

# Review of SSA Laser Frostbite, December 18, 2016

*On December 18, 2016, the Severn Sailing Association Laser and Laser Radial fleets—roughly 14-foot singlehanded boats racing as part of their Sunday-afternoon November through March “frostbite” series—experienced a dramatic gust front that resulted in the SSA Race Committee requesting emergency support from local authorities. In a matter of minutes, winds shifted 180 degrees and increased from warm, light air (0-5 mph) to a gale (steady wind over 30 mph with gusts reaching 50 mph).*

*This document provides a comprehensive description of the events of that day and subsequent related efforts. Severn Sailing Association hopes the “lessons learned” will highlight what policies and actions worked well that day—and what improvements it and other sailing clubs can make to continue to raise the bar on safety.*

## **12/18 1200-1400: Light Winds; RC Runs Two Races**

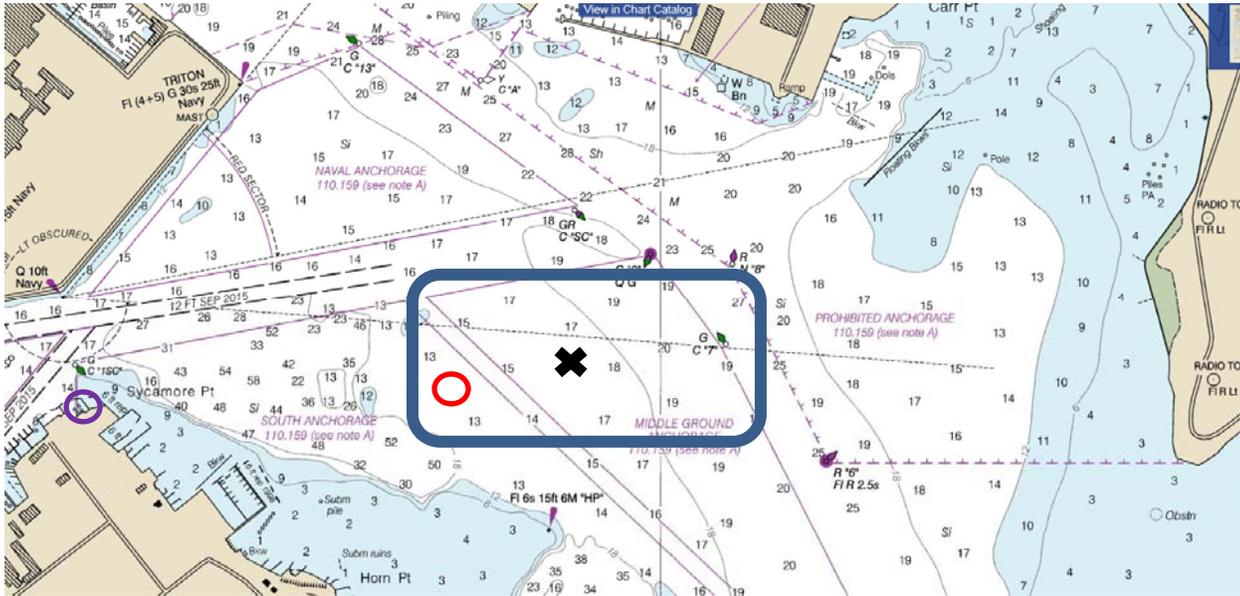
At 1200, the Severn Sailing Association (SSA) Race Committee (RC) for the day assembled on shore to finalize preparations for the day’s racing. The group identified two RC members who had drysuits as those who would staff the SSA RIB safety boat; the other three staffed SSA’s Parker 23 main committee boat. The Parker 23 left the dock at roughly 1230 to set the course; they dropped anchor in the Severn River downstream from Triton Point, approximately 0.5 miles from SSA.

Competitors left the dock between 1230 and 1245 for the roughly 15-minute sail in light air to the race course. All sailors were wearing the required lifejacket and drysuit or wetsuit (the vast majority, if not all, were in drysuits). No Laser or Laser Radial launched until the RC and safety boat were under way as required in the Notice of Race. Prior to the scheduled 1300 start, RC confirmed 20 boats present; it later recorded information on two additional boats—a 21<sup>st</sup> joined the first race, and a 22<sup>nd</sup> joined the second race.

The first race started at 1300 in light breeze, well under 5 mph, and was run around drop marks. The wind direction at the start was more or less from off Horn Point. By midway through the race, the wind on the leeward end of the course (closer to the north shore of the Severn River) had shifted 180 degrees and was coming off Greenbury Point. On the other end of the course, the breeze was still coming off Horn Point, still well under 5 knots.

Due to the wind shifts, rather than resetting all the drop marks, the RC started a second race (at roughly 1340 or 1345) using green can #7 as the windward mark and a 6 mph buoy along the line from the Horn Point Shoal to Triton Point as the leeward mark. During the races, the RC observed several Maryland Department of Natural Resources (DNR) vessels and the Annapolis Fire Department (AFD) fire boat respond to a call, and then return. Thus, the RC was aware that public safety boats were manned and in the vicinity.

RC understood that the forecast was for a wind shift and increasing winds with the approach of a cold front. Throughout their time on the water, RC monitored radar and several weather apps, including Weather Channel and SailFlow, on their smartphones to track the approaching front. Radar showed the front moving to the northeast/east-northeast; precipitation on radar was represented as light green (indicating light rain). To the southwest, the front appeared to be expanding somewhat across its width, but the expanded green line was rather far away as of 1400. As of 1400, the Weather Channel app showed a forecast of 10-15 knots for the near term for Annapolis.



*Approximate location of race course for December 18; "X" is roughly where SSA Parker 23 anchored, red circle is 6 mph buoy used as a mark in race 2, and G C 7" is the green can used as a mark in race 2. SSA is the purple circle on shore.*

### **12/18 1400-1630: Immediate Reaction and Response to Dramatic Conditions**

At roughly 1410, the last of the full rig Lasers struggled to cross the finish line of the second race in drifting conditions, and the Radials were still on their last leg of the race. Water on the race course was glassy; RC noticed a bit of light wind on the water up the river.

Starting at 1415, in just a few minutes, conditions changed dramatically. The wind shifted 150 degrees and increased from warm, light air from the east (0-5 mph) to a gale (steady wind over 30; gusts initially to 50 and continuing well into the 40s) from the northwest (straight down the Severn River) with rapidly dropping air temperature. The river changed from flat to steep, closely spaced chop. The first major gust capsized all or almost all of the fleet. The RC could not confirm that any boats needed immediate assistance, but suspected that several would need support soon. The RC quickly determined that the Parker 23 (serving as main committee boat) and SSA RIB (the safety boat, staffed with two people in drysuits), while manned appropriately, would be unable to assist the number of sailors the RC perceived to be likely in need in a timely fashion without additional support.

At 1415, the RC called the SSA General Manager and asked for assistance. At 1416, the RC called the U.S. Coast Guard (USCG) on channel 16. Because the RC had previously noticed both AFD and DNR operating nearby, calls were made to state and local authorities as well. At 1418, the RC called (by phone) the Annapolis Police Department; at 1419, the RC called (by phone) DNR Police. Annapolis Yacht Club, monitoring channel 16, also responded and offered support, which was accepted.

Of the 22 sailors, 11 were able to right their boats and sailed their boats to shore. Six sailed upwind back to SSA; four sailed a tight reach and came ashore at the beach at the City of Annapolis street-end park at the foot of Chesapeake Ave. One other sailed to the north shore of the Severn River and landed his boat at a floating dock in Carr's Creek at the Naval Station with the assistance of authorities on site (he was later transported to SSA in the SSA RIB).

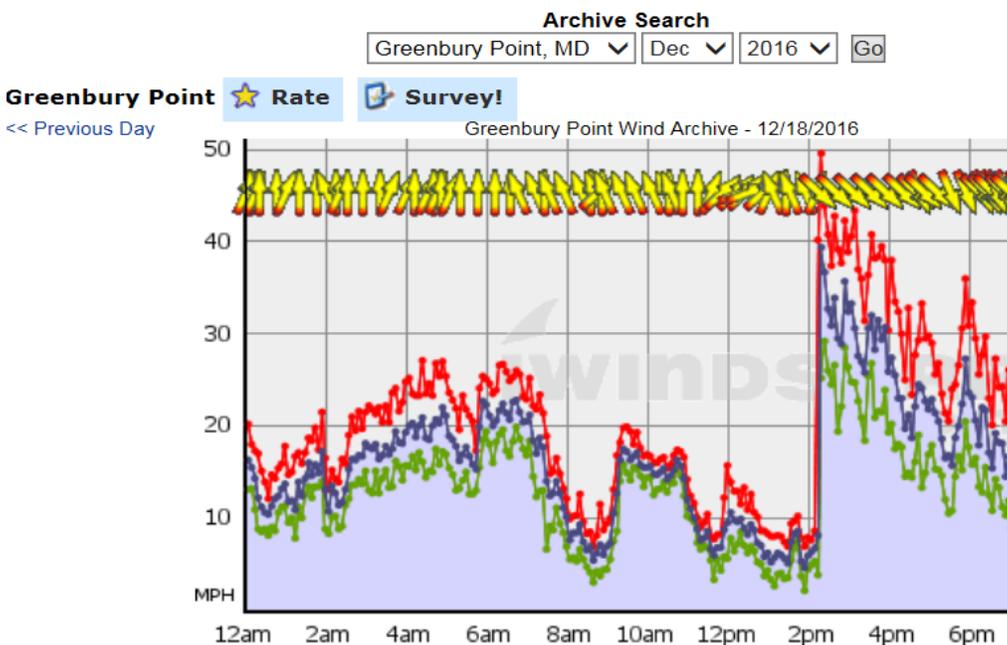
Eleven sailors were unable to immediately right their boats and sail in due to the continued high winds. The SSA RIB began collecting sailors immediately, and within a few minutes, had three sailors on board. Of these, only one had become separated from their boat; most were waiting on their overturned hulls. Eventually, one of the three sailors on the SSA RIB was transferred to an SSA-operated Boston Whaler that arrived on scene shortly after the calls were made to SSA and local authorities. (The Whaler was captained by the SSA Junior Director who deployed the Whaler as soon as he saw conditions deteriorate.) The other two sailors on the SSA RIB were transferred to a USCG vessel. One sailor's boat was secured to one of the 6 mph buoys in Annapolis Harbor, and he was retrieved from there.

The other seven sailors were either holding on to their capsized boat or sitting on their turtled boats, waiting to either right their boats if the breeze lessened or transfer themselves to a safety craft. The Parker 23, due to its size and maneuverability, had limited ability to perform rescue operations, so it headed down river to get in front of the boats as they drifted and were blown downwind. Within minutes of the request for assistance, one USCG vessel, the AFD fire boat (which had just finished fueling and was on its way out of Spa Creek), and several smaller DNR vessels had arrived on scene. A Maryland State Police helicopter appeared overhead about the same time.

Others lent timely support as well. A large sailing catamaran took up station off Greenbury Point, picked up one sailor, and confirmed the retrieval over channel 16. By this time, USCG had picked up four sailors.

Throughout the operation, the RC, on board the Parker 23, maintained a running tally of all sailors who had been reported safe. In addition, a sailor who came ashore at the foot of Chesapeake Avenue maintained a tally of those who came ashore there, returned by foot to SSA, and assisted the SSA General Manager, who was collecting the names of those who had sailed back to SSA.

There was some confusion at one point whether one sailor was safe or missing. He was initially reported safe and standing by on his boat by the RIB, but was subsequently collected by another rescue boat, unbeknownst to the SSA RIB. His whereabouts could not be confirmed for some time, but he was later reported safe.



*Archived wind readings from iwindsurf.com.*

At 1444, the SSA General Manager texted a list of the persons confirmed back at SSA or at Chesapeake Avenue to the Parker 23. RC added the names provided by the SSA General Manager to the list the RC was maintaining. Shortly thereafter, the USCG confirmed the four sailors they had retrieved over channel 16. Once the USCG confirmed its four a few minutes later—roughly 30 minutes after the initial calls for assistance—the tally of those reported safe matched the daily check in-sheet. At 1447, SSA RC sent a text to SSA General Manager noting that all were accounted for. With further inquiries, it was clear that all sailors were safe well before 1445, but it took time to receive confirmation of this from all parties. Immediately after receiving the rescue count from the supporting authorities, the Parker 23 dropped off one of the SSA RC members at SSA, who double-checked his list with those compiled by DNR, AFD, and USCG.

At 1506, DNR tweeted that all competitors were safe and accounted for.

### ***12/19-20: Search for and Recovery of Abandoned Boats***

Once all sailors were accounted for, USCG requested that SSA develop a plan to retrieve the abandoned boats in order to minimize hazards to navigation. The Parker 23 and the RIB, along with the Annapolis Yacht Club RIB, were dispatched to look for boats at approximately 1520. SSA's Commodore, by then on site, set 1615 as a time for the three search boats to end operations and head back to shore due to approaching sunset (1646 on December 18).

Through the efforts of these three teams, three Lasers were located and secured to anchors off Greenbury Point, and two were towed into Lake Ogleton and tied to a dock. (Later that evening, sailors drove to Bay Ridge and collected these and other boats that came ashore nearby.) As night fell, AFD called off the search for boats until daylight. All safety boats were in shortly before dark (Parker 23 accompanied the AYC RIB, which had no running lights, back to shore). As of nightfall the evening of December 18, the whereabouts of three boats was unknown.

The search and retrieval effort for boats resumed the morning of Monday, December 19, as the SSA Parker 23, SSA RIB, and a Whaler searched off of Greenbury and Tolly Points; along the shoreline of Bembe Beach, Annapolis Roads, and Bay Ridge; and across the Bay to Kent Island and parts south. Conditions were marginal for visibility out on the open waters, with fairly good size rollers with whitecaps coming down the Bay. This effort eventually collected two boats—one of the boats anchored off Greenbury Point overnight was towed to Bay Ridge, and boat that had been tied off to the 6 mph buoy was retrieved. Two of the three boats that had been anchored off Greenbury Point on the evening of December 18 could not be located. The whereabouts of three other boats, not anchored, remained unknown.

By early afternoon on December 19, SSA had received reports of boats near the shoreline of Kent Island near Bloody Point as well as even further south, near Herring Bay. By late afternoon, three more boats had been sighted and retrieved or at least secured (one in Herring Bay was retrieved by DNR, USCG reported one off Poplar Island that was retrieved by SSA, and one was secured on the shoreline of southern Kent Island by a waterman and SSA members). As of nightfall on December 19, two boats were still at large.

The morning of December 20 brought two reports of Lasers adrift close to mouth of the Severn, including a call from USCG with GPS coordinates. SSA responded to retrieve this boat. The final boat was sighted at 1330 by an SSA search team along the southern Kent Island shoreline. All missing boats were located and retrieved by 1400 on December 20.

The SSA Commodore and the USCG command center outside Baltimore were in contact throughout the search and retrieval effort so that SSA could keep USCG updated on how many unmanned Lasers were still out on the Bay, potentially posing hazards to navigation. Through this communications channel, USCG and DNR provided several reports of hulls, assisting SSA's boat retrieval efforts.

### ***Lessons Learned***

All people were safe on shore in a timely fashion with no injuries. In addition, in less than 48 hours, all boats were recovered—though some sustained serious damage. The credit for this must go to SSA RC and staff; the responding search and rescue units of the USCG, DNR, and AFD; fellow mariners (AYC and the catamaran); and the Laser and Laser Radial sailors themselves.

SSA sailors and RC followed established safety protocols. All sailors, per the Laser/Laser Radial Frostbite Notice of Race/Sailing Instructions, were wearing appropriate gear and lifejackets. When the front hit and it became clear that assistance beyond what SSA assets could handle was needed, RC quickly made the call to request that assistance.

SSA RC and staff called emergency services and responded promptly to sailors in need while communicating and coordinating effectively with emergency services. The response by various government agencies was, quite simply, phenomenal—rapid, effective, and well-coordinated. The assistance rendered by fellow mariners also proved to be effective and seamless. The catamaran positioned itself to stay in the path of drifting Lasers. AYC's RIB proved very helpful in boat recovery efforts. Lastly, all sailors acted responsibly and rationally in very trying conditions.

Those who could make it to SSA or to a nearby shore on their own did so. Those sailors waiting on their capsized hull for the wind to ease so they could right their boat and sail in understood that, in these situations, only lives matter—and they willingly boarded rescue craft.

While many things went well that afternoon, enabling the safe return to shore of all sailors, a review of this incident enables lessons learned to be applied to future SSA events—and for consideration by other sailing groups as well.

### ***Weather***

SSA RC, staff, and competitors were aware of forecasts for warm, light winds, building to around 20 knots with an approaching strong cold front. RC actively monitored wind speeds and radar to track approaching weather via smartphones. On the SSA main race committee boat (Parker 23), ship's radio was on channel 65a to enable communications between the Parker 23 and the SSA RIB safety boat. When the effects of the front arrived, winds increased nearly instantaneously to more than 30 mph with gusts approaching 50—roughly 20 mph above what forecasts they were monitoring indicated they would see. Although RC members were constantly tracking conditions via smartphone apps including SailFlow and Weather Channel, NOAA National Weather Service warnings did not reach them.

Of note, many of the smartphone apps used by race committees and dinghy sailors alike do not relay critical National Weather Service warnings and statements effectively (if at all), and often report forecasts for on land rather than on the Bay. The National Weather Service (NWS) has meteorologists working 24/7 to monitor conditions and issue warnings/statements as conditions evolve, rather than relying on computer models to create forecasts as many apps do. Relevant to December 18, a gale warning was in effect, and, at 1328, a

special marine statement was issued indicating “a gust front capable of producing wind gusts to 40 knots” was approaching the area from the northwest. Neither of these were relayed by the apps the RC was tracking, nor did the RC hear the 1328 special marine statement broadcast on the radio (NWS indicates it would *not* have been announced with a tone signal). SSA is in touch with the NWS Baltimore/Washington Weather Forecast Office to collaborate on improvements to how sailors can access information, and has reached out to SailFlow (perhaps the most-used app by sailors in SSA’s area) to encourage them to add these warnings and statements to their app.

SSA will implement policies to enable greater cognizance of the day’s forecast by RC and competitors, and will ask RC to track updates to conditions and forecasts in improved ways.

- For all days (year-round) that racing is scheduled at SSA, no later than two hours before the first scheduled start, an RC representative will print out the official National Weather Service forecast and any applicable watches, warnings, or advisories for the Sandy Point to North Beach marine forecast zone (<http://forecast.weather.gov/shmrn.php?mz=anz532>). This can be printed out from the computer in SSA’s Race Committee office on the second floor. It will then be posted on the Official Notice Board.
- While on the water (year-round), the Race Committee will monitor weather conditions, particularly to see if any new watches, warnings, advisories, or weather statements are issued for the Annapolis area. *Note that while mobile apps can be informative, many do not reliably relay NWS watches, warnings, advisories, or weather statements that provide critical, timely information.* For that purpose, track <http://forecast.weather.gov/shmrn.php?mz=anz532>. SSA’s Standing Race Committee will further research additional smartphone apps to determine those that may successfully relay NWS warnings.
- Each day of frostbite racing will include a competitors’ meeting (time to be scheduled by the fleets that are racing) that includes a weather briefing, to share :
  - the latest National Weather Service marine forecast for SSA’s marine forecast zone (Sandy Point to North Beach; available at <http://forecast.weather.gov/shmrn.php?mz=anz532> )
  - any current watches, warnings, advisories, or weather statements for SSA’s marine forecast zone
  - current water temperature (from December 1-March 31, use Thomas Point Light at [http://www.ndbc.noaa.gov/station\\_page.php?station=tplm2](http://www.ndbc.noaa.gov/station_page.php?station=tplm2); otherwise use the NOAA CBIBS Annapolis buoy at <http://www.buoybay.noaa.gov/locations/annapolis>)

### ***Competitor Tracking and Safety Equipment***

SSA requires competitors to check in with the RC main committee boat when they arrive in the racing area. Per SSA’s standard Sailing Instructions, which govern racing during most SSA events, compliance with this requirement is encouraged by penalizing the scores of boats that do not comply. While many competitors did formally check in with the RC main committee boat, others did not; active identifying of all boats and then counting and recounting enabled the RC to know precisely which 22 boats were on the water on December 18—so that when verifying all sailors were safely back on shore, they and authorities were working with a concrete list.

In addition, the fact that all sailors were in compliance with SSA’s safety regulations contributed to a good outcome. SSA’s standard SIs require appropriate protective clothing to be worn by competitors from November 15 through March 15 and at all other times that the water temperature is below 60F; the SIs note that wetsuits or dry-suits may be appropriate for this purpose, but that skippers are solely responsible for the safety of their crew, their vessel, and themselves. The Laser/Laser Radial Frostbite NOR/SIs rightly take this

requirement a step further, given the boat size and time of year—requiring all competitors to wear a lifejacket at all times while on the water, as well as either a drysuit or wetsuit. In addition, boats are not allowed to leave the SSA basin until the safety boat has left. Boats that do not follow these rules are not scored for that day. These requirements will be continued.

The events of December 18 illuminated that while these policies are important, several items can be added to enhance personal safety and make accounting for sailors' whereabouts more seamless.

- For all frostbite sailing, all boats will indicate when they leave shore and return to shore via a check-in board. If skippers do not follow this procedure, they will not be scored. Sailors launching out of Eastport YC are asked to walk over to indicate their status on the board; sailors out of Annapolis YC or other locations may dock briefly at SSA for this purpose on their way to and from the race course or may ask a friend to do so for them by phone.
- For all frostbite sailing, sailors will be required to carry a whistle. They are encouraged to also carry a sailing knife/rescue tool.
- For year-round sailing, *all* RC boats will receive a list of the boats sailing that day.
- For year-round sailing, competitors are encouraged to wear highly visible clothing. Many lifejackets and drysuits currently available for purchase are dark colors; consider adding a brightly colored hat or pinney (tight-fitting lifejacket cover) to increase visibility in case sailors become separated from their boat.
- For year-round sailing, all sailors should more clearly mark their dollies with their names/hull or sail numbers, to provide an additional layer of knowledge about what boats are out on the water.
- In addition, sailors should consider that, should trouble arise, their closest option may not be sailing all the way back to the club from which they launched, but the nearest soft shoreline.
- Proper check in and acknowledgement on the water needs to be stressed, but Race Committees should not rely on competitors checking in on the water and should actively and continuously check and reconfirm the count and identification of boats on the water. The SSA frostbite fleet is generally of a size that this is possible.
- In addition, in case of a similar future situation, sailors that make it back to shore should actively seek to inform race organizers and/or first responders that they are safely on shore.

### ***Committee/Support Boats***

SSA owns and operates a number of motorboats in order to run races and provide safety support. While some of these motorboats—like the RIB—are well designed and powered to enable safety operations, others are designed primarily as race management platforms. In the long run, as boats age out and are replaced, SSA will continue to consider safety operations in selecting new boats. In addition, a review of equipment on board all SSA motorboats will be conducted to ensure that they are prepared not only to run races—but to offer safety support.

- For all frostbite sailing, RC should consider course location, and keep it as close to SSA as practicable, noting that other sailing (Annapolis Yacht Club frostbiting) and wind conditions may require the race course to be off the shore a bit.
- For frostbite sailing, all RC staff members are required to wear lifejackets; those on the safety RIB are required to wear drysuits. These are important policies that will continue.
- Each RC boat should carry a knife/rescue tool as part of its standard equipment. Standard equipment should also include extra anchors and floats for securing boats in case they are abandoned.

- Safety of SSA’s Race Committee members is critical. Before leaving shore, for all regattas, RC must leave a list in the RC office indicating who is going out on which RC boats.
- Before leaving the dock, RC should decide on and communicate to all RC members which RC member will serve as POC for accounting for sailors in case of an incident (to minimize confusion by maintaining one central list).
- Before 2017 SSA Opening Day (mid-April), when SSA fleets venture out to the Bay for their race course rather than the more-confined waters of Annapolis Harbor, SSA’s Standing Race Committee should:
  - develop guidelines for dealing with weather issues on the water (For example, Clearwater YC/Sailing Center has a protocol in case dense fog rolls in, gathering all boats near the main committee boat.)
  - explore and suggest ways RC and safety boats could identify boats from which people have been removed
  - develop a quick safety matrix to be completed as part of the RC morning routine to help RC members understand the risks for the day—including assessing steady wind, air temperature, water temperature, forecasted gusts, time of sunset
  - review SSA’s radio capabilities, including perhaps adding a mounted radio to the safety RIB, Parker 18, and largest Junior Program RIB as well as a second ship’s radio to the Favored End (SSA’s largest RC boat) and Parker 23 so that one radio on board can be tuned to channel 16 and a separate radio tuned to a race committee working channel; ability to access NOAA Weather Radio should be incorporated into this review
  - develop and distribute quick-reference guides on radio use (how the radios work, which channels to monitor for which purposes)
  - recommend whether SSA should add more safety boats to events (perhaps given certain conditions and/or fleet size) and whether a rapid-response boat and crew need to be at the ready at the club

### ***Information Sharing with Responders and the Community***

SSA is working with City of Annapolis Office of Emergency Management, and other City first responder agencies, to enhance communications among those groups. Representatives from SSA participated in an after-action session on January 16 held by the Office of Emergency Management to identify things that went well during the response, as well as area for improvement. The City encouraged people on the water to call 911 in case of emergency. 911 serves as a “one-stop shop” for response, even if on the water. Depending on the situation, calls to 911 can initiate response from the City fireboat, U.S. Coast Guard, and other agencies. The City stressed that, while of course people should not make frivolous calls, 911 is there to be used—that they would much rather respond and not be needed, than to be needed and not called.

SSA and other yacht clubs and sailing organizations in Annapolis intend to meet this winter with City responders to share protocols, grow understanding of each other’s processes, and identify areas where they can support each other more effectively in emergency situations.

Due to the unique location of SSA’s Laser and Laser Radial Frostbite race course, much of the events on December 18 were easily viewable from shore. Understandably, residents and visitors were greatly concerned as they saw the wind increase, boats capsize, and an impressive response by local authorities, both on the water and on shore.

Most spectators do not understand the nature of small-boat racing, including that boats do capsize, and that—if wearing proper gear—sitting on the bottom of a turtled hull is a relatively safe place to be until the wind either dies down, and the sailor can right the boat and sail to shore, or a sailor is removed from that situation by a rescue boat. SSA plans to work with local media in coming months (warmer water) to introduce them to small-boat sailing so they can begin to appreciate how dinghies are sailed. (Many Laser sailors objected to the “thrown from boats” phrase that media used to describe events, noting that while they would rather not have capsized, they felt quite secure.)

Although they are small, Lasers are a fairly good boat for frostbiting. If capsized, they generally can be righted by their skipper without outside assistance, and do not have a large cockpit that can fill with water. If turtled, it remains a good raft, even if it cannot be righted. These qualities make the Laser a dinghy sailed in frostbite racing as far north as Boston.

While the rescue and initial boat recovery efforts were under way, SSA did not interact with media, though the Commodore did answer questions from media later that evening and the next day. Instead, SSA RC, staff, and officials focused on the important tasks at hand, and on ensuring that any information they would pass along to media would be accurate. Initial media accounts, based on preliminary information from other agencies, incorrectly noted that 22 sailors were rescued. SSA endeavored to more fully and clearly describe the situation through a Facebook post the evening of December 18, and a more comprehensive article on the SSA web page on December 20.

A follow-up on-camera interview was done on December 19 with WJZ-TV (Baltimore) that focused on the gear that Laser sailors wear; the SSA Commodore described how important that gear is at this time of year, and a Laser Radial sailor who had been participating in the retrieval efforts was able to show what her drysuit and lifejacket look like, and how they work.

SSA is fortunate that all sailors involved were indeed wearing the required gear, and that the response to the request for assistance was so swift and effective. That enables SSA, and the greater sailing community, to explore ways to enhance safety. Once the SSA community has reviewed this document, SSA will meet with representatives from the Potomac River Sailing Association, which encountered similar conditions—with a similar outcome—the same day. The goal is to share combined lessons learned with other sailing and yacht clubs along the East Coast that support frostbite sailing.