

TROPICAL STORM AND HURRICANE GUIDANCE FOR COMMERCIAL AQUATIC VENUES

Created in Collaboration with the Florida Swimming Pool Association

Introduction

Maintaining the safety of swimming pools and aquatic features is an incredible balance of chemistry and physics. Tropical storms and hurricanes can create unique challenges to keep a commercial aquatic venue up-and-running.

This guidance is intended for commercial aquatic venues to prepare for the impacts caused by a tropical storm system or hurricane, and help get the venue operational after the storm. Residential pool owners should consult with a pool professional on guidance specific to residential pools.

Before the Storm

Depending on the size and strength of the storm or hurricane, an aquatics venue may experience severe impacts well before landfall. The Qualified Operator should carefully monitor conditions at least 72 hours prior to any expected impacts and act accordingly.

Secure all Documentation and Manuals

Paperwork is often not thought of when closing an aquatics venue. The impact of wind, rain, and/or storm surge can make such documents unusable or even unavailable. Any records, aquatic facility manuals, equipment, and/or instructional materials should be secured. Consider having cloud-based digital copies, moving documents to a high floor in a watertight container, or moving them off-site to a secured location.

Do Not Drain Pools or Spas

In coastal areas with high water tables, the weight of the water in a swimming pool is vital to resisting the hydrostatic pressure imparted on swimming pools from below and keeping the swimming pool in place. These hydrostatic forces increase during hurricanes due to the increased rain. The aquatics venue can handle any rainwater intrusion, so there is no need to partially drain your pools and spas to accommodate rain or flood waters.



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Store and Secure all Unanchored Deck Furniture and Safety Equipment

It is important that all unanchored items on decks, walkways, or patios be stored securely, either inside a building or secured and anchored to prevent the items from becoming projectiles under wind or flood forces.

Safety equipment should also be securely stored to avoid becoming projectiles and ensure availability when it is time to reopen the aquatic venue.

Power Off all Aquatic Feature Equipment

It is likely your equipment will already be equipped with Ground Fault Circuit Interrupter (GFCI) protection. However, manually turning off the power supply to your facility's equipment will provide an extra level of safety and aid in getting you back up and running more quickly after the storm passes.

Add Additional Chemicals to Pools and Spas

Adding additional chemicals to your swimming pool and spa helps mitigate the effects of added debris and contaminants that will be introduced during a storm and will help maintain the health of your swimming pool in the event of extended power outages post-storm.

Remove and Store Pumps and Equipment that can't be Protected in Place or are Below Grade

If the equipment room is below grade, remove and store any materials, chemicals, pumps, automated chemical controllers, and other equipment to prevent damage. While the equipment used at an aquatic venue is robust, ensuring its protection during a storm will speed up the post-storm clean-up process and enable a quicker re-opening.

The Qualified Operator is advised not to rely on any existing sump pumps to remove excess water. Sump pumps will fail in the event of power loss, or if any flooding or storm surge exceeds capacity.



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Store ORP & pH probes

Probes for automated controllers should be stored per manufacturer's instructions. ORP and pH probe tips are sensitive to drying out. During prolonged periods where the sensor tips may become dry, probe accuracy can be severely impacted.

After a Tropical Storm or Hurricane

Inspect the Aquatic Venue for Safety

Depending on the strength and severity of the tropical storm or hurricane, the impacted area may see significant damage. Remember that human safety and public health are the first priorities. Please keep the following in mind:

- Do not attempt to assess any physical damage until the storm passes and local authorities deem that travel is safe.
- Flying debris is a major concern with hurricanes and tropical storm systems. Check for broken glass in and around the pool area should be checked, even if everything appears to be intact.
- If the aquatic venue has suffered structural damage, the venue should not be accessed until an inspection has been performed by the Authorized Health Jurisdiction or a licensed engineer.
- The aquatic venue should not be accessed if there are downed power lines. The aquatic venue staff should wait until power utility crews have ensured the area is safe to access.

Check for Flooding

If the aquatic venue is in a coastal flood zone, check for saltwater intrusion. If sea water has been introduced to the aquatic venue, any bodies of water will need to be drained and refilled prior to restarting the filtration and disinfection systems. Storm surges associated with a hurricane can severely impact the aquatic venue. Sand, seaweed, other debris, and even marine life can end up in the aquatic venue due to storm surge. Flooding can also introduce other contaminants such as oil, pesticides, and sewage into the aquatic venue.

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If the aquatic venue has experienced localized flooding due to torrential rains, assume that any flood waters are contaminated with sewage and hazardous chemicals. This means that any impacted bodies of water should be drained, the surfaces cleaned of contaminants, and refilled prior to restarting the filtration and disinfection systems. This includes performing an assessment of piping, any impacted pumps, and filters for impacted mud.

Due to potential larger scale impacts on human health and safety, the Qualified Operator should contact the Authority Having Jurisdiction and the local water provider prior to draining and filling to ensure the treatment plant is operational and to comply with any existing water restrictions.

If draining of the aquatic venue is not possible, Qualified Operators are recommended to work with a water analysis lab and, if applicable, their pool service provider to develop a plan of action that mitigates the harmful effects of oils, pesticides, phosphates, and other contaminants that may have entered the aquatic venue.

Remove all Debris from the Aquatic Venue and Features

Storm debris must be removed from your aquatic features and the aquatic venue thoroughly cleaned to ensure proper operation and water sanitization post-storm. Leaf nets and rakes should be used to remove all limbs, leaves, nails, or any storm debris that can cause staining or water toxicity. Facility staff familiar with the cleaning and operation of the aquatic features should consult the Qualified Operator to establish a clean-up timeline, and together, establish what work can be done by the facility staff, by the Qualified Operator, or subcontracted out to a commercial pool service company.

Conduct a Post-Storm Inspection

Once it is safe to access the aquatic venue, the Qualified Operator should conduct a thorough inspection to check for any damage that water features and attractions may have sustained during the storm. The Qualified Operator should utilize available safety checklists provided by their insurance provider or equipment manufacturer.

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It is also advisable to have a licensed electrician inspect below ground or below grade equipment rooms for damage to the electrical connections.

Long-Term Closures

If the aquatic venue will experience a long-term closure due to the storm impacts, the Qualified Operator and/or owner of the aquatic venue should contact their Authority Having Jurisdiction and, if a separate entity, the local Health Department. Standing water in pools may become breeding grounds for disease spreading mosquitoes, as well as inadvertent habitats for dangerous reptiles. The local Department of Health or Department of Environmental Health may have additional guidance to prevent vector borne diseases.

Superchlorination and Adjustment to Calcium Saturation Index

A tropical storm or hurricane can create unhealthy and imbalanced water. These storms can introduce massive amounts of fresh water and organic matter to an aquatic venue in a short period of time. When this occurs, it is recommended to:

- Superchlorinate the aquatic venue. Sanitizer values between 10-20 ppm or more can help mitigate potential algae blooms and inactivate other contaminants that would make the water unsafe. If localized flooding has introduced sewage water in the aquatic venue, the venue should be drained and cleaned.
- Once the water is clear, add any necessary chemicals to ensure proper balance according between -0.5 and +0.5 on the Calcium Saturation Index. Proper water balance is essential for the longevity and efficiency of pool equipment.
- Prior to reopening, lower the sanitizer level to the acceptable range per the Authority Having Jurisdiction.
- Ensure the filter media is backwashed, cleaned, or replaced at the appropriate times as determined by the Qualified Operator.

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Opening Your Facility

The aquatic venue should remain closed until:

- Power is back on
- All necessary repairs have been completed
- Water is properly balanced and appropriate sanitizer levels have been achieved
- The aquatic venue has been thoroughly cleaned.

After the previous criteria is met, it is recommended that the aquatic venue filtration and disinfection equipment runs for a minimum of 24 hours to ensure the system is working properly and the aquatic venue is prepared for opening.

If you have any questions or for additional guidance, contact CMAHC's Technical Director Dewey Case at Dewey.Case@CMAHC.org or email CMAHC@CMAHC.org.

About CMAHC: [The Council for the Model Aquatic Health Code](#) (CMAHC) promotes health and safety for public swimming facilities in the United States. As a member-driven organization, CMAHC exists exclusively to advocate, evolve, innovate, promote implementation, organize research in support of, and advise [the Centers for Disease Control and Prevention](#) (CDC) on needed updates to [the Model Aquatic Health Code](#) (MAHC). Owned by the CDC, the MAHC is the only all-inclusive national pool code that addresses current aquatic issues.

About FSPA: [The Florida Swimming Pool Association](#) is the coordinating organization for 16 local FSPA Chapters. FSPA provides education courses, timely information, networking opportunities, and government relations representation to the swimming pool industry in Florida.