

Proactive Flood Prevention Solutions



Picture taken from
Peacock golf blog

Presented By:
Flood Risk America




golf industry show



Who We Are

- ◆ Flood Risk America (FRA) and Flood Risk Canada (FRC) are proactive Flood Risk Management companies specializing in thorough evaluation and reporting of flood risks throughout the United States and Canada.
- ◆ Our focus is on exposure, uninsured losses, and liability.
- ◆ We are experienced flood mapping professionals and emergency managers built from a team of local and national experts in the field of flood services.

An aerial photograph of a golf course bunker. The bunker is a circular depression in the grass, filled with a layer of sand. In the center of the sand trap, there is a small, dark, circular pond of water. The surrounding grass is lush and green. The text "What will 'sink' your golf course?" is overlaid in white, serif font on the image.

What will “sink”
your
golf course?

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- An aerial photograph of a lush green golf course. The course features several fairways, green fairways, and sand traps. A large, winding body of water, possibly a river or lake, runs alongside the course. In the background, an industrial facility with numerous white storage tanks and tall chimneys is visible under a clear blue sky. The text is overlaid on the image in a white, bold, sans-serif font.
- In the U.S., roughly 23.5 million golfers enjoy 15,000-plus courses, representing a \$169 billion indirect impact to the economy.
 - Canada's 5.7 million players, contribute \$14.3 billion.
 - Hurricanes, macro weather, and other "Acts of God" require course owners to now act smarter to save both money and business interruption.
 - Despite golf-industry lobbying initiatives, the U.S. government doesn't classify courses worthy of needed disaster relief assistance.

*6 Step Flood Protection
Program*

Designed for Golf Courses



STEP ONE

Flood Risk Assessment

- Identifies exact location of golf course that is prone to flooding by analyzing low points of elevation and floodways.



STEP TWO

Zone Analysis

- ◆ Evaluates current flood insurance program to *Flood Assessment* of golf course
- ◆ Assesses opportunities for lower flood deductibles and better sub-limits and how to acquire flood insurance on bunkers and greens
- ◆ Identifies locations for possible savings

STEP THREE

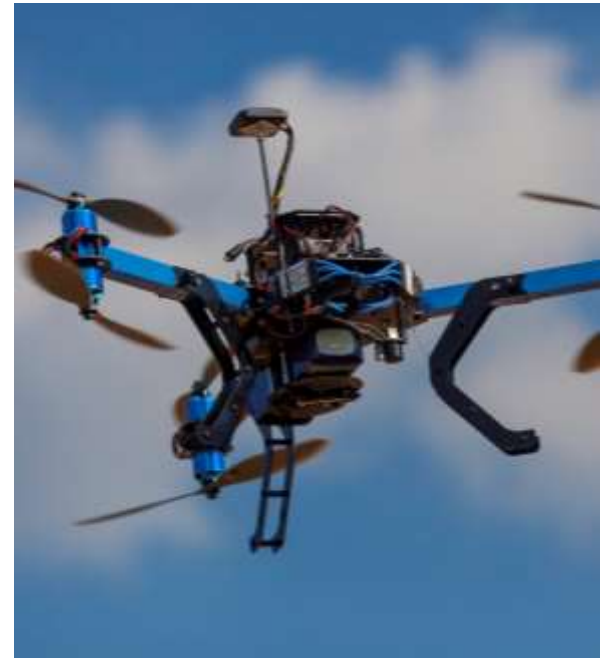
Zone Verification

- ◆ Sophisticated flood model using LIDAR technology
- ◆ Identifies exact location of the golf course that is prone to flooding, including flood sources, and analyzing low points of elevations
- ◆ Flood modeling can be done in 100-year and 500-year storm, also 12 and 24 inches of rain within a 24-hour period
- ◆ Investigation of historical flooding from tidal water, storm surge, heavy rainfall, and groundwater inundation

Zone Verification Cont..

Flood Mapping

- ◆ Incorporates building, land, and area characteristics
- ◆ Challenge FEMA on ground elevations
- ◆ Assessment includes in-depth, customized view of the entire golf course location and vulnerability to climate change, global warming, and a drainage study



Sunny-Day Tidal and Category 1 Flooding Risk



FLOOD RISK AMERICA



Proactive Flood Prevention Solutions

**Tidally-Influenced
Flooding
2017**



The property has a limited risk of non-storm flooding in 2017. The map on the right is a close-up look at the area surrounding the property. The upper left map is zoomed out to show extent, but not flood risk. The black outline shown on this map depicts the extent of the close-up map as a reference.



**Category 1
hurricane
storm
surge:
2017**



This map on the right shows land vulnerable to flooding and wave energy from a category 1 hurricane maximum surge. The different colors portray the depth of flooding in terms of water above land, as shown in the legend. Green shows up to 1 ft of water, yellow indicates 1 to 2 ft, orange is 2 to 3 ft, red is 3 to 4 ft, and purple is greater than 4 ft.



STEP FOUR

Flood Mitigation and Risk Mitigation

- ◆ A *Flood Mitigation Plan and Vulnerability Assessment* can be customized to each golf course that is subject to flooding
- ◆ This plan will give suggestions on flood mitigation products and sizes needed for the subjected courses

Flood Mitigation Plan & Vulnerability Assessment

- ◆ Provides information and recommendations to improve the functionality of critical facilities within the course and flood proofs expensive equipment
- ◆ Identifies vulnerabilities in essential facility systems and equipment
- ◆ Prevention of flood exposure to club house and valuable assets
- ◆ Reduction to the vulnerability, damage, and disruption of operations during severe flood events
- ◆ Mitigation plan to account for loss of power
- ◆ Investigation of historical flooding on specific location

*Flood Mitigation Measures
and Products*

Designed for golf courses



Outdoor Flood Sensory System



- ◆ Measures waves, tides, and currents
- ◆ Sends alerts, alarms, emails, and texts
- ◆ Internal battery and solar powered
- ◆ Reports temperature, wind speed, water levels
- ◆ Monitors streams and rivers
- ◆ Provides groundwater levels
- ◆ Collection of rainfall, stream levels, stream flow data
- ◆ Monitors storm surge
- ◆ Monitors in real-time
- ◆ Snow depth, melting monitoring
- ◆ Water temperature



Flood Panels for Club Houses and Vulnerable Equipment



Flooded clubhouse from a river source in California



Flood Panel installed on Industrial garage in Tampa, FL

Flood Barriers for Golf Courses



Flood Bags for Maintenance Equipment/Golf Carts

**Which is more expensive?
golf cart?**



or lawn equipment?

Benefits of Flood Proofing

- ◆ Lower Flood Premiums by up to 85%
- ◆ Loan Compliance
- ◆ Better Coverage Limits
- ◆ Lower Deductibles
- ◆ 24/7 Flood Defense
- ◆ Avoid Business Interruption and Flood Loss
- ◆ Eliminate Amount Of Loss Payouts
- ◆ More Control Over Costs and Potential Exposure
- ◆ FEMA Compliance
- ◆ Federal Grant Assistance (For Clubhouse)

STEP FIVE

Flood Safety Plan

- ◆ **Flood safety plan can be designed for each golf course for potential incidents that could result from severe weather, hazardous materials, infrastructure failure, and environmental impact**





STEP SIX

Flood Prevention Tools

- ◆ A mobile flood response vehicle can be customized for all golf course locations in case of an emergency.
- ◆ If a golf course is at risk of flooding, the flood prevention team will be dispatched to the location immediately.

**Don't let this happen
to YOUR golf course!**



Aerial Footage from a drone in Ontario, Canada

**We appreciate your participation!
Let us know how we can help you.**

Thank you



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