Reserve Name JOB NERR Water Quality Metadata
Months and year the documentation covers: 01/01/2025 to 06/30/2025
Latest Update: 07/31/2025

Note: This is a provisional metadata document; it has not been authenticated as of its download date. Contents of this document are subject to change throughout the QAQC process and it should not be considered a final record of data documentation until that process is complete. Contact the CDMO <cdmosupport@belle.baruch.sc.edu> or Reserve with any additional questions.

I. Data Set and Research Descriptors

1> Principal investigator<s> and contact persons

Jobos Bay National Estuarine Research Reserve
PO Box 159
Salinas, PR 00704-0159
Ph. 787-853-4617
Fx. 787-853-4618

Angel Dieppa, Research Coordinator
Ph. 787-853-4617
Email. adieppa.jbnerr@gmail.com, adieppa@drna.pr.gov

Edlyn Jusino, SWMP Technician
Ph. 787-853-4617
Email. edlynjusino.jbnerr@gmail.com , edlyn.jusino@drna.pr.gov

2> Entry verification

Deployment data are uploaded from the YSI data logger to a Personal Computer by Edlyn Jusino. Files are exported from KOR-EXO (YSI Proprietary) program in a Microsoft Excel format by Edlyn Jusino and Angel Dieppa then excessive pre- and post-deployment data are removed from the file prior to upload with up to 2 hours of pre- and post-deployment data retained to assist in data management. Then it is converted to a comma-delimited file (*.cdf) and uploaded to the CDMO where it undergoes automated primary QAQC and becomes part of the CDMO's online provisional database. During primary QAQC, data are flagged if they are missing or out of sensor range. The edited file is then returned to the Reserve where it is opened in Microsoft Excel and processed using the CDMO's NERRQAQC Excel macro by Edlyn Jusino and Angel Dieppa. The macro inserts station codes, create metadata worksheets for flagged data and summary statistics, and graphs the data for review. It allows the user to apply QAQC flags and codes to the data, remove any overlapping deployment data, append files, and export the resulting data file for upload to the CDMO. Upload after secondary QAQC results in ingestion into the database as provisional plus data, recalculation of cDepth or cLevel parameters, and finally tertiary QAQC by the CDMO and assimilation into the CDMO's authoritative online database. Where deployment overlap occurs between files, the data produced by the newly calibrated sonde is generally accepted as being the most accurate. The final yearly file and metadata was submitted by Edlyn Jusino and Angel Dieppa. For more information on QAQC flags and codes, see Sections 11 and 12.

3> Research objectives –

The principal objective is to record and track long-term changes and short term variability in water quality parameters that can be associated to changes in estuarine habitats. Through this, we support management decisions based on scientific data. A secondary objective is to promote the access and use of reliable baseline information by federal and local agencies, universities, researchers, educators and local communities to enhance the process by which they make decisions regarding their daily

activities. This data is also invaluable in the identification and development of future monitoring and research activities.

A total of four data loggers <YSI EXO-2> are deployed in Jobos Bay. Two sondes are deployed in the inner lagoons of the Mar Negro Component and the other two in the Jobos Bay. The instruments are depth-fixed from a pole at a distance at about 0.5 meters from the bottom at each selected site. Data from stations 9, 10, 19 and 20 are being submitted to the Centralized Data Management Office as part of the System-Wide Monitoring Program. Measurements are taken at fifteen-minute intervals for approximately two-week periods. The sites are identified as representative of areas within the reserve and comparable to the sites that may be receiving impact from human activities from surroundings areas or may act as a habitat gradient in the Bay.

Station number nine <9>, subject to impacts from coastal processes <close to a power plant retentions pond>, collects water quality data in a site associated with runoff from littoral and basin mangrove areas. This sampling station is located in the most inland lagoon, closest to the Thermoelectric Power Plant <oil and natural gas>. It is subjected to runoff, which may include potential oil spill contamination from this industrial facility. Information compiled from historical environmental documents, indicate that station nine <9> was used as a disposal site for residues of the previously operating sugar mill operation, and therefore might have high organic input into the sediments.

Station number ten <10>, located in a mangrove lagoon area towards the southwestern section of Mar Negro is considered the reference or non-impacted site.

Station number <19> is located over a sea grass bed <*Thalassia testudinum*> in the inner western part of the bay just northeast of Cayo Colchones. This station is located near the thermal outfall and operating piers of the Aguirre Power Plant Complex, both activities may have significant effects on sea grass communities. This area is exposed to barge stranding, sediment re-suspension and oil spills.

Station number <20> is located on the eastern inner bay section of the Cayos Caribe cays. This station is just south of the mangrove islets associated with the Reserve's coral reefs. Water streams coming through the coral platform may help characterize water conditions of the main marine currents reaching Jobos Bay, as well as possible effects of industrial and chemical activities associated with Phillips Core, AES Coal Energy Plant and Pharmaceuticals located just east to this system.

4> Research methods

The National Estuarine Research Reserve Water Quality Monitoring Program began sampling at Station nine <9> on December 20, 1995 and Station ten <10> on February 1, 1996. Monitoring at station 19 began in April 2004 and at station 20 in June 2004. Long term water quality monitoring is being performed at these stations.

Before each YSI 6600 or EXO-2 data logger is deployed, calibration and maintenance is performed following the Standard Operation Procedures of the NERRS. Calibration standards are only required for pH, salinity, and turbidity, all other parameters are done as described in the manual. Buffer solutions for two-point calibration <pH 7 and pH 10> are purchased from a scientific supply company. Salinity is calibrated with a specific conductance standard 50 ms/cm and is purchased from YSI.

The two-point turbidity calibration is performed using a 0 NTU <DI water> and 124 FNU <for EXO-2> standard purchased from a scientific company. EXO-2 are equipped with dissolved oxygen optical sensors, both are allowed to sit at least 24 hours after proper calibration. Weather conditions and tide stage are recorded in the field observation log during deployment. Measurements of DO,

pH, salinity, specific conductance, turbidity, and temperature are taken at the deployment time to check the accuracy and functionality of the instruments. Each YSI data logger hangs inside a 6-inch diameter PVC pipe which is attached to a concrete filled PVC stable pole. Data loggers are at approximately 0.5 meter from the bottom of the selected site. Data is recorded every 15 minutes. The following measurements are recorded: date, time, temperature, specific conductance, salinity, dissolved oxygen saturation, dissolved oxygen concentration, depth, pH, and turbidity, all station have an optical chlorophyll-a sensor. Chl-a is an optional parameter non-required for SWMP program. Approximately, every two weeks the data loggers are retrieved, inspected, cleaned, data is downloaded into a personal computer and re-calibrated as noted previously. The data logger is then ready to be deployed again.

The data is processed through a standard quality control/quality assurance established for all 29 reserves within the system. It consists in submitting the raw data to the Centralized Data Management Office <CDMO> server where data undergoes through a macro to flag anomalies predetermine for each station. The data is sent back to the reserve to pass through a secondary QA/QC and finally resubmitted to CDMO for the final approval. Data may be available in different stages of the QA/QC process.

A Sutron Sat-Link2 transmitter was installed at the JOB20 station on 07/20/06 and a second station JOB09, transmits data to the NOAA GOES satellite, NESDIS ID # 3B0297EC and NESDIS ID # 3B0424AC respectively. The transmissions are scheduled hourly and contain four <4> data sets reflecting fifteen-minute data sampling intervals. Upon receipt by the CDMO, the data undergoes the same automated primary QAQC process detailed in Section 2 above. The "real-time" telemetry data become part of the provisional dataset until undergoing secondary and tertiary QAQC and assimilation in the CDMO's authoritative online database. Provisional and authoritative data are available at http://cdmo.baruch.sc.edu.

Station 20 and Station 9 telemetry was interrupted on 09/20/17 after Hurricane Maria destroyed the platform losing all the equipment. We are planning to reestablish communication in the near future.

5> Site location and character –

The Jobos Bay National Estuarine Research Reserve <JBNERR> is located on the southern coastal plain of the island of Puerto Rico, a reserve within the West Indies geographical area. JBNERR is composed of two major areas: <1> Mar Negro, located on the western margin of the Bay, and <2> Cayos Caribe <a chain of 17 tear-shaped islets located to the southeast> and Cayos Barca <a chain of 7 tear-shaped islets located to the southwest boundaries> both with a back-reef system. The Mar Negro area comprises the bulk of the Reserve, and consists of mangrove forests and a complex system of lagoons and channels interspersed with salt and mud flats. Coral reefs and sea grass beds, with small beach deposits and upland areas fringe Cayos Caribe and Cayos Barca mangrove islands. Few areas in the watershed drain directly to the bay. Rio Seco to the north-east of the bay is active only during heavy rain events during the wet season. A small creek, Quebrada Coqui, near JBNERR's pier to the north of the bay, drains into an extensive mangrove fringe forest in a laminar flow. During heavy rain events, Station 09 received runoff water from the upland and finally, a diffuse flow of water reached the bay from the local aquifer.

Station 9 is an impacted site and is located on the northeastern section of the Mar Negro component. This sampling station is associated with mangrove lagoon areas and receives runoff from mudflats, the Thermoelectric Power Plant, and adjacent areas. The tidal range varies from 12 to 18 inches or 0.12 to 0.18 m near the monitoring station. The salinity in the vicinity of the monitoring station during this quarter varies from 34.3 ppt to 42.1 ppt. The average depth at station 09 are 0.38 and 0.95 meters. The bottom is covered by a thick layer of thin sediments with a high content of organic material. *Microcoleus sp.* <blue-green algae>, brown and green algae <*Caulerpa sp.*> are also present at this site, but a better assessment is needed. The station pole was located at 17°56'34.87"N and 66°14'18.64"W until 09/02/2010 12:00PM, then it was relocated to 17° 56' 35.0"

N and 66° 14' 18.9" W approximately 65.0 meters from original position. The relocalization was due to sedimentation issues and the construction of a new telemetry station. Fresh water input to the station comes only from runoff and rain. This station has been subject of several studies indicating the presence of relatively high level of cooper and pesticides compared to other stations. Since 2015 an invasive seagrass, *Halophila stipulacea* was reported at Jobos Bay, it was after the pass of Hurricane Maria in September 21, 2017 that it was more evident and wide distributed. Although it is not present at Station 9, it is present in the channels toward the station and we expect it will colonize the area in the near future.

Station 10 is located in a mangrove lagoon not impacted directly by any upland or marine activities. It provides a reference for comparison of data obtained in other stations, especially to the station in Mar Negro lagoon. The tidal range varies from 12 to 18 inches or 0.12 to 0.18 m. The salinity at the vicinity of the monitoring station during this quarter varies from 38.8 ppt to 39.9 ppt. The average depth at station 10 is 0.24 and 0.61 meters. The bottom is covered with a layer of fine sediments with organic material, followed by a layer of calcareous material mainly from shells and oysters. At this site, we can find sea grass <*Thalassia testudinum*>, calcareous algae <*Halimeda sp.*>, green algae <*Caulerpa sp.*> and brown algae <*Dictyota sp.*> among others. The pole is located at 17° 56' 19.00 N, 66° 15' 27.85 W. Fresh water input to the station comes only from runoff and rain. There is not any direct source of fresh water. Since 2015 an invasive seagrass, *Halophila stipulacea* was reported at Jobos Bay, it was after the pass of Hurricane Maria in September 21, 2017 that it was more evident and wide distributed been observed in the perimeter of the station. See notes below regarding Sargassum arrivals.

Station 19 is located on the western inner section of the bay at a distance of 233 meters from Cayo Colchones Mangroves over sea grass beds <*Thallasia testudinum*>. Tidal ranges in this area vary from 12 to 18 inches or 0.12 to 0.18 m. The salinity at the vicinity of the monitoring station during this quarter varies from 31.0 ppt to 40.4 ppt. The average depth at this station is 0.46 and 0.99 meters. The YSI sonde is deployed at about 0.05 meter from the bottom. The bottom is of sandy composition. Sea grass, algae, echinoderms and other related organisms could be found in the area. The pole is located at 17° 56' 34.49"N, 66° 13' 43.77"W. There is no freshwater input to this area. Since 2015 an invasive seagrass, *Halophila stipulacea* was reported at Jobos Bay, it was after the pass of Hurricane Maria in September 21, 2017 that it was more evident and wide distributed been observed in the perimeter of the station.

Station 20 is located in the inner eastern section at about 190 meters of Cayos Caribe Mangrove islets and at about 688 meters from the coral reef barrier. This station is the closest to Mar Caribe. It has a sandy bottom, with calcareous and coral fragments, sea grass <*Thalassia testudinum*> communities, echinoderms and other associated organisms. Tidal ranges in this area vary from 12 to 18 inches or 0.12 to 0.18 m. The salinity at the vicinity of the monitoring station during this quarter varies from 33.2 ppt to 37.1 ppt. The average depth at this station is 0.16 and 0.75 meters. There is no surface freshwater input to this area. The pole is located at 17° 55' 49.14"N, 66° 12' 41.30"W. Since 2015 an invasive seagrass, *Halophila stipulacea* was reported at Jobos Bay, it was after the pass of Hurricane Maria in September 21, 2017 that it was more evident and wide distributed been observed in the perimeter of the station.

Data from stations 9, 10, 19, and 20 is being submitted to the CDMO. Eight sondes are permanently devoted to taking readings from these two sites, to assure continuous readings while sondes are taken out of the water for data upload and maintenance. This will avoid data gaps for the stations between sonde maintenance procedures. Due to errors in calibration, turbidity data in these files is considered inadequate. All monitoring is considered long term.

Site location and character Tables:

Site name	**ST 09**
Latitude and longitude *(Decimal degrees **or** degrees, minutes, seconds format)*	17° 56' 35.0" N 66° 14' 18.9" W
Tidal range *(meters)*	0.12 to 0.18
Salinity range *(psu)*	35.0 to 38.7
Type and amount of freshwater input	This sampling station is associated with mangrove lagoon areas and receives runoff from mudflats, the Thermoelectric Power Plant, and adjacent areas. Fresh water input to the station comes only from runoff and rain.
Water depth (*meters, MLW*)	0.24
Sonde distance from bottom (*meters*) *Fixed distance sonde is deployed above the bottom*	0.35 and 0.85
Bottom habitat or type *Soft sediment, grassbed, oyster bar, etc*	The bottom is covered by a thick layer of thin sediments with a high content of organic material. *Microcoleus sp.* <blue-green algae>, brown and green algae <*Caulerpa sp.*> are also present at this site, but a better assessment is needed. Since 2015 an invasive seagrass, *Halophila stipulacea* was reported at Jobos Bay, it was after the pass of Hurricane Maria in September 21, 2017 that it was more evident and wide distributed. Although it is not present at Station 9, it is present in the channels toward the station and we expect it will colonize the area in the near future.
Pollutants in area	Station 09 is an impacted site and is located on the northeastern section of the Mar Negro component. This sampling station is associated with mangrove lagoon areas and receives runoff from mudflats, the Thermoelectric Power Plant, and adjacent areas. This station has been subject of several studies indicating the presence of relatively high level of cooper and pesticides compared to other stations. Station number nine <9>, subject to impacts from coastal processes <close to a power plant retentions pond>, collects water quality data in a site associated with runoff from littoral and basin mangrove areas. This sampling station is located in the most inland lagoon, closest to the Thermoelectric Power Plant <oil and natural gas>. It is subjected to runoff, which may include potential oil spill contamination from this industrial facility. Information compiled from historical environmental documents, indicate that station nine <9> was used as a disposal site for residues of the previously operating sugar mill operation, and therefore might have high organic input into the sediments. A Baseline Assessment of the Ecological Resources of Jobos Bay, Puerto Rico founded this: ST 9 is named SWP 43, in ST 9 has found presence of this pollutants: Polycyclic Aromatic Hydrocarbons, Polychlorinated Biphenyls, Organochlorine insecticide (Dichloro-diphenyltrichloroethane), and some and some major and trace elements.

Description of watershed *(in reference to station)*	The Jobos Bay watershed is primarily comprised of the low-relief South Coastal Plain of Puerto Rico, but reaches elevations of greater than 700 m (2,297 ft) at its landward boundary. Many of Jobos Bay watershed's physical characteristics are attributed to the presence of two of Puerto Rico's Central Interior Mountain Ranges to the north, La Cordillera Central and La Sierra de Cayey. These mountains serve as a barrier to the moisture-laden northeast trade winds and give rise to a zone of low precipitation throughout the southern coast of Puerto Rico. The Jobos Bay watershed is located in the Subtropical Dry Forest Zone, the most arid ecological life zone in Puerto Rico. The Central Aguirre subwatershed (SW3) has a total area of 16.5 km^2, one third of which is covered by intertidal lands. The northern reach of the basin begins just south of the convergence of Highways 52 and 53. It widens as it extends southward towards Jobos Bay until a long serpentine coastline of over 20 km forms the southern boundary of the watershed. Most of the coastline is formed by the Mar Negro wetland complex, but it also extends beyond the Central Aguirre waterfront and shipping port. Similar to many subwatersheds in Jobos Bay, the Central Aguirre subwatershed has no defined stream channels and as a result discharges surface waters to Jobos Bay at several locations. A diversity of land cover types exist on the Central Aguirre subwatershed, including agriculture, industry, residential development, and natural forested and wetland areas. The dominant feature in the watershed is Mar Negro's mangrove forests and associated tidal waterways and mud flats. These wetlands are protected as part of the Jobos Bay National Estuarine Research Reserve. Mar Negro and another mangrove forest to its east comprise 32% of the subwatershed's land cover.

Site name	**ST 10**
Latitude and longitude *(Decimal degrees **or** degrees, minutes, seconds format)*	17° 56' 19.00 N 66° 15' 27.85 W
Tidal range *(meters)*	0.12 to 0.18 m
Salinity range *(psu)*	33.8 to 37.6
Type and amount of freshwater input	Fresh water input to the station comes only from runoff and rain. There is not any direct source of fresh water.
Water depth (*meters, MLW*)	0.38
Sonde distance from bottom (*meters*) *Fixed distance sonde is deployed above the bottom*	0.25 and 0.77 meters
Bottom habitat or type *Soft sediment, grassbed, oyster bar, etc*	The bottom is covered with a layer of fine sediments with organic material, followed by a layer of calcareous material mainly from shells and oysters. The bottom is covered with a layer of fine sediments with organic material, followed by a layer of calcareous material mainly from shells and oysters. At this site, we can find sea grass <*Thalassia testudinum*>, calcareous algae <*Halimeda sp.*>, green algae <*Caulerpa sp.*> and brown algae <*Dictyota sp.*> among others. Since 2015 an invasive seagrass, *Halophila stipulacea* was reported at Jobos Bay, it was after the pass of Hurricane Maria in September 21, 2017 that it was more evident and wide distributed been observed in the perimeter of the station. See notes below regarding Sargassum arrivals.
Pollutants in area	Characterizing Jobos Bay, Puerto Rico: A Watershed Modeling Analysis and Monitoring Plan has found: ST 10 located in a mangrove lagoon area towards the southwestern section of Mar Negro, is considered the reference or non-impacted site. This station is characterized by a low water exchange due to a restricted circulation pattern. This lagoon has an average depth of 2 m and the water regime is subject to high concentrations of tannin pigments associated with red mangroves. Benthic vegetation is scarce. This station is considered the less than impacted SWMP station in comparison with the other stations. But, this affirmation not significally 100% this station is not impacted. In other study, A Baseline Assessment of the Ecological Resources of Jobos Bay, Puerto Rico founded this: ST 10 is named SWP44, in ST 10 has found presence of this pollutants: Polycyclic Aromatic Hydrocarbons, Polychlorinated Biphenyls, Organochlorine insecticide (Dichloro-diphenyltrichloroethane), and some and some major and trace elements.
Description of watershed *(in reference to station)*	The Jobos Bay watershed is primarily comprised of the low-relief South Coastal Plain of Puerto Rico, but reaches elevations of greater than 700 m (2,297 ft) at its landward boundary. Many of Jobos Bay watershed's physical characteristics are attributed to the presence of two of Puerto Rico's Central Interior Mountain Ranges to the north, La Cordillera Central and La Sierra de Cayey. These mountains serve as a barrier to the moisture-laden northeast trade winds and give rise to a zone of low precipitation throughout the southern coast of Puerto Rico. The Jobos

	Bay watershed is located in the Subtropical Dry Forest Zone, the most arid ecological life zone in Puerto Rico. The Central Aguirre subwatershed (SW3) has a total area of 16.5 km^2, one third of which is covered by intertidal lands. The northern reach of the basin begins just south of the convergence of Highways 52 and 53. It widens as it extends southward towards Jobos Bay until a long serpentine coastline of over 20 km forms the southern boundary of the watershed. Most of the coastline is formed by the Mar Negro wetland complex, but it also extends beyond the Central Aguirre waterfront and shipping port. Similar to many subwatersheds in Jobos Bay, the Central Aguirre subwatershed has no defined stream channels and as a result discharges surface waters to Jobos Bay at several locations. A diversity of land cover types exist on the Central Aguirre subwatershed, including agriculture, industry, residential development, and natural forested and wetland areas. The dominant feature in the watershed is Mar Negro's mangrove forests and associated tidal waterways and mud flats. These wetlands are protected as part of the Jobos Bay National Estuarine Research Reserve. Mar Negro and another mangrove forest to its east comprise 32% of the subwatershed's land cover.

Site name	**ST 19**
Latitude and longitude *(Decimal degrees **or** degrees, minutes, seconds format)*	17° 56' 34.49"N 66° 13' 43.77"W
Tidal range *(meters)*	0.12 to 0.18 m
Salinity range *(psu)*	31.4 to 37.8
Type and amount of freshwater input	There is no freshwater input to this area.
Water depth (*meters, MLW*)	0.44
Sonde distance from bottom (*meters*) *Fixed distance sonde is deployed above the bottom*	0.51 and 0.99
Bottom habitat or type *Soft sediment, grassbed, oyster bar, etc*	Station 19 is located on the western inner section of the bay at a distance of 233 meters from Cayo Colchones Mangroves over sea grass beds <*Thallasia testudinum*>. The bottom is of sandy composition. Sea grass, algae, echinoderms and other related organisms could be found in the area. Since 2015 an invasive seagrass, *Halophila stipulacea* was reported at Jobos Bay, it was after the pass of Hurricane Maria in September 21, 2017 that it was more evident and wide distributed been observed in the perimeter of the station.
Pollutants in area	This station is close to the power plant navigation channel used by barges to bring oil and gas into the power plant pier. This area is exposed to barge strandings and sediment re-suspension. Potential Oil spills are always a threat. A Baseline Assessment of the Ecological Resources of Jobos Bay, Puerto Rico founded this: ST 19 is named CNT16, in ST 19 has found presence of this pollutants: Polycyclic Aromatic Hydrocarbons, Polychlorinated Biphenyls, Organochlorine insecticide (Dichloro-diphenyltrichloroethane), and some and some major and trace elements.
Description of watershed *(in reference to station)*	The Jobos Bay watershed is primarily comprised of the low-relief South Coastal Plain of Puerto Rico, but reaches elevations of greater than 700 m (2,297 ft) at its landward boundary. Many of Jobos Bay watershed's physical characteristics are attributed to the presence of two of Puerto Rico's Central Interior Mountain Ranges to the north, La Cordillera Central and La Sierra de Cayey. These mountains serve as a barrier to the moisture-laden northeast trade winds and give rise to a zone of low precipitation throughout the southern coast of Puerto Rico. The Jobos Bay watershed is located in the Subtropical Dry Forest Zone, the most arid ecological life zone in Puerto Rico.

Site name	ST 20
Latitude and longitude *(Decimal degrees **or** degrees, minutes, seconds format)*	17° 55' 49.14"N 66° 12' 41.30"W
Tidal range *(meters)*	0.12 to 0.18 m
Salinity range *(psu)*	31.1 to 38.0
Type and amount of freshwater input	There is no surface freshwater input to this area.
Water depth (*meters, MLW*)	0.23
Sonde distance from bottom (*meters*) *Fixed distance sonde is deployed above the bottom*	0.25 and 0.73 meters
Bottom habitat or type *Soft sediment, grassbed, oyster bar, etc*	Station 20 is located in the inner eastern section at about 190 meters of Cayos Caribe Mangrove islets and at about 688 meters from the coral reef barrier. This station is the closest to Mar Caribe. It has a sandy bottom, with calcareous and coral fragments, sea grass <*Thalassia testudinum*> communities, echinoderms and other associated organisms. Since 2015 an invasive seagrass, *Halophila stipulacea* was reported at Jobos Bay, it was after the pass of Hurricane Maria in September 21, 2017 that it was more evident and wide distributed been observed in the perimeter of the station.
Pollutants in area	ST 20 it is located adjacent to the Cayos Caribe reef system. Water streams coming from the reef platform may mean that this station is representative of water conditions behind the coral reef. These waters are part of the main marine current coming from the eastern side of Jobos Bay that runs along the coast, coming into contact with potential sources such as agricultural fields, a coal power plant, a Phillips Core oil refinery (closed in 2005) and other industries. A Baseline Assessment of the Ecological Resources of Jobos Bay, Puerto Rico founded this: ST 20 is named SWP41, in ST 20 has found presence of this pollutants: Polycyclic Aromatic Hydrocarbons, Polychlorinated Biphenyls, Organochlorine insecticide (Dichloro-diphenyltrichloroethane), and some and some major and trace elements.
Description of watershed *(in reference to station)*	The Jobos Bay watershed is primarily comprised of the low-relief South Coastal Plain of Puerto Rico, but reaches elevations of greater than 700 m (2,297 ft) at its landward boundary. Many of Jobos Bay watershed's physical characteristics are attributed to the presence of two of Puerto Rico's Central Interior Mountain Ranges to the north, La Cordillera Central and La Sierra de Cayey. These mountains serve as a barrier to the moisture-laden northeast trade winds and give rise to a zone of low precipitation throughout the southern coast of Puerto Rico. The Jobos Bay watershed is located in the Subtropical Dry Forest Zone, the most arid ecological life zone in Puerto Rico. SW9 is the most near place of sampling near to St 20. The Punta Pozuelo subwatershed does not support any agricultural, commercial or industrial land uses. Furthermore, most of the drainage area is

	covered by natural vegetation. As a result, the small subwatershed contributes only negligible amounts of predicted pollutant loads to Jobos Bay and the Caribbean Sea. The Punta Pozuelo subwatershed's 3.4 km^2 form a peninsula that separates the protected waters of inner Jobos Bay from the Caribbean Sea. Punta Pozuelo connects to the Puerto Rican mainland by a 300 m wide shared border with the Barrio Jobos subwatershed. The subwatershed is the only basin in the study area that does not discharge its entire runoff into Jobos Bay. The peninsula lacks any substantial relief and is too narrow to allow surface runoff to aggregate and form major stream channels. Instead, surface waters generated by precipitation events discharge to the nearest shoreline by overland sheet flow. As a result, surface flow from the Punta Pozuelo subwatershed will be distributed between Jobos Bay and the Caribbean Sea. During rain events, a sediment plume drains west from the shallow coastal lagoons of Punta Pozuelo into Jobos Bay.

References:

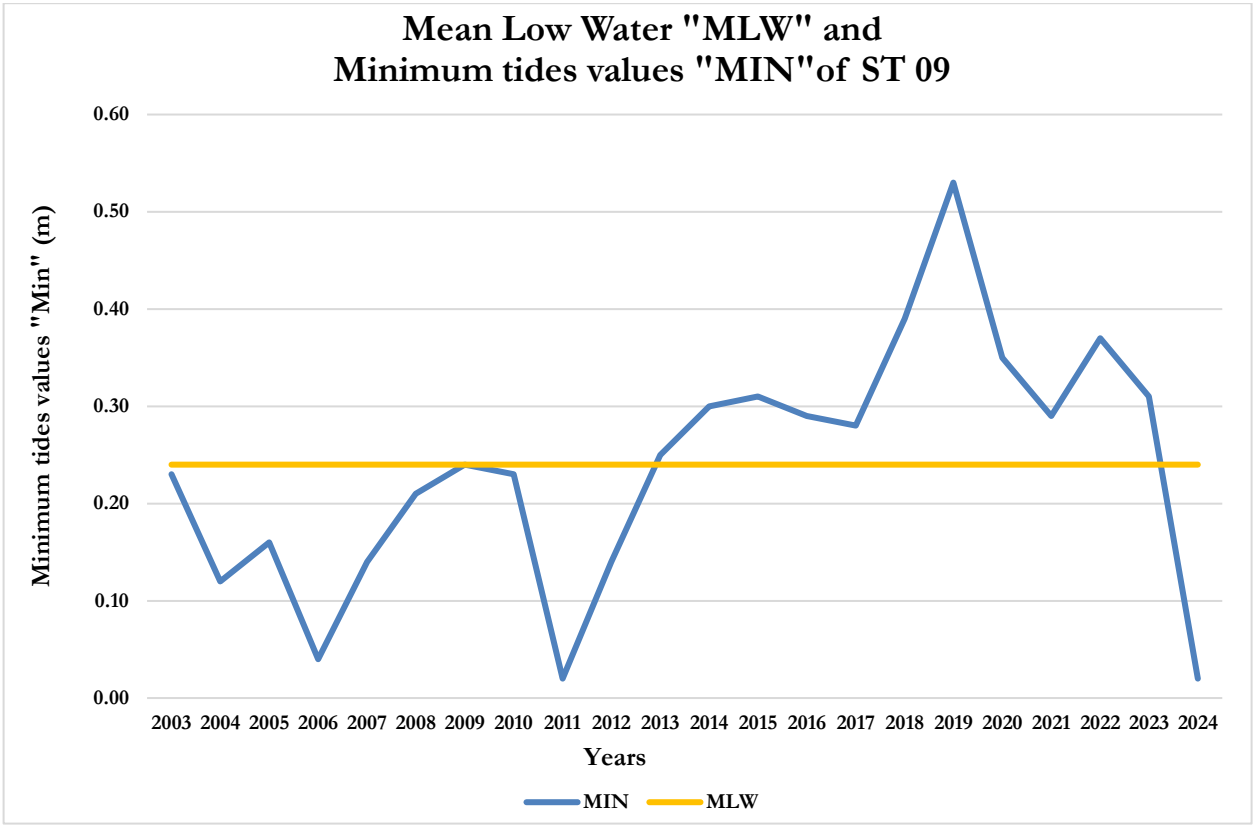
Characterizing Jobos Bay, Puerto Rico: A Watershed Modeling Analysis and Monitoring Plan
https://repository.library.noaa.gov/view/noaa/496/noaa_496_DS1.pdf
Zitello, A.G., D.R. Whitall, A. Dieppa, J.D. Christensen, M.E. Monaco and S.O. Rohmann. 2008. Characterizing Jobos Bay, Puerto Rico: A Watershed Modeling Analysis and Monitoring Plan. NOAA Technical Memorandum NOS NCCOS 76. 81 pp.

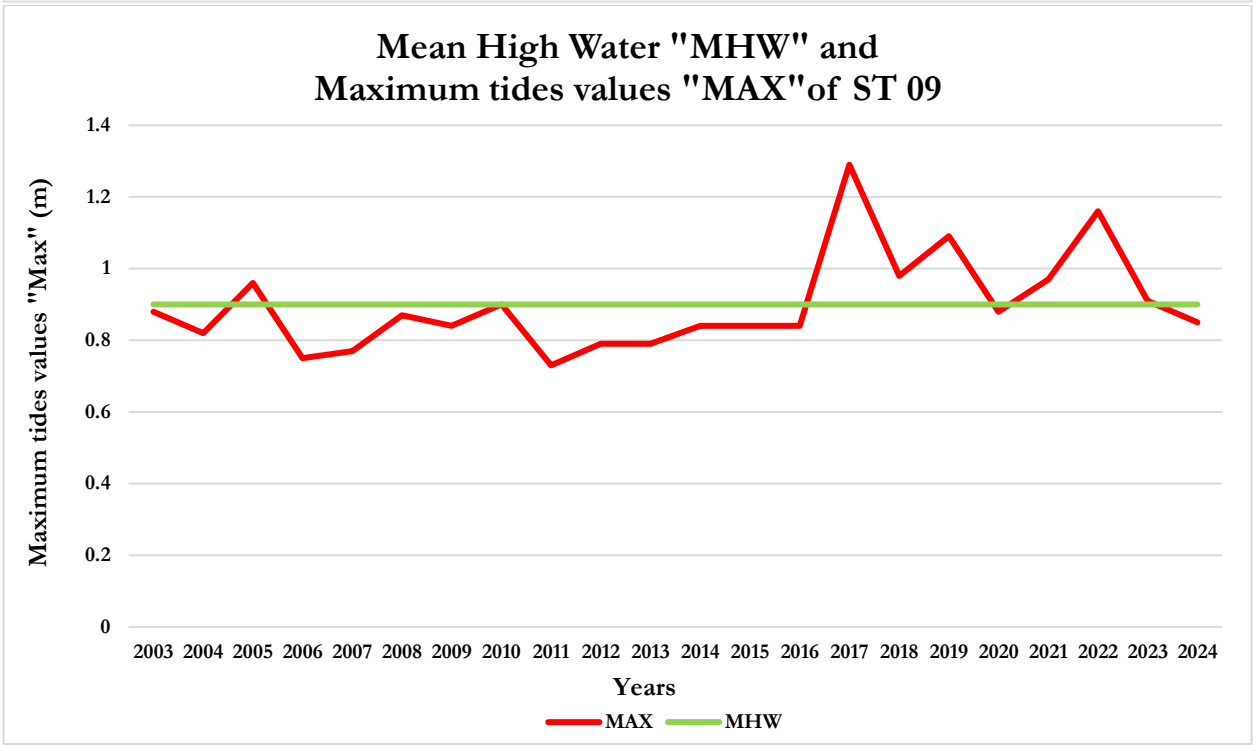
A Baseline Assessment of the Ecological Resources of Jobos Bay, Puerto Rico
https://repository.library.noaa.gov/view/noaa/669/noaa_669_DS1.pdf
Whitall, D.R., B.M. Costa, L.J. Bauer, A. Dieppa, and S.D. Hile (eds.). 2011. A Baseline Assessment of the Ecological Resources of Jobos Bay, Puerto Rico. NOAA Technical Memorandum NOS NCCOS 133. Silver Spring, MD. 188 pp.

The Mean low water "MLW" and Mean High water "MHW", is calculated based on 21 years 6 months of historical data of Depth (m) of JOB NERR, SWMP Stations. For Mean low water was used a minimum Depth tides values (m) and for Mean high water was used a maximum Depth tides values (m) of SWMP Stations. For calculated this values JOB NERR, used this references: https://tidesandcurrents.noaa.gov/datum_options.html - MLW, https://tidesandcurrents.noaa.gov/datum-updates/ntde/. "National Tidal Datum Epoch "NTDE" specify is necessary a 19-year time period established by National Ocean Service for collecting observations on water levels and calculating tidal values".

ST 09:

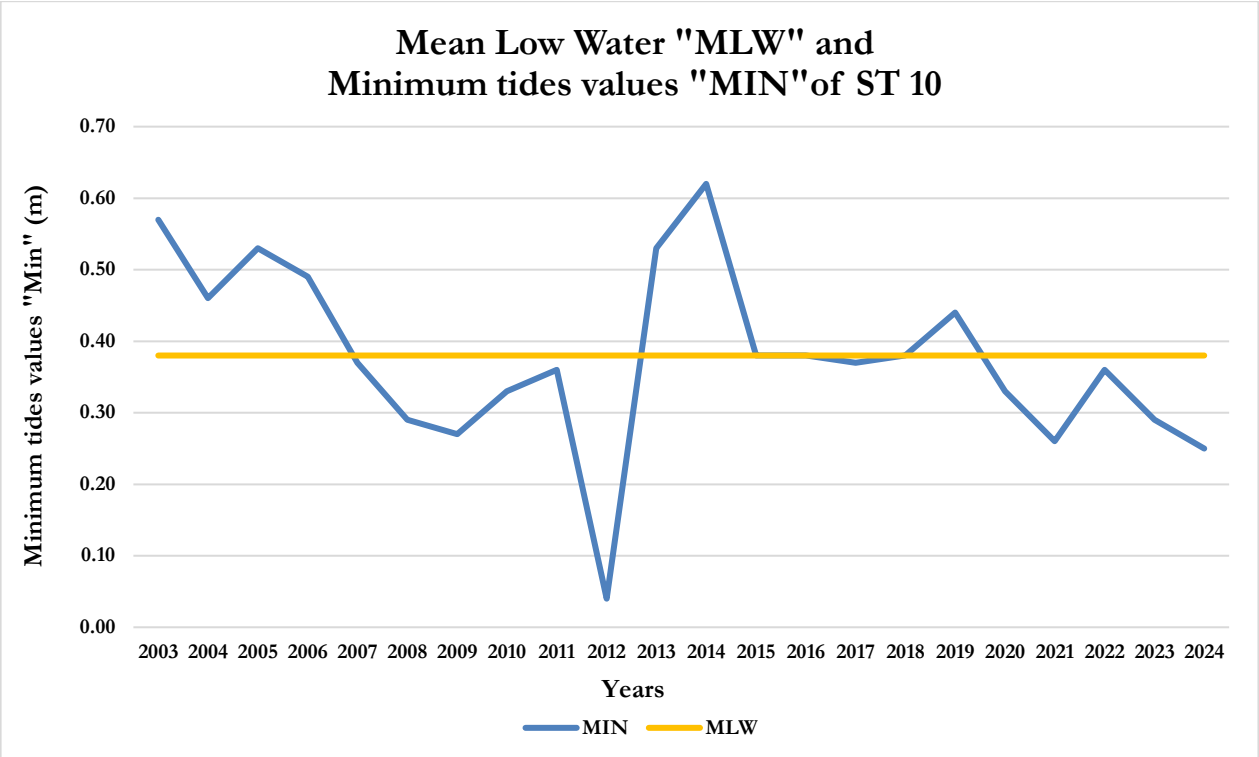
MLW - MHW ST 09		
DEPTH (m)		
YEARS	**MIN Tides Values (MLW)**	**MAX Tides Values (MHW)**
2003	0.23	0.88
2004	0.12	0.82
2005	0.16	0.96
2006	0.04	0.75
2007	0.14	0.77
2008	0.21	0.87
2009	0.24	0.84
2010	0.23	0.90
2011	0.02	0.73
2012	0.14	0.79
2013	0.25	0.79
2014	0.30	0.84
2015	0.31	0.84
2016	0.29	0.84
2017	0.28	1.29
2018	0.39	0.98
2019	0.53	1.09
2020	0.35	0.88
2021	0.29	0.97
2022	0.37	1.16
2023	0.31	0.91
2024 *(Until 06-17-2024)*	0.02	0.85
AVERAGE	**0.24**	**0.90**
STD DEV	**0.13**	**0.14**

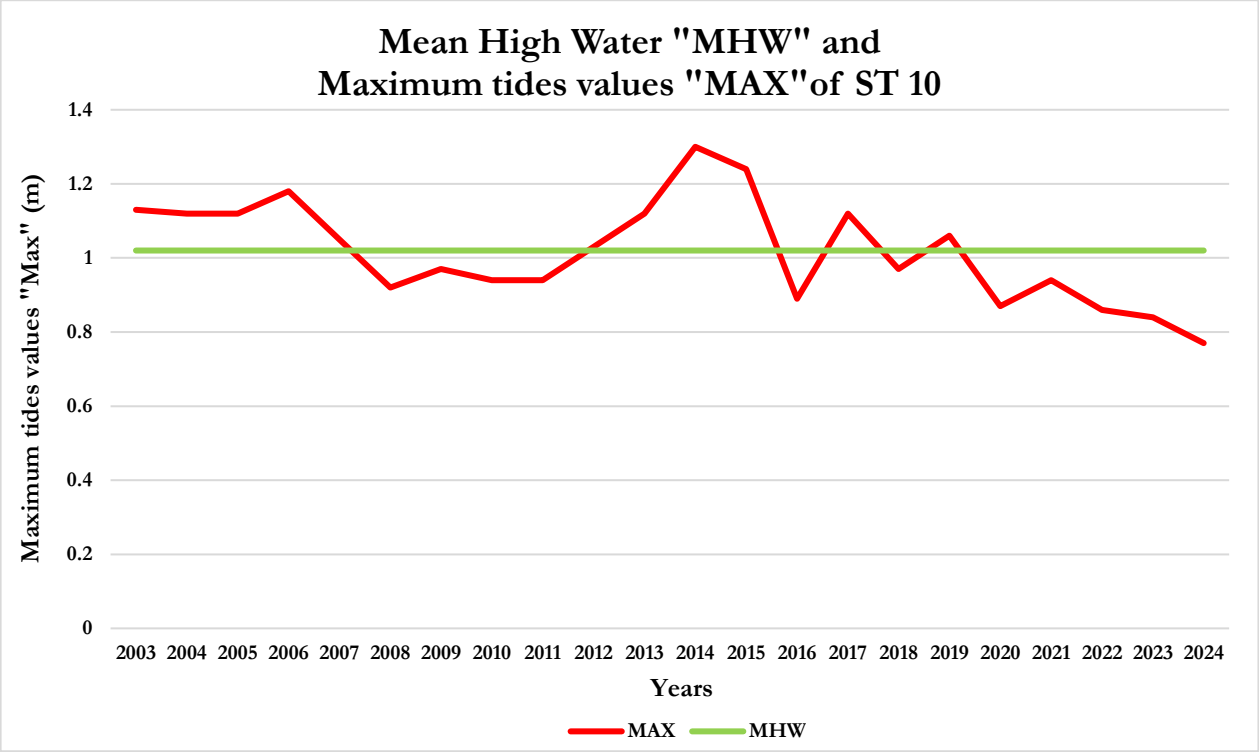

Mean Low Water "MLW" and
Minimum tides values "MIN"of ST 09
Minimum tides values "Min" (m)
0.60
0.50
0.40
0.30
0.20
0.10
0.00
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
Years
MIN
MLW


Mean High Water "MHW" and
Maximum tides values "MAX"of ST 09
Maximum tides values "Max" (m)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
Years
MAX
MHW

ST 10:

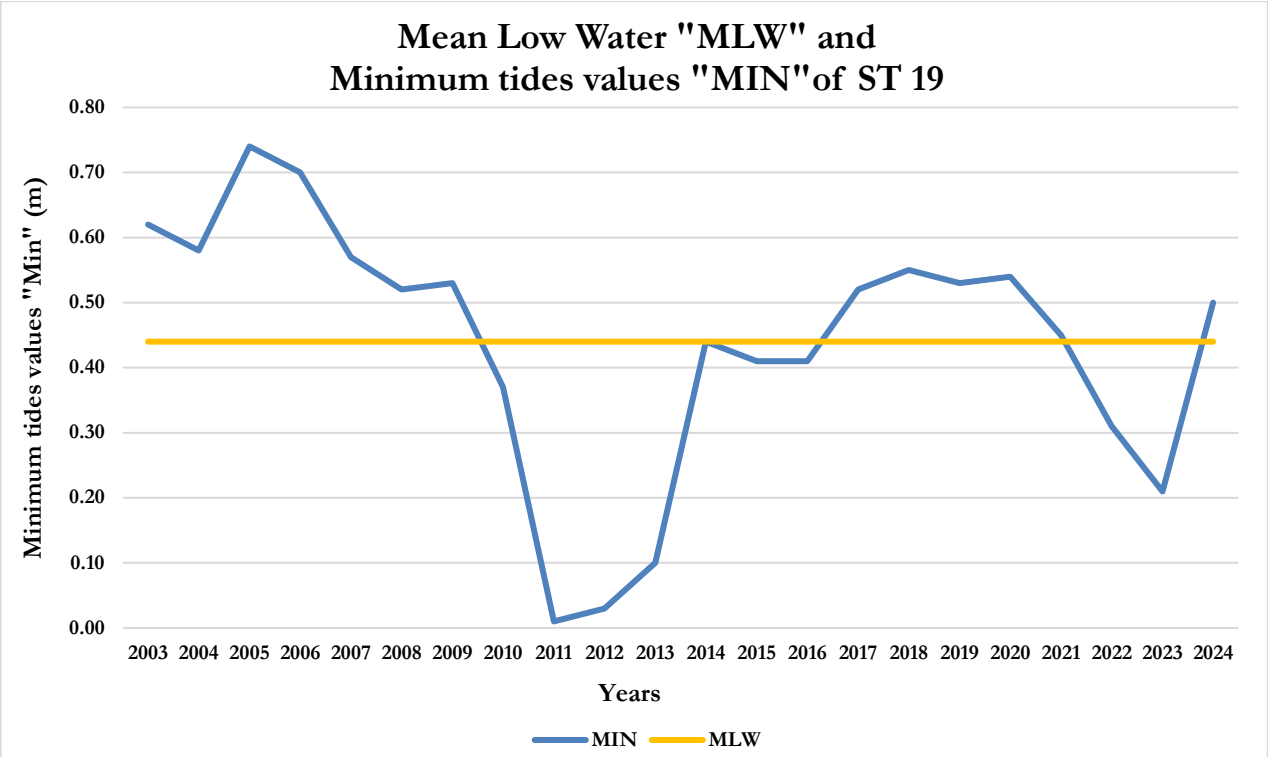
MLW - MHW ST 10		
DEPTH (m)		
YEARS	MIN Tides Values (MLW)	MAX Tides Values (MHW)
2003	0.57	1.13
2004	0.46	1.12
2005	0.53	1.12
2006	0.49	1.18
2007	0.37	1.05
2008	0.29	0.92
2009	0.27	0.97
2010	0.33	0.94
2011	0.36	0.94
2012	0.04	1.03
2013	0.53	1.12
2014	0.62	1.30
2015	0.38	1.24
2016	0.38	0.89
2017	0.37	1.12
2018	0.38	0.97
2019	0.44	1.06
2020	0.33	0.87
2021	0.26	0.94
2022	0.36	0.86
2023	0.29	0.84
2024 *(Until 06-17-2024)*	0.25	0.77
AVERAGE	**0.38**	**1.02**
STD DEV	**0.13**	**0.14**

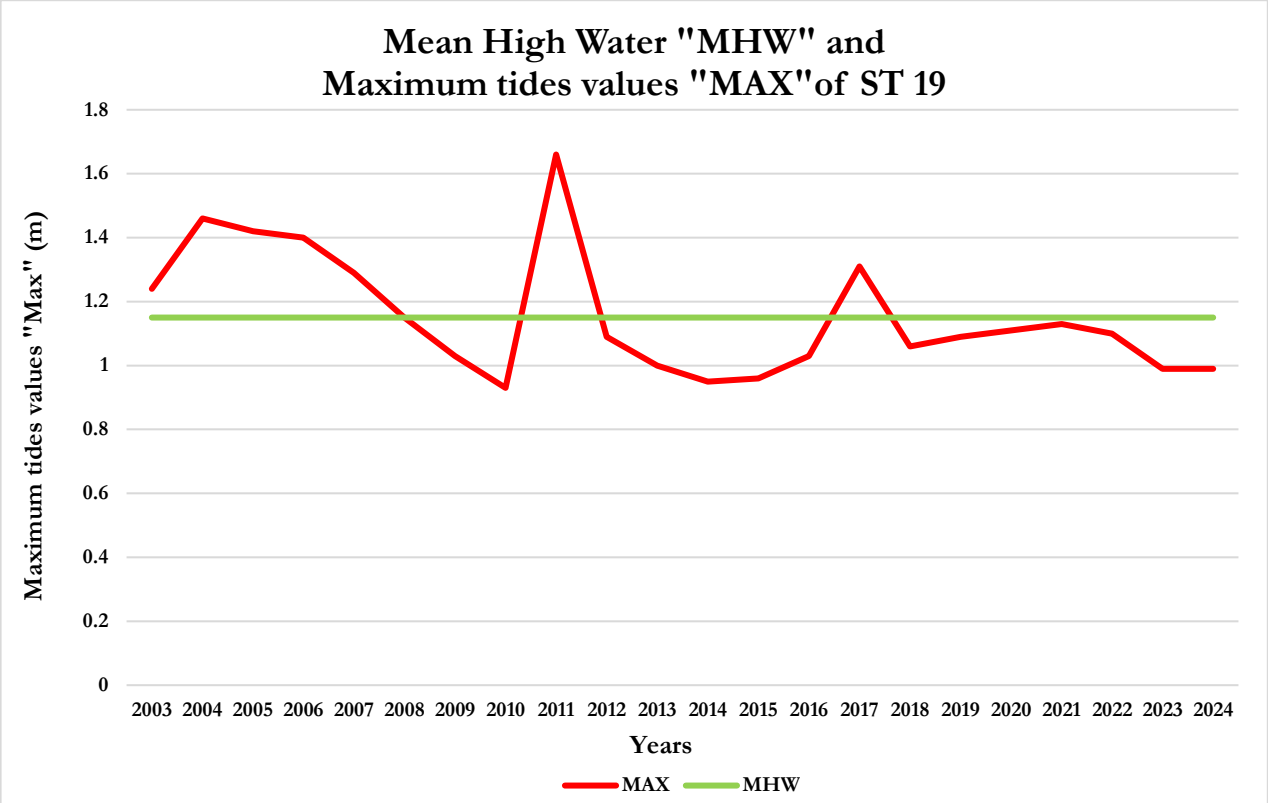

Mean Low Water "MLW" and
Minimum tides values "MIN"of ST 10
Minimum tides values "Min" (m)
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
Years
MIN
MLW


Mean High Water "MHW" and
Maximum tides values "MAX"of ST 10
Maximum tides values "Max" (m)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
Years
MAX
MHW

ST 19:

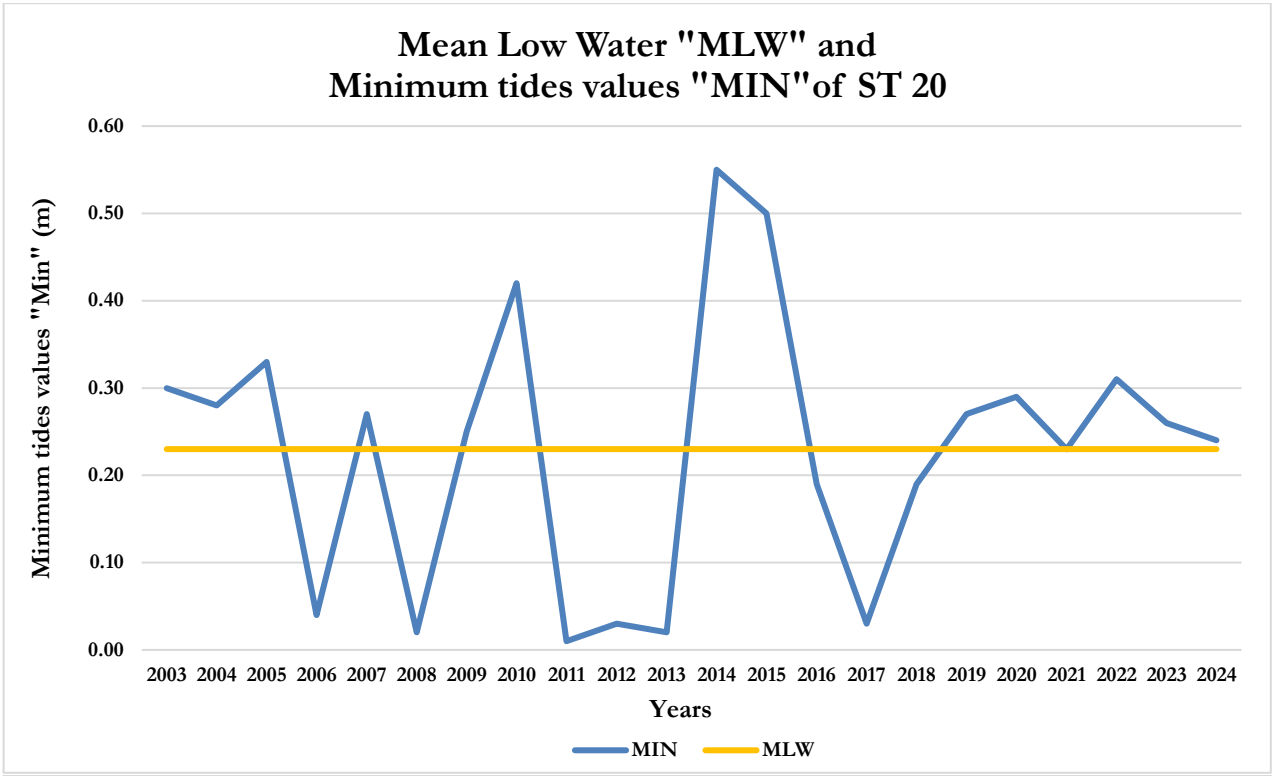
MLW - MHW ST 19		
DEPTH (m)		
YEARS	MIN Tides Values (MLW)	MAX Tides Values (MHW)
2003	0.62	1.24
2004	0.58	1.46
2005	0.74	1.42
2006	0.70	1.40
2007	0.57	1.29
2008	0.52	1.15
2009	0.53	1.03
2010	0.37	0.93
2011	0.01	1.66
2012	0.03	1.09
2013	0.10	1.00
2014	0.44	0.95
2015	0.41	0.96
2016	0.41	1.03
2017	0.52	1.31
2018	0.55	1.06
2019	0.53	1.09
2020	0.54	1.11
2021	0.45	1.13
2022	0.31	1.10
2023	0.21	0.99
2024 *(Until 06-17-2024)*	0.50	0.99
AVERAGE	**0.44**	**1.15**
STD DEV	**0.20**	**0.19**

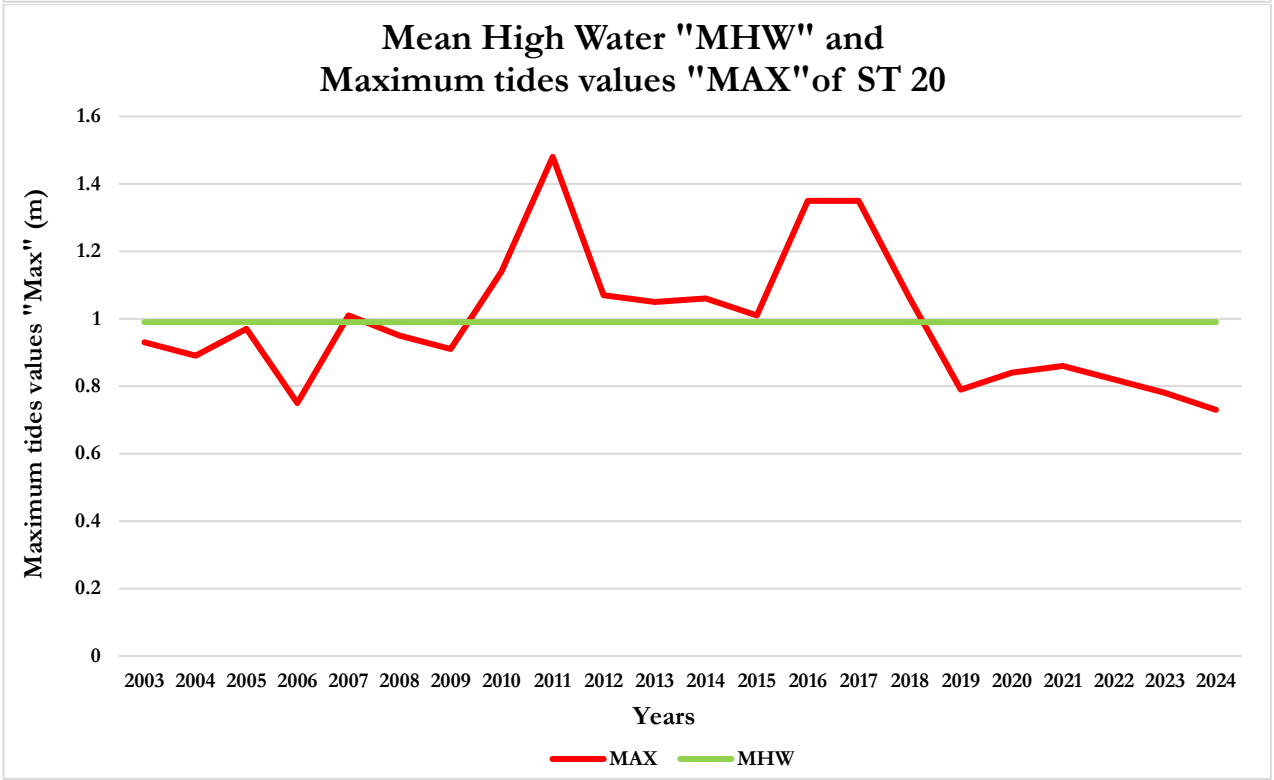

Mean Low Water "MLW" and
Minimum tides values "MIN"of ST 19
Minimum tides values "Min" (m)
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
Years
MIN
MLW


Mean High Water "MHW" and
Maximum tides values "MAX"of ST 19
Maximum tides values "Max" (m)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
Years
MAX
MHW

ST 20:

MLW - MHW ST 20		
DEPTH (m)		
YEARS	MIN Tides Values (MLW)	MAX Tides Values (MHW)
2003	0.30	0.93
2004	0.28	0.89
2005	0.33	0.97
2006	0.04	0.75
2007	0.27	1.01
2008	0.02	0.95
2009	0.25	0.91
2010	0.42	1.14
2011	0.01	1.48
2012	0.03	1.07
2013	0.02	1.05
2014	0.55	1.06
2015	0.50	1.01
2016	0.19	1.35
2017	0.03	1.35
2018	0.19	1.06
2019	0.27	0.79
2020	0.29	0.84
2021	0.23	0.86
2022	0.31	0.82
2023	0.26	0.78
2024 *(Until 06-17-2024)*	0.24	0.73
AVERAGE	**0.23**	**0.99**
STD DEV	**0.15**	**0.20**


Mean Low Water "MLW" and
Minimum tides values "MIN"of ST 20
Minimum tides values "Min" (m)
0.60
0.50
0.40
0.30
0.20
0.10
0.00
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
Years
MIN
MLW


Mean High Water "MHW" and
Maximum tides values "MAX"of ST 20
Maximum tides values "Max" (m)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
Years
MAX
MHW

6> Data collection period – Include each YSI deployment and retrieval date and time <**first** and **last** readings in the water> for each monitoring site for the year. Do not include times of pre- and post-deployment or datasondes' transport. Note when data collection began initially for your Reserve or sample sites.

Station nine <9> water quality monitoring began on December 20, 1995.
Station ten <10> water quality monitoring began on February 1, 1996.
Station nineteen <19> water quality monitoring began on April 1, 2004.
Station twenty <20> water quality monitoring began on May 13, 2004.

Deployment and Retrieval Dates 2025:

Station 09

Date/	Time In	Date/	Time Out
12/18/2024	10:32	01/08/2025	09:57
01/10/2025	12:51	01/22/2025	10:16
01/24/2025	11:22	02/04/2025	10:12
02/06/2025	11:04	02/19/2025	10:09
02/21/2025	09:43	03/18/2025	10:00
03/20/2025	11:40	04/09/2025	10:00
04/11/2025	11:45	04/30/2025	10:30
05/02/2025	11:10	05/14/2025	10:35
05/16/2025	10:00	06/16/2025	10:18
06/18/2025	10:42	07/21/2025	09:58

***No Data

Station 19

Date/	Time In	Date/	Time Out
12/18/2024	10:02	01/08/2025	09:30
01/10/2025	10:47	01/22/2025	09:30
01/24/2025	10:05	02/04/2025	09:45
02/06/2025	10:25	02/19/2025	09:47
02/21/2025	09:13	03/18/2025	09:20
03/27/2025	08:55	04/09/2025	09:25

Station 10

Date/	Time In	Date/	Time Out
12/18/2024	11:12	01/08/2025	10:30
01/10/2025	13:55	01/22/2025	10:48
01/24/2025	12:22	02/04/2025	10:44
02/06/2025	12:04	02/19/2025	10:35
02/21/2025	10:45	03/18/2025	10:40
03/20/2025	12:30	04/09/2025	10:45
04/11/2025	13:04	04/30/2025	10:58
05/16/2025	10:42	06/16/2025	10:50
06/18/2025	11:34	07/21/2025	10:30

***No Data

Station 20

Date/	Time In	Date/	Time Out
12/18/2024	09:28	01/08/2025	09:15
01/10/2025	09:19	01/22/2025	08:36
01/24/2025	09:32	02/04/2025	09:22
02/06/2025	10:03	02/19/2025	09:20
02/21/2025	08:53	03/18/2025	08:55
03/20/2025	09:00	04/09/2025	08:48
04/11/2025	09:45	04/30/2025	09:43
05/02/2025	09:44	05/14/2025	09:30
05/16/2025	08:50	06/16/2025	09:49
06/18/2025	09:51	07/21/2025	09:23

7> Distribution

NOAA retains the right to analyze, synthesize and publish summaries of the NERRS System-wide Monitoring Program data. The NERRS retains the right to be fully credited for having collected and process the data. Following academic courtesy standards, the NERR site where the data were collected should be contacted and fully acknowledged in any subsequent publications in which any part of the data are used. The data set enclosed within this package/transmission is only as good as the quality assurance and quality control procedures outlined by the enclosed metadata reporting statement. The user bears all responsibility for its subsequent use/misuse in any further analyses or comparisons. The Federal government does not assume liability to the Recipient or third persons, nor will the Federal government reimburse or indemnify the Recipient for its liability due to any losses resulting in any way from the use of this data.

Requested citation format:
NOAA National Estuarine Research Reserve System <NERRS>. System-wide Monitoring Program. Data accessed from the NOAA NERRS Centralized Data Management Office website: http://www.nerrsdata.org/; accessed 12 October 2020.

NERR water quality data and metadata can be obtained from the Research Coordinator at the individual NERR site <please see Principal Investigators and Contact Persons>, from the Data Manager at the Centralized Data Management Office <please see personnel directory under the general information link on the CDMO home page> and online at the CDMO home page **www.nerrsdata.org.** Data are available in text tab-delimited format.

8> Associated researchers and projects

The Jobos Bay NERR maintains four water quality monitoring stations as part of the System Wide Monitoring Program <SWMP> to monitor variability in the estuarine environment. Meteorological station collects continuous information that support water quality data intended to address short-term variability and long-term changes in estuarine water parameters within the bay <i.e., localized impacts of seasonal storms and hurricane events, variability due to tidal circulation, seasonal and interannual differences in rainfall, magnitude and influence of major events such hurricanes, spatial extent of oceanic and tidal forcing.

Our water quality monitoring program is a key component of SWMP. Variables measured include Temperature, Dissolved Oxygen, Turbidity, pH, Salinity and Depth in 4 permanent stations equipped with YSI data sondes. The program supports a nutrient monitoring at the same stations, nitrogen, phosphorus, and chlorophyll are measured in a monthly basis. Also, a diel nutrient sampling is performed in a monthly basis.

SWMP data has been used by:

- Caribbean Regional Association for the Caribbean Regional Coastal Ocean Observing System <CariCOOS> who monitors Real Time data from our SWMP stations.
- Environmental Quality Board for their biennial Puerto Rico 305<b>/303<d> Integrated Report
- Puerto Rico Energy Power Authority <PREPA>
- Department of Natural and Environmental Resources
- Ocean Physics Education (OPE) an educational effort by physical oceanographer Dr. Edwin Alfonso-Sosa.

II. Physical Structure Descriptors

9> Sensor specifications –

YSI EXO-2 Sonde:
Parameter: Temperature
Units: Celsius <C>
Sensor Type: Thermistor
Model#: 599870-01
Range: -5 to 50 C
Accuracy: -5 to 35: +/- 0.01, 35 to 50: +/- .005
Resolution: 0.01 C

Parameter: Conductivity
Units: milli-Siemens per cm <mS/cm>
Sensor Type: 4-electrode cell with auto ranging
Model#: 599870-01
Range: 0 to 200 mS/cm
Accuracy: 0 to 100: +/- 0.5% of reading or 0.001 mS/cm; 100 to 200: +/- 1% of reading
Resolution: 0.001 mS/cm to 0.1 mS/cm <range dependent>

Parameter: Salinity
Units: practical salinity units <psu>/parts per thousand <ppt>
Sensor Type: Calculated from conductivity and temperature
Range: 0 to 70 psu
Accuracy: +/- 1.0% of reading pr 0.1 ppt, whichever is greater
Resolution: 0.01 psu

Parameter: Dissolved Oxygen % saturation
Sensor Type: Optical probe w/ mechanical cleaning
Model#: 599100-01
Range: 0 to 500% air saturation
Accuracy: 0-200% air saturation: +/- 1% of the reading or 1% air saturation, whichever is greater 200-500% air saturation: +/- 5% or reading
Resolution: 0.1% air saturation

Parameter: Dissolved Oxygen mg/L <Calculated from % air saturation, temperature, and salinity>
Units: milligrams/Liter <mg/L>
Sensor Type: Optical probe w/ mechanical cleaning
Model#: 599100-01
Range: 0 to 50 mg/L
Accuracy: 0-20 mg/L: +/-0.1 mg/l or 1% of the reading, whichever is greater
20 to 50 mg/L: +/- 5% of the reading
Resolution: 0.01 mg/L

Parameter: Non-vented Level - Shallow <Depth>
Units: feet or meters <ft or m>
Sensor Type: Stainless steel strain gauge
Range: 0 to 33 ft <10 m>
Accuracy: +/- 0.013 ft <0.004 m>
Resolution: 0.001 ft <0.001 m>

Parameter: pH
Units: pH units
Sensor Type: Glass combination electrode
Model#: 599701<guarded> or 599702<wiped>
Range: 0 to 14 units
Accuracy: +/- 0.01 units within +/- 10° of calibration temperature, +/- 0.02 units for entire temperature range
Resolution: 0.01 units

Parameter: Turbidity
Units: formazin nephelometric units <FNU>
Sensor Type: Optical, 90-degree scatter
Model#: 599101-01
Range: 0 to 4000 FNU
Accuracy: 0 to 999 FNU: 0.3 FNU or +/-2% of reading <whichever is greater>; 1000 to 4000 FNU +/-5% of reading
Resolution: 0 to 999 FNU: 0.01 FNU, 1000 to 4000 FNU: 0.1 FNU

Parameter: Chlorophyll
Units: micrograms/Liter
Sensor Type: Optical probe
Model#: 599102-01
Range: 0 to 400 ug/Liter
Accuracy: Dependent on methodology
Resolution: 0.1 ug/L chl a, 0.1% FS

Depth Qualifier:

The NERR System-Wide Monitoring Program utilizes YSI data sondes that can be equipped with either vented or non-vented depth/level sensors. Readings for both vented and non-vented sensors are automatically compensated for water density change due to variations in temperature and salinity; but for all non-vented depth measurements, changes in atmospheric pressure between calibrations appear as changes in water depth. The error is equal to approximately 1.02 cm for every 1 millibar change in atmospheric pressure, and is eliminated for vented sensors because they are vented to the atmosphere throughout the deployment time interval.

Beginning in 2006, NERR SWMP standard calibration protocol calls for all non-vented depth sensors to read 0 meters at a <local> barometric pressure of 1013.25 mb <760 mm/hg>. To achieve this, each site calibrates their depth sensor with a depth offset number, which is calculated using the actual atmospheric pressure at the time of calibration and the equation provided in the SWMP calibration sheet or digital calibration log. This offset procedure standardizes each depth calibration for the entire NERR System. If accurate atmospheric pressure data are available, non-vented sensor depth measurements at any NERR can be corrected.

In 2010, the CDMO began automatically correcting depth/level data for changes in barometric pressure as measured by the Reserve's associated meteorological station during data ingestion. These corrected depth/level data are reported as cDepth and cLevel, and are assigned QAQC flags and codes based on QAQC protocols. Please see sections 11 and 12 for QAQC flag and code definitions.

NOTE: older depth data cannot be corrected without verifying that the depth offset was in place and whether a vented or non-vented depth sensor was in use. No SWMP data prior to 2006 can be corrected using this method. The following equation is used for corrected depth/level data provided by the CDMO beginning in 2010:

<<1013-BP> * 0.0102> +Depth/Level = cDepth/cLevel.

Salinity Units Qualifier:

In 2013, EXO sondes were approved for SWMP use and began to be utilized by Reserves. While the 6600 series sondes report salinity in parts per thousand <ppt> units, the EXO sondes report practical salinity units <psu>. These units are essentially the same and for SWMP purposes are understood to be equivalent, however, psu is considered the more appropriate designation. Moving forward the NERR System will assign psu salinity units for all data regardless of sonde type.

Turbidity Qualifier:

In 2013, EXO sondes were approved for SWMP use and began to be utilized by Reserves. While the 6600 series sondes report turbidity in nephelometric turbidity units <NTU>, the EXO sondes use formazin nephelometric units <FNU>. These units are essentially the same but indicate a difference in sensor methodology, for SWMP purposes they will be considered equivalent. Moving forward, the NERR System will use FNU/NTU as the designated units for all turbidity data regardless of sonde type. If turbidity units and sensor methodology are of concern, please see the Sensor Specifications portion of the metadata.

Chlorophyll Fluorescence Disclaimer:

YSI chlorophyll sensors <6025 or 599102-01> are designed to serve as a proxy for chlorophyll concentrations in the field for monitoring applications and complement traditional lab extraction methods; therefore, there are accuracy limitations associated with the data that are detailed in the YSI manual including interference from other fluorescent species, differences in calibration method, and effects of cell structure, particle size, organism type, temperature, and light on sensor measurements.

10> Coded variable definitions

Sampling station:	Sampling site code:	Station code:
Station 9	ST09	job09wq
Station 10	ST10	job10wq
Station 19	ST19	job19wq
Station 20	ST20	job20wq

11> QAQC flag definitions

QAQC flags provide documentation of the data and are applied to individual data points by insertion into the parameter's associated flag column <header preceded by an F_>. During primary automated QAQC <performed by the CDMO>, -5, -4, and -2 flags are applied automatically to indicate data that is missing and above or below sensor range. All remaining data are then flagged 0, passing initial QAQC checks. During secondary and tertiary QAQC 1, -3, and 5 flags may be used to note data as suspect, rejected due to QAQC, or corrected.

-5 Outside High Sensor Range
-4 Outside Low Sensor Range
-3 Data Rejected due to QAQC
-2 Missing Data
-1 Optional SWMP Supported Parameter
0 Data Passed Initial QAQC Checks

1 Suspect Data
2 *Open - reserved for later flag*
3 Calculated data: non-vented depth/level sensor correction for changes in barometric pressure
4 Historical Data: Pre-Auto QAQC
5 Corrected Data

12> QAQC code definitions

QAQC codes are used in conjunction with QAQC flags to provide further documentation of the data and are also applied by insertion into the associated flag column. There are three <3> different code categories, general, sensor, and comment. General errors document general problems with the deployment or YSI data sonde, sensor errors are sensor specific, and comment codes are used to further document conditions or a problem with the data. Only one general or sensor error and one comment code can be applied to a particular data point, but some comment codes <marked with an * below> can be applied to the entire record in the FRecord column.

General Errors

GIC	No instrument deployed due to ice
GIM	Instrument malfunction
GIT	Instrument recording error; recovered telemetry data
GMC	No instrument deployed due to maintenance/calibration
GNF	Deployment tube clogged / no flow
GOW	Out of water event
GPF	Power failure / low battery
GQR	Data rejected due to QA/QC checks
GSM	See metadata

Corrected Depth/Level Data Codes

GCC	Calculated with data that were corrected during QA/QC
GCM	Calculated value could not be determined due to missing data
GCR	Calculated value could not be determined due to rejected data
GCS	Calculated value suspect due to questionable data
GCU	Calculated value could not be determined due to unavailable data

Sensor Errors

SBO	Blocked optic
SCF	Conductivity sensor failure
SCS	Chlorophyll spike
SDF	Depth port frozen
SDG	Suspect due to sensor diagnostics
SDO	DO suspect
SDP	DO membrane puncture
SIC	Incorrect calibration / contaminated standard
SNV	Negative value
SOW	Sensor out of water
SPC	Post calibration out of range
SQR	Data rejected due to QAQC checks
SSD	Sensor drift
SSM	Sensor malfunction
SSR	Sensor removed / not deployed
STF	Catastrophic temperature sensor failure
STS	Turbidity spike
SWM	Wiper malfunction/loss

Comments

CAB*	Algal bloom
CAF	Acceptable calibration/accuracy error of sensor
CAP	Depth sensor in water, affected by atmospheric pressure
CBF	Biofouling
CCU	Cause unknown CDA* DO hypoxia <<3 mg/L>
CDB*	Disturbed bottom
CDF	Data appear to fit conditions
CFK*	Fish kill
CIP*	Surface ice present at sample station
CLT*	Low tide
CMC*	In field maintenance/cleaning
CMD*	Mud in probe guard
CND	New deployment begins
CRE*	Significant rain event
CSM*	See metadata
CTS	Turbidity spike
CVT*	Possible vandalism/tampering
CWD*	Data collected at wrong depth
CWE*	Significant weather event

13> Post deployment information

STATION 09				Post Deployment Calibration Values			
Date In	Time In	Date Out	Time Out	SpCond <50mS/cm>	DO%	pH <7>	Turb <0 NTU>
12/18/2024	10:32	01/08/2025	09:57	53.24	99.1	7.11	0.02
01/10/2025	12:51	01/22/2025	10:16	51.52	95.9	7.11	0.06
01/24/2025	11:22	02/04/2025	10:12	52.47	81.4	7.07	0.09
02/06/2025	11:04	02/19/2025	10:09	50.075	95.8	7.00	0.09
02/21/2025	09:43	03/18/2025	10:00	47.37	65.7	7.09	-0.14
03/20/2025	11:40	04/09/2025	10:00	50.07	83.3	7.00	0.02
04/11/2025	11:45	04/30/2025	10:30	49.04	96.0	7.08	0.00
05/02/2025	11:10	05/14/2025	10:35	64.31	96.2	7.07	0.00
05/16/2025	10:00	06/16/2025	10:18	52.95	98.3	7.07	0.05
06/18/2025	10:42	07/21/2025	09:58	47.54	94.7	7.14	0.00

***Bad sensor, **Fouling, ***No Data**

STATION 10				Post Deployment Calibration Values			
Date In	Time In	Date Out	Time Out	SpCond <50mS/cm>	DO%	pH <7>	Turb <0 NTU>
12/18/2024	11:12	01/08/2025	10:30	53.40	99.1	6.98	0.07
01/10/2025	13:55	01/22/2025	10:48	50.65	100.5	7.19	-0.20
01/24/2025	12:22	02/04/2025	10:44	51.37	109.8	7.01	0.00
02/06/2025	12:04	02/19/2025	10:35	49.57	96.5	7.06	-0.09
02/21/2025	10:45	03/18/2025	10:40	50.22	96.3	7.05	0.02
03/20/2025	12:30	04/09/2025	10:45	53.08	99.7	7.12	0.18
04/11/2025	13:04	04/30/2025	10:58	60.98	108.9	7.06	0.07
05/16/2025	10:42	06/16/2025	10:50	60.13	97.0	7.15	0.01
06/18/2025	11:34	07/21/2025	10:30	59.10	90.1	7.13	0.00

***Bad sensor, **Fouling, ***No Data**

STATION 19				Post Deployment Calibration Values			
Date In	Time In	Date Out	Time Out	SpCond <50mS/cm>	DO%	pH <7>	Turb <0 NTU>
12/18/2024	10:02	01/08/2025	09:30	58.64	94.4	7.04	0.17
01/10/2025	10:47	01/22/2025	09:30	50.00	108.5	7.06	0.04
01/24/2025	10:05	02/04/2025	09:45	50.00	85.8	6.97	0.07
02/06/2025	10:25	02/19/2025	09:47	49.054	99.4	7.05	0.06
02/21/2025	09:13	03/18/2025	09:20	0.103	94.0	7.10	0.11
03/27/2025	08:55	04/09/2025	09:25	50.62	103.4	7.03	0.07

***Bad sensor, **Fouling, ***No Data**

STATION 20				Post Deployment Calibration Values			
Date In	Time In	Date Out	Time Out	SpCond <50mS/cm>	DO%	pH <7>	Turb <0 NTU>
12/18/2024	09:28	01/08/2025	09:15	54.06	99.9	6.93	0.10
01/10/2025	09:19	01/22/2025	08:36	50.22	94.8	7.06	0.07
01/24/2025	09:32	02/04/2025	09:22	50.93	92.9	6.99	0.02
02/06/2025	10:03	02/19/2025	09:20	50.40	98.3	6.97	0.02
02/21/2025	08:53	03/18/2025	08:55	50.37	95.2	7.14	0.30
03/20/2025	09:00	04/09/2025	08:48	52.60	96.9	7.01	0.08
04/11/2025	09:45	04/30/2025	09:43	50.17	75.5	7.03	0.00
05/02/2025	09:44	05/14/2025	09:30	51.08	100.3	6.94	-0.09
05/16/2025	08:50	06/16/2025	09:49	52.36	96.8	7.07	0.00
06/18/2025	09:51	07/21/2025	09:23	50.08	96.3	7.08	0.02

***Bad sensor, **Fouling, ***No Data**

14> other remarks/notes

Data are missing due to equipment or associated specific probes not being deployed, equipment failure, time of maintenance or calibration of equipment, or repair/replacement of a sampling station platform. Any NaNs in the dataset stand for "not a number" and are the result of low power, disconnected wires, or out-of-range readings. If additional information on missing data is needed, contact the Research Coordinator at the reserve submitting the data.

Conductivity/Salinity comments:

JOB09WQ: Suspect Conductivity and Salinity values from 05/16/2025 at 10:00 am to 05/18/2025 at 16:00 <1> [GSM]. Conductivity/Temperature sensor calibration has been a good QC Score and cell Constant. At the time the probe was placed in the deployment tube, the tide was at its lowest Point "TSL", so we infer that due to the depth at Station 9, there was stratification in the water. Upon placing the probe in its tube, we infer that the stratified water mixed and "homogenized," which is why the conductivity and salinity values increased until they stabilized. On June 16, 2025, a discrete sample was taken with a handheld at 10:11 a.m., obtaining conductivity values of 56.15 ms/cm and a salinity of 37.23. Therefore, we can infer that the data obtained by the probe and the handheld are comparable at sonde data of 06/16/2025 at 10:15; for this reason, the data are not being rejected.

Suspect Conductivity and Salinity values from 06/18/2025 at 10:45 am to 06/19/2025 at 07:15 <1> [GSM]. Conductivity/Temperature sensor calibration has been a good QC Score and cell Constant. At the time the probe was placed in the deployment tube, the tide was receding, approaching its lowest point, so we infer that due to the depth at Station 9, there was stratification in the water. Upon placing the probe in its tube, we infer that the stratified water mixed and "homogenized," which is why the conductivity and salinity values increased until they stabilized. On July 21, 2025 (Deployment last date), a discrete sample was taken with a handheld at 09:56 a.m., obtaining conductivity values of 52.85 ms/cm and a salinity of 34.73. Therefore, we can infer that the data obtained by the probe and the handheld are comparable at sonde data of 06/30/2025 at 23:45; for this reason, the data are not being rejected.

JOB10WQ: Conductivity/Temperature sensor #22K101002 on Sonde 14K101407 is changed to sensor #22K1002 on 05/14/2025. Conductivity sensor failure [SCF]. Rejected Temperature, Conductivity, Salinity, Dissolved Oxygen, Depth and pH values from 04/11/2025 at 13:15 to 04/30/2025 at 11:00, 05/16/2025 at 10:45 to 06/30/2025 at 23:45.

JOB19WQ: Rejected Conductivity and Salinity values from 01/01/2025 at 00:00 to 01/01/2025 at 20:00, 01/02/2025 at 03:00 to 01/08/2025 at 09:15 <-3> [SSM].

Rejected Conductivity and Salinity values from 02/06/2025 at 10:45 to 02/19/2025 at 09:45 <-3> [SSM]. On post deployment reading, this sensor was completely obstructed by a calcium carbonate buildup, {CSM}.

Rejected Conductivity and Salinity values from 02/21/2025 at 09:30 to 03/18/2025 at 09:15, <-3> [SCF].

C/T serial #: 16F101024 sensor out of range in post-deployment <-3> [SCF] on 03/19/2025. C/T sensor are replaced for the new one C/T sensor serial #: 16B101681 at 03/25/2025.

Rejected Conductivity and Salinity values from 03/27/2025 at 09:00 to 03/27/2025 at 09:30, <-3> [SQR].

Missing Temperature, Conductivity and Salinity values from 03/30/2025 at 04:00 to 03/31/2025 at 23:45, <-2>.

Conductivity sensor failure [SCF]. Rejected Temperature, Conductivity, Salinity, Dissolved Oxygen, Depth and pH values from 04/01/2025 at 00:00 to 04/03/2025 at 16:15.

JOB20WQ:

DO Data comments:

JOB09WQ:
JOB10WQ:
JOB19WQ: Rejected DO values from 03/30/2025 at 04:00 to 04/03/2025 at 16:15, <-3> [SCF].
JOB20WQ:

pH Data comments:

JOB09WQ: The pH sensor 22L101169 show bad QC score warning and issue for calibrate correctly. I replaced for new pH sensor 23K104998 on 03/19/2025.
JOB10WQ:
JOB19WQ: Rejected pH values from 03/30/2025 at 04:00 to 04/03/2025 at 16:15, <-3> [SCF].
JOB20WQ:

Chlorophyll Data comments:

JOB09WQ:
JOB10WQ:
JOB19WQ:
JOB20WQ:

Turbidity Data comments:

JOB09WQ:
JOB10WQ:
JOB10WQ:
JOB19WQ:
JOB20WQ:

Depth Data Comments:

JOB09WQ:
JOB10WQ:
JOB19WQ: Rejected Depth values from 03/30/2025 at 04:00 to 04/03/2025 at 16:15, <-3> [SCF].
JOB20WQ:

Additional Notes:

ST09 on 03/07/2025 at 12:45 pm to 13:00, Out of water event, <-3> [GOW], because the sonde is out of water for infield maintenance, sensor and batteries check. All parameters are rejected, {CMC}.

ST09: Sonde 13J101770 is changed to station 9 for station 10 on 07/23/2025, Station 9 is out of service temporarily.

ST10 sonde stop to record data on deployment of 02/21/2025 to 03/18/2025; specific time range between of 03/06/2025 to 03/07/2025 some missing data <-2>, (CCU).

ST10 on 03/07/2025 at 14:00, Out of water event, <-3> [GOW], because the sonde is out of water for infield maintenance, sensor and batteries check. All parameters are rejected, {CMC}.

ST10: Conductivity/Temperature sensor #22K101002 on Sonde 14K101407 is changed to sensor #22K1002 on 05/14/2025. Conductivity sensor failure [SCF]. Rejected Temperature, Conductivity, Salinity, Dissolved Oxygen, Depth, and pH values from 04/11/2025 at 13:15 to 04/30/2025 at 11:00, 05/16/2025 at 10:45 to 06/30/2025 at 23:45.

*ST10: Suspect Temperature, Conductivity, Salinity, Dissolved Oxygen, Depth and pH values from 04/01/2025 at 00:00 am to 04/09/2025 at 10:45; 04/11/2025 at 13:15 to 04/30/2025 at 11:00; 05/16/2025 at 10:45 to 06/16/2025 at 10:45; 06/18/2025 at 11:45 to 06/30/2025 at 23:45 <1> [GSM]. It was decided to flag the data as suspicious since we need to verify the next deployment with another probe and another sensor and compare the data to ultimately determine whether the data will be rejected or not.

ST10: Sonde 14K101407 is temporarily out of service on 07/23/2025. Sonde 13J101770 is changed to station 9 for station 10 on 07/23/2025.

ST19 sonde stop to record data on deployment of 01/24/2025 to 02/04/2025, <-2>, (CCU).

ST19 on 03/07/2025 at 14:00, Out of water event, <-3> [GOW], because the sonde is out of water for infield maintenance, sensor and batteries check. All parameters are rejected, {CMC}.

ST19 serial number: 17L101173 sonde stop to record data on deployment of 03/27/2025 to 04/09/2025, specific on 04/03/2025. After this deployment this sonde is out of service temporarily, I will waiting for new C/T sensor arrives.

ST19 on deployment from 03/27/2025 to 04/09/2025 the file was edited for the time {CSM}.

*ST19: Sonde 17L101173 is temporarily out of service on 04/09/2025. Station 19 is out of service temporarily.**

ST20 on deployment from 02/06/2025 to 02/19/2025 the file was edited for the time {CSM}.

ST20 on 02/22/2025 at 09:46 am to 09:48 am, Out of water event, <-3> [GOW], because the sonde I was used in a demonstration water quality instruments on "TOTE Certification" Teacher on the Estuary Certification of Taller Ecologico de Puerto Rico in collaboration with JBNERR Research Program and Education Program. All parameters are rejected.

ST20 on 03/07/2025 at 11:00 am, Out of water event, <-3> [GOW], because the sonde is out of water for infield maintenance, sensor and batteries check. All parameters are rejected, {CMC}.

ST20 on deployment from 04/10/2025 to 04/30/2025 and 05/02/2025 to 05/14/2025 the file was edited for the time {CSM}.

Other:

Significant rain events 2025:

Date	Precipitation (mm)	Event associated with
04/19/2025	35.3	Rain Event
04/29/2025	21.8	Rain Event
04/30/2025	29.5	Rain Event
05/02/2025	25.9	Rain Event