Hurricane Preparation: Marinas and Yacht Clubs

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Martin, Ottaway, van Hemmen & Dolan

Image Source: www.boats.com

About Me

Dual B.S.E., University of Michigan, 2011

Drilling Operations, Schlumberger, 2011 – 2015

Maritime Consulting, Martin & Ottaway, 2016 – present

MARTIN OTTAWAY
Marine Consultants, Engineers, Surveyors, Naval Architects & Appraisers
Founded in 1875

Image Source: www.oilrig-photos.com

Planning

- Begins in the off-season
- Built into or included with both slip and storage contracts
- Responsibilities outlined between boat owners and marinas
- Specific action items should be time-based
  - Off-season
  - In-season
  - Hurricane season
  - Following hurricane watch or warning
  - Specified time increments before landfall
- Cooperation between nearby marinas, emergency resources, and local communities

What to plan for

- Surge: water levels rising above high tide
- Wind: when wind speed doubles, wind pressure quadruples
- Waves: much higher due to both surge and wind (seawalls and other barriers breached)
- Rainfall: e.g. Harvey in Houston
- Tornados: can be a devastating hurricane byproduct

Image Source: www.surfertoday.com

Off-Season Preparation - People

- Develop the plan, then PRACTICE
- Distinguish between boat owner and marina responsibilities
- Designate an alternative contact for unavailable owners or have captains on call
- Designate an emergency task force beyond marina personnel (owners/emergency workers/past employees) and designate tasks
- Cooperate with alternate marinas and/or identify accessible hurricane holes

Off-Season Preparation - Equipment

- Detailed photos of all marina properties
- Pre-cut plywood (or other approved material) fitted for all windows
- All points of drainage kept clear (gutters, down spouts, etc.)
- Spare lines available
- Regular emergency drills practiced by employees, including hurricane response exercises

Image Source: www.todayshomeowner.com

Off-Season Preparation - Docks

- Are piles for floating docks high enough to accommodate surge?
- Are fixed docks made with quality material?
- Are there adequate seawalls or breakwaters or other such shelter from harsh waves?

Image Sources: Kyle Antonini, www.meecosullivan.com

Contract Considerations

- Boat owner is responsible for boat, OR
- Marina agrees ahead of time to prep boat, OR
- Boat owner designates alternate contact
- Marinas can only prep so many boats among all other tasks, THEREFORE
- Use the Emergency Task Force where owners are not available, AND/OR
- Have Captains on-call to shift boats if necessary

Boat Owner Responsibilities

- Have extra lines, pennants, chafe gear, etc. (required by some marinas)
- Have a storm tie-up plan, anchorage plan, or designated hurricane hole destination in place
- Remember you are a boat owner when the watches and warnings come about
- Ignoring your boat could place many others at risk
- Judges have stated that boats can be liable if not properly tied

During Hurricane Season - Marina

- Monitor weather forecasts and National Hurricane Center data
- Boat inventory: what to haul ashore, what to tie up, what to move elsewhere
- Securing longer term stored vessels
- Stockpile food and water supplies
- Regularly backup all computer data off site or in secure area

Images Source: Kyle Antonini

As Storm Approaches - Marina

- Mobilize Emergency Task Force
- Secure all windows/doors with pre-cut coverings
- Secure or store all loose outside items
- Refill on-site fuel tanks early
- Turn refrigerators/freezers to coldest settings
- Prepare pools
  - Some pool furniture can go in pool
  - Drop water level up to 2 feet
  - Turn off electricity
  - Extra chlorine for heavy rains

Image Source: www.nspf.org

As Storm Approaches - Marina

- Ensure 1 gallon of water per person per day for employees staying at marina
- Extra cash if banks are closed or ATMs inaccessible
- Move computer/electrical equipment away from windows and cover with plastic bags or secure in safe room
- No valuables should be at floor level in expected flooding/surge areas
- Charge all batteries/lights/phones, have sufficient spares
- If evacuating, turn off electricity, water, gas
- If remaining on property, notify trusted individuals

Dry Storage Considerations

- Dry rack storage facilities create significant windage profiles
- All recent construction should have a hurricane rating
- Older racks are susceptible to failure
- Higher-rated construction in frequently affected areas susceptible to fatigue failure and “loosening” effect

Images Source: Kyle Antonini

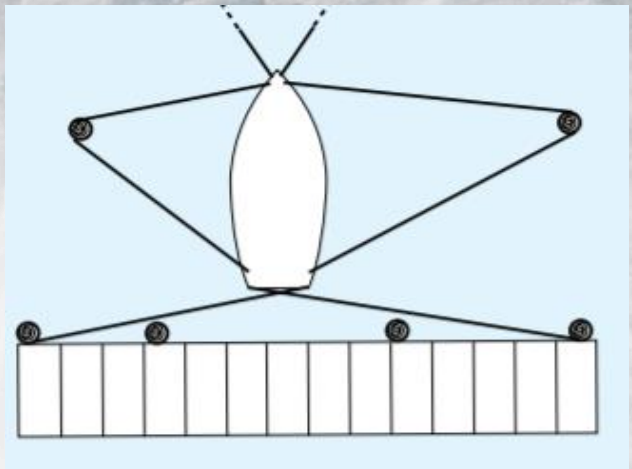
Jack Stand Storage

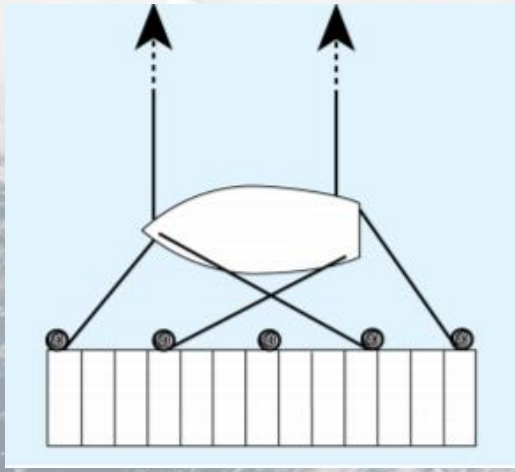
- Additional stands – 3 to 4 per side <30’, 5 to 6 >30’
- Anchor with straps:
  - Helical anchors in ground
  - Concrete-embedded eyes
  - Gunwale-to-gunwale

Images Source: www.boatus.com

As Storm Approaches – Boat Owners

- Strip the boats (biminis, sails, dodgers, dinghies, loose items, etc.), lash down anything else loose
- Extend and/or double lines
- Lines to be adjustable from dock
- Extra lines available on boat
- Know alternate marinas or hurricane holes
- Never stay aboard during hurricane!





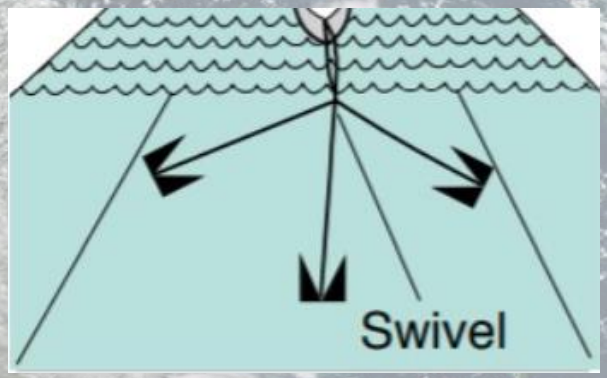
Images Source: www.boatus.com

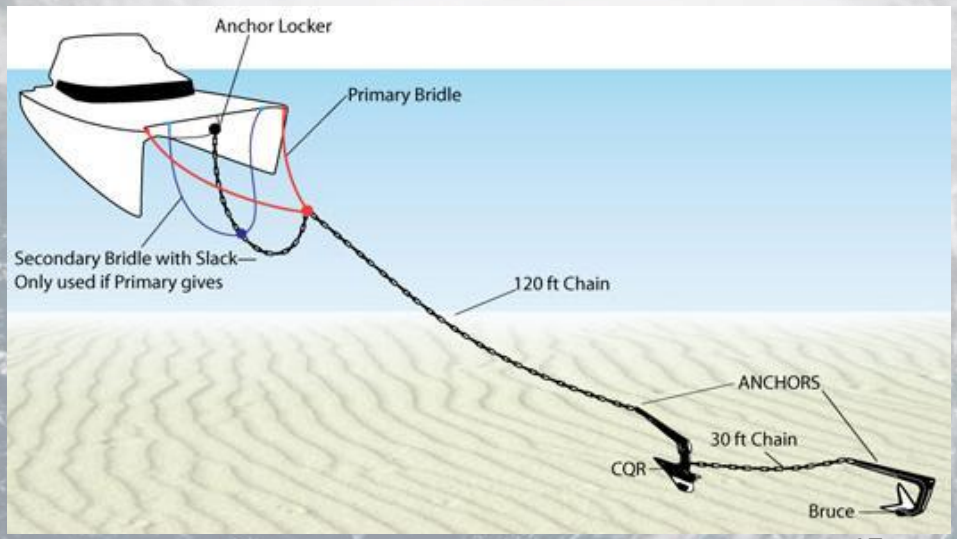
Chafe Protection

- Routine chafe protection useless in storm (PVC on nylon line)
- Line wears *internally* due to heat from friction during constant load cycling – needs to be cooled
- Nylon stretches more than polyester (40% vs 8%) but therefore has more frictional heat
- Polyester sleeves on nylon lines; polyester line from cleat through chock
- Larger cleats and chocks
- Line redundancy; composite lines

Anchor Rodes

- Consider: tensile strength, stretch, chafe and cleat location, age/cleanliness, fiber/weave/lay type
- Scope (length vs depth ratio): at least 7 to 1 and up to 10 to 1 for worst conditions
- 1/8” additional diameter for each 9’ length
- Enough anchor chain to prevent sea bottom chafe (50/50 optimum chain/line ratio)
- Multiple anchors





Images Source: www.boatus.com

Moorings

- Deadweight anchors and mushroom anchors prone to loosening during hurricane
- Helical anchors have held fast in testing (shackles and lines failed first)

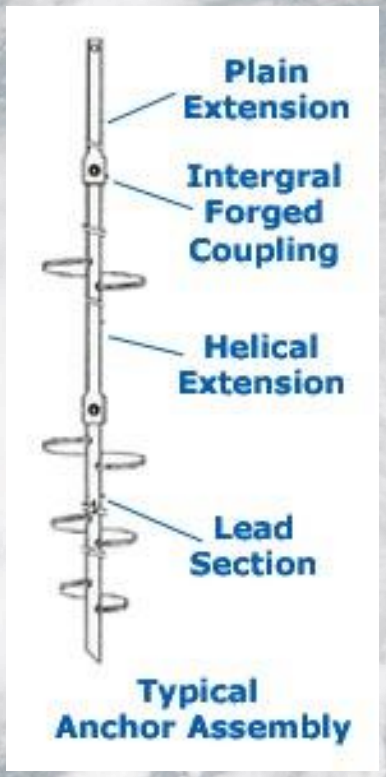


Image Sources: www.boater-supplies.com, www.maine.gov, www.boatmoorings.com

Tying Arrangements

- Move to larger slip if possible
- Face direction of wind
- Add redundant lines
- Add longer lines to further slips, docks, trees

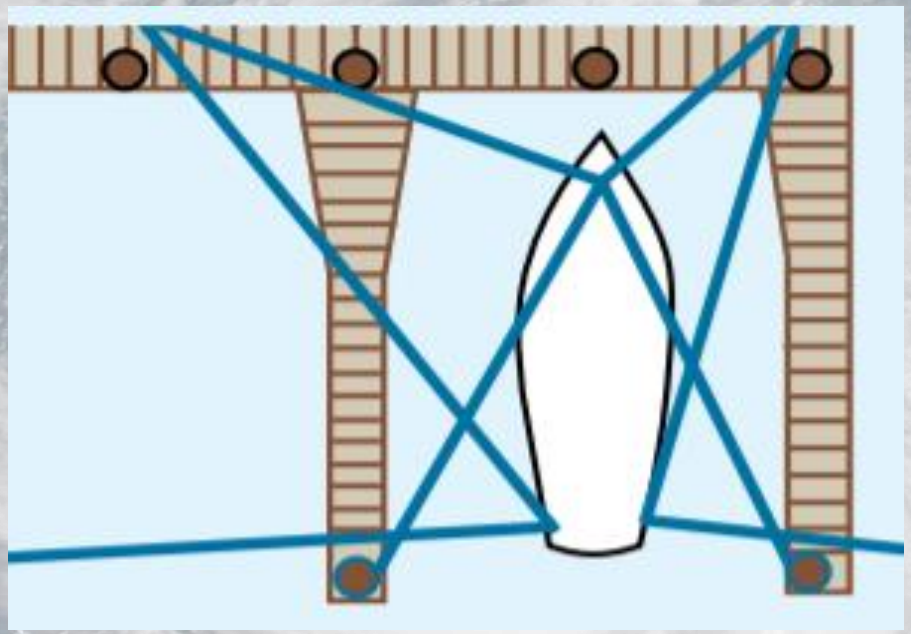
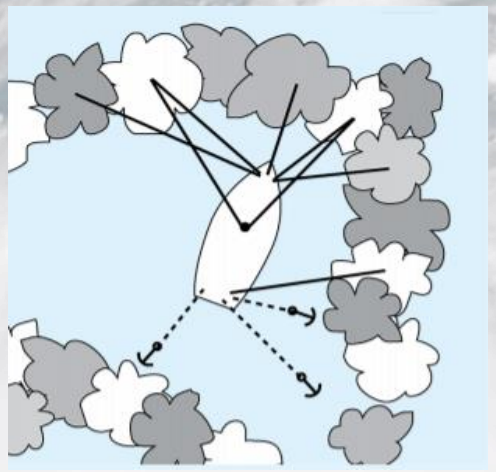


Image Source: www.boatus.com

Alternate Marinas and Hurricane Holes

- Sheltered canals, rivers, waterways
- Know before you go (e.g. drawbridge issues)
- May require prior cooperation from marina or from community around hole
- Practice setting anchors, knowing sturdy shore tying options



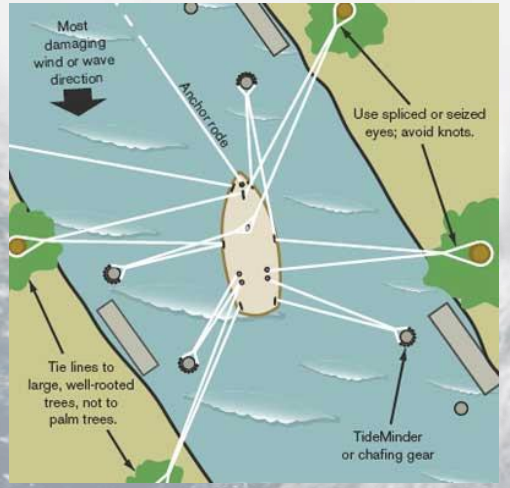


Image Sources: www.boatus.com, www.citimarinestore.com

Conclusion

- Planning begins in the off-season
- Everyone must know their responsibilities
- Quality, age, and design standards of all the structures must be known
- Location! Location! Location!
- Plenty of spare/extra lines, straps, anchors, etc.
- Cooperation is needed between all entities, not just members and employees
- Practice and re-evaluate regularly

Thank You!

Image Source: www.yelp.com