

# Hurricane Preparedness

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## Seamanship

*"The time for taking all measures for a ship's safety is while still able to do so. Nothing is more dangerous than for a seaman to be grudging in taking precautions lest they turn out to have been unnecessary. Safety at sea for a thousand years has depended on exactly the opposite philosophy."*

Admiral Chester W. Nimitz

## Topics

- What is a Hurricane?
- What YOU Need To Do
- Preparing in Advance
- With Motivating Photos

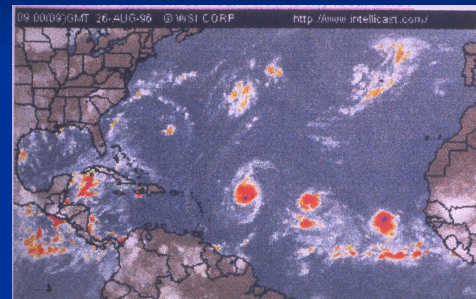
## Please ...

- Now ... interrupt and ask questions
- Afterwards ... Learn more online
- Soon ... Make a plan!

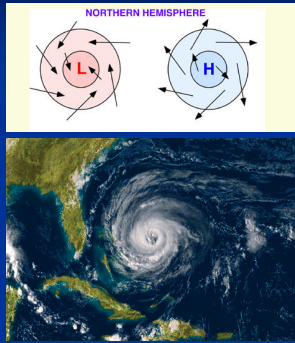
## What is a Hurricane?

- Tropical (low pressure) wave comes off Africa
- Travels west over warm water.
- Heat of the ocean fuels the convection.
- Rotates counter-clockwise (northern hemisphere)
- Becomes tropical depression
- Becomes a tropical storm
- Becomes a hurricane

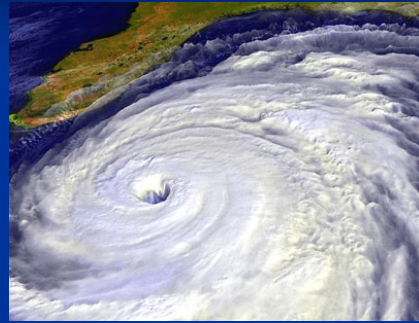
## Tropical Waves



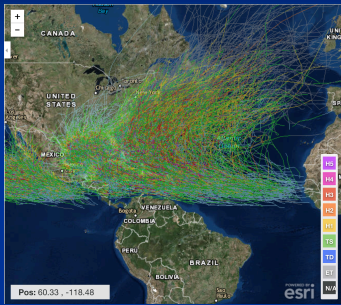
### Wind



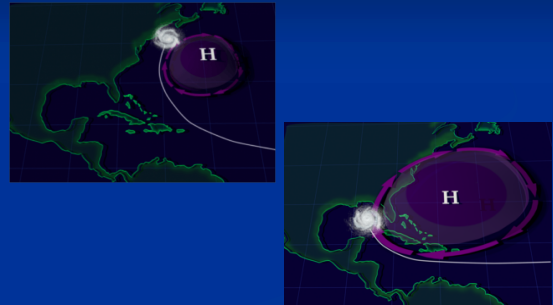
### Hurricane



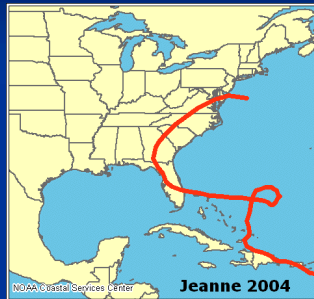
### Tracks...Historical



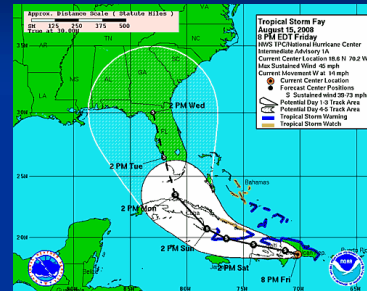
### Bermuda High Steering



### Tracks...Unpredictable



### Tracks...Cone of Uncertainty



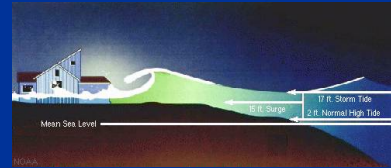
Watch the updates continuously!

## The Categories

- Category 1...64-82 knots..... 4-5 ft surge
- Category 2...83-95 knots..... 6-8 ft surge
- Category 3...96-113 knots..... 9-12 ft surge
- Category 4...114-135 knots..... 13-18ft surge
- Category 5...135+ knots.....18-25ft surge

## Surge – the Biggest Danger

- Water is pushed up by the wind
- The low pressure “sucks” the water higher
- 0.1-0.2 inches per 10 millibars fall in pressure
- Labor Day storm - 888mb and 25ft surge



## Boats on Moorings

- Mooring's scope can't cope with surge
  - You bow goes underwater, or your cleats pull out
  - Leaving your boat on a mooring is a way to sink
- CGSC policies and recommendations
  - Tried and true practices

## Motivating Photo - Surge



## What do YOU Need To Do?

Prepare for the Storm

- Know the CGSC rules
- Reduce windage
- Be prepared to move

Prepare for Your Situation

- Boats on Moorings
- Boats on Land

## Getting Help

- CGSC will do what it can for you, but ...
- Do not ask or try to pay CGSC dock staff to take care of your boat – they have work to do.
- Your friends are useful, bribed if necessary, but ultimately ...
- Your boat ... Your responsibility

## Boats on Moorings

Tropical Storm Watch (NOAA 48hrs out)

- By this time, recommended reduction of windage

Tropical Storm Warning (NOAA 36hrs out)

- By this time, mandatory reduction of windage, optional evacuation

Recommendation: Do these when a tropical storm is 72hrs away in the cone of uncertainty.

## Boats on Moorings

Hurricane Watch (NOAA 48hrs out)

- By this time, mandatory reduction of windage; recommended evacuation.

Hurricane Warning (NOAA 36hrs out)

- By this time, mandatory evacuation

Recommendation: Do these when a hurricane is 72hrs away in the cone of uncertainty.

## Reducing Windage

- All sails down. Leave in the boat or at home
- Bimini and frame down, all canvas covers off
- Dingy and outboard off
- Secure all line ends (halyards)
- Replace dorades and cowl vents with covers
- Remove solar panels and windmills
- Remove “deck junk” - BBQs, Cushions, etc.
- You MUST do this!

## Motivating Photo - Sails



## Places to Move to

- Boatyards up the Miami River
- A slip in a marina, e.g., Dinner Key
- Coral Gables waterway (the mangroves)\*
- Marine Stadium\*
- Star Island
- Hurricane harbor, NoName harbor, Pines canal
- \* CGSC hopes to be able to ferry you ashore

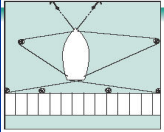
## Boatyards

- E.g., Hurricane Cove, Oceanika
- Visit the yard in advance, check out the situation
- Befriend the dockmaster, find out what is needed
- Know the bridge schedule
- Go well in advance (before bridges lock down)
- BoatUS insurance pays half of haul-out



## Boats in Slips – Tying Up

- Check your cleats and chocks
- Double all lines - bow, stern, springs
- Maximize line size
- Use snubbers and chafe gear
- Use fenders and fenderboards
- Don't tie too tight – cleats break
- Do not tie across other boats and docks



A simple stern arrangement: note the spring lines, which cross the bowlines, and run the stern. Note the 90-degree angle to line slip away. Additional lines from bow secure to the next dock or to stern anchors placed out from the slip.

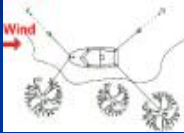
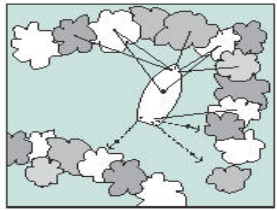
## Motivating Photos - Docks




## Coral Gables Waterway



## Tying to the Mangroves

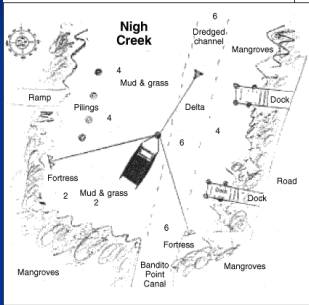



One boat that survived Hurricane Andrew was secured in a mangrove channel with eight 3/4" lines to shore and three large anchors: a 60-lb. Danforth; a 37-lb. Fortress; and a 45-lb. Bruce. Each of the lines had 10' of slack to allow for the tidal surge.

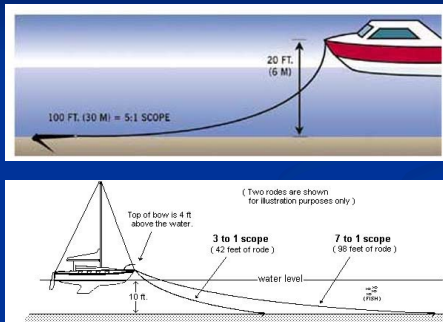
## Marine Stadium



## Triple Anchors



## Principles of Anchoring



## Triple Anchoring Procedure

- Marine Stadium is 10ft - use 70ft rode plus chain
- All lines over the anchor roller (not side chocks)
- Put tag buoys on anchors
- Drop primary anchor, reverse hard to set
- Go 120ft perpendicular to expected wind
- Drop secondary anchor, reverse hard to set
- Fall 120ft off primary and secondary anchors
- Drop tertiary anchor, reverse hard to set
- Bring all rodes to 70ft plus chain, add kelleys, lash helm
- And don't use wimpy anchors

## Motivating Photo - Anchoring



## Take Inventory

- Take photographs of your preparations
  - Onboard
  - From all sides
- Inventory inside
  - Make a list and take photographs
  - Especially electronics and other valuables
  - List anything you take off

## Leave Your Information

- Leave the following information in a ziplock taped in the cockpit (required in waterway)
  - Boat name
  - Year, Make/Model, Length of vessel
  - HIN number, FL # or USCG Doc #
  - Full name and date of birth
  - Phone numbers and Email addresses
  - Physical address

## Preparing in Advance

- Explore and practice at all the areas and anchorages beforehand
- Get anchors, chain, shackles, rodes, floats, and chafe protection
- Test the engine, check the prop, have clean fuel and filters
- Check cleats
- Close all seacocks
- Prepare information cards, and take inventory
- Get insurance, especially towing
- Not using the boat or leaving town? ... reduce windage
- Check the weather web pages every day
- Read club emails when a storm is coming
- Be able to complete the task without assistance

### Motivating Photo - Prop



### Final Word - Get Friends to Help

- Teams of three or four help each other
- Useful if you (or they) might be away
- Practice with team in advance (bribes help)
- Be able to cope if they bail on you

**Prepare and practice, it'll be OK!**

### Motivating Photo - Martini



**The End**

**Any (more) Questions?**

### Equipment - Anchors

- |                  |          |
|------------------|----------|
| ■ 46 lb Bruce    | 1900 lbs |
| ■ 47 lb CQR      | 3300 lbs |
| ■ 30 lb Danforth | 2200 lbs |
| ■ 18 lb Guardian | 3900 lb  |
| ■ 21 lb Fortress | 7600 lbs |

### Mechanics of Wind Speed

- |                                       |            |          |
|---------------------------------------|------------|----------|
| ■ 15knots (sailing)                   | 1lb/sqft   | 700 lbs  |
| ■ 30 knots (anchor)                   | 4lbs/sqft  | 600 lbs  |
| ■ 60 knots                            | 16lbs/sqft | 2400 lbs |
| ■ 100 knots                           | 32lbs/sqft | 4800 lbs |
| ■ 120 knots                           | 64lbs/sqft | 9600 lbs |
| ■ Holding force of a ??? weight Delta |            | 1500 lbs |

## Equipment - Rodes

Dock Line Working Strains in Pounds				
Taken from the American Boat & Yacht Council's Safety Standards				
Size of Line (inches)	Nylon 3 Strand	Nylon Braided	Dacron 3 Strand	Dacron Braided
1/4	182	400	182	330
5/16	281	680	281	560
3/8	407	960	407	750
1/2	704	1630	704	1400
5/8	1144	2800	1100	2400
3/4	1562	3900	1374	3000
7/8	2200	5300	1900	4800
1	2730	6260	2420	5600

## Equipment - Chain

- 5/16 chain (high test) 2600 lbs
- 3/8 chain BBB 2600 lbs
- 3/8 chain (high test) 5400 lbs