

# GOMA's Clean and Resilient Marina Initiative

Waterfronts Florida Spring Meeting

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Ft. Myers Beach, FL

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# Outline

- What is Resiliency?
- Background on Clean and Resilient Marina Initiative
- Elements of the Clean and Resilient Marina Initiative
- Florida Examples of Resilient Marina BMPs
- Questions

# What Is Resilience?



“Resilience is the capacity of human, natural and physical systems to adapt to and recover from change.”

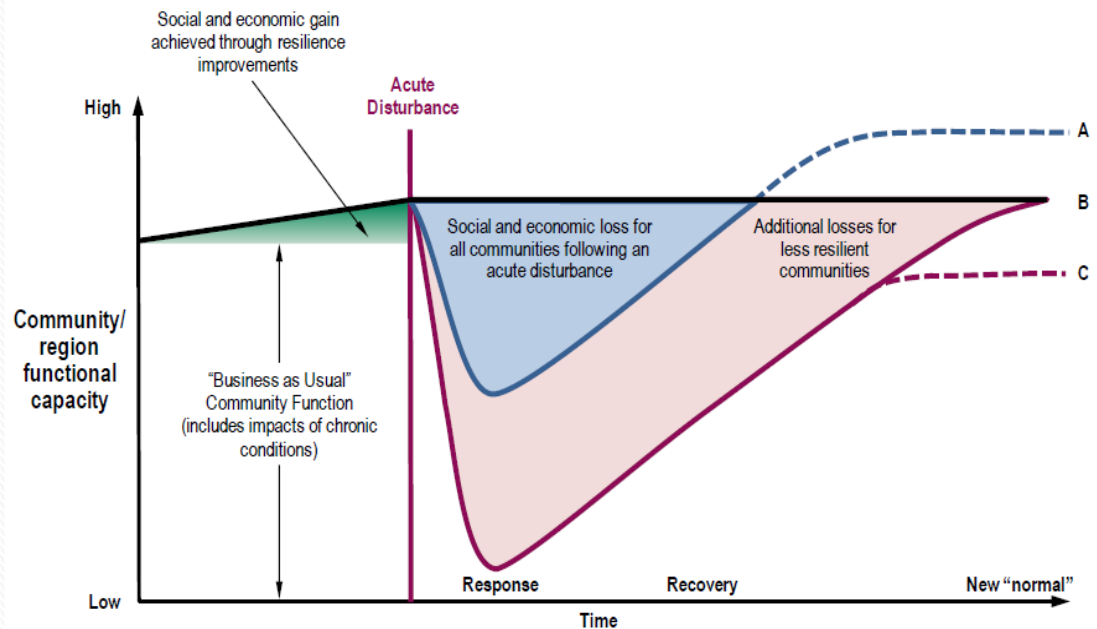
*Gulf of Mexico Alliance  
Coastal Community  
Resiliency Team*



# Community Resiliency

**Every \$1 spent  
in mitigation  
saves \$4 after a  
disaster \***

## Framing Community Resilience



Model: Dr. Mary Ellen Hynes, DHS (2001); Blair Ross, ORNL; CARRI 2008 ©

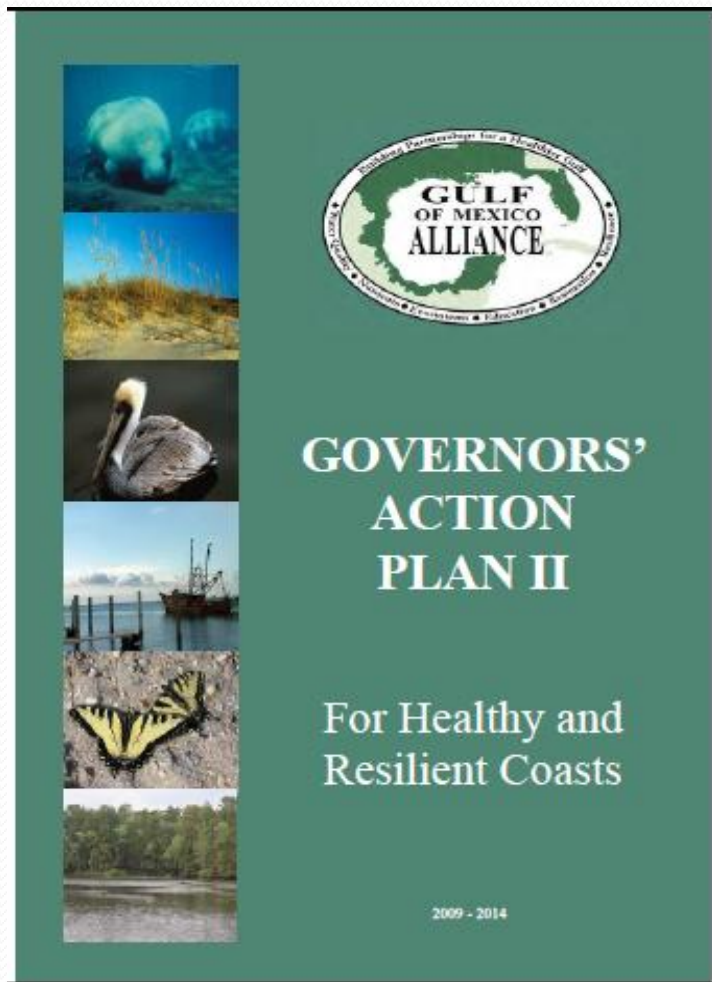
\* *Natural Hazard Mitigation Saves*. MultiHazard Mitigation Council & National Institute of Building Sciences

# How Did the Initiative Begin?

## GOMA Governor's Action Plan, Sub action 5

*Promote and expand resilient and environmentally responsible operations and best management practices at marinas*

- Standardize *Resilient* practices across the Gulf States
- **Goal:** Coastal marinas adopt more resilient and environmentally responsible operations and volunteer to become certified Clean & Resilient Marinas



# Resilient Marina Initiative Background

- GOMA
  - Multi-state partnership
  - Enhance the ecological and economic health of the Gulf
- Priority Issue Teams (PITs):
  - **Coastal Community Resilience**
  - Water Quality,
  - Habitat Conservation and Restoration
  - Ecosystem Integration and Assessment
  - Nutrients & Nutrient Impacts
  - Environmental Education.
- Resilient Marina Initiative
  - Coastal Community Resilience PIT
  - GOMA's Governors' Action Plan

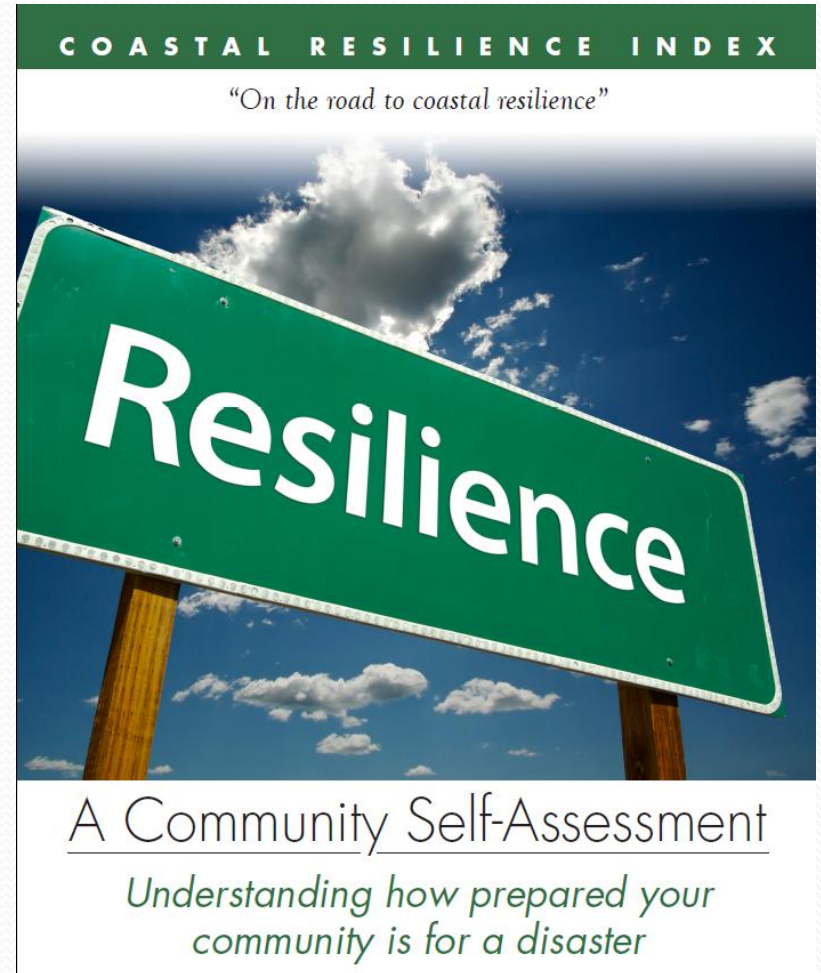


# Mitigating Marina Impacts

- ① Reduce Risk to Life and Personal Injury
  - During evacuation
  - While securing marina
  - During hazards
- ① Reduce Property Damage
  - Wet slip damage
  - Dry rack damage
  - Boat damage
  - Displacement of boats
  - Bulkhead erosion
- ① Resume Operations Quickly



# What did we Build on?





# Action Items and Milestones

- Formed Task Force
- Mapped Coastal Marinas & Certified Clean Marinas
- Surveyed Marinas
- Researched and Compiled Resources
- Developed User-Friendly Guidance Documents
- Created Outreach and Education Materials

# Resilient Marina Task Force

**Florida:** Brenda Leonard, FL Department of Environmental Protection; Mike Spranger, University of Florida

**Alabama:** Chris Miller, MS/AL Sea Grant Consortium

**Mississippi:** Rhonda Price, Mississippi Dept. of Marine Resources; Tracie Sempier, MS/AL Sea Grant Consortium;

**Louisiana:** Melissa Daigle, LA Sea Grant Law Program; Linda Pace and Jon Truxillo, LA Dept. of Natural Resources

**Texas:** Dewayne Hollin and Logan Respass, Texas Sea Grant

**Eco-Systems, Inc:** Melissa Pringle, Kimberly Miller, Jay Estes, Courtney Vanderschaaf, Paul Lanning

# Where will the Program Apply?

## Coastal and Clean Coastal Marinas for TX, LA, MS, AL, and FL

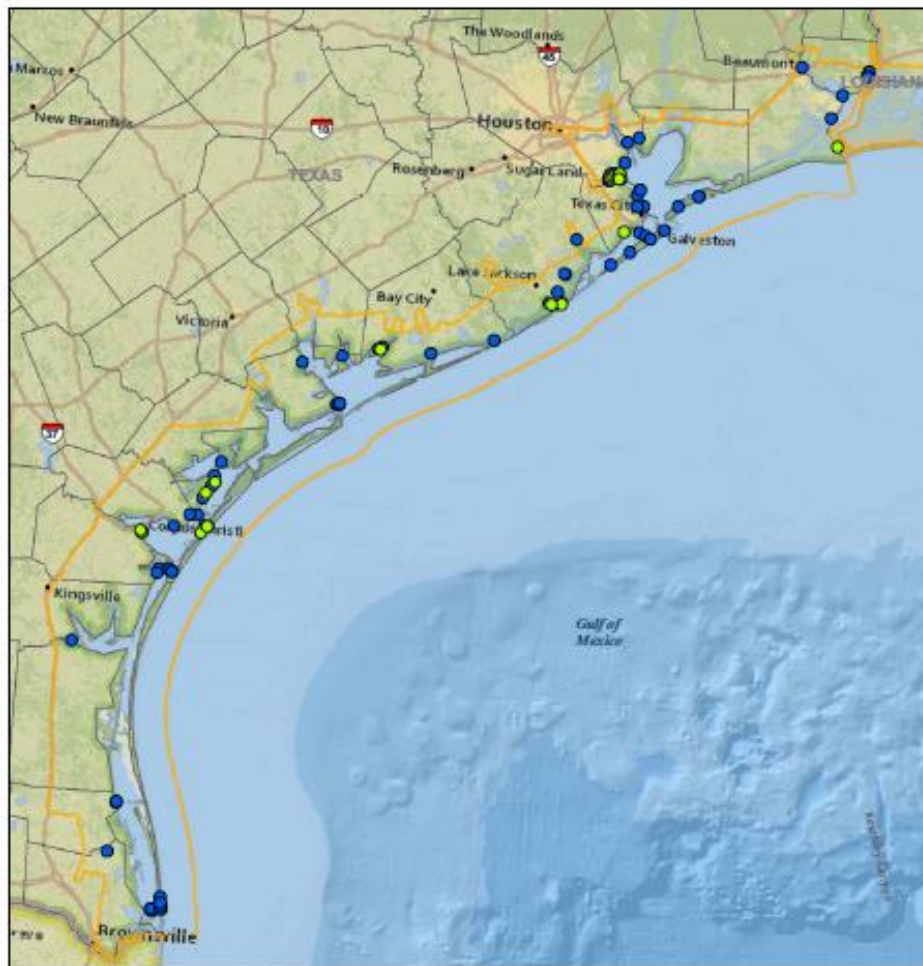


### Legend



# Texas

TEXAS: Coastal and Clean Coastal Marinas

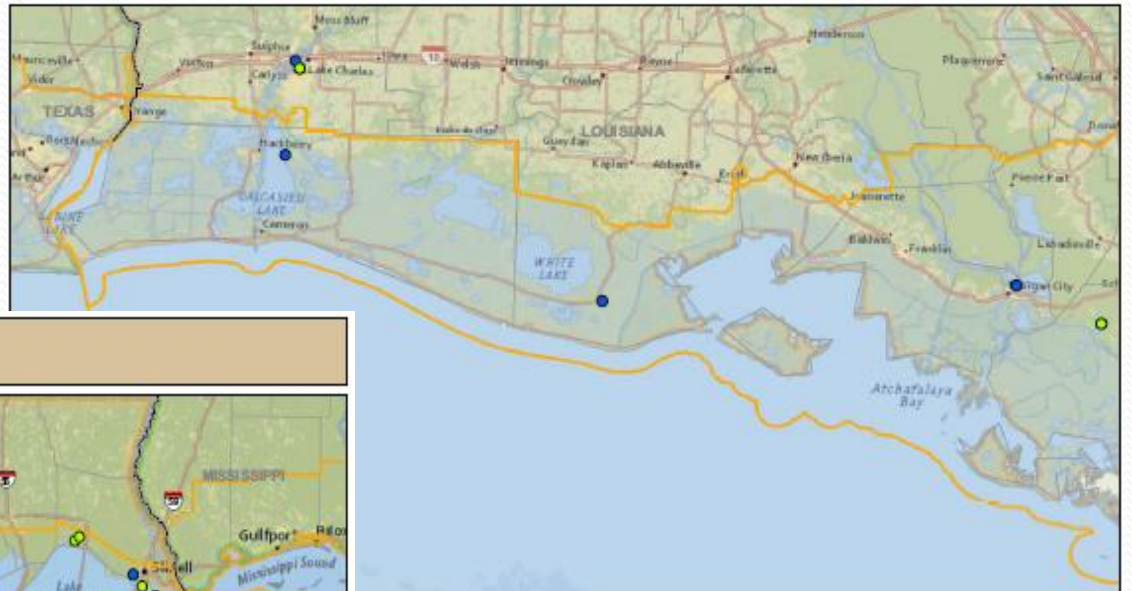


TEXAS: Coastal and Clean Coastal Marinas



# Louisiana

LOUISIANA: Coastal and Clean Coastal Marinas



LOUISIANA: Coastal and Clean Coastal Marinas



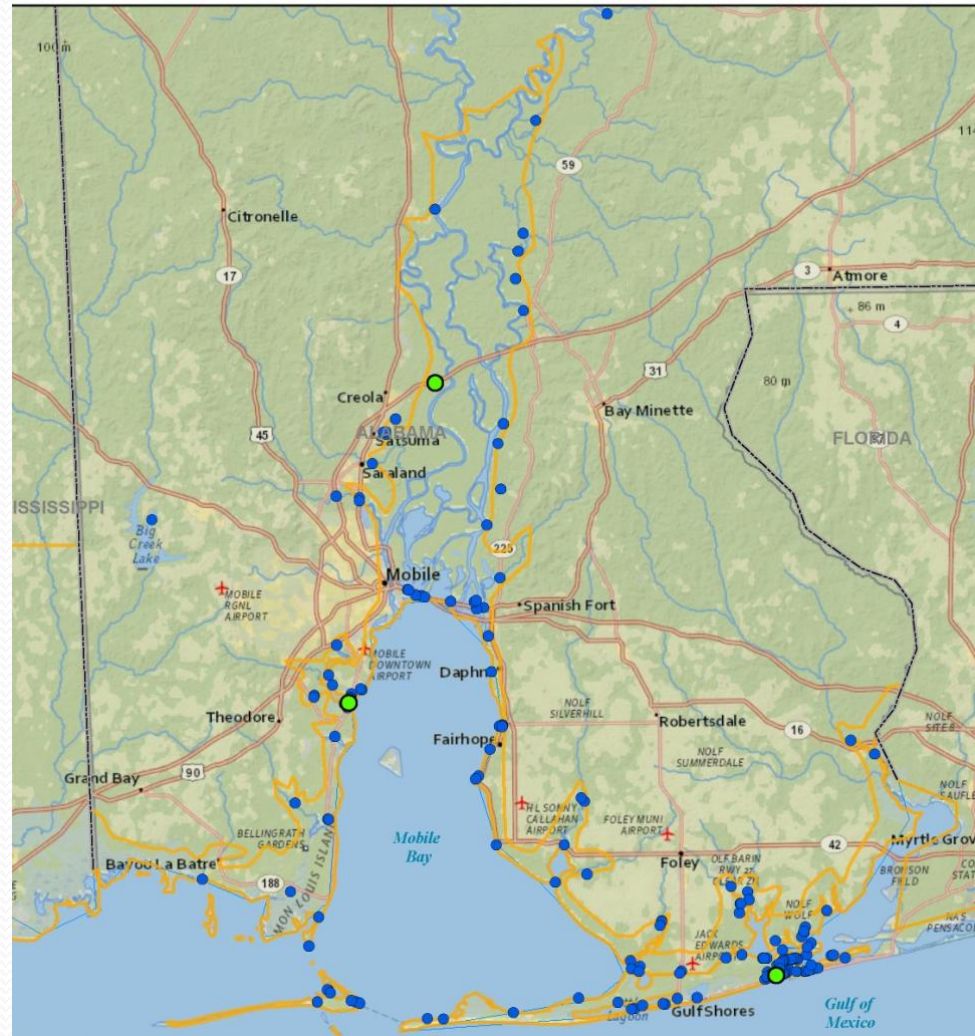
# Mississippi

## MISSISSIPPI: Coastal and Clean Coastal Marinas



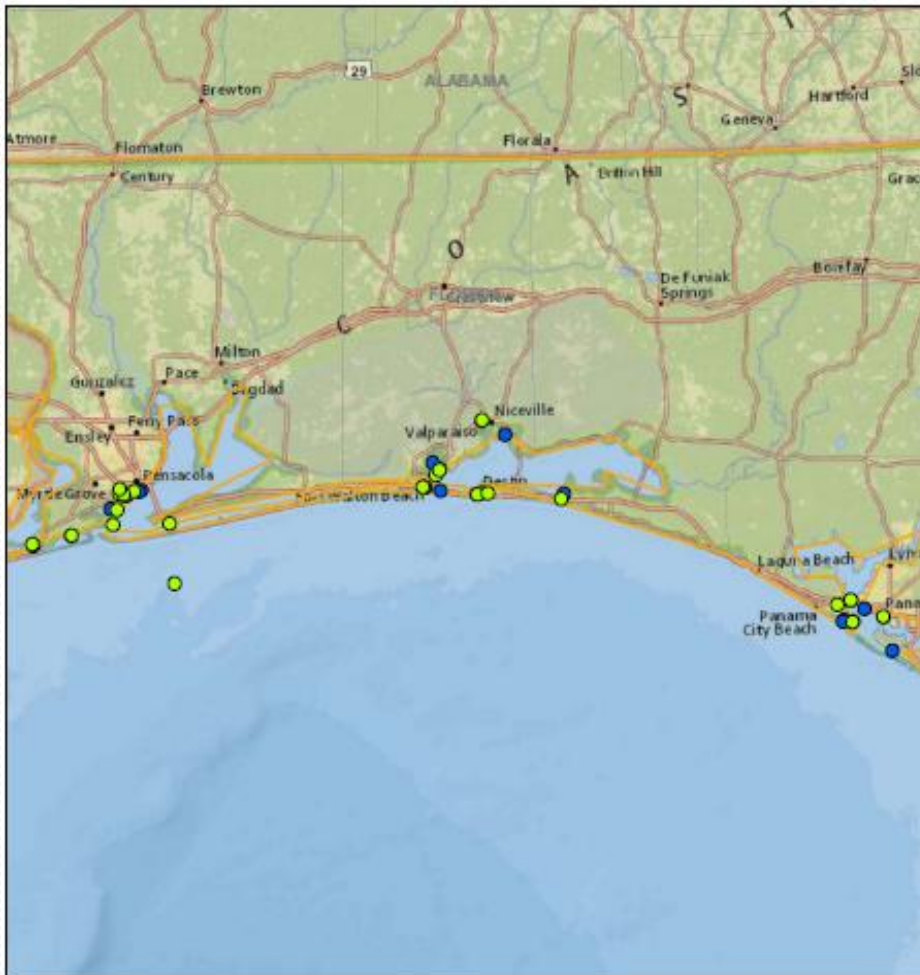
# Alabama

## ALABAMA: Coastal and Clean Coastal Marinas



# Florida

FLORIDA: Coastal and Clean Coastal Marinas



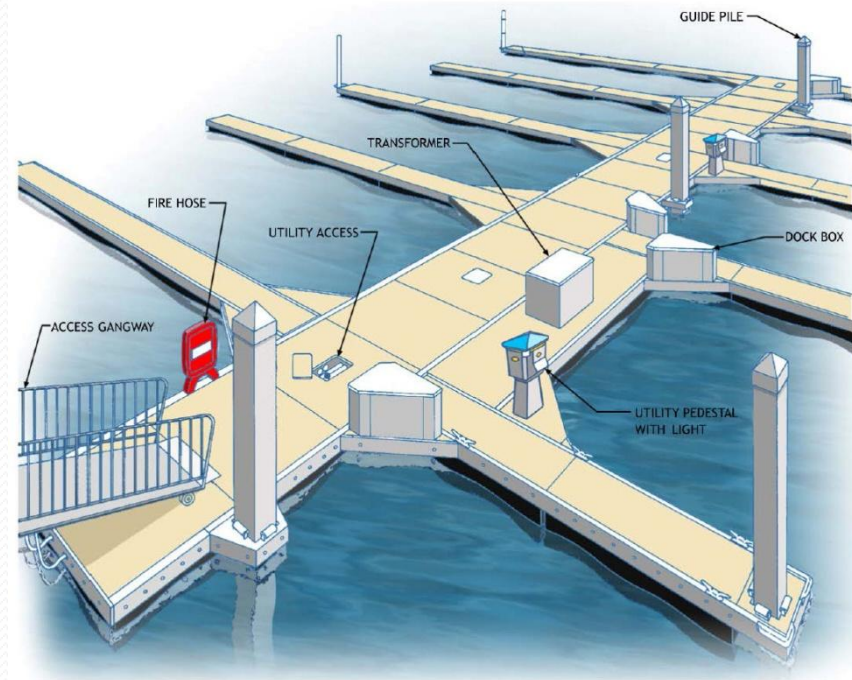
FLORIDA: Coastal and Clean Coastal Marinas





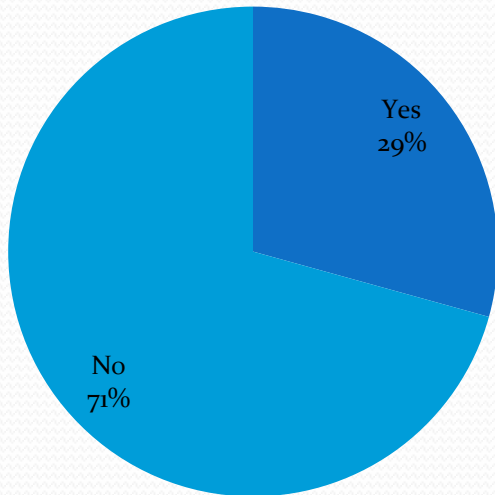
# What do Marina Operators Think?

- We surveyed marina operators who will use the Clean & Resilient Marina Program
- Marina operators and owners across the Gulf responded
- Survey results guided the selection of resiliency topics.

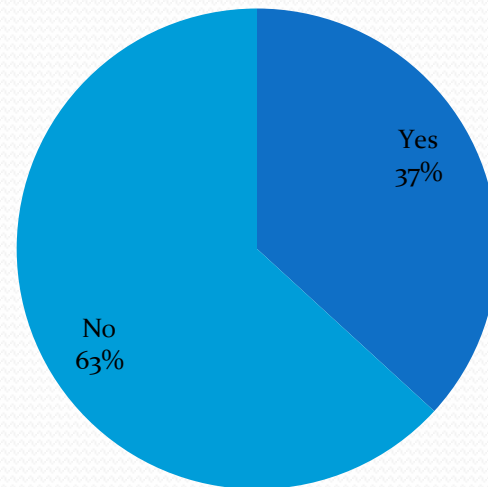


# What they had in place at marinas

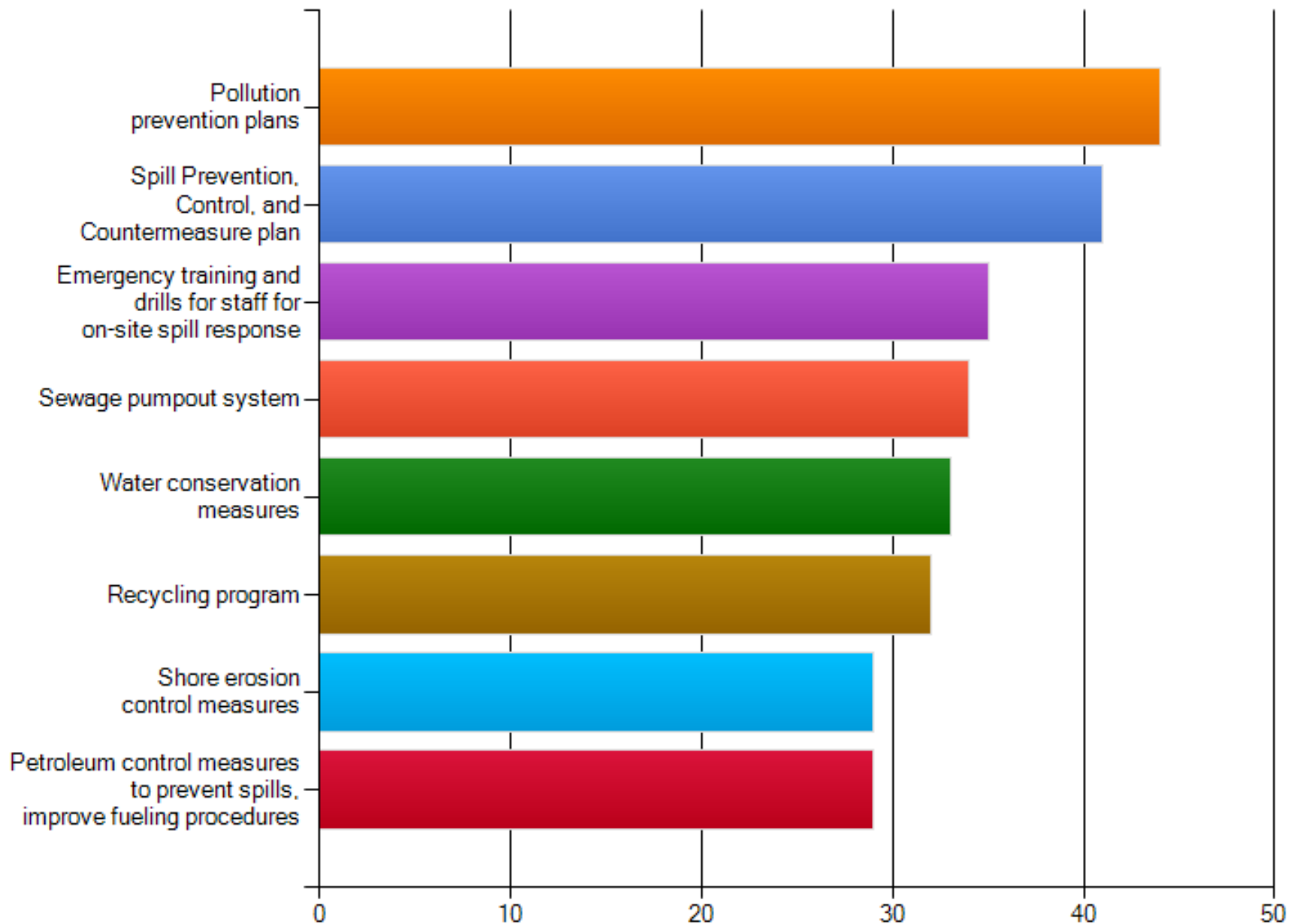
**Available Designated Storm Anchorage Locations**



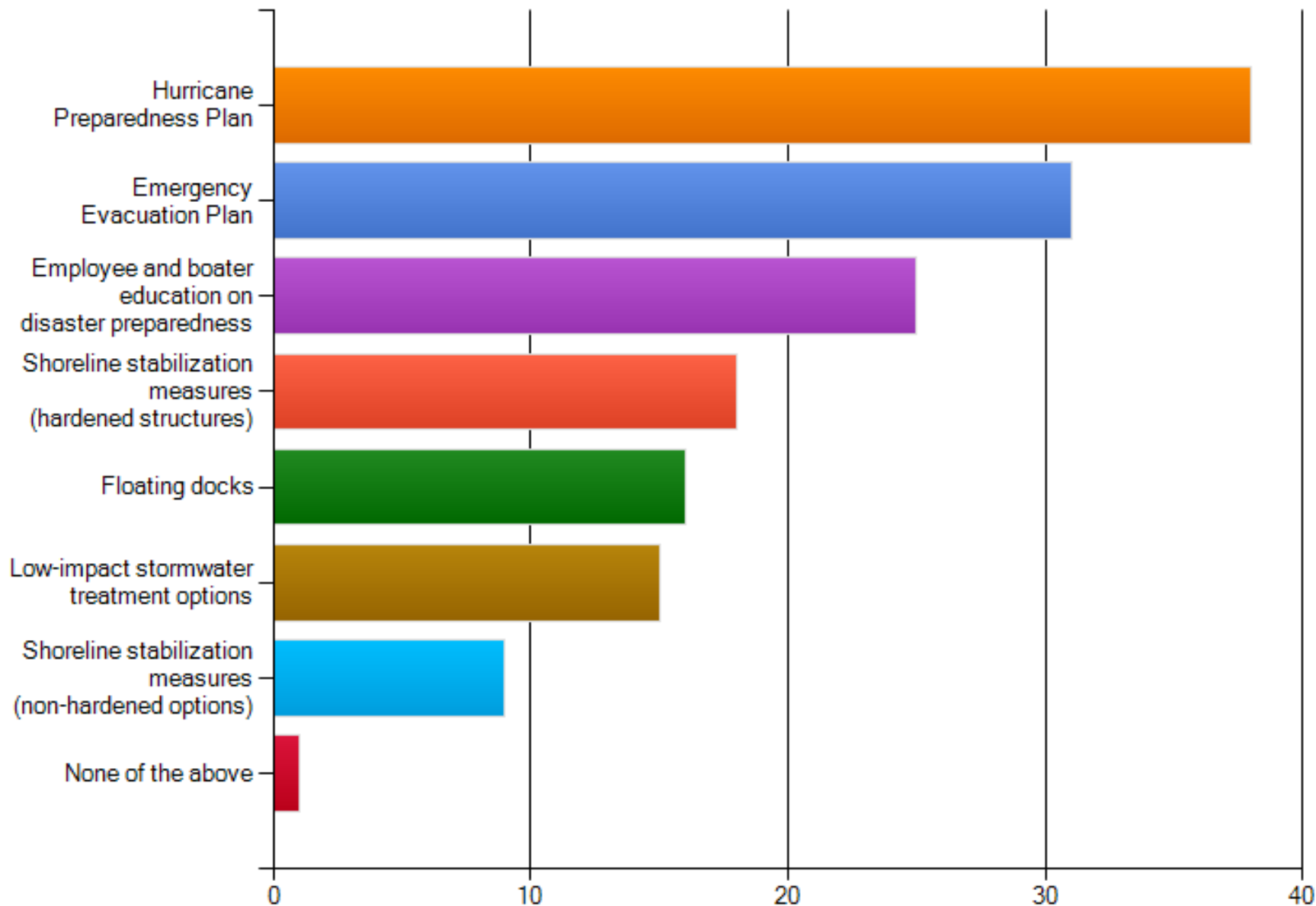
**Active Hazard Mitigation Plan (Government Authored)**



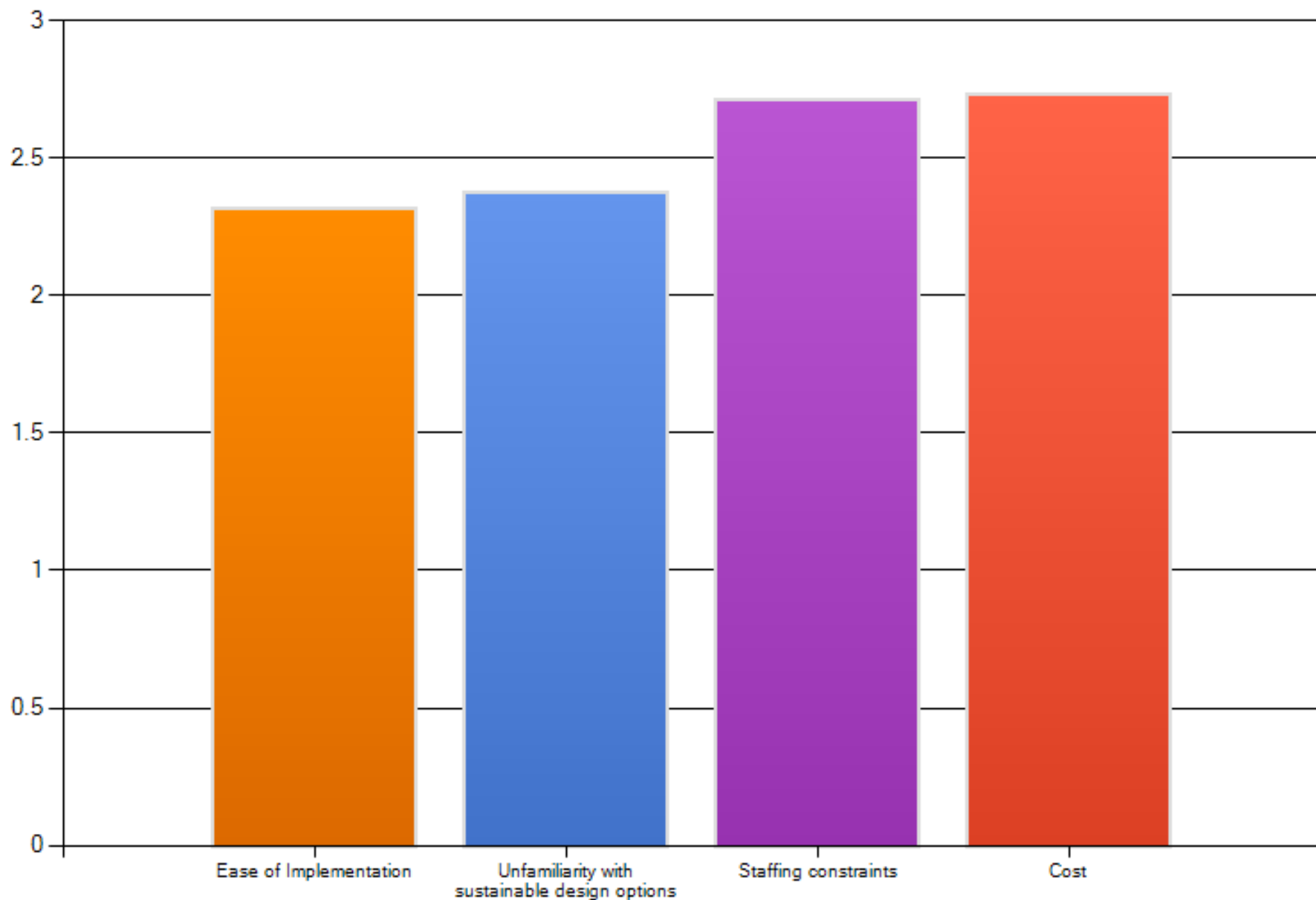
## Which Clean Marina strategies are currently employed at your marina?



**Which of the following strategies are employed at your marina to promote resilience to natural and other environmental hazards?**



**Rate the following items that would prevent your marina from seeking Clean/Resilient Marina status (4 is the greatest obstacle)**



# Which Resilient Strategies Would Marina Operators Use?

## OPERATIONAL

- Hurricane Preparedness Plan
- Emergency Evacuation Plan
- Better Stormwater Management

## STRUCTURAL

- Floating Docks
- Hardened Shoreline Stabilization
- Non-hardened Shoreline Stabilization

# Elements of the GOMA Clean and Resilient Marina Initiative



# What Guidance is Provided in the Resilient Marina Initiative?

- I. Strengthening Clean Marina Programs
- II. Marina Siting and Design
- III. Emergency Preparedness
- IV. Evacuation Procedures
- V. Stormwater Management
- VI. Climate Adaptation & Sea Level Rise
- VII. Outreach & Education



# What Resources were Produced?

1. Checklist for Clean & Resilient Marinas
2. Guidebook at a Glance
3. Clean & Resilient Marina Guidebook + Appendices (Vol. I, II)
4. Best Policies & Practices Guide for Policymakers
5. Outreach Materials

## AT A GLANCE

### Clean & Resilient Marina Checklist

#### 1.0 MARINA DESIGN & MAINTENANCE

##### 1.1 CLEAN MARINA CHECKLIST QUESTIONS

- Yes  No  New Construction - Use Environmentally neutral materials?
- Yes  No  New Construction - Employ shore erosion control measures?
- Yes  No  Maintain property using Clean Marina/Best Management Practices (BMPs)?
- Yes  No  Practice water conservation?
- Yes  No  Use upland and inland areas for storage & maintenance?
- Yes  No  Have a vegetated area or conservation easement on your property?
- Yes  No  Avoid toxic lawn & garden chemicals to the greatest extent possible?
- Yes  No  Practice waterwise landscaping?

##### 1.2 RESILIENT MARINA CHECKLIST QUESTIONS

###### Marina Siting

- Yes  No  Conduct soils stability, or geotechnical, testing before construction or expansion?
- Yes  No  Determine maximum potential wind speeds at site?
- Yes  No  Estimate potential wave height by determining distance wind travels over open water (or fetch)?
- Yes  No  Determine potential heights of elevated tidal and storm surge?
- Yes  No  Determine prevailing currents?
- Yes  No  Location provides shelter from water impact and storm surge?
- Yes  No  Harbor entrance channel is aligned to account for prevailing winds, waves, and currents?
- Yes  No  Located in area requiring a minimum of excavating, filling, and dredging?
- Yes  No  Improvements made to maximize circulation and minimize need for dredging?
- Yes  No  Water-calming measures employed at appropriate?

###### Waterside Facilities

- Yes  No  Piers and docks extend into naturally deep waters?
- Yes  No  Slips for deep draft boats located in naturally deep waters?
- Yes  No  Dock system designed to allow for free exchange of water between harbor and surrounding water?
- Yes  No  Launch ramps can accommodate high volume traffic in the event of an evacuation?
- Yes  No  Fuel tanks are located on-shore?
- Yes  No  Channels are of adequate width to promote safe movement of boats?

For more information, visit [www.gulfofmxcoalliance.org](http://www.gulfofmxcoalliance.org).



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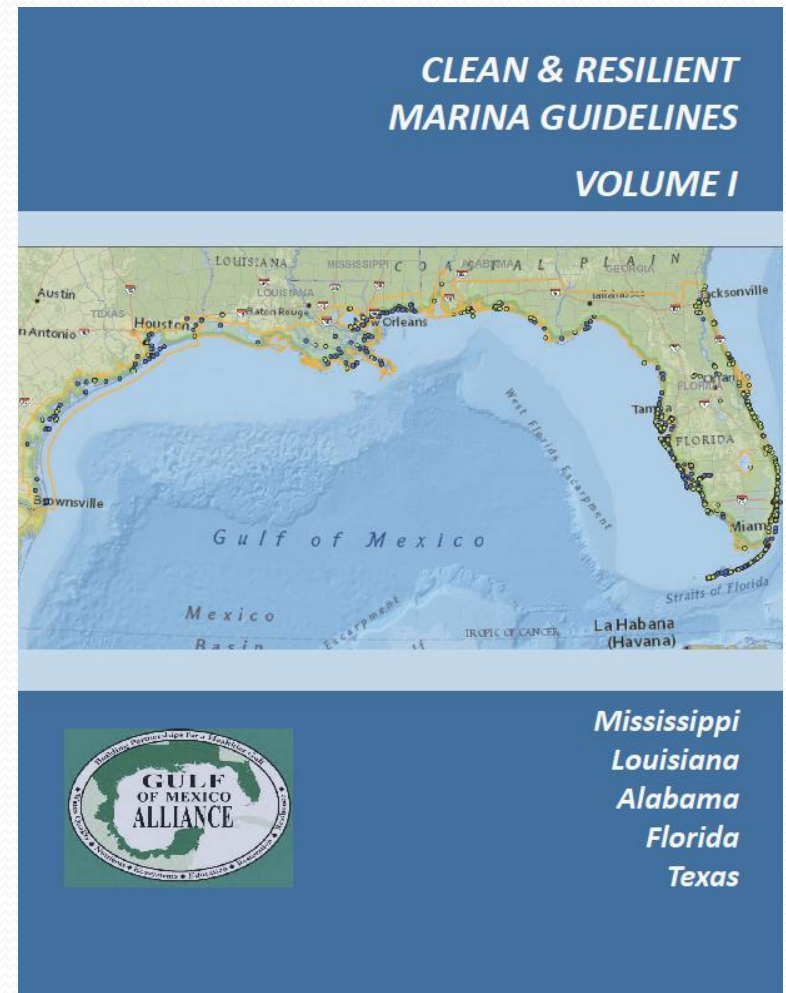
### CLEAN & RESILIENT MARINA GUIDELINES VOLUME I



Mississippi  
Louisiana  
Alabama  
Florida  
Texas

# Clean & Resilient Marina Guidebook

- **The Clean and Resilient Marina Guidebook, Vol. I:**
  - 1) Available in Full & At-A-Glance Versions
  - 2) Offers Technical and Best Practices Guidance
  - 3) Includes Examples & Reference
  - 4) Sample Hurricane Preparedness Plan



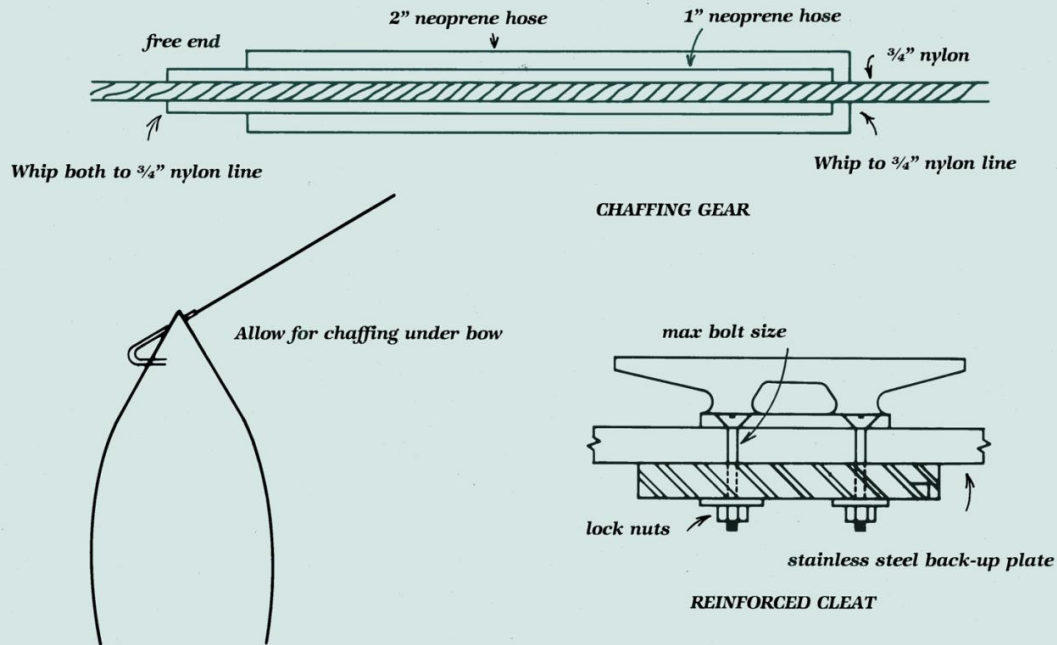
# Clean & Resilient Marina Guidebook, Vol. II

- Complements *Clean & Resilient Marina Guidebook* as *Volume II*
- Structured in the same order as the chapters in the *Clean and Resilient Marina Guidebook*.
- References and resources in *Volume II* include:
  - Appendix A: Introduction
  - Appendix B: Marina Design and Siting
  - Appendix C: Emergency Preparedness
  - Appendix D: Evacuation Procedures
  - Appendix E: Stormwater Management and Erosion Controls
  - Appendix F: Climate Adaptation and Sea Level Rise
  - Appendix G: Outreach and Education for Marinas

# Vol. II Sample Content

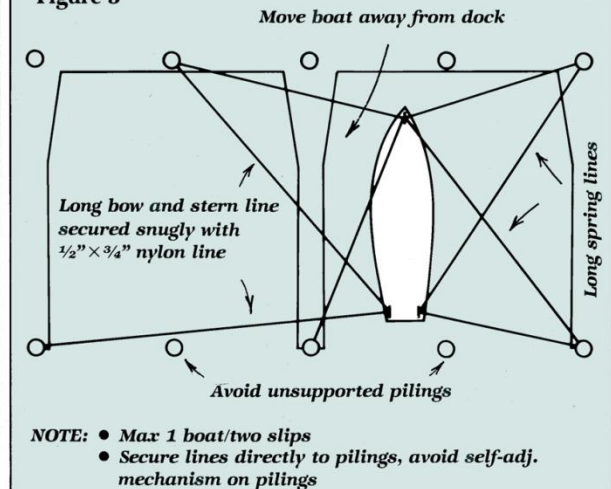
## Boat Owner Preparedness

Figure 2



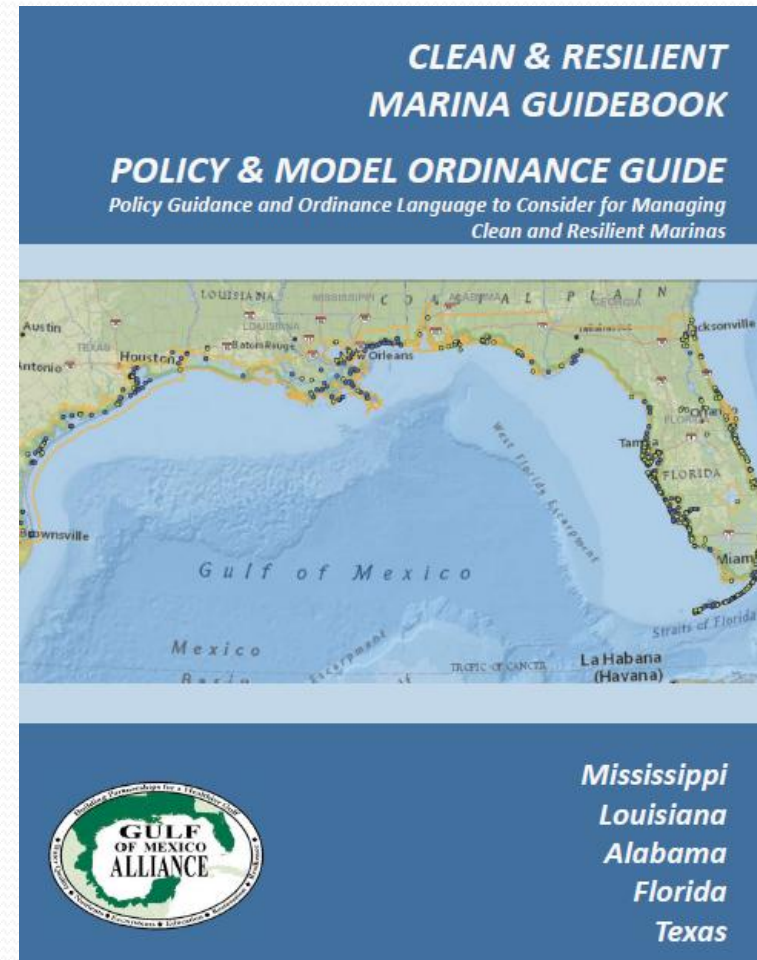
From: *Protecting Your Boat Against Severe Weather*. Source: TX Sea Grant

Figure 3



# Marina Policy & Model Ordinance Guide

- 1) Overview of Federal Coastal Management Policy
- 2) Provides state/local law & BMPs on:
  - Water/Wastewater Cross Connections
  - Marina Siting & Design
  - Flood Hazard Prevention
  - Stormwater Management
  - Spill Prevention Control And Countermeasure Plan
  - Hurricane Preparedness Plans
  - Vessel Pump-out Procedures
  - Pet Waste
  - Abandoned Vessels



# Education and Outreach

- Flyers distributed at Gulf of Mexico Coast Conferences
- Information and materials provided to State Extension programs
- Presentations made to State Clean Marina Programs and other interested parties
- Materials available online


**MISSISSIPPI'S CLEAN AND RESILIENT MARINA PROGRAM**

Promoting resilient and environmentally responsible operations and best management practices at marinas across coastal Mississippi.

**Is Your Facility a Resilient Marina?**


The Mississippi Department of Marine Resources in conjunction with the Alabama-Mississippi Sea Grant Program and other Gulf of Mexico States is pleased to announce the **future** release of the Gulf of Mexico Alliance Clean and Resilient Guidebook. The intent of the guidebook is to provide marina operators and owners the resources, tools and best management practices necessary to create a more resilient marina during an emergency situation.

For more information, visit our website in the upcoming months at [www.dmr.ms.gov](http://www.dmr.ms.gov).



**“Resilience is the capacity of human and natural/physical systems to adapt to and recover from change.”**

*Gulf of Mexico Alliance Coastal Community Resiliency Priority Issue Team*



# Educational Brochures

To find out more, visit

[www.gulfofmexicoalliance.org](http://www.gulfofmexicoalliance.org)

## RESOURCES AND TOOLS:

- 1) Clean and Resilient Marina Checklist
- 2) Outreach Materials
- 3) Educational Presentation
- 4) Guidebook-at-a Glance
- 5) Clean and Resilient Marina Policy Guide
- 6) Clean and Resilient Marina Guidebook & Appendices



## CLEAN AND RESILIENT MARINA INITIATIVE

*Is Your Marina a Certified Clean and Resilient Marina?*

*Don't Wait for a Rainy Day!!!*



## CLEAN AND RESILIENT

The *Clean and Resilient Marina Initiative* is a Gulf of Mexico Alliance (GOMA) project. GOMA is a partnership of the states of Alabama, Florida, Louisiana, Mississippi, and Texas, with the goal of significantly increasing regional collaboration to enhance the ecological and economic health of the Gulf of Mexico. GOMA made it a priority to provide marina operators and owners with strategies and practices to better design, develop and manage their marinas before, during and after a storm.



The *Clean and Resilient Marina Initiative* builds on the five Gulf of Mexico States' Clean Marina Programs and was established to "promote and expand resilient and environmentally responsible operations and best management practices at marinas."

## INCENTIVE-BASED PRACTICES

The Clean Marina Programs in the five Gulf of Mexico States are voluntary, incentive-based programs promoted by NOAA and cooperating state agencies. They are designed to encourage marina operators and owners to protect coastal water quality by employing best management practices to prevent or reduce water pollution. Practices promoted address stormwater runoff management, proper wastewater and waste management, spill prevention, emergency preparedness, and sensitive species habitat protection.

## RESILIENCE

Resilience is the capacity of humans and natural/physical systems to adapt to and recover from change.

For marinas on the Gulf of Mexico directly exposed to tropical storms, flooding and land loss, being resilient means being able to prevent loss of life and personal injury, reduce property damage, and resume normal business activities as soon as possible following a hazardous storm.

## INFORMATION PROVIDED FOR SPECIFIC ISSUES OF CONCERN

The key marina issues are addressed in the *Clean and Resilient Marina Guidebook*. Useful information, tools and recommended practices are provided for each issue identified below, including references and additional resources:

- Marina Design and Siting,
- Emergency Preparedness,
- Evacuation Procedures,
- Climate Adaptation and Sea Level Rise, and
- Outreach and Education for Marina Operators and Boaters.

In addition, an example *Hurricane Preparedness Plan* and a *Clean and Resilient Marina Checklist* are provided for your use.

## EASY STEPS TO BECOME CLEAN & RESILIENT

- 1) Pledge
- 2) Self Assessment
- 3) Engage State Agency
- 4) Certify

# Selected Logo





# Certification of Recognition



**Certificate of Recognition**

This certificate is awarded to \_\_\_\_\_

on this, the \_\_\_\_\_ day of \_\_\_\_\_ Year of \_\_\_\_\_

in recognition of the marina's achievement in meeting all the requirements necessary to  
obtain the designation of a Clean and Resilient Marina

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

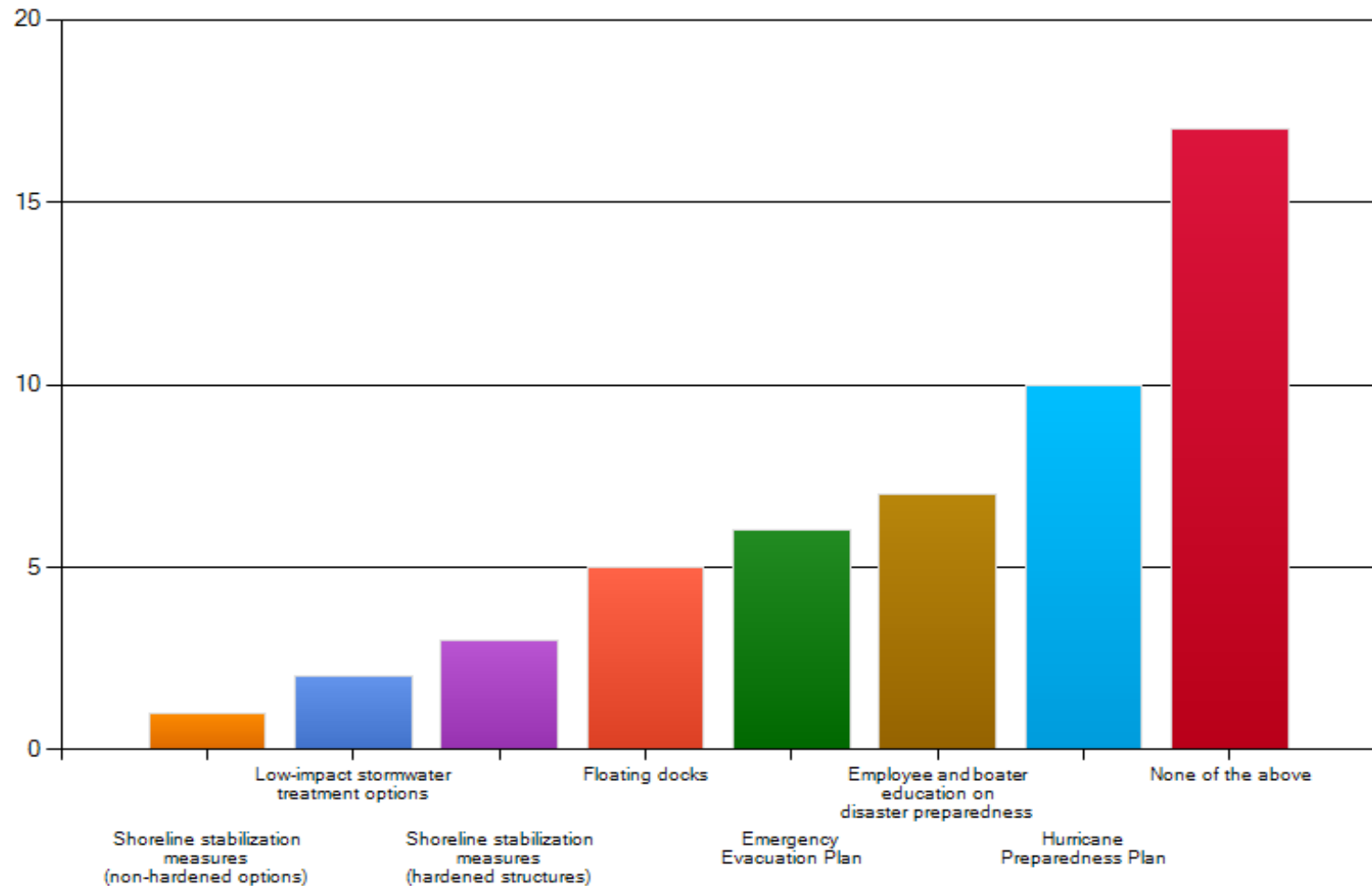


# Banner Ideas



# Pre-Launch Survey of Marinas

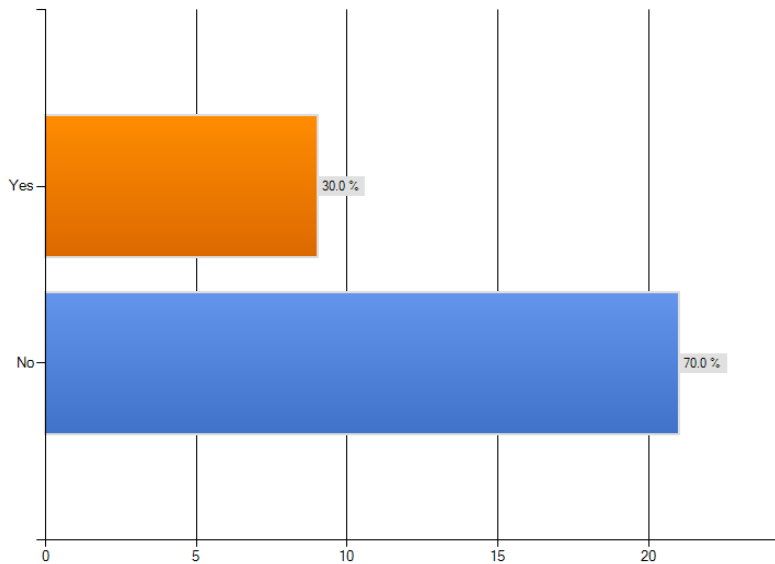
Resilient Marina Improvements in the last 24 months?



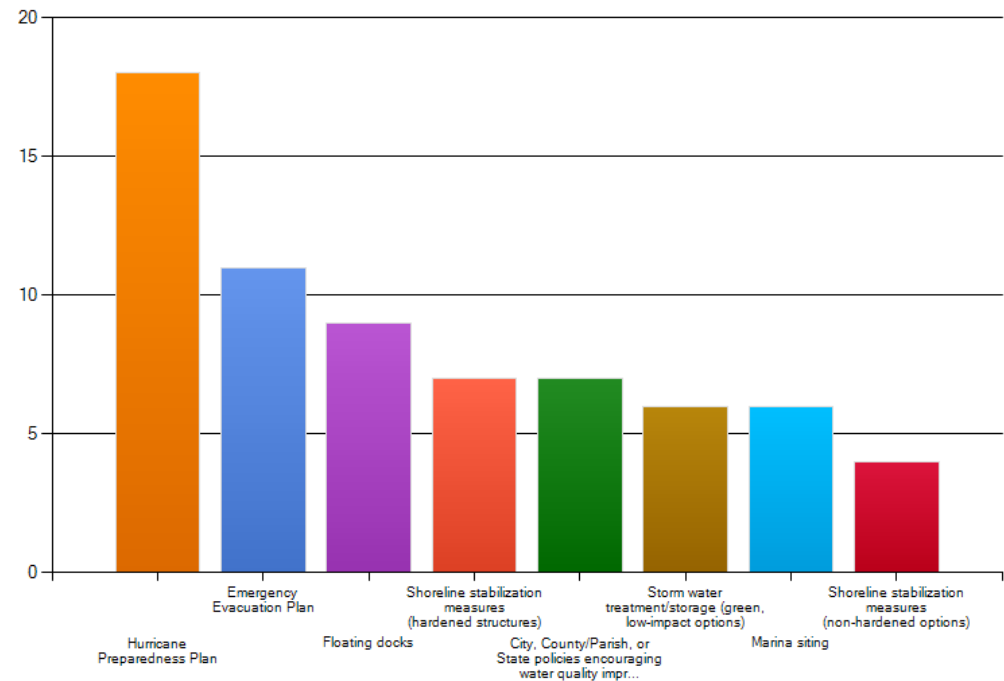
# Survey Results



Have you experienced hurricane or flooding damage in the last 18 to 24 months?



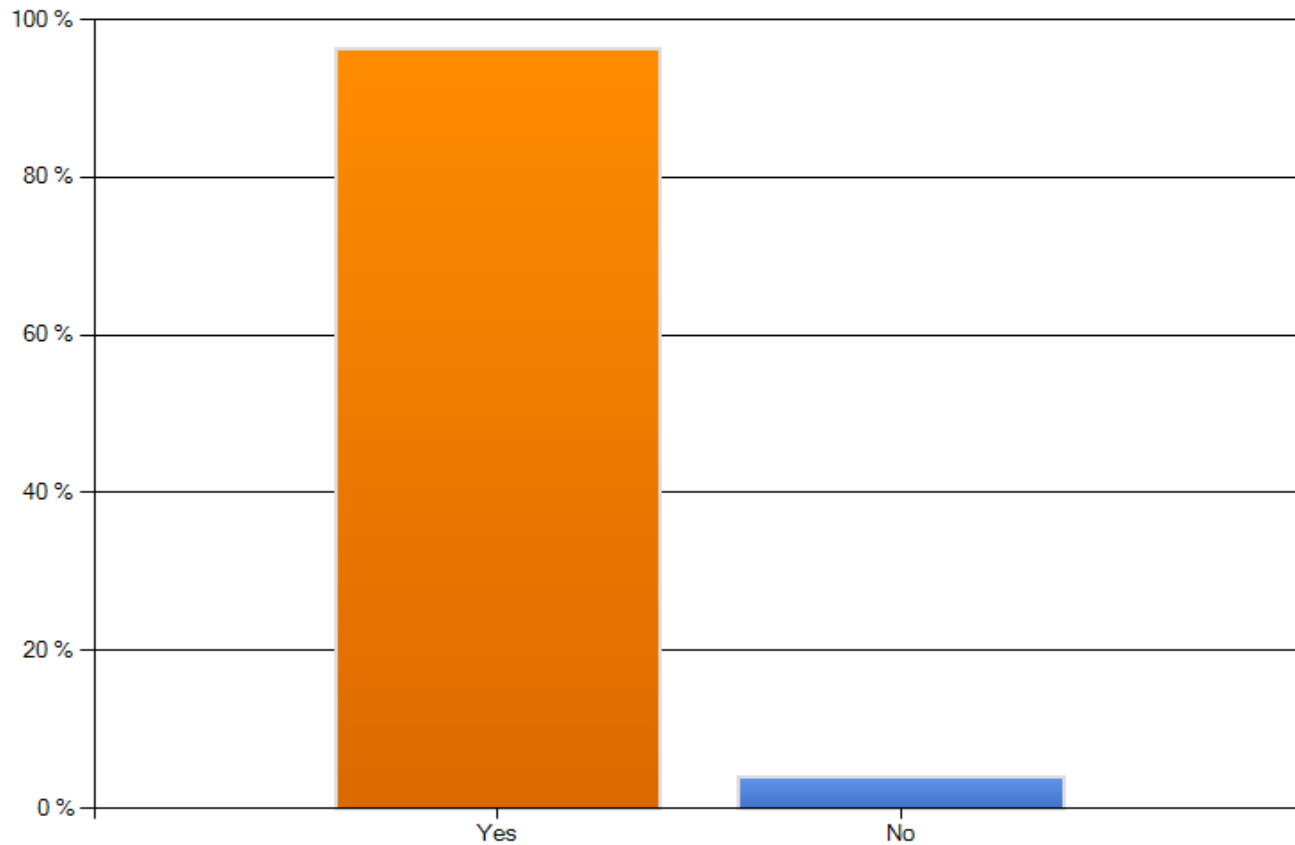
Are you likely to use Clean & Resilient Marina Info to make any of these Improvements at your Marina?



# Survey Results



**Will the new information provided in the Clean & Resilient Marina Guidebook be useful to you during future facility improvements at your marina?**



# Survey Results



- Damages in last 24 months at 30% of Marinas Responding.
- Clean & Resilient Marina Information Likely to Shape Future Improvements
- Non-structural Improvements Most Popular
- Growing Interest in Certification
- Cost & Staffing Remain Biggest Barriers

# Materials Available Online



## CLEAN AND RESILIENT MARINA INITIATIVE

### KEY AREAS OF INTEREST

Example Hurricane Plan

Siting & Design

Emergency Preparedness

Evacuation Procedures

Stormwater Management

Climate Adaptation & Sea Level Rise

Outreach & Education

Checklist

4 Easy Steps

Partners

Resources

Background



<http://www.gulfofmexicoalliance.org>

# Florida Marina Examples

## Resilient BMPs for Hurricanes





# Florida Department of Environmental Protection



Office of Sustainable Initiatives

## Florida's Clean and Resilient Marinas

Brenda Leonard

Florida Dept Environmental Protection





# Hurricane Preparedness

## **2012 HURRICANE PREPAREDNESS GUIDELINES FOR BLUEPOINTS MARINA (Cape Canaveral)**

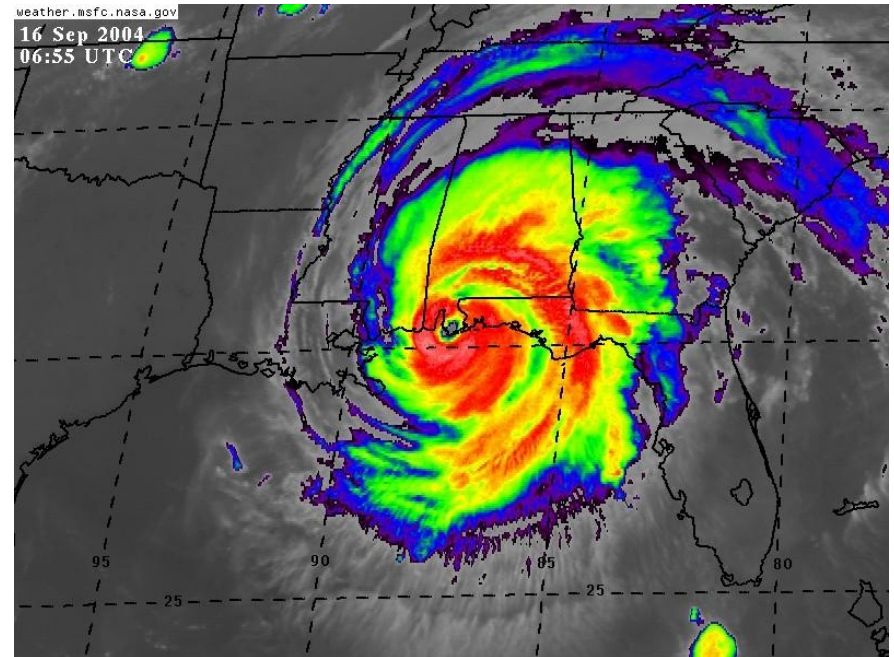
### A. Introductory Comments

The order of priority when preparing Bluepoints Marina for a hurricane is:

1. Protect Human Life
2. Seek to prevent or minimize personal injury
3. Reduce the exposure of property to damage
4. Minimize damage to property that cannot be relocated
5. Seek to restore normal operations as quickly as possible

# Hurricane Preparedness

- Hurricane Plan
- Evacuation Procedures
- Trained Personnel
- Practice procedures



# Design and Siting

- Marina built into the environment
- Shielded by natural barriers
- Natural shoreline



Bluewater Bay, Niceville, FL

# Design and Siting

- Marina is shielded by barrier island along the intercoastal waterway.





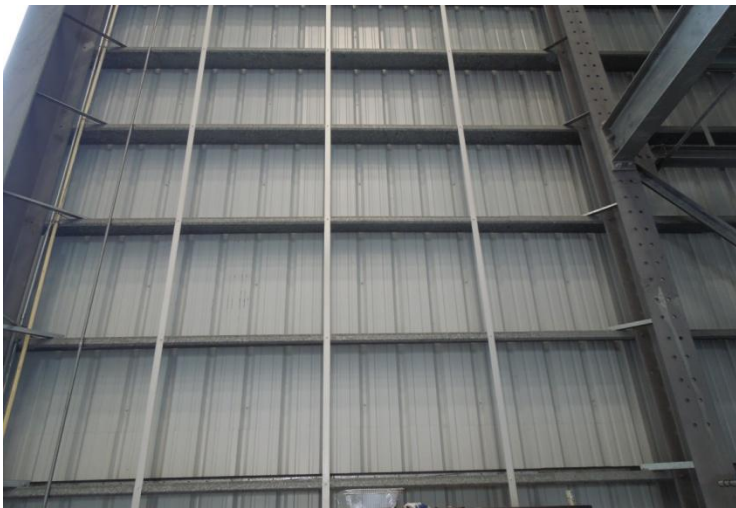
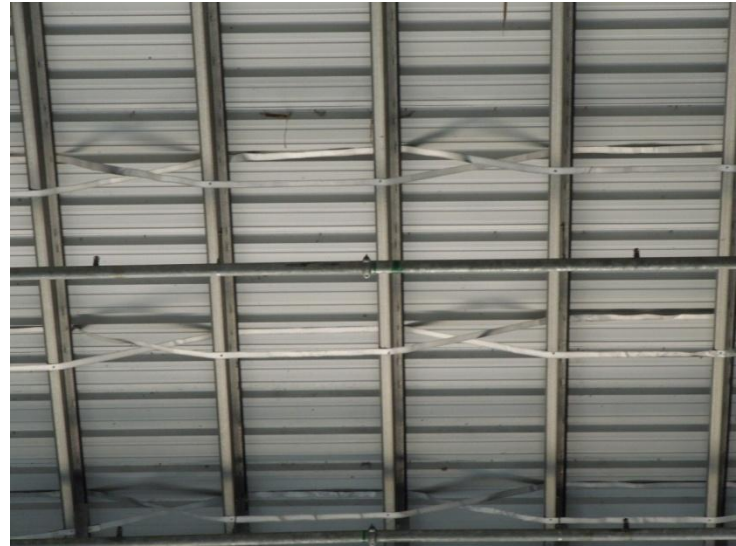
# Hurricane Resilient Dry Stack

- Dry stack resilient to 150 mph winds
- Reinforced to prevent twisting
- Vented at bottom
- Boats are moved inside if storm threat



Bluepoints Marina  
Cape Canaveral

# Hurricane Resilient Dry Stack



- 
- 
- 

Bluepoints Marina, Cape Canaveral

# Hurricane Resilient Dry Stack

- Dry stack is vented at bottom to help equalize pressure and release water from storm surge



Bluepoints Marina  
Cape Canaveral, FL



# Hurricane resilient dry stack

- One of the most advanced boat storage facilities in FL
- Constructed of steel reinforced concrete



Hamilton Harbor Yacht Club, Naples, FL

# Hurricane resilient drystack

- Dry stack resilient to 150 mph winds
- Concrete walls separate each boat
- Protects each boat bay from the spread of fire



Hamilton Harbor Yacht Club, Naples, FL

# Hurricane Resilient Storage



River Forest Yachting Center, LaBelle, FL (Near Ft. Myers)



# Hurricane Resilient Storage

- Climate controlled indoor storage constructed to withstand 140 mph winds
- Sprinkler system and 24 hour security system
- Hurricane protected dockage with internal crosstie cleats for tie-down
- Outdoor storage lots for long term or hurricane season storage
- Airline grade tie down cleats set in concrete for hurricane protection



# Restoring Operations

- Marina built in a half-moon cove protected by land behind it which is 20' above sea level
- Marina is shielded by an island 300' from the docks
- Was fully operational with electricity, water, and fuel after hurricane Ivan in 2004.
- Supplied the Coast Guard and other emergency vessels fuel and dockage when no other marinas were left operational.



Island Cove Marina, Pensacola, FL

# Restoring Operations

- Bluepoints Marina seeks to restore operations as quickly as possible after a hurricane
- Floating docks are removed before a storm then reassembled afterwards.
- Water recycling system





# Hurricane Club

- Some marinas offer a hurricane club to its members for a yearly fee
- Guaranteed a reserved space for their boat in the event of a wind storm
- Meets insurance requirements for hurricane plan



...Don't be left out  
in a storm...

**Sebastian Inlet Marina, Micco, FL**

**Forest Yachting Center, LaBelle, FL**

# Questions?

