dn_El	m (NAVD88)	Dune crest elevation after one year of settlement.	Dune crest elevation was taken from typical barrier island/headland project template assuming 0.5 ft/ 0.1524 m of settlement after one year. 8.5 ft/ 2.4384 m NAVD88 for barrier island dune feature and 7.5 ft/2.2860 m NAVD88 for headland dune feature after Year 1.
Dune Volume	Dn_Vol	m^3	Total estimated volume of fill material required to construct the dune component of the project.	Dune volume was provided by the modeling team.
Marsh Area	Mh_Area	km^2	Total area of marsh created or nourished on the seaward side of the barrier island by project.	Marsh area was calculated by multiplying the width of the marsh section and length of project based on the barrier island or headland template. The marsh section is defined as the width of the marsh portions which is shown on the template as 750 ft.
Marsh Elevation	Mh_El	m (NAVD88)	Marsh elevation on seaward side of Barrier Island/ Headland typical template after one year of settlement.	Marsh elevation after Year 1 from typical Barrier Island/Headland project template assumes 1 ft/ 0.3044 m of settlement to elevation 4 ft/1.2192 m NAVD88.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Marsh Volume	Mh_Vol	m^3	Total estimated volume of marsh fill material required to construct the seaward side back barrier marsh component of a Barrier Island/ Headland project.	Marsh volume was provided by the modeling team.
Volume	Volume	m^4	Total estimated volume of marsh, beach, dune fill material required to construct the Barrier Island/ Headland project.	Volume was provided by the modeling team.
D_{50}	D50	mm	50th Percentile Diameter of Sediment.	D_{50} is the diameter of the sediment particles of which 50% is of a greater size and 50% is a lesser size; i.e., the median sediment particle diameter of the sediment source. Based on boring logs from the surficial sand borrow locations.
Percent Sand in Eroding Profile	PerSndErd	Percentage	Percentage of sand within the eroding profile (d>0.063mm).	Percent sand in eroding profile is the ratio of the sand in the fill material to the total volume of fill material and was developed using the soil characteristics of the surficial sand source data provided from representative soil borings. Sand is defined as particles greater than 0.063 mm.
Percent Silt in Eroding Profile	PerSltErd	Percentage	Percentage of silt within the eroding profile (d<0.063mm).	Percent silt in eroding profile is the ratio of the silt in the fill material to the total volume of fill material and was developed using the soil characteristics of the surficial sand source data provided from representative soil borings. Silt is defined as particles less than 0.063 mm.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Marsh Creation				
Borrow Source	Bor_Src1	Numerical Code	Borrow area(s) required to construct project feature(s).	Typically identified from the Surficial Sediment Deposits Database, first borrow source, by distance to marsh area boundary, with known sediment characteristics (i.e., nearest borrow source). Borrow Area D is unknown and was not recommended. These were then adjusted based on current scientific understanding and design practice.
Second Borrow Source	Bor_Src2	Numerical Code	Borrow area(s) required to construct project feature(s). Used only once Borrow_Src1 has been depleted.	Typically identified from the Surficial Sediment Deposits Database, second borrow source, by distance to marsh area boundary, with known sediment characteristics (i.e., second closest borrow source). Borrow Area D is unknown and was not recommended. These were then adjusted based on current scientific understanding and design practice.
Date of Planting (Marsh)	DatePlntMh	Date	The implementation date of the planting program.	The date of planting for marsh was calculated by adding the Engineering Duration and the Construction Duration and then the addition of one year.
Fraction Vegetation Species (Marsh)	FracSpecMh	Ratio	The fraction of each 500 m^2 cell within the project footprint covered by each vegetation species identified for planting.	Based on vegetative planting schemes for coastal projects, it was determined that 60% of the project would be planted; therefore, the fraction of vegetation species is calculated by taking 60% divided by the number of species to be planted.
Vegetation Type (Marsh)	VegTypeMh	Species Code	Vegetation type(s) specific to marsh habitat to be planted following project construction.	The species to be utilized in the planting scheme was based on project location and salinity levels as well as associated habitat composition to achieve the highest survival rates and species composition typical of the habitat type.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Volume	Volume	m^3	Total estimated volume of fill material required to construct the project feature using one initial lift based on the construction grade elevation.	The fill volume was provided by the modeling team.
Marsh Area	Mh_Area	km^2	Total area of marsh created or nourished by project.	The value for marsh area was provided by the modeling team.
Marsh Elevation	Mh_El	m (NAVD88)	Marsh elevation of consolidated fill material after one year of settlement.	Year 1 marsh elevation is based on historical sub-region consolidation settlement curves.
Bulk Density	Blk_Densty	g/cm^3	Bulk Density of fill material.	Bulk density is based on existing geotechnical information as well as borrow sediment location and type. The three bulk densities (with sources) include: 1. 2.1 g/cm^3 (Grand Liard - Inshore) - Assumed to apply to Surficial Mixed and Surficial Fines outside the Mississippi River. 2. 2.2 g/cm^3 (Lake Hermitage - Mississippi River) - Assumed to apply to both Surficial Mixed and Surficial Sand from the Mississippi River. 3. 2.02 g/cm^3 (Ship Shoal) - Assumed to apply to all Surficial Sands outside the Mississippi River.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Sediment Size Distribution	Sed_Size	mm	Particle size distribution of fill material.	Sediment size distribution is based on existing geotechnical information as well as borrow sediment location and type. The three bulk densities (with sources) include: 1. 0.06 mm (Grand Liard - Inshore) - Assumed to apply to Surficial Mixed and Surficial Fines outside the Mississippi River. 2. 0.3 mm (Lake Hermitage - Mississippi River) - Assumed to apply to both Surficial Mixed and Surficial Sand from the Mississippi River. 3. 0.19 mm (Ship Shoal) - Assumed to apply to all Surficial Sands outside the Mississippi River.
Ridge Restoration				
Crest Elevation	Crest_El	m (NAVD88)	Top of crown elevation.	Crest elevation was taken from ridge restoration project template (5.0 ft/1.5240 m NAVD88).
Length	Lngth	m	Total length of the project centerline.	Length was provided through a GIS query to determine each projects length.
Top Width	Top_Wdth	m	Total width at top of project perpendicular to the project centerline.	Top width of 50 ft/15.24 m was based on recently constructed ridge restoration project template.
Base Width	Bse_Wdth	m	Total width at base of project perpendicular to the project centerline.	Base width was calculated using the existing average elevation, side slopes, and crown elevation from the typical ridge restoration design template.
Side Slope Water	Sd_Slp_Wtr	Ratio	The slope of the fill expressed as the ratio of horizontal distance to vertical distance on water side of project.	Side slope water of 5H:1V was taken from ridge restoration project template.
Side Slope Marsh	Sd_Slp_Mh	Ratio	The slope of the fill expressed as the ratio of horizontal distance to vertical distance on marsh side of project.	Side slope marsh of 5H:1V was taken from ridge restoration project template.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Ridge Area	Ridge_Area	km^2	Total area of ridge created or nourished by project.	Ridge area was calculated by multiplying the perpendicular width of the base of the ridge by the length of the ridge, that value was then converted to square kilometers.
Borrow Source	Bor_Src1	Numerical Code	Borrow area required to construct project feature(s).	Borrow source was assumed to be in-situ for Ridge Restoration projects.
Date of Planting	DatePlnt	Date	The implementation date of the planting program.	The date of planting was calculated by adding the Engineering Duration and the Construction Duration and then the addition of one year.
Fraction Vegetation Species	FracSpec	Ratio	The fraction of each 500 m^2 cell within the project footprint covered by each vegetation species identified for planting.	Based on vegetative planting schemes for coastal projects, it was determined that 60% of the project would be planted; therefore, the fraction of vegetation species is calculated by taking 60% divided by the number of species to be planted.
Vegetation Type	VegType	Species Code	Vegetation type(s) to be planted following project construction.	The species to be utilized in the planting scheme was based on project location and salinity levels as well as associated habitat composition to achieve the highest survival rates and species composition typical of the habitat type.
Volume	Volume	m^3	Total estimated volume of fill material required to construct the project feature using one initial lift based on the template.	Fill volume was calculated in the cost worksheets with a formula utilizing the average cross sectional area times the length. The cross sectional area was calculated using the typical ridge restoration template and the existing average elevation. Source cut volume was calculated based on the typical ridge restoration project template access channel dredge volumes.
Existing Average Elevation	ExstAvgEl	m (NAVD88)	Elevation of the existing ground calculated as an average for length of project.	The existing average elevation was calculated in GIS and is based on the 2017 Coastal Master Plan DEM.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Hydrologic Restoration				
Crest Elevation	Crest_El	m (NAVD88)	Top of crown elevation.	Crest elevation upon constructed project templates for a rock barrier (5.0 feet NAVD88).
Length	Lngth	m	Total length of the project centerline.	Length was provided through a GIS query to determine each projects length.
Top Width	Top_Wdth	m	Total width at top of project perpendicular to the project centerline.	Top width was taken from a project template from the Shoreline Protection typical project template (4 ft/1.2192 m).
Base Width	Bse_Wdth	m	Total width at base of project perpendicular to the project centerline.	Base width was calculated using the side slope, design crown elevation, and local water depth based on the Shoreline Protection typical project template.
Side Slope Water	Sd_Slp_Wtr	Ratio	The slope of the fill expressed as the ratio of horizontal distance to vertical distance on water side of project.	Side slope water of 3H:1V was taken from the Shoreline Protection typical project template for a rock barrier.
Side Slope Marsh	Sd_Slp_Mh	Ratio	The slope of the fill expressed as the ratio of horizontal distance to vertical distance on marsh side of project.	Side slope marsh of 3H:1V was taken from the Shoreline Protection typical project template for a rock barrier.
Invert Elevation	Invert_El	m (NAVD88)	Estimated invert elevation of control structure.	Invert of control structure. Based on information from existing planning or feasibility level studies. For those projects where existing information was not available, the invert elevation was calculated based on similar projects which have undergone some level of feasibility and/or design.
Opening Geometry Area	OpnGeoArea	m^2	Total area of the control structure opening.	Opening geometry was taken from existing reports where possible. Where no reports existed, it was calculated using the structure's net opening size (Length x width x number of openings) in square feet then converting the area to square meters.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Opening Geometry	OpenGeo	Textual Description	Description of the dimensions and geometric shape of control structure opening.	The dimensions and geometric shape of the control structure opening are described and based on peak design flow, and similar projects in the area in feasibility and or design.
Operational Regime	Op_Regime	Textual Description	Explanation of the operational strategies and triggers for each structure.	For fixed structures this attribute is not applicable. For projects in which operational regime is applicable, operation at capacity was assumed and informed by the hydrodynamic modeling teams.
Wave Attenuation	Wave_Attn	Percentage	Percent of wave energy deflected away/prevented from contact with the shoreline by the project.	Nomographs from the USACE Coastal Engineering Manual were utilized. Fetch was determined based on an estimate of water depth at project location, to help determine if the wave was depth limited, and the 90 percentile wind, at 40-45 mph, was used to determine if the wave was time limited or fetch limited. The developed wave was then compared to the size and height of the shoreline protection and given a ratio for overtopping plus a factor for run up. Each project was calculated separately.
Diversion				
Invert Elevation	Invert_El	m (NAVD88)	Invert elevation of diversion intake control structure.	Invert of intake structure of diversion. Based on information from existing planning or feasibility level studies. For those projects where existing information was not available, the invert elevation was calculated based on similar projects which have undergone some level of feasibility and/or design.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Opening Geometry Area	OpnGeoArea	m^2	Total area of the control structure opening.	Opening geometry area was taken from existing reports where possible. Where no reports existed, it was calculated using the intake structure's net opening size of all bays or culverts (Length x width x number of openings) in square feet then converting the area to square meters.
Opening Geometry	OpenGeo	Textual Description	Description of the dimensions and geometric shape of control structure opening.	Description of the opening type of the intake structure using information from existing planning or feasibility level studies. For those projects where existing information was not available, the dimensions and geometric shape of the control structure opening was calculated based on peak design flow and similar projects in the area which have undergone some level of feasibility and/or design.
Operational Regime	Op_Regime	Textual Description	Explanation of the operational strategies and triggers for each structure.	Description of the operational rules of the diversion implemented in the ICM model. Information from existing planning or feasibility level studies was used where possible. Where information was unavailable, hydrodynamic modeling teams informed the assignment of an operational regime.
Bulk Density	Blk_Densty	g/cm^3	Bulk density of fill material.	Information from existing geotechnical reports from known source material.
Discharge	Discharge	m^3/s	Peak design flow through the structure and channel.	Maximum conveyance capacity of diversion based on information from existing planning or feasibility level studies. Where information was unavailable, hydrodynamic modeling teams informed the assignment of maximum discharge based on available flow, hydrodynamic head, receiving basin characteristics, source river historical data, and project intent.

Attribute	Attribute Reporting Name	Reporting Unit	Definition	Assumptions
Diversion Channel Depth	Chnl_Dpth	m	Average depth of diversion conveyance channel.	Depth of conveyance channel in NAVD88 based on information from existing planning or feasibility level studies. For those projects where existing information was not available, depth was calculated based on required channel geometry to balance flow conveyance and sediment transport versus scour considerations. Similar projects in the area which have undergone some level of feasibility and/or design also informed the calculation.
Diversion Channel Length	Chnl_Lngth	m	Length of diversion channel from the beginning of the diversion, including the diversion structure, to the outfall area.	Information from existing planning or feasibility level studies was used where possible. For those projects where existing information was not available, the diversion length was based on GIS measurement of the diversion and outfall locations corresponding to the ICM model discharge boxes.
Diversion Channel Width	Chnl_Wdth	m	Bottom width of conveyance channel from diversion structure to outfall area.	Bottom width of conveyance channel based on information from existing planning or feasibility level studies. For those projects where existing information was not available, the width was calculated based on peak design flow, sediment or freshwater transport considerations, and scour considerations. Similar projects in the area which have undergone some level of feasibility and/or design also informed the calculation.
River	River	Numeric Code	Numerical code corresponding to river that is the source of fresh water for a diversion project.	River was provided through a GIS query to determine each projects location and river source.
Sand, Silt, and Clay Concentration	SndSltClay	Percentage	Sand, silt, and clay concentration of water during peak diversion flow.	Information from existing planning or feasibility level studies.
Sediment to Water Ratio	STW	Ratio	Sediment Capture Efficiency	Information from existing planning or feasibility level studies.