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Corrigendum: Water quality mitigation strategy analysis of the Salton Sea, California, using the Delft-3D modeling suite

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KEYWORDS

Salton Sea, Delft3D-FLOW, Delft3D-WAVE, Delft3D-WAQ, nature-based solutions, sediment resuspension, endorheic lakes

A corrigendum on
Water quality mitigation strategy analysis of the Salton Sea, California, using the Delft-3D modeling suite

by Lee, M.-C., and Stenstrom, M. K. (2023). *Front. Sustain. Resour. Manag.* 2:1178038. doi: 10.3389/fsrma.2023.1178038

In the published article, there was an error in Figure 7 as published. The red brackets for the storm period were erroneously omitted from the figure along the x-axis. The corrected Figure 7 and its caption appear below.

In the published article, there was an error in Figure 8 as published. The red brackets for the storm period were erroneously omitted from the figure along the x-axis. The corrected Figure 8 and its caption appear below.

In the published article, there was an error in the legend for Figure 10 as published. The corrected legend appears below.

In the published article, there was a typographical error. In the Abstract, "playa" was incorrectly written as "play a".

A correction has been made to **Abstract**. This sentence previously stated:

"This has resulted in inflows reduction, and the dust storms created by the dried-up play a have become a prominent risk to public health in the region."

The corrected sentence appears below:

"This has resulted in inflows reduction, and the dust storms created by the dried-up playa have become a prominent risk to public health in the region."

In the published article, there was a grammatical error in the Introduction.

A correction has been made to **Introduction**, Paragraph Number 1. This sentence previously stated:

"The Salton Sea is a terminal hypersaline lake located in the southeast of the famous desert resort city- of Palm Springs."

The corrected sentence appears below:

"The Salton Sea is a terminal hypersaline lake located in the southeast of the famous desert resort city of Palm Springs."

In the published article, there was an error. "Lower Colorado River Basin" was written as 'Lower Colorado Bain".

A correction has been made to **Introduction**, Paragraph number 2. This sentence previously stated:

"The Imperial Irrigation District, the agency that controls the bulk of the agricultural allocation within the Lower Colorado Bain's annual water allocation, agreed to transfer 0.246 km^3a^{-1} of water to San Diego County Water Authority by 2021 until at least 2077, 0.0616 and 0.123 km^3a^{-1} to Coachella Valley Water District and Metropolitan Water District by 2018, respectively, until at least 2077 (Hughes, 2020)."

The corrected sentence appears below:

"The Imperial Irrigation District, the agency that controls the bulk of the agricultural allocation within the Lower Colorado River Basin's annual water allocation, agreed to transfer 0.246 km^3a^{-1} of water to San Diego County Water Authority by 2021 until at least 2077, 0.0616 and 0.123 km^3a^{-1} to Coachella Valley Water District and Metropolitan Water District by 2018, respectively, until at least 2077 (Hughes, 2020)."

In the published article, there was an error wherein "proposed" was incorrectly written as "prosed".

A correction has been made to **Introduction**, Paragraph Number 7. This sentence previously stated:

"In recent decades, the government has shifted focus and prosed to implement a sequence of dust suppression and habitat restoration projects around the perimeter of the Salton Sea to address air quality and ecological threats due to the projected decline of the Sea."

The corrected sentence appears below:

"In recent decades, the government has shifted focus and proposed to implement a sequence of dust suppression and habitat restoration projects around the perimeter of the Salton Sea to address air quality and ecological threats due to the projected decline of the Sea."

In the published article, there was an error.

A correction has been made to **Introduction**, Paragraph Number 10. This sentence previously stated:

"Furthermore, the seawater import/export mitigation scenario showed promising results of reducing salinity levels from 46 ppt to 38–39 ppt in 2 years and other contaminants."

The corrected sentence appears below:

"Furthermore, the seawater import/export mitigation scenario showed promising results of lowering contaminants such as unionized ammonia and chlorophyll *a* and reducing salinity levels from 46 ppt to 38–39 ppt in 2 years."

In the published article, there was an error.

A correction has been made to **Materials and methods**, *2.2. Salton Sea's physical and chemical characteristics*, Paragraph Number 1. This sentence previously stated:

"The wind speeds recorded off the coast in the southwestern corner of the Salton Sea showed that the predominant and strongest winds were from the west (240°-280°) and reached 15–20 m/s on average from 2015 to 2019, and weakest from the northwestern (∼300°) at the north end with the 5-year average wind speed below 5 m/s."

The corrected sentence appears below:

"The wind speeds recorded off the coast in the southwestern corner of the Salton Sea showed that the predominant and strongest winds were from the west (240°-280°) and reached 15–20 m/s on average from 2015 to 2019, while the weakest wind was recorded in the land-based station located at the north end of the Sea with the 5-year average wind speed below five m/s from the south (∼180°)."

In the published article, there was an error, wherein the word "advection" was omitted.

A correction has been made to **Materials and methods**, *2.2. Salton Sea's physical and chemical characteristics*, Paragraph Number 3. This sentence previously stated:

"The discrepancy between the two basins disappears during periods of high wind speeds due to horizontal (Watts et al., 2001)."

The corrected sentence appears below:

"The discrepancy between the two basins disappears during periods of high wind speeds due to horizontal advection (Watts et al., 2001)."

In the published article, there was an error.

A correction has been made to **Materials and methods**, *2.3. Model configuration and boundary conditions*, Paragraph Number 2. This sentence previously stated:

"The user-defined background horizontal viscosity (ν_H^{back}) encompasses the motions removed by solving the Reynolds-Averaged shallow water equations."

The corrected sentence appears below:

"The user-defined background horizontal viscosity (ν_H^{back}) accounts for horizontal turbulent motions and forcings that are not resolved by the Reynolds-averaged shallow-water equations."

In the published article, there was an error. The word "tributary" is erroneously spelled "triburary".

A correction has been made to **Materials and methods**, *2.3. Model configuration and boundary conditions*, Paragraph Number 8. This sentence previously stated:

"The transport condition at the flow boundary was specified by prescribing timeseries data of the constituents in the triburary rivers, including dissolved substances, salinity, temperature, and sediment."

The corrected sentence appears below:

"The transport condition at the flow boundary was specified by prescribing timeseries data of the constituents in the tributary rivers, including dissolved substances, salinity, temperature, and sediment."

In the published article, there was an error.

A correction has been made to **Materials and methods**, *2.3. Model configuration and boundary conditions*, Paragraph Number 9. This sentence previously stated:

"The wind velocity/direction measured hourly at the CIMIS #128 meteorological site were used to generate the time-dependent wind field, and was defined uniformly on the computational grid."

The corrected sentence appears below:

"The wind velocity/direction measured hourly at the CIMIS #128 meteorological site were used to generate the time-varying wind field, and was defined uniformly on the computational grid."

In the published article, there was an error. "Delft3D-WAQ" was incorrectly in a number of incidences. This error has been corrected throughout. See:

Materials and methods, *2.3.2. Delft3D-WAQ*, Paragraph Number 1; **Results**, *3.4. Water quality simulations in the status quo and mitigation scenarios*, *3.4.5. Total bottom shear stress*,

Paragraph Number 2; **Discussion**, *4.1. Summary and conclusions*, *4.1.1. Delft3D WAQ simulation results for the status quo Salton Sea*, Subheading 4.1.1. and Paragraph 1.

In the published article, there was an error. The word "stress" was erroneously omitted.

A correction has been made to **Materials and methods**, *2.3.2. Delft3D-WAQ*, 2.3.2.1. Expressions for sediment settling and resuspension, Paragraph Number 2. This sentence previously stated:

"The Partheniades-Krone concept is the principle theory used to express the sedimentation and erosion processes in which the bottom shear significantly determines the concentration of suspended sediments in the water column (Krone, 1962; Partheniades, 1962)."

The corrected sentence appears below:

"The Partheniades-Krone concept is the principle theory used to express the sedimentation and erosion processes in which the bottom shear stress significantly determines the concentration of suspended sediments in the water column (Krone, 1962; Partheniades, 1962)."

In the published article, there was an error.

A correction has been made to **Materials and methods**, *2.3.2. Delft3D-WAQ*, 2.3.2.1. Expressions for sediment settling and resuspension, 2.3.2.1.1. Sediment settling, Paragraph Number 1. This sentence previously stated:

"τ_c critical shear stress."

The corrected sentence appears below:

"τ_c critical shear stress (Pa)."

In the published article, there was an error.

A correction has been made to **Materials and methods**, *2.3.2.2. Expression for total bed shear stresses*. The section previously stated:

"The value of the total bed shear stress, along with the critical shear stress, determines the sedimentation and resuspension rates. The total bed shear stress depends on the shear stresses created by flow (currents) and the windgenerated surface waves, and are additive as follows (Deltares, 2020):

$$\tau = \tau_{\text{flow}} + \tau_{\text{wave}} \tag{3}$$

The friction exerts on the lakebed by three-dimensional flow is a function of stream velocity and Chézy coefficient, as shown in Equation 4:

$$\tau_{flow} = \frac{g\rho_l}{C_{3D}^2}\overrightarrow{u_b}\left|\overrightarrow{u_b}\right| \tag{4}$$

where

$$C_{3D} = \frac{\sqrt{g}}{\kappa}\ln\left(1+\frac{h_b/2}{z_0}\right) \tag{5}$$

with:

g acceleration of gravity (m/s^2);
ρ_l density of water (g/ml);
C_{3D} 3D Chezy coefficient (m$^{1/2}$/s);
u_b velocity at bed layer (m/s);
κ constant of Von Karman (0.4);
h_b thickness of bed layer (m);
z_0 roughness height of the bed (m).

The shear stress exerted by waves is a function of wind speed, water depth, and wind fetches to calculate relevant wave parameters such as the significant wave height, wave period, and wave amplitude. The magnitude of the time-averaged wave-induced bed shear stress is computed based on linear wave theory followed from van Rijn (1993) and Soulsby (1997) as given in Equation 6:

$$\tau_{wave} = \frac{1}{4}\rho f_w U_{orb}^2 \tag{6}$$

In which the wave orbital velocity just above the bed decreases with depth and is estimated as such:

$$U_{orb} = \frac{\pi H}{T\sinh(2\pi hL)} \tag{7}$$

with:

f_w a wave friction factor;
U_{orb} wave orbital velocity (m/s);
H wave height;
T wave period;
L wavelength;
h water depth.

The corrected section appears below:

"The value of the total bed shear stress, along with the critical shear stress, determines the sedimentation and resuspension rates. The shear stresses created by flow (currents) and the wind-generated surface waves, and are additive as follows in Delft3D-WAQ:

$$\tau = \tau_{\text{flow}} + \tau_{\text{wave}} \tag{3}$$

Nonetheless, the bed shear stress resulting from the combined effects of waves and current surpasses the value obtained through simple linear addition of the bed shear stress due to waves and that caused by the current. Therefore, Delft3D-FLOW provides various wave-current interaction models to express the non-linear interaction at the bed boundary layers enhanced by both waves and current, differentiating between 2D and 3D modeling. The computed total bed shear stress was derived from Delft3D-FLOW and utilized as input parameters in Delft3D-WAQ (Deltares, 2020).

In 3D implementation the bottom boundary layer is consisted of total or effective wave-current combined bed shear-stress, and is corrected for the Stokes drift (i.e. the wave-induced drift velocity) as shown in Equation 4:

$$\overrightarrow{\tau}_b = \frac{\left|\overrightarrow{\tau_m}\right|}{\left|\overrightarrow{U_{2D}}\right|}(\overrightarrow{u} - \overrightarrow{u}^s) \tag{4}$$

where $\left|\overrightarrow{\tau_m}\right|$ denotes the magnitude of mean bed stress for combined waves and current, and the magnitude of the depth-averaged horizontal velocity, $\left|\overrightarrow{U_{2D}}\right|$, is given by:

$$\overrightarrow{U}_{2D} = \frac{1}{d+\zeta}\int_{-d}^{\zeta}\overrightarrow{u}\,dz \tag{5}$$

where u is horizontal velocity, (d+ ζ) is total water depth, and z is vertical coordinate.

The mean bed stress for combined waves and current is defined as:

$$\vec{\tau}_m = \rho_0 \vec{u}_* \left| \vec{u}_* \right| \quad (6)$$

where ρ_0 is density of water, $\vec{u_*}$ is friction (shear-stress) velocity due to current and waves, and can be expressed in the magnitude of the horizontal velocity in the first layer just above the bed ($\vec{u_b}$) in the logarithmic boundary layer, user-defined bed roughness height (z_0) and constant of Von Kármán ($\kappa = 0.4$) as shown in Equation 7:

$$\vec{u}_b = \frac{\vec{u}_*}{\kappa} \ln\left(1 + \frac{\Delta z_b}{2z_0}\right) \quad (7)$$

in which z_0 is where the bottom is positioned at in the numerical implementation of the logarithmic law of the wall for a rough bottom and Δz_b is the distance to the computational grid point closest to the bed."

In the published article, there was an error wherein the abbreviation "OBS" was not expanded upon.

A correction has been made to **Results**, *3.1. Data inputs and sources,* Paragraph Number 2. The sentence previously stated:

"The measured turbidity concentrations (a surrogate for suspended sediment concentration) were collected by OBS sensors that were deployed 0.5m off the bottom of the water depths of 4, 6, and 8 min the southeastern basin of the Salton Sea (Chung et al., 2009b)."

The corrected sentence appears below:

"The measured turbidity concentrations (a surrogate for suspended sediment concentration) were collected by optical backscatter sensors (OBSs) that were deployed 0.5 m off the bottom of the water depths of 4, 6, and 8 min the southeastern basin of the Salton Sea (Chung et al., 2009b)."

In the published article, there was an error.

A correction has been made to **Results**, *3.2. Model validations,* 3.2.1. Sediment concentration and bottom shear stress validation, Paragraph Number 1. The sentence previously stated:

"The restart file at the last timestep of the warm-up run was used as the initial conditions for the calibration runs."

The corrected sentence appears below:

"The last timestep in the restart file of the warm-up run was used as the initial conditions for the calibration runs."

In the published article, there was an error.

A correction has been made to **Results**, *3.2. Model validations,* 3.2.1. Sediment concentration and bottom shear stress validation, Paragraph Number 1. The sentence previously stated:

"The simulated suspended solid concentrations in the water column at the southeastern basin were calibrated against the measured turbidity data from 8/15/2005 to 9/1/2005 at roughly the same location where the OBS sensor was placed based on the study by Chung et al. (2009b)."

The corrected sentence appears below:

"The simulated suspended solid concentrations in the water column at the southeastern basin were calibrated against the measured turbidity data from 8/15/2005 to 9/1/2005 at roughly the same location where the OBS was placed based on the study by Chung et al. (2009b)."

In the published article, there was an error. The word "precipitation" was written incorrectly.

A correction has been made to **Results**, *3.2. Model validations,* 3.2.2. Water quality variables validations, Equation 8. The sentence previously stated:

$$\frac{\Delta PO_4}{\Delta t} = loads + transport \pm sorption + mineralization \pm percipitation + primary\ production + autolysis + atmospheric\ deposition \pm sediment\ exchange\ flux$$

The corrected sentence appears below:

$$\frac{\Delta PO_4}{\Delta t} = loads + transport \pm sorption + mineralization \pm precipitation + primary\ production + autolysis + atmospheric\ deposition \pm sediment\ exchange\ flux$$

In the published article, there was an error.

A correction has been made to **Results**, *3.3.1. Status quo,* 3.3.1.2. Horizontal velocity, Paragraph Number 1. The sentence previously stated:

"The simulation showed that during the peak of the storm event on 9/9/2005 at 18:00, the horizontal velocity magnitude increased from about 0.03 m/s to 0.3 m/s in both basins in two meters above the bottom."

The corrected sentence appears below:

"The simulation showed that during the peak of the storm event on 9/9/2005 at 18:00, the horizontal velocity magnitude increased from about 0.03 m/s to 0.3 m/s in both basins from two meters above the bottom."

In the published article, there was an error, wherein "emerged islands" has incorrectly been written as "emerged island". This has been corrected in the following places:

Results, *3.3.2. Emerged islands as wind obstruction device scenario*, Subheading and Paragraph Number 1; **Results**, *3.4. Water quality simulations in the status quo and mitigation scenarios*, Paragraph Number 1; **Discussion**, *4.1. Summary and conclusions*, 4.1.3. Delft3D-WAQ applications on water quality mitigation strategies simulations of the Salton Sea, Paragraph Number 7.

In the published article, there was a typographical error.

A correction has been made to **Results**, *3.3.3. Seawater import/export scenario*, Paragraph Number 2. The sentence previously stated:

"The mass balance to estimate out-going salinity was calculated as give in Equation 9:"

The corrected sentence appears below:

"The mass balance to estimate out-going salinity was calculated as given in Equation 9:"

In the published article, there was an error.

A correction has been made to **Results**, *3.3.3. Seawater import/export scenario*, Paragraph Number 4. The sentence previously stated:

"Average values for the tributary river flow and evaporation rates were used to estimate the out-going salinity concentration."

The corrected sentence appears below:

"Average values for the tributary river flows and evaporation rates were used to estimate the out-going salinity concentration."

In the published article, there was an error.

A correction has been made to **Results**, *3.4. Water quality simulations in the status quo and mitigation scenarios*, Paragraph Number 1. The sentence previously stated:

"A water quality simulation of approximately 2 years from 9/1/2005 to 8/8/2007 is shown in this section, and the water quality variables being examined are dissolved oxygen (DO), orthophosphate (PO4), unionized ammonia (NH3), chlorophyll a (*Chl a*), and salinity."

The corrected sentence appears below:

"A water quality simulation of ∼2 years from 9/1/2005 to 8/8/2007 is shown in this section, and the water quality variables being examined are dissolved oxygen (DO), orthophosphate (PO4), unionized ammonia (NH3), chlorophyll *a* (*Chl a*), and salinity."

In the published article, there was an error.

A correction has been made to **Results**, *3.4. Water quality simulations in the status quo and mitigation scenarios,* 3.4.4. Chlorophyll *a*, Paragraph Number 3. The sentence previously stated:

"The reason is due to the growth constraints within the BLOOM module is set to maximize the total net growth; if the actual biomass is lower than the threshold biomass concentration of an algal species at the beginning of a timestep, threshold (minimum) level would be used."

The corrected sentence appears below:

"The reason is due to the growth constraints within the BLOOM module are set to maximize the total net growth; if the actual biomass is lower than the threshold biomass concentration of an algal species at the beginning of a timestep, threshold (minimum) level would be used."

In the published article, there was an error.

A correction has been made to **Discussion**, *4.1. Summary and conclusions*, 4.1.1. Delft3D WAQ simulation results for the status quo Salton Sea, Paragraph Number 5. The sentence previously stated:

"Nonetheless, the results showed that the sediment resuspension flux corresponded well to wind velocity magnitudes, and that showed the fate and transport of orthophosphate concentrations in the water column is intricately linked to this wind-driven mechanism."

The corrected sentence appears below:

"Nonetheless, the results showed that the sediment resuspension flux corresponded well to wind velocity magnitudes, and that the fate and transport of orthophosphate concentrations in the water column is intricately linked to this wind-driven mechanism."

In the published article, there was an error.

A correction has been made to **Discussion**, *4.1. Summary and conclusions*, 4.1.1. Delft3D WAQ simulation results for the status quo Salton Sea, Paragraph Number 5. The sentence previously stated:

"Lastly, the simulation of agal productivity resolved the seasonal trend for chlorophyll *a* concentration that followed the measured trends rather well, except for under-estimation in mid-February 2007 (data not shown)."

The corrected sentence appears below:

"Lastly, the simulation of algal productivity resolved the seasonal trend for chlorophyll *a* concentration that followed the measured trends rather well, except for under-estimation in mid-February 2007 (data not shown)."

In the published article, there was an error. The word "model" was incorrectly written as "mode".

A correction has been made to **Discussion**, *4.1. Summary and conclusions*, 4.1.2. The critical role of a water quality modeling framework in Salton Sea restoration, Paragraph Number 4. The sentence previously stated:

"Hydrologic models such as SALSA and SSAM can be used to simulate a wide range of configurations/conservation efforts (i.e., habitats, wetlands, and divided Sea, etc.) in an uncertainty framework; they were operated in the stochastic mode to simulate conditions in the Sea for each of the possible input traces, providing a range of future outcomes of inflows, salt loads, elevations, precipitation, and evaporation rates."

The corrected sentence appears below:

"Hydrologic models such as SALSA and SSAM can be used to simulate a wide range of configurations/conservation efforts (i.e., habitats, wetlands, and divided Sea, etc.) in an uncertainty framework; they were operated in the stochastic model to simulate conditions in the Sea for each of the possible input traces, providing a range of future outcomes of inflows, salt loads, elevations, precipitation, and evaporation rates."

In the published article, there was an error. A space was missed between "ALL" and "13".

A correction has been made to **Discussion**, *4.1. Summary and conclusions*, 4.1.2. The critical role of a water quality modeling framework in Salton Sea restoration, Paragraph Number 5. The sentence previously stated:

"Without a validated water quality model to analyze the restoration concepts' potential influences on water quality of the Sea, habitat areas located within the Salton Sea footprint, and the inflowing waters, the SSMP has deemed ALL13 proposed plans scored three out of five in their ability to improve water quality, majority of the concepts scored full score in their ability to meet selenium standards, suggesting that the features such as sedimentation basins, flow-through systems, and export of high nutrient Salton Sea water are adequate and sufficient to provide beneficial uses and reduce environmental consequence."

The corrected sentence appears below:

"Without a validated water quality model to analyze the restoration concepts' potential influences on water quality of the Sea, habitat areas located within the Salton Sea footprint, and the inflowing waters, the SSMP has deemed ALL 13 proposed plans scored three out of five in their ability to improve water quality, majority of the concepts scored full score in their ability to meet selenium standards, suggesting that the features such as sedimentation basins, flow-through systems, and export of high nutrient Salton Sea water are adequate and sufficient to provide beneficial uses and reduce environmental consequence."

In the published article, there was an error.

A correction has been made to **Discussion**, *4.1. Summary and conclusions*, 4.1.2. The critical role of a water quality modeling framework in Salton Sea restoration, Paragraph Number 5. The sentence previously stated:

"In addition, SSMP recommended the divided Sea concept for further evaluation because of scored highest in all categories in both the high and low probability inflow scenarios (CNRA, 2022)."

The corrected sentence appears below:

"In addition, SSMP recommended the divided Sea concept for further evaluation because it scored highest in all categories in both the high and low probability inflow scenarios (CNRA, 2022)."

In the published article, there was an error. The word "summary" was incorrectly written as "Summa". The "species conservation habitat" was also incorrectly abbreviated to "SHC".

A correction has been made to **Discussion**, *4.1. Summary and conclusions*, 4.1.2. The critical role of a water quality modeling framework in Salton Sea restoration, Paragraph Number 6. The sentence previously stated:

"However, this recommendation contradicted the assessment conducted by the Bureau of Reclamation in 2007; the Summa report stated that there are operational uncertainties associated with each major feature: marine lake, brine pool, SHC, and sediment retention basins, as they altered the current combination of physical, chemical, and biological components in the Sea."

The corrected sentence appears below:

"However, this recommendation contradicted the assessment conducted by the Bureau of Reclamation in 2007; the summary report stated that there are operational uncertainties associated with each major feature: marine lake, brine pool, the species conservation habitat, and sediment retention basins, as they altered the current combination of physical, chemical, and biological components in the Sea."

In the published article, there was an error wherein "chlorophyll *a* concentration", is incorrectly written as "chlorophyll concentration". This has been corrected in the following places:

Discussion, *4.1. Summary and conclusions*, 4.1.2. The critical role of a water quality modeling framework in Salton Sea restoration, Paragraph Number 9; **Discussion**, *4.1. Summary and conclusions*, 4.1.3. Delft3D-WAQ applications on water quality mitigation strategies simulations of the Salton Sea, Paragraph Number 2, 4, and 5.

In the published article, there was an error. A space was incorrectly added between "Delft" and "3D-WAQ". This has been corrected in the following places:

Discussion, *4.1. Summary and conclusions*, 4.1.3. Delft3D-WAQ applications on water quality mitigation strategies simulations of the Salton Sea, Paragraph Number 1, and 7.

In the published article, there was an error wherein the chemical notation "NH_3" was incorrectly written as "NH3". This has been corrected in the following places:

Discussion, *4.1. Summary and conclusions*, 4.1.3. Delft3D-WAQ applications on water quality mitigation strategies simulations of the Salton Sea, Paragraph Number 1, 4, and 6.

In the published article, there was an error wherein the chemical notation "PO_4" was incorrectly written as "PO4". This has been corrected in the following places:

Discussion, *4.1. Summary and conclusions*, 4.1.3. Delft3D-WAQ applications on water quality mitigation strategies simulations of the Salton Sea, Paragraph Number 2, 3, 4, 5, and 6.

In the published article, there was an error. There is a space between "Delft" and "3D".

A correction has been made to **Discussion**, *4.1. Summary and conclusions*, 4.1.3. Delft3D-WAQ applications on water quality mitigation strategies simulations of the Salton Sea, Paragraph Number 7. The sentence previously stated:

"Overall, the Delft 3D numerical water quality modeling framework is capable of simulations for non-steady flow and transport phenomena/water quality processes resulting from meteorological forcing in three dimensions, which provides a better understanding of thermal stratification and wind-driven sediment resuspension events in influencing nutrient cycling and phytoplankton growth that take place in the water column and sediment layers of the Salton Sea."

The corrected sentence appears below:

"Overall, the Delft3D numerical water quality modeling framework is capable of simulations for non-steady flow and transport phenomena/water quality processes resulting from meteorological forcing in three dimensions, which provides a better understanding of thermal stratification and wind-driven sediment resuspension events in influencing nutrient cycling and phytoplankton growth that take place in the water column and sediment layers of the Salton Sea."

In the published article, there was an error, wherein quote marks were erroneously used.

A correction has been made to **Discussion**, *4.2. Future direction and recommendations*, Paragraph Number 1. The sentence previously stated:

"Therefore, a more intensive, long-term monitoring program (monthly or bi-weekly) at the tributary rivers" mouths and every 1–2m depth for the north, center, and south basins in the Sea to collect sediment/water quality samples for sediment concentration/composition, thereby orthophosphate adsorption capacity analysis would help estimate orthophosphate concentration in the sediment and water column of the Sea more precisely."

The corrected sentence appears below:

"Therefore, a more intensive, long-term monitoring program (monthly or bi-weekly) at the tributary rivers' mouths and every 1–2m depth for the north, center, and south basins in the Sea to collect sediment/water quality samples for sediment concentration/composition, thereby orthophosphate adsorption capacity analysis would help estimate orthophosphate concentration in the sediment and water column of the Sea more precisely."

In the published article, there was an error, wherein the word "of" was omitted.

A correction has been made to **Discussion**, *4.2. Future direction and recommendations*, Paragraph Number 2. The sentence previously stated:

"Future work should consider using D-Water Quality software with extended functionalities that allow users to create a separate computational grid for the active sediment layer, having been able to compute redox reactions of sulfate, dissolved sulfide, particulate sulfide, apatite-phosphate, vivianite-phosphate, methane that take place in the deep sediment boundary layer allows a more

comprehensive simulation the fate and transport of nutrients and sulfate in the Salton Sea."

The corrected sentence appears below:

"Future work should consider using D-Water Quality software with extended functionalities that allow users to create a separate computational grid for the active sediment layer, having been able to compute redox reactions of sulfate, dissolved sulfide, particulate sulfide, apatite-phosphate, vivianite-phosphate, methane that take place in the deep sediment boundary layer allows a more comprehensive simulation of the fate and transport of nutrients and sulfate in the Salton Sea."

In the published article, there was a typographical error, wherein "Delft3D-FLOW" was written as "Deflt3D-FLOW".

A correction has been made to **Discussion**, *4.2. Future direction and recommendations*, Paragraph Number 3. The sentence previously stated:

"As a result, to simulate the current Salton Sea (74.25 ppt as of January 2020, measured by BOR), an equation of state for hypersaline water needs to be integrated into existing Deflt3D-FLOW to accurately characterize the spatial-temporal changes in density structure that affect temperature and salinity simulation directly."

The corrected sentence appears below:

"As a result, to simulate the current Salton Sea (74.25 ppt as of January 2020, measured by BOR), an equation of state for hypersaline water needs to be integrated into existing Delft3D-FLOW to accurately characterize the spatial-temporal changes in density structure that affect temperature and salinity simulation directly."

In the published article, there was an error.

A correction has been made to **Discussion**, *4.2. Future direction and recommendations*, Paragraph Number 4. The sentence previously stated:

"Relying heavily on SSAM for Salton Sea's resource management tasks has been restricted to SSMP to approach addressing challenges of the Salton Sea from the land perspective."

The corrected sentence appears below:

"Relying heavily on SSAM for the Salton Sea's resource management tasks has been limiting the Salton Sea Management Program to addressing challenges of the Salton Sea from only the land perspective."

In the published article, the reference for "Soulsby, R. (1997). *Dynamics of Marine Sands, a Manual for Practical Applications*. London: Thomas Telfords.", was erroneously included and has therefore been removed from the reference list, as well as the in-text citation.

In the published article, the reference for "van Rijn, L. C. (1993). *Principles of Sediment Transport in Rivers, Estuaries and Coastal Seas*. The Netherlands: Aqua Publications.", was erroneously included and has therefore been removed from the reference list, as well as the in-text citation.

The authors apologize for these errors and state that this does not change the scientific conclusions of the article in any way. The original article has been updated.

Publisher's note

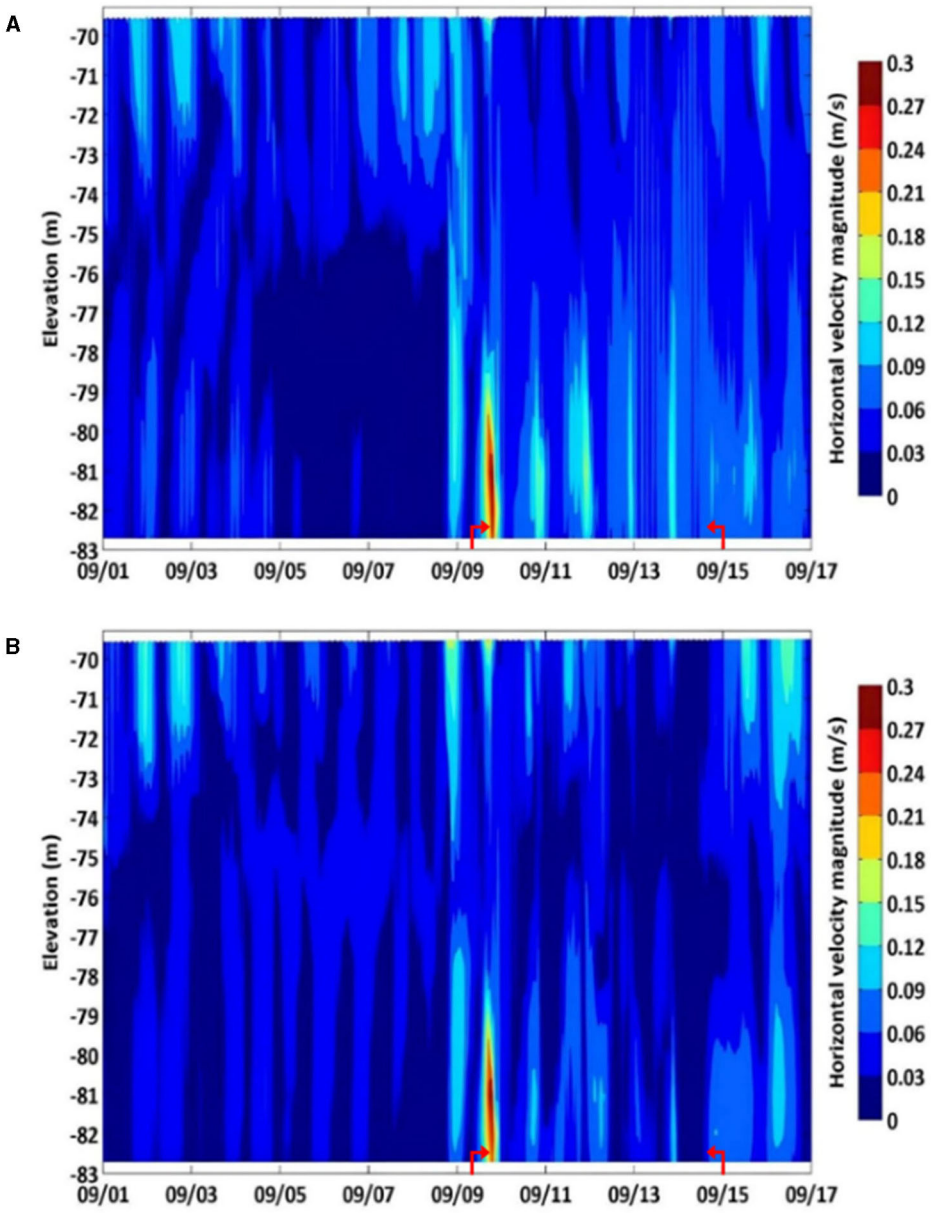

FIGURE 7
Simulated horizontal velocity magnitudes in depth contour in central north **(A)** and central south basin **(B)** from 9/1/2005 to 9/17/2005 in the status quo condition. The red bracket denotes the storm period.

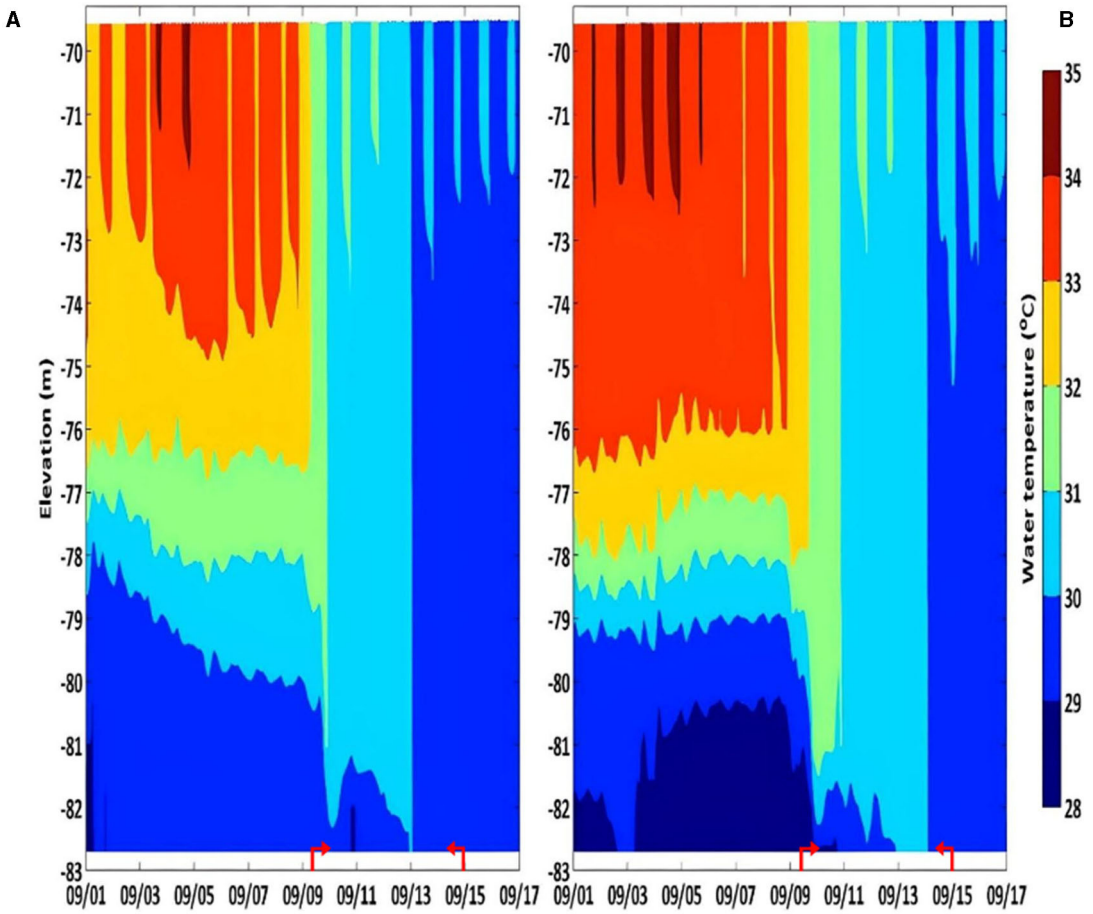

FIGURE 8
Simulated thermal stratifications in central north **(A)** and central south basin **(B)** from 9/1/2005 to 9/17/2005 in the presence of emerged islands. The red bracket denotes the storm period.

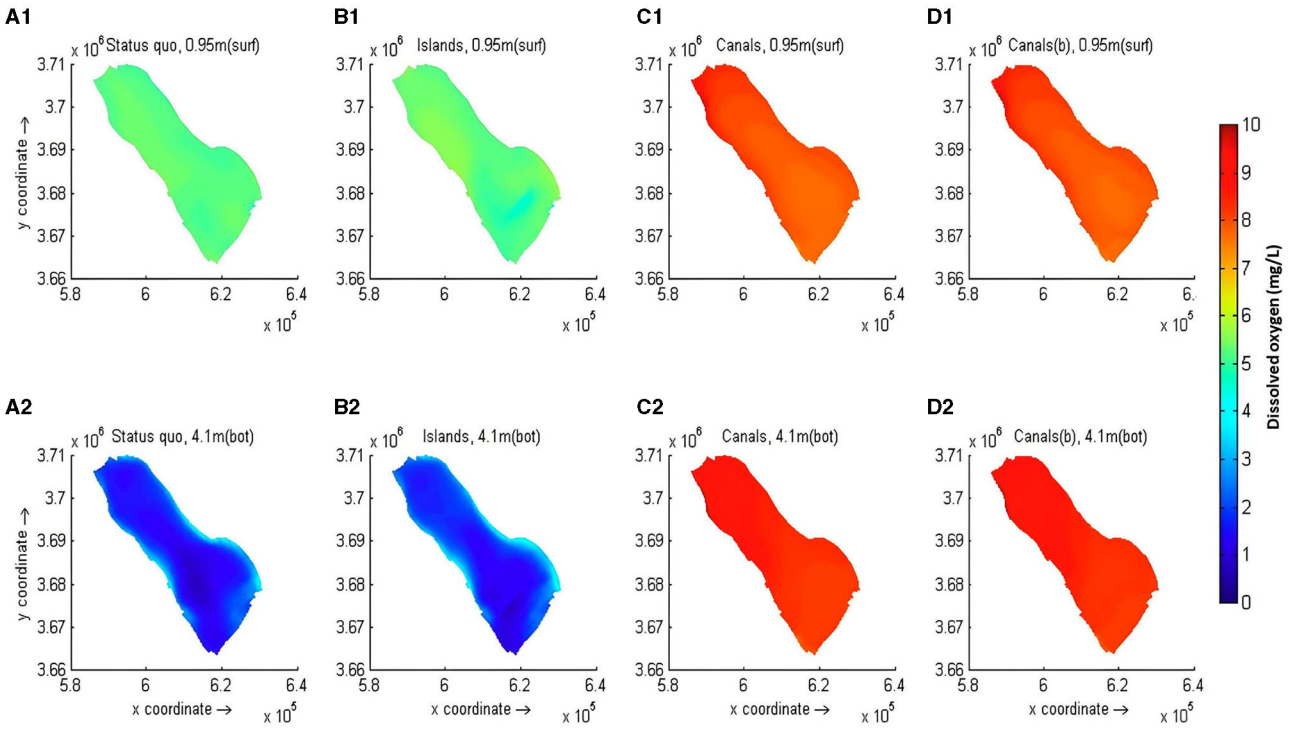

FIGURE 10
Comparison of the simulated mean dissolved oxygen (DO) concentrations in the status quo condition **(A1, A2)** and under the three mitigation scenarios, including emerged islands **(B1, B2)**, seawater canals **(C1, C2)**, and seawater canals with treated tributary rivers **(D1, D2)** during simulated period, 4/1/2007 to 6/30/2007. The upper four figures represent DO concentrations at 0.95 m below the surface, and the lower four figures show that of 4.1 meters above the bottom.