Southeast Coast Network

National Park Service
Inventory and Monitoring Division

Standard Operating Procedure 3.1.02

Safe Operation of Southeast Coast Network Watercraft—Version 2.1

Please cite this as:

Southeast Coast Network. 2021. Safe operation of Southeast Coast Network watercraft—Version 2.1. Southeast Coast Network Standard Operating Procedure NPS/SECN/SOP—3.1.02. Southeast Coast Network, Athens, Georgia.

Summary

Boat operation comes with inherent danger, and therefore certain precautions must be taken to ensure safety of the boat operator and passengers. The safety requirements include, but are not limited to, sufficient operator skill level, proper safety equipment, and safe weather and sea conditions. Certain guidelines also must be followed during operation of the watercraft.

This standard operating procedure (SOP) applies to the operation of motorized and non-motorized watercraft and must be read in its entirety prior to commencing fieldwork.

Revision History

Revision Date	Author	Changes Made	Reason for Change	New Version #
3/17/2013	Editor	Citation updated	Estuarine Water Quality protocol publication	1.0
12/2016	Editor	Editorial, Regional, and Network PM review	Protocol publication	2.0
2/26/2021	Network staff	Minor edits to bring up to date	Annual review	2.1

Vessel Types in Use by the Southeast Coast Network

The Southeast Coast Network (SECN) maintains several boats for use in vital signs monitoring, including both motorized and non-motorized watercraft.

- One 18-foot aluminum-hull, flat bottom boat with a Honda 150 horsepower (hp) motor with jet drive; used for installation and data collection for marsh monitoring, and for collection of water and sediment water quality samples as a part of the SECN parkwide assessment protocol.
- Two 16-foot aluminum SeaArk, modified tunnel hull, center console Jon boat with a 60 hp four stroke Yamaha outboard motor with a stainless-steel propeller. One boat is used for estuarine water quality monitoring. The other is used to collect salt marsh elevation and vegetation data.
- One 16-foot aluminum SeaArk Jon boat with a Honda 50 hp motor with jet drive; occasionally used for collection of salt marsh elevation/vegetation data as well as stream habitat monitoring.
- Three sit-on-top kayaks; used by field support staff when conducting wadeable and non-wadeable stream habitat monitoring and field reconnaissance.

Equipment Checklist

The following safety equipment must always be on board when embarking on a field mission.

Table 1. List of safety equipment to include on board motorized and non-motorized boats during SECN monitoring.

Equipment	Motorized Boat	Non-Motorized Boat
Lifejackets (as described in the requirements section below)	X	X
Fire extinguisher	X	–
Throwable flotation device	X	–
Flares and daylight markers	X	–
Sound producing device (air horn, whistle, bell, etc.)	X	X
VHF radio	X	X
GPS unit	X	X
Hardcopy maps for navigation	X	X
First aid kit	X	X
Push pole (for manual movement of boat in extremely shallow conditions)	X	–
Paddle	X	X
Boat hook	X	–
Anchor and rope	X	X
Manual bilge pump	X	–
Extra fuel	X	–
Tool kit	X	X
Rescue rope	–	X
Cell phone	X	X
Phone list for local Coast Guard stations (Appendix B)	X	–

Requirements

Motorized Boat Operator

The boat operator must meet the following specifications and accept the following responsibilities:

- Has completed the U.S. Department of the Interior (USFWS) Motorboat Operator Certification Course (MOCC SAF4102, US DOI 2021).
- Responsibility for the safety of personnel on board regardless of position and grade.
- Responsibility for operating the watercraft in compliance with existing policies, guidelines, and training.
- Can swim.
- Can navigate in coastal and inland waters.

Crew

At least one crew member (in addition to the boat operator) must meet the following minimum specifications and accept the following responsibilities:

- Has completed Red Cross or equivalent First Aid training.
- The ability to swim.
- A basic understanding of boat operation and basic coastal navigation.

All crew members should:

- Obey instructions of watercraft operator.
- Adhere to all safety regulations.
- Always conduct themselves in a reasonable and prudent manner.

Solo Operation of Boats

- Solo operation of any watercraft IS NOT ALLOWED without approval from the employee's supervisor and the program manager. Both the employee who will be the operator and the specifics of the trip must receive approval prior to solo boat use.

- For solo watercraft operation, the operator must receive written clearance from his or her supervisor and the program manager, with an explicit description of conditions under which solo operation is appropriate. At minimum, clearance letters will indicate which boat(s), vital signs monitoring protocols, and location, along with any other criteria, are warranted. The determination to allow solo operation of boats can be based on one or a combination of the following:

    - Number of hours of documented operator experience (one day is equal to six hours) while conducting SECN monitoring work.

    - Equivalent experience with past employers serving as a boat operator.

    - Field evaluation of competence by the employee's branch chief or the network coordinator.

Operating Conditions

The following guidelines pertain to boat operation in unsafe weather and sea conditions:

- No operations will occur if **Small Craft Warnings** or **Lake Effect Warnings** are issued or predicted in the area of proposed operation.
- Boat operations will not occur below 45° F air temperature or 55° F water temperature, unless all participants are wearing dry suits.
- Boats should not be operated if winds exceed 16 knots sustained or wave conditions exceed 18 inches in the proposed operation area. If winds exceed 16 knots during operations, the operator will use sound judgment in seeking safe harborage.
- Boat operators will use sound judgment when operating in the vicinity of air to ground lightning.
- When confronted with rapidly changing conditions, the boat operator should seek safe harbor until conditions improve.
- Boats should be operated between 30 minutes before sunrise and 30 minutes past sunset, unless the operator is delayed by conditions beyond normal control, such as groundings or squalls.
- Operation of boats in areas where there is an elevated risk of accidental groundings during the late afternoon or evening should be avoided. Falling tides late in the day in areas with large tidal fluctuations (more than 6 feet) such as those that occur at FOSU, FOPU, FOFR, CUIS, TIMU make temporary grounding exponentially more dangerous because it may cause operation and navigation after sunset.

Flotation Devices

Flotation devices are required for each person on board and will be worn as follows:

- Wear Type III personal flotation devices (PFDs) at all times when on the boat unless otherwise stated below.
- Wear Type I PFDs when operating alone and when winds exceed 10 knots sustained and/or wave heights exceed 12 inches. Always carry the Type I PFD aboard the boat when operating alone regardless of conditions.
- Wear non-inflating Type I, II, or III PFDs when water temperatures are below 80° F, or when winds exceed 10 knots and wave heights exceed 12 inches.
- If approved, wear an appropriate automatic/manual inflating Type V PFD in accordance with DOI regulations and in conditions other than those stated above.

Use of Kayaks

Who Can Use Kayaks

The three SECN-owned kayaks are available for use by NPS staff (permanent and part time) and volunteers, and their guests. At least one staff member, volunteer or partner trained in kayak safety and first aid must accompany every trip. Trips with more than five paddlers are required to have one properly trained participant per every five paddlers.

With your direct supervisor's permission, you may use the kayaks for official use while on duty, during normally scheduled working hours. While in official work status, you may use a government vehicle to pull the kayak trailer to a launch/retrieval site. This use is for conducting government business.

Where Kayaks May Be Used

Trips must be within the boundaries of SECN parks, unless the program manager or designee gives specific permission.

When Kayaks May Be Used

Kayaking is only permitted during daylight hours; night trips are forbidden. Kayaking is not permitted when dangerous weather is imminent. Such situations exist when a small craft advisory has been issued, or a weather system accompanied by threat of thunderstorms is forecast to occur within two hours from the scheduled start or end time of the proposed trip.

Operational Procedures

Trailer Operations/Towing

When towing a trailer, the following guidelines will be followed:

- Complete an examination of the trailer before towing.
- Check the trailer hitch and electrical connections.
- Check boat tie downs.
- Ensure loose objects are removed from or fastened to the boat.
- Confirm that the driver is comfortable pulling and backing the trailer.
- Adjust vehicle mirrors to account for the trailer.
- Verify tires are in good condition, properly inflated, and bearings are greased.
- Adhere to state Department of Transportation (DOT) trailer speed limits.

Boat Operation

- Prior to boat operation, the boat operator or crew lead (for kayak use) must review safety procedures with any crew or passengers present.
- Maintain a safe distance from other boats (100 feet [30.5 meters (m)]) minimum unless overtaking or passing).
- Avoid producing wake within 100 feet (30.5 m) of a person, non-natural structure, or inhabited area.
- Slow to idle speed when entering, leaving, or passing within 50 yards (45.7 m) of a state-owned or state-controlled boating or fishing access area.
- Adhere to all state and federal boating regulations. These often vary from state to state. It is the boat operator's responsibility to know the state regulations.
- Record operating date, time, operators name, area of operation, and engine hours in the proper log before and after operations.

A boat operations checklist is provided in Appendix 3.

Float Plans

Each individual boat operator will provide the float plan to a pre-designated person. This person will usually be the protocol lead in charge of the vital sign being monitored during the operation unless that person is also in the field than a designated office staff person will be listed. Float plans are required when using any SECN watercraft.

- Float plans which are part of an overall trip plan will be completed and filed with the pre-designated person, program manager, and park technical committee representative (or other park staff member designated by park technical committee representative) no later than 48 hours prior to launching. See Appendix A for a sample float plan form.
    - Float plan must include:
        - Description of watercraft
        - List of occupants
        - Emergency equipment on board
        - Point of departure
        - Planned route
        - Estimated time of departure
        - Estimated time of return

        - Means of contact (e.g., VHF radio, mobile phone), and contact schedule
        - Purpose of trip
        - Description of vehicle(s) left at launch site(s)
        - Recommended plan of action if overdue
    - If the operator plans to operate a boat alone, the operator must explicitly request and receive clearance for solo operation.

- Prior to launch, place a notice on the driver's side vehicle dashboard indicating ownership, operator, and points of contact in case of emergency. Appendix A contains a sample notice.
- Upon launch and retrieval, contact designated people via text message or phone call to note the start and end of that day's boating operations.

Cleaning and Care of Watercraft and Equipment

Proper care of equipment is required to ensure that boats, engines, and associated gear are in working condition.

Boats

- Refuel tanks and check oil on engines
- Grease trailer hubs. Grease jet drive (low pressure)
- Connect freshwater wash and crank engine (run for 5-10 minutes)
- Pull hull drain plugs
- Clean bilge, boat, and trailer
- Rinse PFDs with fresh water and hang to dry. Store PFDs when dry.
- Clean and dry, then place radios in re-charge receptacles.
- Charge batteries or pull for long term storage

Kayaks

- Rinse kayaks with fresh water; dry cockpits with bilge pumps and sponges. Replace kayaks on trailer in an upside-down position.
- Rinse paddles with fresh water and place in designated storage.
- Rinse PFDs with fresh water and hang to dry. Place PFDs back into dock box when dry. Clean and dry, then place radios in re-charge receptacles.

Emergency Situations

The following sections summarizes some procedures and recommendations for dealing with common emergency situations encounter while boating including accidental grounding, collisions, falls overboard, and capsizing. In cold water conditions hypothermia can be a factor in fatalities even if the accident itself does not cause injury.

Accidental Grounding

Accidental grounding are common in areas with high tidal ranges and shifting bars and shoals. Operators should use extreme caution when navigating areas with high tidal ranges during low or falling tides. Even the best boat operators can run boats aground. Know how to properly navigate and learn about the local area to reduce the likelihood of running aground. Be sure to review navigation charts and maps and use a depth finder when navigating unknown waters. Keep a lookout posted to help reduce the chance of running aground. Although a grounded vessel in and of itself does not necessitate an emergency situation, it can become an emergency especially if extra water and emergency gear are not on board. Accidental grounding can also expose passengers to inclement weather and lightning with little or no protection and delay late afternoon trips beyond daylight hours.

Always be prepared and assume that you may run aground and be trapped on your vessel until the tide lifts your boat or until you are rescued. In addition to required emergency gear, extra food, water, and clothing should be on board when boating in areas where accidental grounding is a risk

Definitions

Hard aground—boat hits so hard that the hull imbeds into the bottom material. The hull may be breached, or forward motion may stop immediately.

Soft aground—boat bumps the bottom or moves into a very soft bottom material such as sand or mud.

Accidental Grounding Procedures

1. Check to make sure PFD is securely fastened; remain calm.

2. DO NOT reverse the engine in an attempt to dislodge the boat—this can cause additional damage to the boat or the environment.

3. Assess the damage. Check for signs of water. Listen for signs of rushing air as this suggests that water is rushing in and forcing air out.

4. If you have bent the propeller or rudder, or damaged the shaft or its support, you will notice a vibration (sometimes violent) when you engage the engine. If this is the case, stop the boat, set the anchor and call for assistance.

5. If there is no structural damage, consider the direction of the tide and whether the tide is sufficient to re-float the boat. If there is no tide, determine if you can safely move the boat

out of the area (typically in reverse) without causing damage—go very slowly. In a small boat, it may be possible to push the boat off. Before exiting the boat, be sure to test the water and sediment depth. Do not exit the boat in soft sediment. Great care should be taken to avoid safety risks associated with freeing the boat (slips, falls, becoming stuck in soft sediment, etc.). These situations can be stressful and dynamic, yet require a calm and collected approach.

6. If you doubt you can free the boat, call for professional assistance such as a marine rescue.

Collisions

Avoid most collisions through defensive operation, knowledge of "rules of the road," compliance with boat lighting requirements, and use of navigational aids. Falls overboard relate to sea conditions, movement about the craft, and tripping/slipping hazards on board. Capsizing accidents usually occur in small boats due to sea conditions and/or improper weight distribution.

The major determining factor in most fatalities is non-use of PFDs. People who end up in the water were not planning on being there and usually were not wearing a PFD. Most deaths are from drowning, with hypothermia as a major contributing factor. Most drowning occurs within 10 feet (3 m) of safety. Therefore, most rescues will be a simple reach or throw. Vessels less than 16 feet (4.9 m) account for most fatalities. Ironically, small vessels have less stringent equipment requirements.

Most fatal accidents occur when persons fall overboard, or when boats capsize and victims drown because they are not wearing PFDs. The urgency of entering the water unexpectedly along with fatigue caused by stressors can render even good swimmers helpless.

Most non-fatal accidents result from collisions with other boats or objects in the water. Remember that the rules of the road suggest having a designated crew member serve as a lookout. Make sure your lookout is doing his or her job.

Capsizing

Small open boats are somewhat unstable and tip easily. Tie the boat securely to the dock when boarding and step into the centerline of the boat running fore and aft. With a hand on the pier and one on the boat, lower yourself down into the center. All other passengers should follow the same procedure and stay low when moving around in the boat. Do not attempt to carry items aboard the boat. Board the boat first; then load items one at a time and, again, place them along the centerline of the boat. Remember to not overload the boat.

Read and take heed of the capacity plate information. Make sure all passengers and carry-on items are secure and the weight is evenly distributed.

Once underway, avoid standing up, avoid riding on the bow or gunwale (side) of the boat, trim the boat so it rides level and avoid making sudden sharp turns.

Most small pleasure boats, and all boats built after 1978, have flotation to prevent sinking even if the boat capsizes. It may be safer to stay with a capsized floating boat than to attempt swimming to shore.

A small unstable boat may capsize from the following causes:

- **Overloading** slows a boat down and reduces the amount of freeboard (area above the waterline). A low freeboard increases the possibility of swamping the boat or taking on water that will slow the boat even more. Do not overload your boat with passengers or equipment.
- **Improper weight distribution** can make the boat unstable. Distribute people and equipment to balance the boat and keep water out.
- **Waves** can be a major factor in capsizing, especially if they are unexpected. Anticipate and aim the bow into all waves.

Capsizing procedures

- Check to make sure your PFD is secure.
- Take a head count to make sure all crew and passengers are present and provide assistance if needed.
- Stay with the boat—try to get as much of your body out of the water as possible.
- If you have nothing to hold on to and cannot find any material to keep you afloat, improvise by using your clothing. Your pants can serve this purpose—remove them, tie the leg ends together, pull the zipper closed and trap air in the legs by blowing or waving in the air, then submerge the pants waist first. As air escapes, blow more air into the waist opening.
- If signaling devices are available, use them to attract attention. Save at least one until you actually see a potential rescuer. Also use shiny objects to attract attention
- Attempt to maneuver to the nearest shore or shallow water.
- Use the H.E.L.P. position (see below).
- Remain calm—do not panic.

Crew Overboard

Standing or riding on the gunwales or bow of a boat causes most crew-overboard situations. If you must move around in a traveling boat, stay low, hold on to both sides and have at least three points of contact with the boat at all times.

Crew Overboard Procedure

1. Whoever first sees or hears someone go overboard should shout “Crew overboard (port or starboard).” This person should become the spotter and continually point to the person in the

water until the boat is safely alongside. Try not to lose sight of the crew overboard; it is extremely difficult to locate a person in the water.

2. Slowly turn the boat and make a gentle turn, keeping the person in view.

3. Approach the person slowly into the wind or current.

4. When alongside the person, put the engine in neutral—keep the engine running in case you need to maneuver quickly to adjust position. Once alongside the person, use the **"Reach, Throw, and Go"** method. First, extend a boat hook or oar toward the person. If they cannot reach the hook or oar, throw a line with a Type IV flotation device. Your type IV throwable flotation device should always be immediately accessible and within reach of the helm. If the victim is unable to board the boat or needs further assistance and someone must go into the water, make sure the persons PFD is secure and is attached to the boat with a line. Do not go into the water to assist the person unless absolutely necessary

5. Adjust weight to keep the boat trimmed and help the person aboard, usually over the stern.

Self-Rescue Procedures

Boat operators and their crew should be able to rescue themselves if they end up in the water. This includes being able to get back onto the boat or mitigate the effects of staying in the water. It is ESSENTIAL that operators utilize their engine kill switch. This small device can make the difference between life and death should you fall overboard. Many boaters have fallen overboard, only to watch their boat continue out of sight, or worse yet, circle over them ("circle of death").

- **Self-Rescue**—boat can be reached.
    - **Chin up bounce**—Difficult for most people, especially on high-sided boats. Grab stern or gunwale at lowest point and bounce up as if doing a chin up. On second bounce, try to get upper half of body over the gunwale and into boat, roll into boat.
    - **Stirrup**—Try to find loose line hanging off the boat and tie in a loop. Step into loop; use line to climb back into boat.
    - **Cavitation Plate**–If engine is out of gear, use cavitation plate on outboard engine or outdrive as a step. Climb onto transom using engine for support.
- **Self-Rescue**—boat unavailable, cold water.
    - **Heat Escape Lessening Posture (H.E.L.P.)**—Defensive posture used by solitary victim to lessen heat loss. Cross legs, fold arms, bring knees up, and hunch shoulders to neck. This may increase survival time as much as four times.
    - **HUDDLE**—Defensive posture used by two or more victims to lessen heat loss. Place arms around each other, and intertwine legs. This may increase survival time as much as four times.

NOTE: Do not use H.E.L.P. and HUDDLE in moving water due to the risk of entrapment or collision.

In-Water Survival

Should you find yourself in the water, use survival techniques while waiting to be picked up. Hopefully, you are a safe boater and are wearing your PFD. If not, you will have to float or tread water until rescued.

One method of **floating** is the horizontal back float. This comfortable position keeps your face out of the water and allows you to conserve energy. You simply lie back motionless with your arms outstretched, arching your back slightly; allow your legs to rise straight out.

Another method of floating is the vertical back float. This position does not float your entire body on the water's surface. Your body is still underwater except for your face and upper chest, with your arms extended out to each side.

If you cannot float in this manner, you can practice **survival floating**. Tilt your head back, slowly press down with your arms and legs to bring your mouth above the water, inhale, hold your breath and go limp for a few seconds. Your face will go underwater while you angle your arms and legs. Exhale as you are tilting your head back and preparing to break the water's surface so that minimal energy and movement is required to keep your head out of the water long enough to inhale.

Treading water requires more energy than floating but keeps your head above water. Tread water by doing a slow series of scissor kicks with your legs while slowly waving your outstretched arms back and forth on the water's surface.

When you find yourself in the water keep your clothes on to help prevent heat loss. Because clothes also trap air, they can assist you in floating.

Victim Rescue

Characteristics of a Person in Distress

- Can wave and yell for help.
- Has not yet reached the panic stage.

Characteristics of a Person Drowning

- Cannot speak, consciously wave for help, or consciously grab rescue device.
- Has reached the stage of panic. This is usually accompanied by inability to breathe.
- Victim is under the surface most of the time.
- May have as little as 20 to 60 seconds before they go under; or may disappear immediately.

- Appears to be doing a breaststroke with arms raised above head; head is tilted far back, and mouth is wide open. May have appearance of playing/splashing.
- Victim will probably attempt to climb onto you if you get too close to them.

Priorities in Rescue Situations

- Self: most important.
- Partner(s): second most important.
- Victim: third important.

Rescue Sequence (In Order of Increasing Risk to Rescuer)

- Talk into self-rescue
- **"Reach"**
- **"Throw"**
- Boat (**"Row"**)
- In-water (**"Go"**)

Note: Maintain visual and verbal contact while using any rescue technique.

Assistance from Shore

Every year people drown within a short distance of the shore. When trauma happens, such as stepping off an underwater shelf, the surprise itself can cause a drowning response. The victim, even if they can swim, suddenly cannot shout for help and just splashes around in the water. Exhaustion can occur in a minute or less and the person then quits splashing and sinks. Should you find someone needing assistance from shore, remember the following:

Talk into self-rescue—since most people end up in the water within 10 feet (3 m) of safety, many rescues simply require getting the victim's attention and directing the victim into one of the self-rescue techniques to regain entry into the boat.

Reach rescue—in this rescue, a device extends the rescuers' reach to the victim. Determine the required proximity to the victim based on the extension device, sea conditions, wind speed/direction, and ability of the rescuer. This type of rescue can be deployed quickly and leaves the rescuer on a safe platform. Use a boat hook, paddle, fishing pole, etc.

- Brace yourself during the rescue—if possible get someone to hold you.
- Extend the device to the victim. Remember that a drowning victim cannot think rationally, so tell him/her what you want them to do.

- Be careful that the victim does not pull you (the rescuer) into the water; you should prepare to let go of the reach device if the situation becomes unsafe for you.
- Pull the victim to the boat.
- Talk the victim into self-rescue or assist them into the boat.

Throw rescue—use when the victim is too far away to use a reaching device, or distance may increase quickly. Throwing devices have the same limitations as reaching devices, are quick to deploy, and allow a greater reach. Use the same techniques as described in the reach rescue. Typical devices include:

- Type IV ring buoy with 70-foot (21.3 m) polypropylene line attached—this offers flotation to the victim but requires skill and accuracy to land near the victim.
- Throw bag or heaving line—this does not offer flotation to the victim and requires skill and accuracy to land near the victim.
- Alternatives—any type of PFD (be sure to "handle" the device to make it easier to throw over distance). Use anything that floats (cooler, tire, etc.), and attach a line if possible. Throw upstream or upwind so the device will float to the victim. Remember: when there is current, surface water generally moves faster than the victim.

Boat rescue ("row")—use when the victim is too far away for a reach or throw. The boat serves as an extension of shore, placing the rescuer in the vicinity of the victim so that a less risky reach or throw can be executed.

- Approach the victim from downwind or current for better control.
- As the boat nears the victim, shut the engine off while in gear, unless other hazards dictate otherwise (e.g., obstacles, dams, currents).
- Use reach and throw techniques.

In -water rescue ("go")—this is the most dangerous form of rescue, and only individuals who have been trained, have practiced, and are in adequate physical condition should attempt this rescue. Use this rescue when the victim cannot help him or herself, and it is not possible to maneuver the boat close enough for a reach rescue. Coldwater rescue (less than 70° F [21.3° C]) requires use of a cold-water survival suit.

Extrication from Water

Getting victim into the boat—position the victim alongside the boat, where freeboard is at a minimum. Usually this is the stern or as far astern as possible. The choice of technique depends on both the boat and the victim's condition/cooperation.

Conscious victim with no major injury—if possible, provide the victim with a PFD.

- **Ladder**—easiest and most effective of all retrievals.
- **Stirrup**—fasten a line with loops to the cleat; use the line as a rope ladder.
- **Retrieval strap**—commercially available, padded loop with hand holds, or large loop tied into the end of a line. Put the loop around the victim under his/her armpits. This technique may require two rescuers. Use the bounce technique to assist the victim to a sitting position on the rail, and then into the boat.
- **Bounce**—On the second bounce, grab the victim's PFD, shirt, or wrists, or grab as high as possible on their body, and assist them onto the gunwale, and then into the boat.

Unconscious or weak/injured victim—support the victim with a PFD during retrieval.

- **Roll aboard**—secure the end of a blanket or net by tying it to the rail or standing on it. Put the rest of net in the water under the victim. Rescuers should grab the outside of the net and pull up in unison (note: blankets are available in each boats first aid kit).
- **Retrieval strap**—commercially available, padded loop with hand holds, or large loop tied into the end of a line. Put the loop around the victim under his/her armpits. This technique may require two rescuers. Use the bounce technique to assist the victim to a sitting position on the rail, and then into the boat (note: retrieval straps are not required on SECN boats but can be quickly fashioned from anchor line or dock lines if needed).

Note: Do not use for a victim with suspected head/cervical/spinal injuries.

Suspected head/cervical/spinal injuries—requires highly specialized training and equipment, most likely provided by local emergency medical services (EMS). Symptoms include: pain, loss of movement and feeling, tingling, deformity of back or neck, and stopped breathing. If hypothermia or other life-threatening conditions are not a factor, keep the victim in the water until EMS arrives. Try to eliminate any movement caused by waves, etc.

NOTE: Possible spinal injury treatment and management requires specialized training and practice. For this reason, information on spinal treatment is not included in this document. Obtain training and use local protocols.

Drowning

Drowning is defined as suffocation in a liquid. It is a leading cause of death among boaters and would-be rescuers. Many people who fall into the water cannot swim well. For those who can swim well, drowning usually results from underestimating the power of moving water, and/or the effects of hypothermia on swimming ability. In a rescue situation, failure to follow the rescue sequence puts the rescuer at additional risk.

Types of Drowning

- **Dry**—little or no water enters the lungs (10–15% of all drowning).

- **Wet**—aspiration of water into the lungs (85–90% of all drowning).
- **Secondary**—victim is successfully revived, but dies later due to complications.
- **Cold water drowning**—a person drowns in cold water but can still be successfully revived.

NOTE: Any revived, near-drowning victim must seek medical attention to avoid the risks of secondary drowning.

Cold Water Drowning Survival Factors

- **Age**—younger is better.
- **Length of submersion**—shorter is better (individuals have been successfully revived after being under water for over one hour).
- **Water temperature**—colder is better (cold produces beneficial physiological changes).
- **Water quality**— cleaner water is better.
- **Cardiopulmonary resuscitation (CPR) quality**—two-person CPR is preferred; steady, high quality compressions/ventilations, confirmed circulation.
- **Victim struggle**—less is better.
- **Physical condition of the victim**—other injuries can complicate survival.

Care for Drowning Victims

- Remove from water.
- Ensure ABCs (see below) and initiate CPR as appropriate.
- Prevent further heat loss.
- Handle gently.
- Administer 100% oxygen.
- Transport to nearest medical facility that can handle emergencies. A drowning victim is not clinically dead until their bodies are re-warmed and there are still no signs of life.

Hypothermia

Do not forget that in many areas the water can be very, very cold even when weather is warm, A sudden unexpected wake or other "unbalancing event" can land you in frigid water. Although the possibility of drowning from falling into the water is a real threat, so is hypothermia.

Hypothermia is a condition that exists when the body's temperature drops below 95ºF, which can result from exposure to water or to air. The reduction of body temperature results in loss of dexterity,

loss of consciousness, and eventually, loss of life. Swimming to keep afloat is very difficult after a few minutes in cold water. In addition, a sudden, unexpected entry into cold water may cause a reflexive "gasp," allowing water to enter the lungs. Drowning can be almost instantaneous.

Your body can cool down 25 times faster in cold water than in air. If you examine the chart below (Figure 1), you will see that survival time can be as short as 15 minutes. Water temperature, body size, amount of body fat, and movement in the water all play a part in cold-water survival. Small people cool faster than large people and children cool faster than adults.

PFDs can help you stay alive longer in cold water. You can float without using energy, and PFDs cover part of your body, thereby providing some protection from the cold water. When boating in cold water, consider using a flotation coat or deck-suit style PFD. These devices cover more of your body and provide even more protection.

Hypothermia does not only occur in extremely cold water. It occurs even in the warmer waters of Florida and the Bahamas. Hypothermia can cause death given enough exposure time relative to the water/air/wind conditions. It can also hasten the onset of drowning in even the best swimmers due to its effects on the extremities. Many "good" swimmers drown attempting to reach shore or their boat, due to cold water immersion. A well-prepared boater must understand the basics of hypothermia and cold water immersion drowning to prevent them from occurring, or mitigate their effects in an accident.

Types of Hypothermia

- **Chroni**c—occurs from prolonged exposure to the water/air environment.
- **Acute—**occurs from sudden cold-water Immersion.

Note: Water conducts heat 25 to 35 times faster than air at the same temperature.

Methods of Body Heat Loss

- **Conduction**—direct transfer of heat from the body by direct contact with water, or some solid surface (rock, ground, boat deck).
- **Convection**—loss of heat by air or water moving across the body and carrying it away.
- **Radiation—**loss of heat energy to the environment from unprotected parts. Over 50% of heat loss is from the head, followed by the neck, armpits, chest and groin.
- **Evaporation**—conversion of perspiration into water vapor, cooling the body at the surface.
- **Respiration**—exhalation of water vapor carrying with it heat from the body.

Heat Loss Factors

- **Age**—children lose heat faster than adults.
- **Body build**—thin people lose heat faster than heavier people.

- **Movement in water**—a person swimming or aggressively moving in the water will lose heat faster than someone who is floating.
- **Alcohol/Caffeine**—dilates the blood vessels, causing the victim to lose heat faster.

Hypothermia is a progressive problem in which the body passes through several stages before the individual lapses into an unconscious state. The extent of a person's hypothermia can be determined through the following categories:

- **Mild hypothermia**—the person feels cold, shivers violently, and slurs speech.
- **Medium hypothermia**—the person loses certain muscle control and experiences drowsiness, incoherence, stupor, and exhaustion.
- **Severe hypothermia**—the person collapses, loses consciousness, and shows signs of respiratory distress and/or cardiac arrest, probably leading to death.

Table 2. Hypothermia chart.

If the Water Temperature (°F) is:	Exhaustion or Unconsciousness occurs in	Expected Time of Survival is
32.5	Under 15 minutes.	Under 15–45 minutes.
32.5–40	30–60 minutes.	30–90 minutes
40–50	1–2 hours	1–3 hours
50–60	1–2 hours	1–6 hours
60–70	2–7 hours	2–40 hours
70–80	3–12 hours	3 hours–indefinitely
Over 80	Indefinitely	–

Note: Temperatures listed are approximate due to individual differences in normal body temperature and response to change.

Conservation of heat is the foremost priority for a person in the water. To accomplish this, limit body movement. Any action generates heat that is absorbed by the water. Do not swim unless you can reach a nearby boat or floating object. Swimming lowers your body temperature and even skilled swimmers can drown in cold water.

If you can pull yourself partially out of the water, do so. The more of your body that is out of the water (on top of an over-turned boat or anything that floats), the less heat you will lose. Especially keep your head out of the water—this will lessen heat loss and increase survival time.

Wearing a PFD in the water is critical for survival. A PFD allows a person to float while expending minimal energy and assume the **h**eat **e**scape **l**essening **p**osition (**HELP)**.

This position, commonly referred to as the fetal position, permits the victim to float effortlessly and protect those areas most susceptible to heat loss, including the armpits, sides of the chest, groin, and back of the knees. If you are in the water with other people, you should huddle as a group to lessen heat loss.

Care for Hypothermia

- Ensure ABCD (airway, breathing, circulation, degrees—prevent further heat loss).
- Protect victim from cold environment.
- Remove wet clothing, wrap in dry clothing and/or blankets.
- Insulate from ground.
- Handle gently.
- Transport to medical facility as soon as possible.
- Beware of after-drop. As the body warms, cold blood trapped in extremities moves into the core. The heart may be affected, causing arrhythmia.

Do not massage the victim's arms and legs. Massage will cause the circulatory system to take cold blood from the surface into the body's core, resulting in further temperature drop. Do not give alcohol, which causes loss of body heat, or coffee and tea, which are stimulants and may have the same effect as massage.

Treat hypothermia by raising the body temperature back to normal. Re-establish body temperature simply by sharing a sleeping bag or blanket with another individual or applying warm moist towels to the individual's head and body. Use a warm bath for mild to medium hypothermia, unless the victim is unconscious. Do not attempt to raise the temperature too rapidly; gradual warming is recommended.

Prevention of Hypothermia

- Rest and eat high-energy foods prior to exertion.
- Maintain fluid and food intake during workday.
- Dress in layers.
- Protect areas of high heat loss (head, neck, armpits, and groin).
- Recognize signs and symptoms of hypothermia; intervene early.

Cold Water Survival

- If sudden immersion occurs, cover mouth and nose to prevent gasping in water.
- Wear a PFD and check to make sure it is secure.
- Keep clothes on.

- In most cases do not try to swim. An exception is in moving water (streams, rivers with fast currents). In that situation, back or sidestroke at an angle, head pointed upstream, toward the shoreline. Do not attempt to fight the current.
- Get out of the water as soon as possible, even partially (i.e., crawl on top of overturned boat).
- If you cannot get out of the water, use the heat escape lessening posture (HELP) or the huddle position (depending on number of people) to conserve body heat.
- Allocate resources for group survival. Rotate people into the "warmest" area regularly.

NOTE: According to the U.S. Coast Guard, water less than 70°F is considered cold water.

First Aid

Every boater should take an American Red Cross or other approved first aid course. It is important not only for your own personal safety but for your passengers and other boaters you may encounter who need first aid assistance. You should also equip your boat with a first aid kit. This kit should be sufficient to deal with common problems such as sunburn, scrapes, bruises, minor burns, seasickness and bug bites.

Supplies

The following is a **minimum** inventory of first aid supplies you should carry:

- First aid manual
- Adhesive bandages in various sizes
- 3-inch (7.6 cm) sterile pads
- Triangular bandages
- 1-inch (2.5-cm) and 3-inch (7.6-cm) rolled bandages
- Tweezers and blunt scissors
- Cotton balls and cotton-tipped applicators
- Antiseptic
- Sun screen (minimum SPF-15)
- Calamine lotion
- Motion sickness pills or patches
- Aspirin or substitutes
- Eyewash cup

Shock

Untreated shock can lead to collapse of the cardiovascular system carrying oxygen to the body's vital organs, ultimately resulting in death. The signs of shock may include cold, clammy skin; profuse sweating; a pale color; bluish lips; rapid pulse and labored or rapid breathing. To treat shock, lay the victim on their back and cover them with blankets or clothing to keep warm. Elevate the victim's feet 8–12 inches (20–30 cm) higher than their head. Do not give the victim anything to eat or drink. Keep the victim comfortable until help arrives.

Bleeding

Control external bleeding by following these guidelines:

- Place direct pressure on the wound with a sterile dressing or clean cloth.
- If you do not suspect a broken bone, elevate the injured part above the level of the heart.
- Apply a pressure bandage to hold the dressing or cloth in place.
- Wrap the bandage snugly over the dressing to keep pressure on the wound.
- If blood soaks through the bandage, add more pads.
- Continue to monitor vital signs.
- Help the victim rest in a comfortable position.
- Maintain the victim's normal body temperature.
- Reassure the victim.
- Care for the victim's other injuries or conditions.

Burns

- Classify burns by the depth of injury; deeper burns are more severe. Treat burns in such a manner as to relieve pain, prevent infection and prevent or treat for shock.
- First-degree burns redden the skin much like sunburn. Immerse the affected area in cool water or cover it with a cloth soaked in cool water. If necessary, apply a dry dressing and cover it with a bandage.
- Second degree burns form blisters. Treat them in the same manner as first-degree burns.
- Do not break or try to remove any burned tissue. Do not apply any kind of antiseptic sprays or ointments. If possible, keep the affected area above the victim's heart.
- Seek medical treatment as soon as possible.
- Third degree burns char and destroy tissue. Call for medical help immediately. Treat for shock if necessary and continue treatment as for second-degree burns.

Broken Bones

Immobilize broken bones to prevent further injury. Stop any bleeding, treat for shock and seek medical attention.

Rescue Breathing

If a victim is not breathing, tend to them immediately. Use rescue breathing to maintain an airway and cause air to flow in and out of the lungs. Continue rescue breathing until the victim can breathe for themself or a doctor or other trained person takes responsibility. Initiate rescue breathing only if the victim still has a pulse; otherwise administer CPR.

Rendering Assistance from a Boat to Other Individuals Involved in an Accident

Be prepared to help others in trouble, but do not take unnecessary risks that could endanger your life. Do not panic, have lifesaving equipment ready, and approach the accident carefully. Watch for people in the water and throw floatation devices to people who do not have any such devices. Talk to the people and assess any injuries they may have.

Administer first aid if necessary and get the people to shore as quickly and safely as possible. Remember: do not overload your own boat with too many people. If necessary, take victims requiring the most assistance into the boat, and throw a line to the others, towing them slowly as you proceed.

Accident Reporting

Federal law states that if you are involved in a boating accident that includes injury requiring medical treatment, death, disappearance of a person, or property damage of at least $500, you must stop, identify yourself and your boat, and give help as needed. Additionally, you must file an accident report with the responsible local law enforcement agency and report the accident to your supervisor using the appropriate agency accident form. The safety officer or a supervisor should enter accidents causing injuries or near-misses into the Safety Management Information System (SMIS).

Many states have laws more stringent than federal law with regard to reporting accidents—check state-specific information. If in doubt, report the accident. Boating accidents include capsizing, crew overboard, collisions, fire, sinking and flooding, explosions and disappearance.

See Appendix A for CG_2692: Report of Marine Casualty and SECN Accident reporting SOP (SECN SOP 3.4.01, SECN 2021).

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Employee Accountability Form

I certify that I have read and I am familiar with SECN Standard Operating Procedure 3.1.02 *Safe Operation of Southeast Coast Network Watercraft*.

I understand that lack of compliance with this SOP may result in disciplinary action.

_____

Name

_____

Date

Appendix A—Field Forms

FLOAT PLAN

INSTRUCTIONS: Complete this plan before you go boating and leave it with a reliable person who can be depended upon to notify the Coast Guard, or other rescue agency, should you not return or check-in as planned. If you have a change of plans, or will be delayed, notify the person holding your Float Plan. Finally, close your plan by notifying the holder you have arrived home safely and if the holder has reported you overdue, notify all applicable rescue authorities of your safe return.

www.cgaux.org

Do NOT file this plan with the Coast Guard

www.uscgboating.org

VESSEL

IDENTIFICATION:

Name & Hailing Port _____

Document / Registration No._____ HIN_____

Year, Make & Model _____

Length _____ Type _____ Draft _____ Hull Mat._____

Hull & Trim Colors _____

Prominent Features _____

COMMUNICATION:

Radio Call Sign / Number _____

DSC MMSI No. _____

Radio-1: Type _____ Ch. / Freq. Monitored _____

Radio-2: Type _____ Ch. / Freq. Monitored _____

Cell / Satellite _____

Email _____

PROPULSION:

Primary-- Type _____ Eng.___ Fuel Capacity _____

Auxiliary--Type _____ Eng.___ Fuel Capacity _____

NAVIGATION: (Check all onboard)

☐ Compass ☐ Radar ☐ GPS / DGPS ☐ Depth Sounder

☐ Charts ☐ Maps ☐ _____

SAFETY & SURVIVAL

VISUAL DISTRESS SIGNALS:

☐ Electric Distress Light (night only)
☐ Flag (day only)
☐ Flare, Aerial (day & night)
☐ Flare, Handheld (day & night)
☐ Signal Mirror (day only)
☐ Smoke (day only)

AUDIBLE DISTRESS SIGNALS:

☐ Bell
☐ Horn
☐ Whistle

EPIRB:

UIN* _____

ADDITIONAL GEAR:

☐ Anchor - Line length _____
☐ Dewatering device
☐ Exposure suits
☐ Fire Extinguisher
☐ Flashlight / Searchlight
☐ Raft / Dinghy
☐ Food for _____ days / person
☐ Water for _____ days / person
☐ _____
☐ _____
☐ _____
☐ _____

PERSONS ONBOARD

OPERATOR:

Name _____ Has experience with: ☐ this vessel; ☐ the boating area(s).

Address _____ Home Phone _____

City _____ State ____ Zip Code _____ Vehicle (Year, Make & Model) _____

Age ____ Gender ___ PFD ☐ PLB UIN* _____ Vehicle License No. _____ Trailer ☐

Note _____ Vehicle parked at _____

Float Plan Note _____

PASSENGERS / CREW: (Identify all on board)

	Name	Home Phone	Age	Gender	PFD	Note	Passenger PLB UIN* (Not listed in a specific order)
1.					☐		
2.					☐		
3.					☐		
4.					☐		
5.					☐		
6.					☐		
7.					☐		
8.					☐		
9.					☐		
10.					☐		
11.					☐		
12.					☐		

If you have a genuine concern for the safety or welfare of the persons onboard this vessel that have not returned or checked-in, in a reasonable amount of time, then follow the step-by-step instructions on the Boating Emergency Guide™ located on the last page of this Float Plan.

(*) EPIRB and PLB registration required by Federal regulations. www.beaconregistration.noaa.gov

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Figure A-1. Coast guard float plan, page one.

FLOAT PLAN continued

www.cgaux.org

INSTRUCTIONS: Complete this plan before you go boating and leave it with a reliable person who can be depended upon to notify the Coast Guard, or other rescue agency, should you not return or check-in as planned. If you have a change of plans, or will be delayed, notify the person holding your Float Plan. Finally, close your plan by notifying the holder you have arrived home safely and if the holder has reported you overdue, notify all applicable rescue authorities of your safe return.

Do NOT file this plan with the U.S. Coast Guard

www.uscgboating.org

CONTACTS

Contact 1 _____ Phone Number _____

Contact 2 _____ Phone Number _____

Rescue Authority _____ Phone Number _____

ITINERARY

		DATE	TIME	LOCATION / WAYPOINT	MODE OF TRAVEL	REASON FOR STOP	CHECK-IN TIME
1	Depart						
2	Arrive						
	Depart						
3	Arrive						
	Depart						
4	Arrive						
	Depart						
5	Arrive						
	Depart						
6	Arrive						
	Depart						
7	Arrive						
	Depart						
8	Arrive						
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9	Arrive						
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14	Arrive						
	Depart						
15	Arrive						
	Depart						
16	Arrive						
	Depart						
17	Arrive						
	Depart						
18	Arrive						
	Depart						
19	Arrive						
	Depart						
20	Arrive						
	Depart						
21	Arrive						

If you have a genuine concern for the safety or welfare of the persons onboard this vessel that have not returned or checked-in, in a reasonable amount of time, then follow the step-by-step instructions on the Boating Emergency Guide™ located on the last page of this Float Plan.

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Figure A-2. Coast guard float plan, page two.

USCG Float Plan - BOATING EMERGENCY GUIDE™

BEFORE YOU BEGIN – This guide is designed to work either with or without a Float Plan. You will need the following items: 1) the Float Plan, if one was given to you; 2) a pen or pencil; 3) a clean sheet of paper or writing tablet; and 4) your local telephone directory.

Step 1: Do you have a genuine concern for the safety or welfare of any persons who have not returned or checked-in, in a reasonable amount of time?

If yes, then continue with **Step 2**. Otherwise STOP – no further action is required at this time.

Step 2: Were you given a prepared Float Plan by anyone on board the vessel?

If yes, then continue with **Step 3**. Otherwise, go to **Step 5**.

Step 3: Locate the Contacts at the top of page 2 on the Float Plan. Call Contact number 1…

IF CONTACT #1	THEN
Answers phone	Take notes during your conversation. 1. Let the person know you are responding to a late return or check-in by the individuals designated on the Float Plan. 2. Determine if the person you are talking to, or anyone else at that location, has recently had contact with anyone on the vessel, and when and where that contact occurred. 3. Are you still concerned about the safety or welfare of any persons on board the vessel?
	IF / **THEN** Yes – Continue with **Step 4**. No – STOP. No further action is required.
Does not answer phone	Continue with **Step 4**.

Step 4: Call Contact number 2…

IF CONTACT #2	THEN
Answers phone	Take notes during your conversation. 1. Let the person know you are responding to a late return or check-in by the individuals designated on the Float Plan. 2. Determine if the person you are talking to, or anyone else at that location, has recently had contact with anyone on the vessel, and when and where that contact occurred. 3. Are you still concerned about the safety or welfare of any persons on board the vessel?
	IF / **THEN** Yes – Continue with **Step 6**. No – STOP. No further action is required.
Does not answer phone	Continue with **Step 6**.

Step 5: Using the checklist below, jot down only what you know about each item:

DO NOT SPECULATE. Incorrect information may mislead Search and Rescue personnel; add to the overall search and rescue time; and adversely affect the outcome.

- ☐ Period of time the vessel has been overdue.
- ☐ Purpose of the trip or voyage.
- ☐ Description of vessel. (Type, size, color, features, etc.)
- ☐ Vessel's departure point and destination.
- ☐ Places the vessel planned to stop during transit.
- ☐ Navigation equipment aboard. (Examples: GPS, radar, compass, sounder, etc.)
- ☐ Number of persons aboard. Relevant characteristics such as dependability, reliability, etc.
- ☐ Was the vessel initially docked or moored or did a vehicle tow it to a launch point?
- ☐ License plate number and description of the tow vehicle p and/or the passenger's transport vehicle.
- ☐ Communications equipment aboard, including type of radio and frequencies monitored, cellular or satellite telephone numbers of individuals, etc.
- ☐ Additional points of contact along the vessel's planned route.
- ☐ Operator and/or a passenger/crew member absolutely had to be back at the scheduled return time.
- ☐ Call your local Rescue Authority that responds to marine emergencies (Police. Sheriff, Constable, First responder, etc.).

Go to **Step 6–2**.

Step 6:

1. Call the Rescue Authority contact at the top of page 2 on the Float Plan.
2. Tell the dispatcher you are responding to a late return or check-in by the persons on board the vessel.
3. The dispatcher will instruct you from there.

Note: The dispatcher will provide you with the necessary contact or agency connection to get a search and rescue mission started. This puts you in direct contact with the agency conducting the actual search and rescue, eliminating unnecessary middlemen.

The dispatcher will tell you if he/she desires a follow-up call on the outcome of the rescue.

4. Continue with **Step 7**.

Step 7: Be patient… you've done everything you can possibly do for now. It is important to keep the telephone available so emergency personnel can contact you with additional information and/or questions concerning the search and rescue effort.

STOP -- End of Guide

Provided as a courtesy by:

<Unit or Organization Name>
<City>, <State>
<phone number>
<website URL>
Get a Vessel Safety Check before you go boating.

USCG Float Plan

The USCG Float Plan is the official Float Plan of the U.S. Coast Guard and U.S. Coast Guard Auxiliary. For more information visit:

www.floatplancentral.org

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Figure A-3. Coast guard float plan, page three.

In Case of Emergency:

Vehicle Ownership: Southeast Coast Network, National Park Service_____

Vehicle Operator: _____Cell Phone:_____

Date: _____Float Plan Filed This Date:_____

Float Plan Point of Contact #1:_____

Phone Number: _____

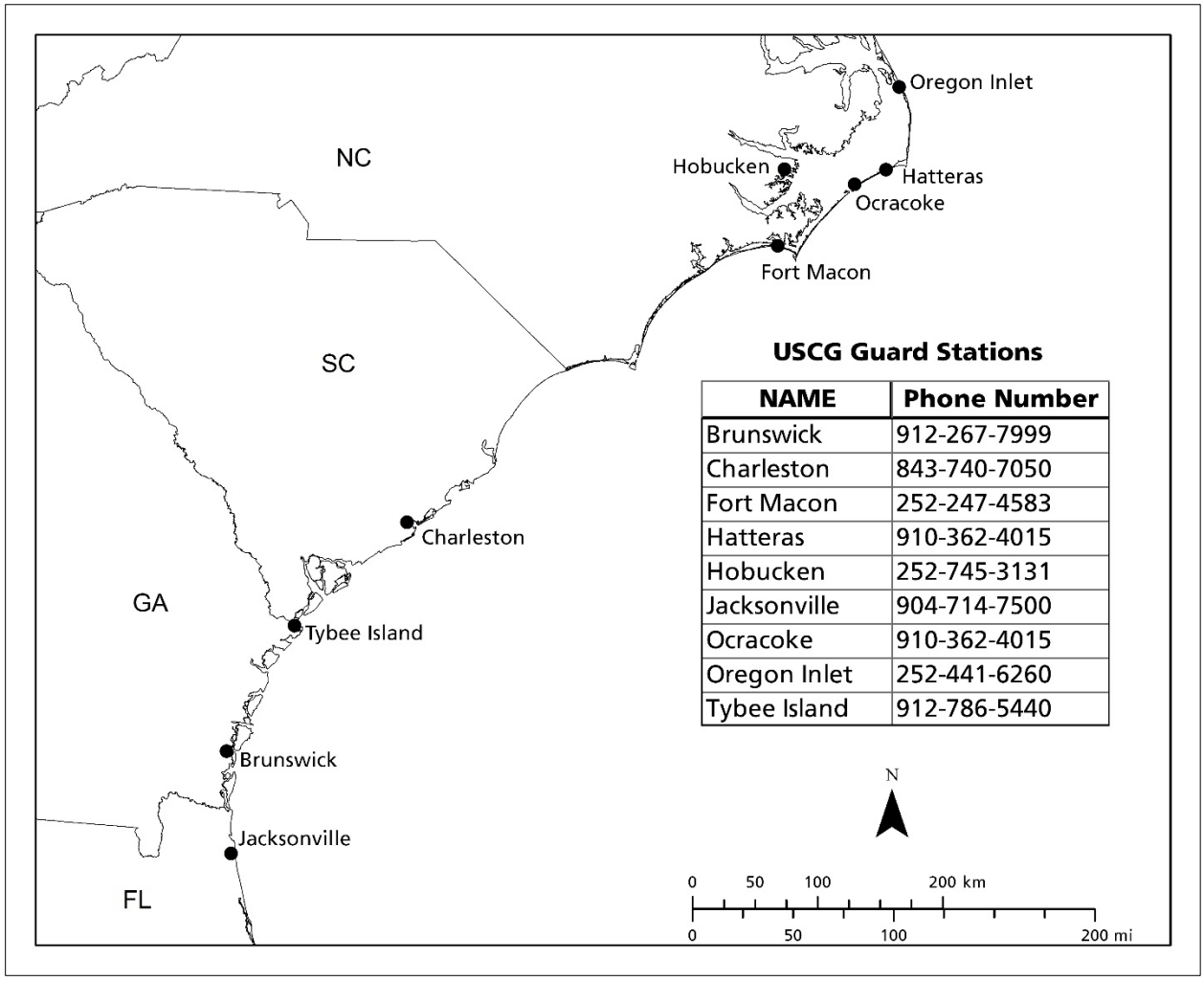
Float Plan Point of Contact #2:_____

Phone Number #2:_____

Other Emergency Contact/Phone #:_____

Figure A-4. Emergency contact information for unattended boats.

Appendix B—Coast Guard Contact List



USCG Guard Stations

NAME	Phone Number
Brunswick	912-267-7999
Charleston	843-740-7050
Fort Macon	252-247-4583
Hatteras	910-362-4015
Hobucken	252-745-3131
Jacksonville	904-714-7500
Ocracoke	910-362-4015
Oregon Inlet	252-441-6260
Tybee Island	912-786-5440

Figure B-1. Coast Guard contact list for Southeast Coast Network parks. Emergency use only.

Appendix C—Boat Operations Checklist

Boat Pre-Start

- □ File Float Plan
- □ Install hull plugs
- □ Check fuel level
- □ Check mooring lines
- □ Check engine oil
- □ Check fuel line
- □ Check battery and cable connection
- □ Check anode
- □ Verify safety equipment
- □ Flares (check expiration)
- □ PFDs (for everyone in boat)
- □ Fire extinguisher
- □ Throwable life preserver
- □ Emergency kit
- □ Turn on power switch
- □ Choke (as necessary)
- □ Pump fuel bulb (as necessary)
- □ Crank
- □ Verify coolant discharge

While Running

- □ Check coolant periodically
- □ Check jet drive intake (for vegetation, shells, or sand that has been sucked in)
- □ Trailering
- □ Check Zerk fittings
- □ Check straps
- □ Check tires
- □ Check hitch (hitch, locks, chains)
- □ Check lights
- □ Empty boat of loose gear

Boat Post-Use

- □ Check oil
- □ Pull hull plugs
- □ Connect freshwater wash and crank engine (run for 15 minutes)
- □ Clean boat and trailer
- □ Clean bilge
- □ Grease jet drive (low pressure)
- □ Dry and stow gear
- □ See trailering
- □ Refuel tanks
- □ Clean life jackets