California Natural Resources Agency 2019 Annual Report on the Salton Sea Management Program

Prepared for the
State Water Resources Control Board
(Order WR 2017-0134)

March 2019

EXECUTIVE SUMMARY

Introduction

On November 7, 2017, the State Water Resources Control Board adopted an order accepting an agreement defining the state's commitment to stabilize and manage the Salton Sea to protect public health and critical Pacific flyway habitat.

Order WR 2017-0134 outlined the State Water Board's oversight role in monitoring and ensuring progress toward the goals of the Salton Sea Management Plan (SSMP), which sets annual milestones for habitat restoration and dust-suppression projects over the next 10 years.

The order requires the Board to hold a public meeting no later than March 31 of each year during phase 1 of the SSMP to receive oral and written comment on the status of Salton Sea restoration. The order also requires a report in the first quarter to identify: 1) completed projects and milestones achieved in the prior year; 2) amount of acreage of completed projects that provide dust suppression and habitat restoration, broken down by habitat type; 3) upcoming projects to be completed and milestones to be achieved prior to the next annual progress report; 4) the status of financial resources and permits that have not been secured for future projects; 5) any anticipated departures from the dates and acreages identified in condition 24 of the order, and; 6) progress toward development of the long-range plan described in the order. If an annual acreage milestone is not met, the report should include a plan to address the deficiency.

This report is submitted to the State Water Board to provide the required information, as well as additional information requested in a May 22, 2018, letter to the Natural Resources Agency regarding current environmental conditions at the Salton Sea.

SSMP Status Overview

Addressing air quality and ecological threats at the Salton Sea is a key priority for Governor Gavin Newsom and Secretary for Natural Resources Wade Crowfoot. The Sea's ongoing decline and continued exposure of playa affect thousands of residents as well as remaining fish and wildlife habitat. Implementing solutions to these challenges is more important than ever.

Since the Natural Resources Agency's update to the State Water Board in March 2018, the State has continued to advance implementation of the Salton Sea Management Plan's first phase,

which prioritizes construction of dust-suppression and habitat projects on exposed playa or areas expected to be exposed by 2028.

Actual project delivery, however, has been hampered by a variety of factors. The State and its partners are working to diligently to resolve issues and allow this important work to move forward.

Following are high-level points about the status of the SSMP. Further detail is contained in the body of the report:

- **The 2018 target of 500 acres was not met.** Though many factors contributed, obtaining an agreement to provide access to project sites has been a significant challenge. A final easement agreement with Imperial Irrigation District (IID) is needed to resolve access issues and enable the State to move forward with design of the Species Conservation Habitat (SCH) project, a large-scale project that anchors the SSMP's first phase.

- **Revitalized discussions underway.** Under the leadership of Natural Resources Secretary Crowfoot and IID General Manager Henry Martinez, focused discussions are taking place to resolve issues so the SCH project can advance. Parties are working together to resolve outstanding questions and concerns, with a focus on reaching an agreement on site access by May 1, 2019.

- **Environmental conditions have worsened.** An increasing amount of playa became exposed in 2018 as was anticipated, with a total of 2,260 acres newly exposed last year. Increasing salinity eventually will displace the desert pupfish from the Salton Sea. Beginning in spring 2016, the number of fish-eating birds present at the Sea began to fall to record lows. Dust remains an urgent problem for residents in nearby communities, with airborne dust from exposed playa adding to pre-existing dust and contaminants already in the air from other sources.

- **The State is committed to completing the SCH project.** If an agreement on site access is secured by May 1, the State anticipates swiftly moving ahead with a procurement process to complete project design. Work will focus on transforming 3,770 acres of exposed playa in the New River area. Regulatory compliance is mostly complete, and once access is available to facilitate the work of contractors, the SCH could be completed by December 2022.

- **Program staffing is being enhanced.** The State is increasing staffing and accountability to implement the SCH project and the overall SSMP. Focused leadership teams are being

established at the Natural Resources Agency, the Department of Fish and Wildlife and the Department of Water Resources, and Secretary Crowfoot has tasked Undersecretary Tom Gibson to work with Assistant Secretary Bruce Wilcox and ensure all parties are coordinating closely to advance this work.

- **Long-term planning continues.** As execution of specific projects advances, the State will continue to assess the entire management plan for the Sea relative to funding availability, site access and the viability of individual projects. As this work moves ahead, the Natural Resources Agency will assess more broadly how to advance the vision of the SSMP.

- **Stakeholder and community engagement continues.** The State is coordinating with numerous stakeholders, Tribes, and local, state and federal agencies on an ongoing basis. A renewed effort to expand and improve public outreach launched earlier this year, highlighted by an interactive community meeting on February 28.

2019 Annual Report to State Water Resources Control Board

This report provides information requested by the State Water Resources Control Board in WR 2017-0134 and augmented by a May 2018 letter to the California Natural Resources Agency. It is organized as follows:

I. Order WR 2017-0134: 500 Acres of Habitat Restoration

- Status of Project Implementation
- Staffing
- Status of Financial Resources

II. Implementation of the Salton Sea Restoration Plan

- Status of the 10-Year plan
- Environmental Planning Status
- Permit Status
- Development of the Long-range Plan

III. Environmental Conditions at the Sea

- New Playa Exposure
- Air Quality Impacts
- Inflow Rates
- Water Quality
- Changes to Bird and Fish Populations

IV. Outreach

V. Deficiency Plan

I. ORDER WR 2017-0134: 500 ACRES OF HABITAT RESTORATION

Status of Project Implementation

The State did not meet the 2018 target of 500 acres of habitat restoration. Many factors contributed, including delays in securing an agreement providing access to project sites for the Species Conservation Habitat project. The State is working diligently to implement the entirety of SCH, which would restore 3,770 acres, and is working with Imperial Irrigation District on a timeline focused on finalizing an access agreement by May 1 and entering the procurement phase for construction by summer 2019. Underscoring the importance of the SSMP to the Newsom Administration, Natural Resources Secretary Crowfoot visited the Salton Sea and met

with project partners in February to strengthen relationships and renew collaborative discussions.

Staffing

The State is increasing staffing and accountability to implement the SCH and the broader SSMP. This increase in staffing and policy-level prioritization at the Natural Resources Agency, the Department of Water Resources and the Department of Fish and Wildlife should result in greater efficiencies and capacity to carry out necessary work.

In addition, Secretary Crowfoot has tasked Undersecretary Tom Gibson to work with Assistant Secretary Bruce Wilcox to ensure all state parties are coordinating closely. The Resources Agency will continually assess staffing and organizational capacity to optimize project implementation.

Status of Financial Resources

The State has allocated nearly $310 million to restoration of the Sea. The State continues to assess fund availability for ongoing operations and maintenance needs that will be associated with habitat creation work but is committed to finding creative solutions to ensure project success. Operations and maintenance includes costs for power, repair, emergency response, management of new infrastructure, and active monitoring and adaptive management of habitat. The State will prepare any future updates to the Board relative to funding availability and limitations.

Funding Source	***Amount***	***Appropriated Agency***
Proposition 50	$14 million	Wildlife Conservation Board
Proposition 84	$26 Million	California Department of Fish and Wildlife
Proposition 1	$80 Million	Department of Water Resources
Proposition 68	$190 Million	California Natural Resources Agency

II. IMPLEMENTATION OF THE SALTON SEA MANAGEMENT PLAN

The State remains committed to the Salton Sea Management Plan. Governor Newsom and Secretary Crowfoot have made this work a key priority, tasking the State team with redoubling efforts to work through issues, including site access.

As discussed above, the 3,770 acres of exposed playa in the New River area adopted as the Preferred Alternative in the Species Conservation Habitat project (SCH) 2013 EIS/EIR will be the first site implemented. Regulatory compliance is mostly complete, and once access is secured to facilitate the work of contractors, the SCH could be completed by December 2022.

The SCH New River project will include water management ponds enclosed by berms to create viable saline aquatic habitat that will support fish populations for birds of the Pacific Flyway. It will also include mixing / sedimentation basins and island habitat features. When completed, the project will suppress dust and provide feeding, resting, and breeding habitat for birds, particularly fish-eating birds whose habitat is deteriorating quickly as the Sea recedes and becomes more saline. The State anticipates that approximately 1,000 acres of the SCH Project could be completed by December 2021 if the current schedule is maintained.

Beyond the SCH, current efforts are underway to plan habitat projects at the mouth of the other two major water sources at the Alamo and Whitewater rivers, which are areas considered to be the primary playa exposure zones as part of a near-term 10-year plan. The State is assessing whether the outflow from these created habitats could then be used to create additional habitat as the Sea recedes and the soil conditions allow for construction of berms.

Additional habitat could be constructed as the Sea recedes at all three river areas and other areas along the perimeter of the lake, where feasible. Specifically, the State is assessing the feasibility of constructing habitat consisting of approximately 7,000 - 7,500 acres at the New River; 4,500 - 6,000 acres at the Whitewater River; and 3,000 - 3,500 acres at the Alamo River. In addition, the State plans to implement approximately 14,900 acres of dust suppression projects. These targets could be achieved assuming the State completes all remaining environmental planning, obtains regulatory authorizations and permits, secures timely access with landowners, and has sufficient water supply to meet its projected goals.

The State is in the process of developing a monitoring and adaptive management plan to prioritize, coordinate, collect and analyze data to inform future restoration actions at the Sea. The program will monitor elements such as biological resources, hydrology, water quality and air quality. The data will help guide management decisions, design and operation of created habitats and ultimately aid in evaluating the performance of the SSMP.

Environmental Planning Status

The 2013 SCH EIS/EIR and California Environmental Quality Act (CEQA) Addendum provides CEQA compliance for all SSMP 10-Year Plan activities in the New River, Alamo River, and Whitewater River areas. It also provides National Environmental Protection Act (NEPA) compliance for project-related activities within the 3,770-acre footprint in the New River area.

There is currently no NEPA compliance for areas and activities outside of the 3,770-acre footprint of the SCH.

The State is collaborating with the U.S. Army Corps of Engineers (ACOE) to execute an agreement to obtain dedicated ACOE Staff to support preparation of a Supplemental Environmental Impact Statement (EIS) and Section 404 Permit for the Alamo River and Whitewater River areas. Upon execution of the new ACOE agreement, the State believes it may be able to complete a Supplemental EIS in mid-2020.

Permitting Status

New River Area: Except for a California Endangered Species Act permit, all permits have been obtained for the 3,770 acres covered in the 2013 SCH EIR/EIS. The Department of Fish and Wildlife anticipates issuing Incidental Take Authorization, pursuant to Fish and Game Code section 2081(a), with planned issuance in the second quarter of 2019.

Alamo and Whitewater River Areas: No permits have been issued for habitat and dust suppression projects in these areas. The State is working toward obtaining all regulatory authorizations in mid-2020.

Development of the Long-Range Plan

In addition to development of a 10-year plan, the State Water Board order requires the development of a long-term strategy for Salton Sea management. The State's 10-Year SSMP plan described above would partially fulfill the first requirement.

The State continues to develop a strategy for long-term management of the Sea. A Long-Range Planning Committee is engaged to identify alternative long-range solutions and recommend those that should advance to scientific review. Most recently, the committee reviewed proposals for a potential water import project that could help meet long-range goals of the SSMP. Three proposals were identified for further review. Additionally, the Long-Range Planning Committee will review the potential for water quality projects or other supplemental sources of water.

III. III. ENVIRONMENTAL CONDITIONS OF THE SALTON SEA

Below is a high-level summary of environmental information requested by the State Water Board. Please see Appendix A-E for supporting technical data compiled by State leads regarding these topics.

Playa Exposure

Since 2003, there has been a steady decline in the surface water elevation of the Salton Sea. That decline continued in 2018, with approximately 2,260 acres of playa exposed by the receding lake. Some of the exposed playa has developed a vegetation cover or is covered by agricultural drainage, making it less likely to be emissive. Playa exposure in 2018 was generally consistent with model predictions.

Air Quality

It is unclear how exposure of additional playa has impacted air quality. While the State believes certain areas have experienced and will continue to experience additional dust because of their location along the Sea, wind-patterns and emissive nature of the playa at particular locations plays heavily into the experience of individual locations. Much of the dust being captured and monitored appears to be coming from the desert and background sources, which could be a product of both the natural geography of the Sea, as well as where monitoring sites and stations are located. Further, location of monitors and current data sources currently do not allow for quantification of air quality differences. State scientists continue to work to assess and ultimately quantify air quality differences driven by the Sea's recession and identify what communities are most likely to experience additional impacts.

Inflow Rates

Inflow remains stable to the Salton Sea, declining by only 30,000 acre-feet feet from 2017 to 2018, which suggests that modeling done in 2002 and thereafter was largely accurate.

Water Quality

Water quality at the Sea appears to be stable. Salinity continued to increase in 2018. Monitoring data shows nutrient concentrations remain relatively high, although some values have decreased in recent years as a result of best management practices implemented on local farms. The Regional Water Board continues its data collection.

Changes to Fish and Bird Populations

Pupfish: Desert pupfish populations were monitored in the northern region of the Salton Sea in 2018. Populations appear to be doing relatively well in some drains, Salt Creek, and Hot Mineral Spa Creek in the north of the Salton Sea. In San Felipe Creek the desert pupfish population is in decline. Most populations are being negatively impacted by many non-native species. State scientists have concluded that increasing salinity in the Salton Sea will eventually displace the desert pupfish from the Salton Sea entirely, regardless of intervention.

Tilapia: Tilapia populations have been declining since 2008. The 2018 population estimate was historically low. It is not yet clear how the population will respond next year to increasing saline conditions at the Sea.

Fish-Eating Birds/Shore Birds (Double-crested Cormorants, Brown Pelicans, and American White Pelicans)

Beginning in spring 2016, the number of fish-eating birds at the Salton Sea began to fall to record lows. The 2017/2018 CDFW surveys showed the American white pelicans occurred at only 10 percent of their historic average (2008-2018). Brown pelicans surveyed in the same year were 3 percent and double-crested cormorants were below 2 percent of their previously surveyed average. Even though bird numbers at the Sea are lower than in previous years, the same species of birds are utilizing the resource in a manner similar to past patterns. External factors such as weather patterns and reduced breeding success may be contributing to the reduced number of birds at the Sea. The decrease in fish populations may be prompting birds to seek alternative forage sites.

Between January 8 and 17, 2019, thousands of water birds died of an avian cholera outbreak at the south end of the Salton Sea. Outbreaks like this occur during the winter in California and may result in the deaths of thousands of birds when they congregate at key water sources during migration, and the weather is cold and damp. Staff from the California Department of Fish and Wildlife and Sonny Bono National Wildlife Refuge (SBNWR) investigated the event and collected more than 1,200 carcasses consisting of mainly Ruddy ducks, Northern Shovelers, Black-necked Stilts and gulls.

IV. OUTREACH

The State is coordinating with numerous entities, stakeholders, and Tribal Governments, including but not limited to: Imperial Irrigation District, Riverside County, Torres-Martinez Desert Cahuilla Indians, Salton Sea Authority, U.S. Bureau of Reclamation (BOR), Imperial County and the two air regulatory districts. An agreement with BOR is currently being drafted for the implementation of 3,900 acres of dust-suppression projects for the years 2019 and 2020. Additionally, the State is working closely with the California Air Resources Board for air quality monitoring and the implementation of dust-suppression projects. Future cooperation with the Imperial County Air Pollution Control District will be needed once land access is secured.

The outreach process provides information to the general public, various stakeholder groups, and local, State, and federal governmental agencies, and solicits feedback. Public outreach

occurs through public meetings, distribution of newsletters and press releases, preparation of articles for publication in magazines or journals, and maintaining current information on the State's Salton Sea website. Public outreach meetings covering all aspects of the program were held in March and October of 2018 with the October meeting concentrating on the potential water import projects. The meetings were held in various venues around the Salton Sea.

In late 2018, the State and its partners revamped the outreach program to make it more interactive with the community. The first of these new meetings that concentrate on public input and less on State-provided information was held on February 28, 2019.

V. DEFICIENCY

The Natural Resources Agency understands that it is deficient in meeting the Board's articulated milestones, and that the Board would like in-depth analysis of how it will make up the deficiency.

In the coming weeks, the Agency will continue working with leadership teams at DWR, CDFW, the State Water Board and the California Environmental Protection Agency to thoroughly assess barriers to project implementation and create a roadmap for moving forward with the SSMP. Once site access issues are resolved for the SCH, the Agency will be positioned to develop a timeline for getting this important work on track to address critical public health and ecological challenges at the Sea. The Agency is committed to advancing the SSMP and looks forward to engaging with the State Water Board and partners to assess the entire management plan and how best to achieve its vision.

Appendix A

Water Inflow by Year and River, in acre-feet.

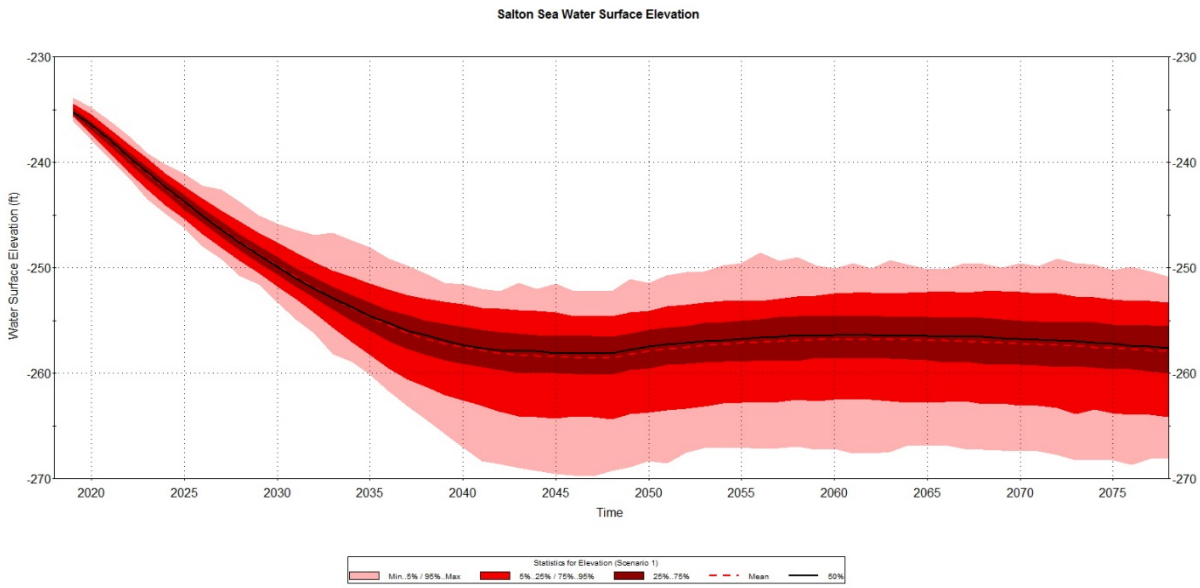
	Whitewater River	Alamo River	New River	Sum of River Inflow	Inflow including drains, small creeks, and GW
2014	38,687	547,829	384,063	970,578	1,066,700
2015	42,985	554,448	406,568	1,004,002	1,103,349
2016	46,521	548,122	420,961	1,015,605	1,116,072
2017	45,735	534,466	398,393	978,595	1,075,491
2018	44,977	571,641	330,250	946,869	1,040,703

Appendix B

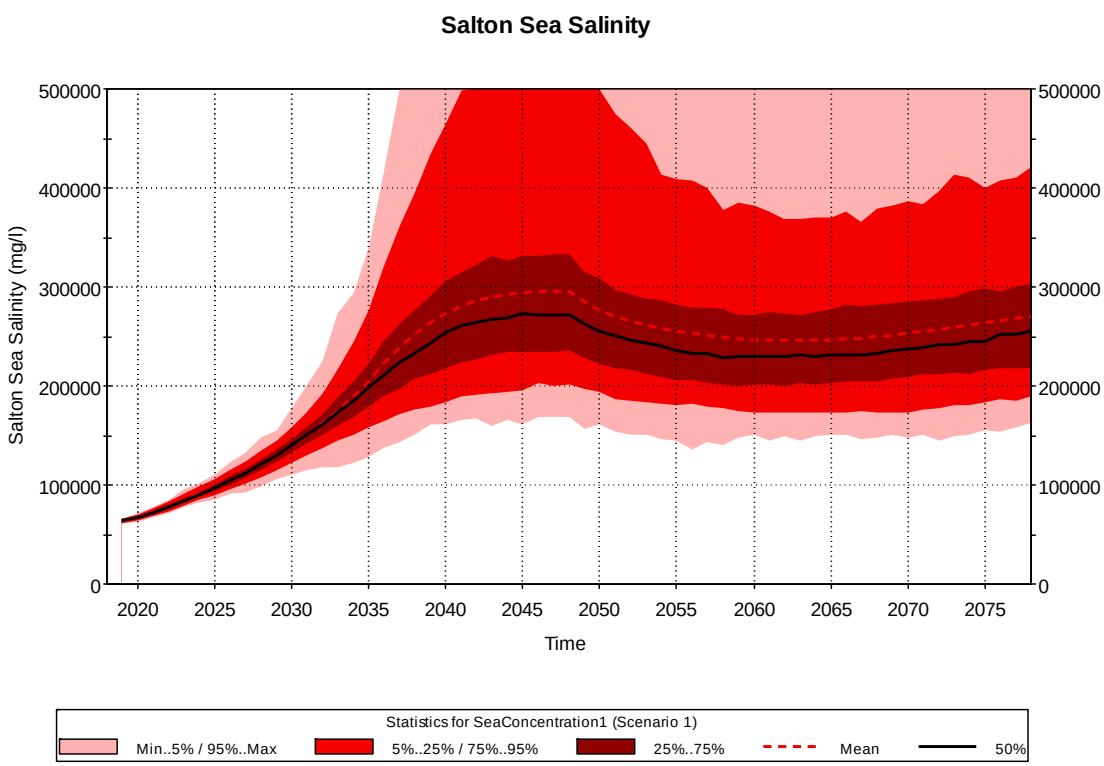
Annual summary of projections from the SALSA2 model

Year	Mean Elevation (feet)	Mean Salinity (PPT)	Projected Exposed Playa (acres)	Observed total bare playa exposure
2018	-235.2	63.7	1,900	1,927
2019	-236.5	67.7	3,600	N/A
2020	-238	72.5	7,500	N/A
2021	-239.6	78.1	13,100	N/A
2022	-241	84.1	18,900	N/A
2023	-242.5	90.5	24,600	N/A
2024	-243.8	97.3	30,000	N/A
2025	-245.1	104.6	34,900	N/A
2026	-246.4	112.4	39,400	N/A
2027	-247.6	120.8	43,500	N/A
2028	-248.7	129.9	47,200	N/A
2029	-249.8	139.9	50,600	N/A
2030	-250.9	150.6	53,900	N/A
2031	-251.9	162.3	57,100	N/A
2032	-252.9	175.2	60,300	N/A
2033	-253.8	189.1	63,300	N/A
2034	-254.7	204.7	66,400	N/A
2035	-255.5	221.7	69,300	N/A
2036	-256.2	238.1	71,900	N/A
2037	-256.8	252.2	74,100	N/A
2038	-257.2	263.9	75,900	N/A
2039	-257.6	273.5	77,400	N/A
2040	-257.9	280.7	78,700	N/A
2041	-258.1	285.8	79,700	N/A
2042	-258.3	289.9	80,400	N/A
2043	-258.4	292.3	80,900	N/A
2044	-258.4	293.8	81,200	N/A
2045	-258.5	294.9	81,400	N/A
2046	-258.5	295.1	81,500	N/A
2047	-258.6	295.1	81,700	N/A
2048	-258.2	285.0	80,200	N/A
2049	-257.9	276.8	78,900	N/A
2050	-257.7	270.6	78,100	N/A

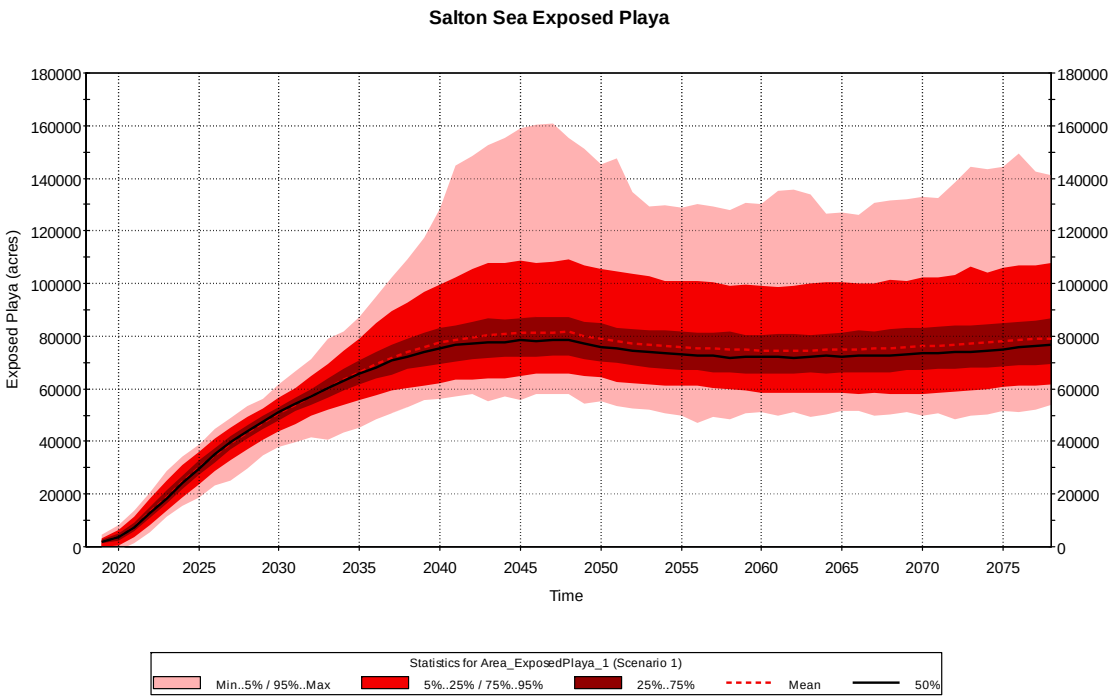
Salton Sea elevations for the moderate uncertainty inflow scenario



Salton Sea salinity for moderate inflow scenario

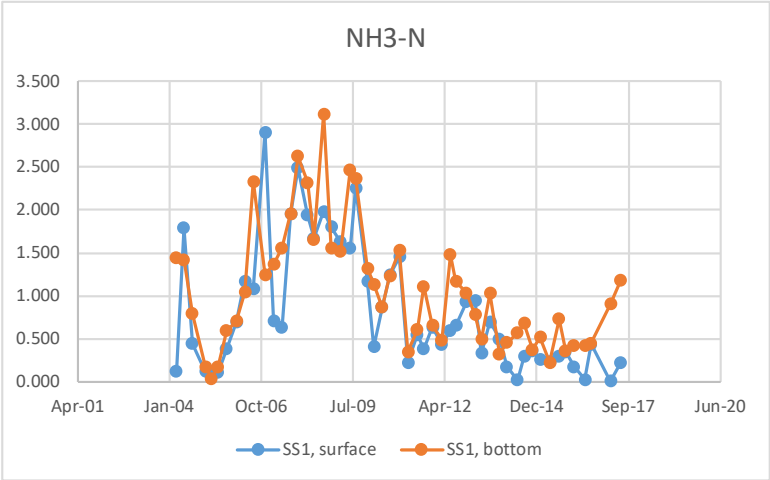


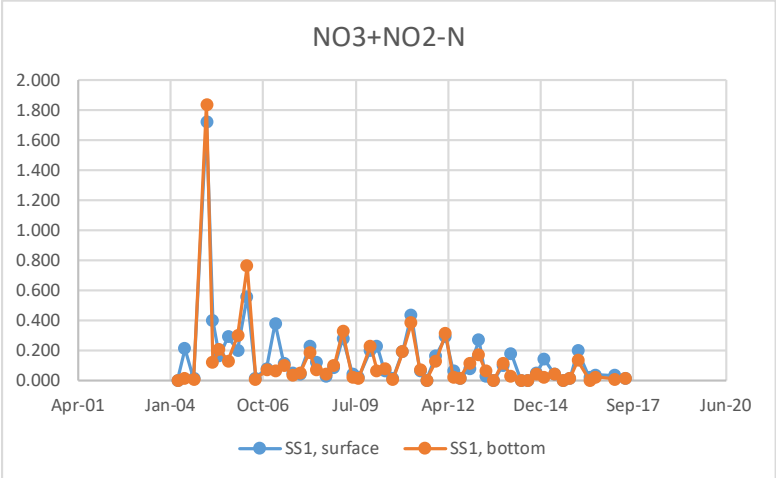
Salton Sea exposed playa for moderate inflow scenario

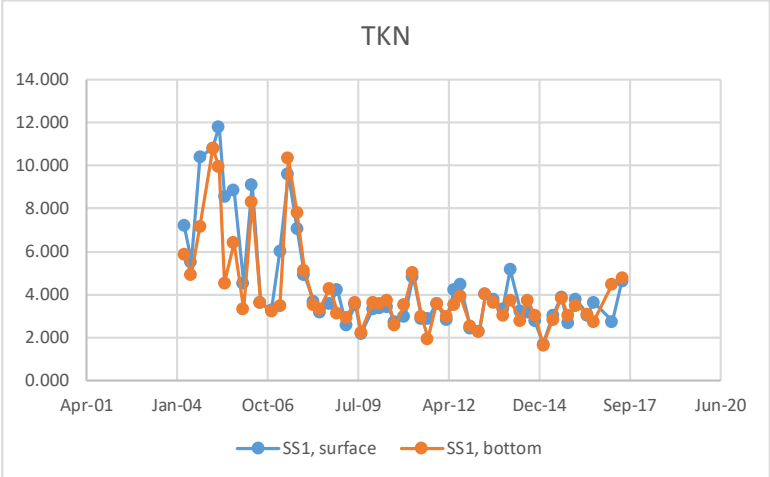


Appendix C- Water Quality

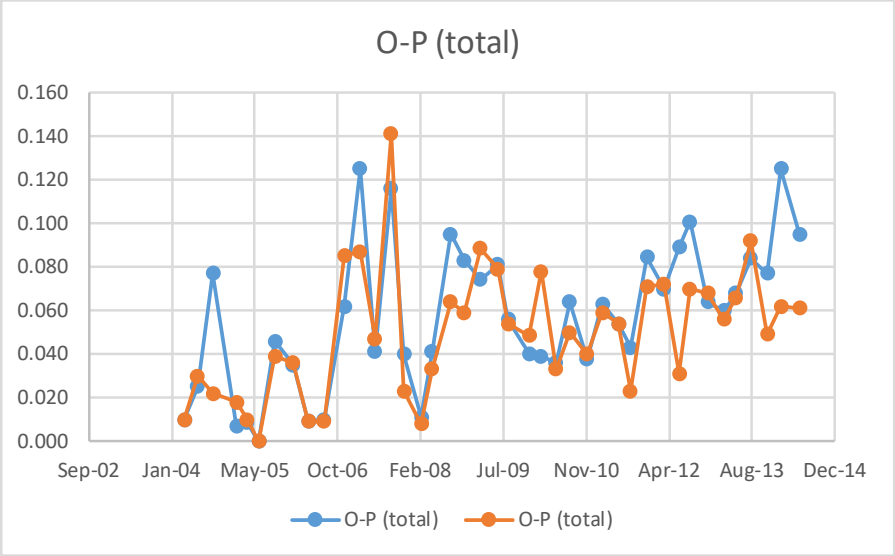
Ammonia (NH3), nitrate plus nitrite (NO3+NO2-N) and total Kjeldahl nitrogen (TKN) concentrations at SS-1 in the Salton Sea

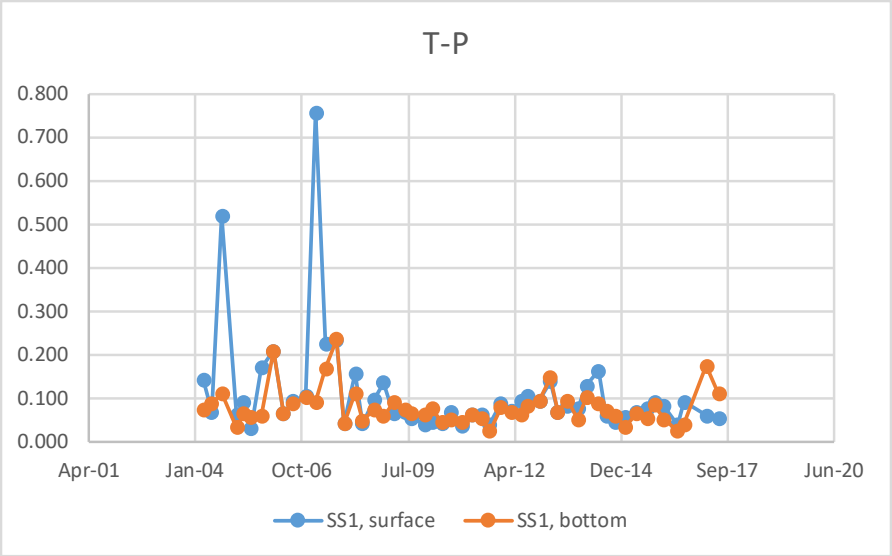




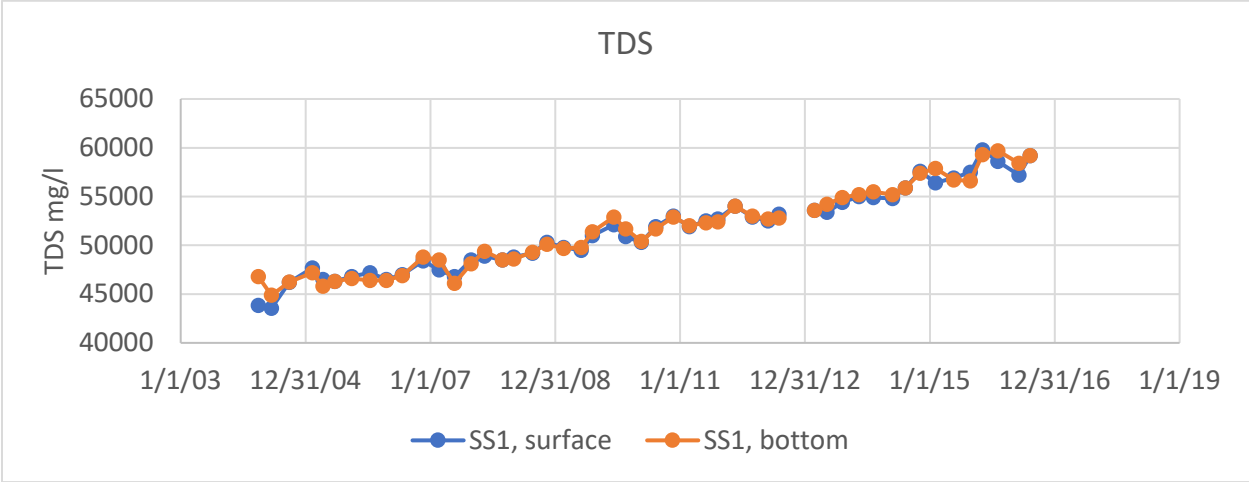


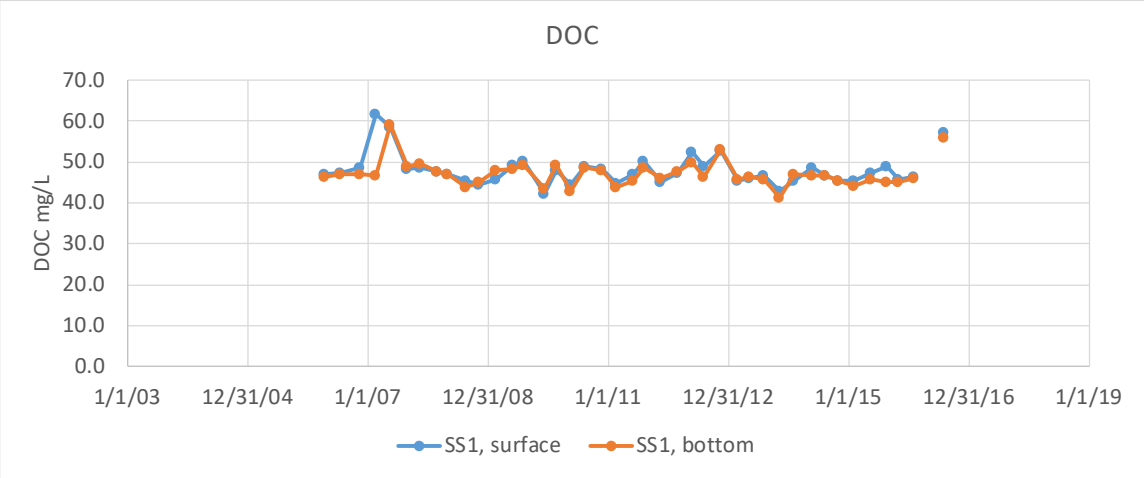
Orthophosphate (O-P) and total phosporus (T-P) concentrations at SS-1 in the Salton Sea

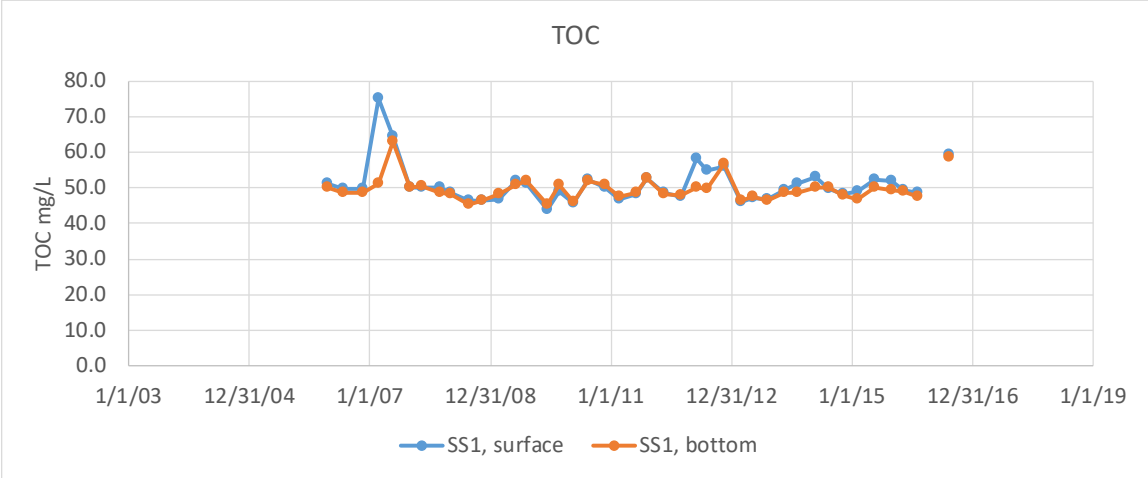




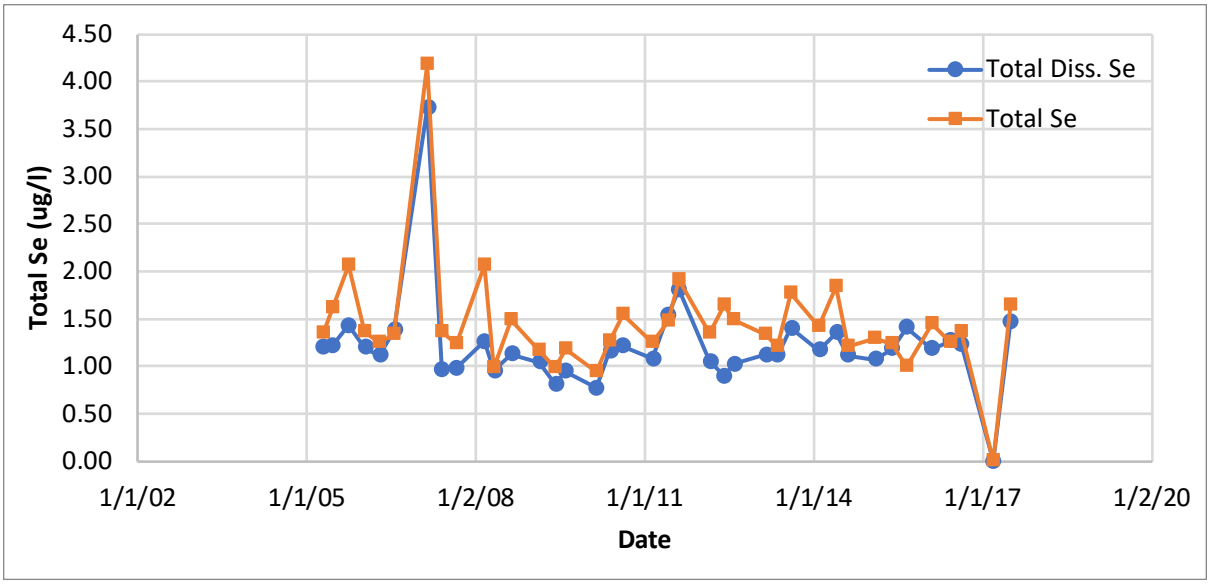
Water Quality at SS-1 in the Salton Sea (TDS, TOC, and DOC)







Water Quality at SS-1 in the Salton Sea (total and dissolved selenium)

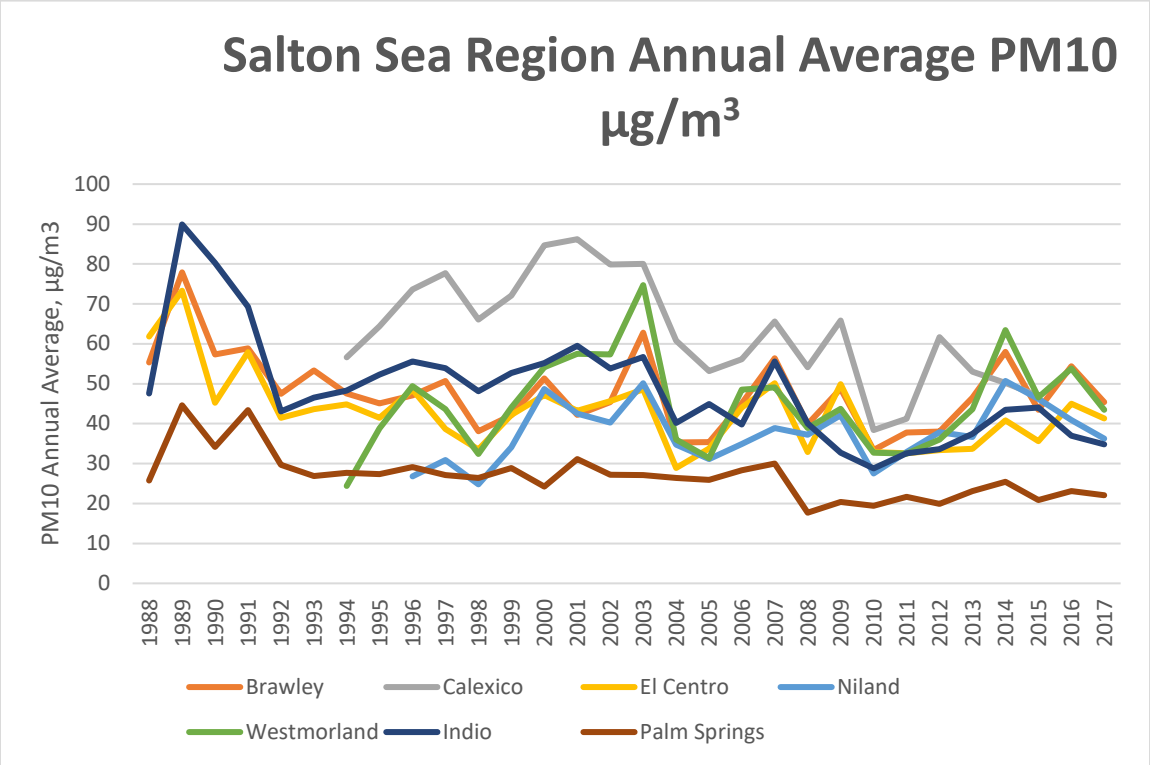


Appendix D - Air Quality

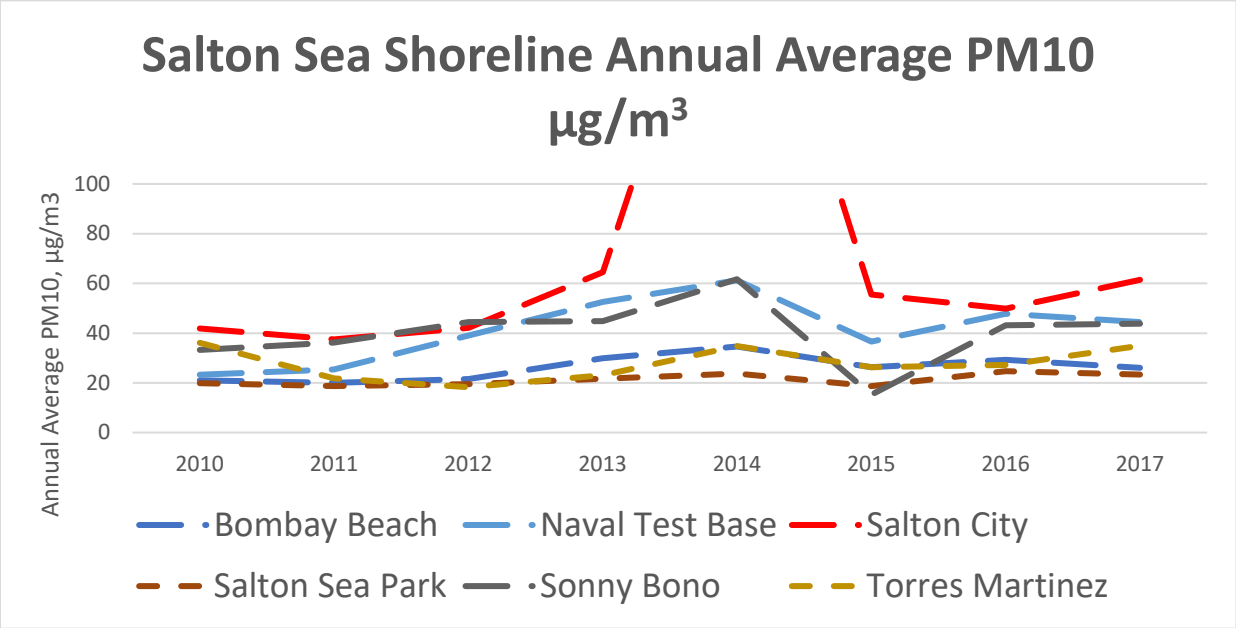
Salton Sea Shoreline 2018 High Wind Statistics

Station	Annual Fraction of Hours	Maximum Wind Speed (mph)	Primary Directions From Which Winds Blow (degrees)
North Shore (Riverside County)			
Salton Sea Park	3.1%	24.8	300-320 (NW)
Torres Martinez	5.4%	25.6	320-350 (NNW)
Central and South Shores (Imperial County			
Bombay Beach	13.8%	35.6	240-300 (W)
Naval Test Base	16.9%	31.4	260-280 (W)
Salton City	13.4%	35.7	240-260 (WSW)
Sonny Bono	13.4%	34.7	250-280 (W)

Salton Sea Region PM10 Annual Averages



Salton Sea Shoreline Station Annual Average PM10



Maximum 24-Hour Average PM_{10}, µg/^{3}

Station	2010	2011	2012	2013	2014	2015	2016	2017	2018
North Shore (Riverside County)									
Palm Springs	145	397	143	186	314	199	447	106	419
Indio	107	376	271	255	322	381	393	199	314
Salton Sea Park	124	348	241	169	155	93	192	122	198
Torres Martinez	186	46	76	120	273	117	154	578	517
Central and South Shore (Imperial County)									
Salton City	585	323	485	1032	6308	647	421	1234	484
Naval Test Base	152	763	1269	613	1681	258	464	962	756
Sonny Bono	101	356	569	600	631	33	464	212	285
Bombay Beach	161	230	143	203	219	163	182	559	280
Westmorland	86	75	109	194	404	193	252	337	415
Brawley	62	85	128	359	439	228	285	450	411
Niland	58	220	213	305	280	211	227	346	334
El Centro	69	82	76	148	120	166	208	269	284
Calexico	113	81	406	141	132	134	239	410	419

Salton Sea Exposed Playa Direction Upwind of Shoreline Monitoring Stations (degrees)

Station	From	To	Percentage of High Winds
North Shore (Riverside County			
Salton Sea Park	137	299	30%
Torres Martinez	78	192	24%
Central and South Shores (Imperial County)			
Bombay Beach	314	93	73%
Naval Test Base	327	128	17%
Salton City	317	151	35%
Sonny Bono	217	24	89%

Salton Sea PM_{10} Averages During High Winds from Playa and Non-Playa Areas, $\mu g/m^3$

Station	PM_{10} Average During High Wind Hours		
	From Playa	From Non-Playa	All Directions
North Shore (Riverside County			
Salton Sea Park	48.7	55.1	43.3
Torres Martinez	258.8	320.5	306.2
Central and South Shore (Imperial County)			
Bombay Beach	68.5	42.6	60.7
Naval Test Base	114.2	192.0	176.7
Salton City	92.8	256.1	198.2
Sonny Bono	68.0	104.5	71.7

Appendix E

CDFW Fish Surveys Protocol

California Department of Fish and Wildlife (CDFW) conducts presence/absence surveys for desert pupfish and monitors the status and trends in many waters of the Salton Sink. The primary survey months are from March through October, when the species is most active. Current sampling sites include San Felipe Creek, Salt Creek, unnamed creek near Hot Mineral Spa, irrigation drains and associated shoreline pools/ponds at the north and south ends of the Sea, the Sea proper (mainly Varner Harbor), and all refuges (artificial habitat). Some habitat, particularly irrigation drains, is inaccessible to CDFW staff. Frequency depends on habitat, ranging from quarterly to every 5 or more years. Limited sampling has been conducted at the south end recently, however in 2019 surveys will be conducted in all accessible drains and shoreline pools at the south end of the Sea.

California Department of Fish and Wildlife conducts gill net surveys. Sampling is done using 45 m-long, five-panel monofilament gill nets. Large mesh nets have 9 X 2 m panels with 1, 2.5, 5, 7.5, and 10 cm mesh. Initially, nets are set at approximately 50 m from shore, at 2 m depth in the water column, and various orientations to the shore, to test if these were important variables to consider. Nets were set for approximately 24 hours to get sufficient data for robust calculations of catch per unit effort (CPUE). Sampling is done during the summer months: June – August. Current sampling sites are at the Whitewater, New, and Alamo Rivers deltas, North Shore the Naval Test Base and the Bat Caves. Once the nets are retrieved from the water, they are taken to the FWS Sonny Bono National Refuge, and fish are sorted, sexed and total lengths are measured to the nearest centimeter.

CDFW Birds Surveys Protocol

California Department of Fish and Wildlife conducts aerial surveys to monitor piscivorous (fish-eating) birds and provide information regarding the current population trends of fish eating birds utilizing the Salton Sea as their feeding habitat. Double-crested Cormorants (DCCO), Brown Pelicans (BRPE), and American White Pelicans (AWPE) are counted from aerial surveys by airplane *(Cesna or Partenavia)* traveling in a counter-clockwise direction around the perimeter of the Salton Sea and flying over the wildlife areas at the south end of the Salton Sea at an altitude of 200 ft. Survey protocol for shoreline birds are based on the 1999 Comprehensive Waterbird Surveys at the Salton Sea. Briefly, a random number of sampling sites are selected along the perimeter of the Salton Sea, and all sites will be visited and shoreline birds are counted within a 48 hour period for each of four seasonal sampling period.