

Cold Water Immersion: A Hands-on Approach
Instructor Manual

Cold Water Immersion: A Hands-on Approach

U.S. Coast Guard Nonprofit Grant Project
From the National Water Safety Congress



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Cold Water Immersion: A Hands-on Approach **Instructor Manual**

TABLE OF CONTENTS

Course Purpose

Learning Objectives

Instructor Lesson Plan

Sample Exercises/Activities (minimum, more needed)

Choosing and Using Life Jackets: Life Jacket Types and Uses

Background Resources

- Survivor Found in NFL Boating Accident
- Cold Water Immersion Response Factors
- Overview
- Causes of Cold Water Immersion
- Effects of Cold Water Immersion
- Preparing for Cold Water Immersion

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Cold Water Immersion: A Hands-on Approach **Instructor Manual**

COURSE PURPOSE

Cold Water Immersion: A Hands-on Approach is a train-the-trainer program designed to spread the message about the dangers of cold water immersion and the importance of wearing a life jacket to reduce the risk of death. The program was developed to teach trainers how to deliver the message and to equip them with the tools and resources they need to present it effectively. The key messages of the program is to stress the importance of preparation, wearing your life jacket and how to respond in the event of a sudden, accidental cold water immersion.

The program will communicate to the target audience - *boating safety and injury prevention advocates* - information they need and the resources available to help them make boaters aware of the risks of not wearing a life jacket – particularly when boating in cold water (generally accepted as temperatures below 70° F.) In addition to this *Instructor Manual*, the initiative includes a variety of resources and information leveraging materials already available in the public domain.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

LEARNING GOALS and OBJECTIVES:

The goal of this presentation is to raise awareness and instill effective boating and water safety principles around the heightened risk of Cold Water Immersion among the boating and outdoor recreation public. Upon completion of this training program, professional and laymen instructors alike will be able to:

- Describe and present the inherent risks associated with sudden exposure to Cold Water Immersion and the relative increase in risks of Cold Water Immersion as water temperatures decrease;
- Convey the importance of wearing a life jacket as the single greatest mitigating factor in surviving sudden Cold Water Immersion;
- Communicate and instill the message of the “**1-10-1**” concept in surviving Cold Water Immersion; and
- Provide hands-on activities and experiences to reinforce key messages around Cold Water Immersion’s impact on manual dexterity, self-rescue efforts and the critical value of advanced preparation and planning.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

INSTRUCTOR LESSON PLAN

- ✓ Instructor Preparation
- ✓ Module 1 - Introduction and Overview
- ✓ Module 2 - Understanding the Risks of Cold Water Immersion: Debunking Hypothermia
- ✓ Module 3 - Mitigating the Risks of Cold Water Immersion: Life Jackets Save Lives
- ✓ Module 4 - Surviving Cold Water Immersion: Remembering 1-10-1 -- the Survival Code!
- ✓ Module 5 - "Hands-On" & "Hands-In:" Sample Exercises and Activities

INSTRUCTOR PREPARATION	
<p>This module is scheduled to take 5 minutes.</p> <p>Teaching Topics:</p> <ul style="list-style-type: none">✓ Welcoming Remarks✓ Instructor Introduction✓ Review of Course Objectives <p>Prior Planning Needs:</p> <ul style="list-style-type: none">✓ Be able to explain to course purpose and rationale for exercises✓ Anticipate age-appropriate exercises for audiences/mixed audiences✓ Make accommodations for chill tank or cold water container✓ Consider safety implications for spilled water and wet surfaces <p>Important Considerations:</p> <ul style="list-style-type: none">✓ Be aware of extreme negative responses to cold water	

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

<p>MODULE 1 – INTRODUCTION AND OVERVIEW</p> <p>This module is scheduled to take 5 minutes.</p> <p><u>Learning Objective:</u> Participants will be introduced to the instructor and learn the goals and objectives for the course.</p> <p>Welcoming remarks and introduction:</p> <ol style="list-style-type: none"> 1. Welcome to Cold Water Immersion, a hands on course in surviving sudden cold water immersion 2. Instructor Introductions <ol style="list-style-type: none"> a. Principle Instructor b. Other instructor information 3. Course Goals and Objectives: <p>SLIDE 6 GOAL: Upon completion of this training program, professional and laymen instructors alike will be able to foster awareness of the heightened risk of Cold Water Immersion among the boating and outdoor recreation public</p> <p>SLIDE 7 OBJECTIVES:</p> <ul style="list-style-type: none"> - Describe and present the inherent risks associated with sudden exposure to cold water and the relative increase in risks as water temperatures decrease; - Convey the importance of wearing a life jacket as the single greatest mitigating factor in surviving sudden cold water immersion; - Communicate and instill the message of the “1-10-1” concept in surviving cold water immersion; and 	<p>Course PowerPoint Presentation Slides</p> <p>SLIDE 1 (cover slide)</p> <p>SLIDE 2 (USCG fund, and materials from Alaska)</p> <p>SLIDE 3 (cover slide again)</p> <p>SLIDE 4 (Module 1 cover slide)</p> <p>SLIDE 5 (instructor contact information)</p> <p>SLIDE 6 (course goal)</p> <p>SLIDE 7 (course objectives)</p>
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Cold Water Immersion: A Hands-on Approach

Instructor Manual

- Provide hands-on activities and exercises to reinforce key messages around cold water immersion's impact on manual dexterity, self-rescue efforts and the critical value of advanced preparation and planning.

SLIDE 8

Helpful Statistics:

- Cold Water Immersion is not just a “northern” boating issue. Cold Water is of concern in all climates, including temperate ones.
- Most open water drownings (55%) occur within 10 feet of safety, while more than 40% occur within about six feet.
- As many as two-thirds of open-water, cold water drowning victims were known to be good swimmers.
- Most drownings/fatal boating accidents as a percent of total accidents occur in colder months.

SLIDE 8 (Helpful Statistics)

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

<p>MODULE 2 - UNDERSTANDING THE RISKS OF COLD WATER IMMERSION: DEBUNKING THE MYTH OF HYPOTHERMIA</p> <p><u>Learning Objective:</u> Participants will be able to recount specific risks associated with sudden exposure to cold water and understand the relative increase in risks as water temperatures decrease.</p> <p>SLIDE 10 Hypothermia is a medical emergency that occurs when your body loses heat faster than it can produce heat</p> <p>SLIDE 11 Cold Water Immersion can be sudden, fatal AND survived.</p> <p>SLIDE 12 1) Cold water immersion can be SUDDEN: <u>Swamping/Overloading</u></p> <ul style="list-style-type: none"> • due to overloading, • poorly secured or shifting loads, • improper boat handling, • loss of power or steering, • anchoring from the stern, • wrapping an anchor, mooring, or pot line around a drive unit, or • Taking a wave over the transom during a sudden stop. 	<p>SLIDE 9 (Module 2 cover slide)</p> <p>SLIDE 10 Hypothermia is a medical emergency that occurs when your body loses heat faster than it can produce heat, causing a dangerously low body temperature. Normal body temperature is around 98.6 F (37 C). Hypothermia (<i>hi-poe-THUR-me-uh</i>) occurs as your body temperature falls below 95 F (35 C). [<i>Mayo Clinic, 1/18</i>]</p> <p>SLIDE 11 Cold Water Immersion can be SUDDEN Cold Water Immersion can be FATAL Cold Water Immersion can be SURVIVED</p> <p>SLIDE 12 From Swamping & Overloading</p> <ul style="list-style-type: none"> • due to overloading, • poorly secured or shifting loads, • improper boat handling, • loss of power or steering, • anchoring from the stern, • wrapping an anchor, mooring, or pot line around a drive unit, • Taking a wave over the transom during a sudden stop.
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Cold Water Immersion: A Hands-on Approach

Instructor Manual

SLIDE 13

Falling Overboard

- most commonly due to slipping,
- loss of balance while standing or moving around the boat,
- striking another boat or object,
- sudden grounding, or
- when reaching for objects overboard

SLIDE 14

Ejection

- while the boat is underway, a sudden change in speed or direction, or
- striking an object or other vessel, causing passengers

SLIDE 15

Swimming to retrieve drifting boat, dog or person

- a loose boat drifting is an irresistible impulse to intentionally leave a place of safety to swim after it
- **Don't do it**
- **Don't become the second victim**

SLIDE 16

2) Cold water immersion can be **FATAL** (in three ways):

- Cold Shock Response
- Cold Incapacitation

SLIDE 13

From Falling Overboard

- most commonly due to slipping,
- loss of balance while standing or moving around the boat,
- striking another boat or object,
- sudden grounding, or
- When reaching for objects overboard.

SLIDE 14

From Ejection from the boat

- while the boat is underway, a sudden change in speed or direction, or
- striking an object or other vessel, causing passengers and/or the operator to be ejected from the boat.

SLIDE 15

While Swimming to Retrieve Drifting Boat

- A person, dog in need of help or loose boat drifting is an almost irresistible impulse to intentionally leave a place of safety to swim after it.
- **Don't do it**
- **Don't become the second victim.**

SLIDE 16

Cold Water Immersion can be **FATAL** in three ways:

- Cold Shock Response
- Cold Incapacitation

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

<ul style="list-style-type: none">• Immersion Hypothermia <p>SLIDE 17 <i>However, of all the ways to die from cold water immersion, hypothermia is the <u>least likely</u>. Note: The media will almost certainly declare a person died of hypothermia rather than cold shock or swim failure.</i></p> <p>SLIDE 18 <i>What really happens to the body when suddenly immersed in cold or very cold water?</i></p> <p><u>First, Cold Shock Response</u></p> <ul style="list-style-type: none">• Occurs within the first 1- 3 minutes• Involuntary gasping & hyperventilation• Panic, vertigo result in water inhalation• Higher risk of drowning if not wearing a life jacket.• The symptoms of underlining or undetected health issues (heart or blood pressure issues for example) could be amplified leading to death.	<ul style="list-style-type: none">• Immersion Hypothermia <p>SLIDE 17 <u>Drowning</u> is the number one concern in cold water immersion.</p> <p>You are more likely to <u>drown</u> than to die from <u>hypothermia</u>.</p> <p>SLIDE 18 Cold Shock Response</p> <ul style="list-style-type: none">• Occurs within the first 1- 3 minutes• Involuntary gasping & hyperventilation• Panic, vertigo result in water inhalation• Higher risk of drowning if not wearing a life jacket. <p>When water temperature is below 50 degrees Fahrenheit, the death-to-accident ratio is over 45%!</p> <p><u>Drowning</u> is the number one concern in cold water immersion!</p> <p>Roughly twenty (20) percent of those who fall into cold water die in the first minute of immersion due to cold water shock.</p>
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Cold Water Immersion: A Hands-on Approach

Instructor Manual

SLIDE 19

After Cold Shock Response, what happens next?

Second, Cold Incapacitation

Cold incapacitation occurs as the result of your body's unconscious effort to maintain its core temperature by restricting blood flow to its extremities.

- Is caused by localized cooling of extremities affects muscles and nerves, impairing their function.
- Occurs within 30 minutes of immersion.
- Results in fingers, arms and legs becoming stiff and unresponsive.
- Results in activities such as swimming, re-boarding a boat, using a radio or distress signal, or holding on to a floating object to become very difficult or impossible.
- Creates a higher risk of drowning (even for good swimmers) if not wearing a life jacket.

SLIDE 20

What is the ultimate impact on the body of sustained of cold water immersion?

Finally, Immersion Hypothermia

Let students know that Hypothermia is defined as a core body temperature of less than or equal to 35° C (less than or equal to 95° F).

This would let students know that what type of body temperature are being talked about and give them a better

SLIDE 19

Cold incapacitation occurs as the result of your body's unconscious effort to maintain its core temperature by restricting blood flow to its extremities.

- Is caused by localized cooling of extremities affects muscles and nerves, impairing their function.
- Occurs within 30 minutes of immersion.
- Results in fingers, arms and legs becoming stiff and unresponsive.
- Results in activities such as swimming, re-boarding a boat, using a radio or distress signal, or holding on to a floating object to become very difficult or impossible.
- Creates a higher risk of drowning (even for good swimmers) if not wearing a life jacket.

SLIDE 20

Immersion Hypothermia

- Occurs after at least 30 minutes after immersion, depending on factors.
- Gradual cooling of the body core will occur at a rate dependent upon factors including water temperature, clothing worn, body type, physical condition and other factors.
- As body core temperature falls, hypothermia symptoms will range

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

understanding that people will die from symptoms they experience “on the road” to clinical hypothermia.

Immersion Hypothermia

- Occurs after at least 30 minutes (and up to one hour or more) of immersion, depending on factors
- Gradual cooling of the body core will occur at a rate dependent upon factors including water temperature, clothing worn, body type, physical condition and other factors
- As body core temperature falls, hypothermia symptoms will range from mild to severe, eventually unconsciousness.
- Higher risk of drowning if not wearing a life jacket.

SLIDE 21

Hypothermia is the result of long term (30 minutes plus) cold water immersion. Cold water incapacitation and hypothermia are a function of body weight, water temperature and exposure time.

Of more than 5,000 drownings in Canada over a ten-year period, cold water immersion was linked to an incredible 35%!

Although 30 minutes can be the minimum exposure time to result in Immersion Hypothermia, data shows that, depending on body weight, type and gender, survival time for some - even in water as cold as 50°F – could exceed more five hours!

from mild to severe, eventually unconsciousness.

- Higher risk of drowning if not wearing a life jacket.

“One should hope to live long enough to die from hypothermia” (following sudden cold water immersion.)

SLIDE 21

Temperature, Weight and Time Chart

Depending on variables like gender, weight and body type, survival time in water as cold as 50°F may exceed five hours or longer!

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

SLIDE 22

The biggest takeaways:

Cold water immersion can be **SURVIVED!**

Cold water immersion is survivable with some key knowledge and preparation.

By preparing for sudden unexpected cold water immersion, by wearing a life jacket at all times and by remembering the simple 1-10-1 Principle, you can take steps to survive!

This module concludes with some important pointers for effective, advanced preparation in cold water boating environments.

Modules 3 and 4 follow with a closer look at how life jackets save lives in cold water and how to use the 1-10-1 principle “to stay calm and float on.”

SLIDE 23

Preparing for Cold Water Immersion

Most immersion events happen quickly and unexpectedly. So, while prevention is best, it is also important to be prepared. Taking these simple steps will help ensure the best possible outcome:

- Always wear a life jacket when in an open boat or on an open deck. Trying to put your life jacket on in cold water is extremely difficult (if not impossible) and costs precious time and energy.

SLIDE 22

Cold water immersion can be **SURVIVED!**

PREPARING for the worst case scenario

WEARING your life jacket at all times

REMEMBERING the 1-10-1 Principle

SLIDE 23

PREPARATION: Planning to Survive!

- Always wear a life jacket in an open boat. May not be able to reach a life jacket, even if it is on deck.
- Putting your life jacket on in cold water is extremely difficult – **cost precious time!**
- Carry emergency communication and distress signaling devices **ON YOUR PERSON.**
- Using an emergency locator beacon, a small hand held VHF radio, a

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

- Carry emergency communication and distress signaling devices ON YOUR PERSON. An emergency locator beacon, a small hand held VHF radio, a waterproof cell phone, a whistle, and some visual distress signals may save the day. Today's devices are smaller, lighter, and easy to carry.
- Unless the boat is designed so that a person in the water can easily get back into the boat unassisted, equip the boat with a re-boarding ladder, rope ladder, foot sling, or a swim platform.

SLIDE 24

Introduce outboard motor trick.

waterproof cell phone, a whistle, and some visual distress signals may save the day.

- Equip the boat with a re-boarding ladder, rope ladder, foot sling, or a swim platform (or ensure the boat is designed so that a person in the water can easily re-board unassisted.) All of these options should be tested in warm water to ensure you can re-board the boat when needed.

SLIDE 24

- If a boat equipped with an outboard motor is upright and there are no accommodations made for a person who has fallen overboard to get in, there is a trick that could be used to re-board the vessel. (**Note: there are risks involved in this technique and it should be used ONLY as a last resort and then the risk of remaining in the water is higher than attempting this maneuver. It should only be attempted when the motor is NOT running.**)
- On many boats, the least amount of freeboard is located where the outboard motor is attached to the transom. If you cannot board your boat in any other manner you can use this area to your advantage.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

SLIDE 25

Explain outboard motor trick.

- This technique involves using the outboard motors anti-cavitation plate (the horizontal fin above the propeller) as a step. First, ensure that the motor is NOT RUNNING, then grab the gunwale or anything else that you can use to help pull you on to the boat. Next place a foot on top of the motors anti-cavitation plate, using your leg(s) and arms, try to stand on this plate. Once you are standing on the motor look for fixtures or structures in the boat that you could grab and pull yourself into the boat.
- **This technique should only be used as a last resort.**

SLIDE 26

- Carry survival suits. Make sure they are well maintained and readily accessible.
- Paddlers should consider using wet or dry suits.
- Practice re-boarding your boat, donning survival suits quickly, signaling, simulate transmitting MAYDAYs, recovering a person overboard, and other cold-water survival techniques described in this section.
- Drills are fun and build skill and confidence.

SLIDE 25

- This technique involves using the outboard motors anti-cavitation plate (the horizontal fin above the propeller) as a step. First, ensure that the motor is NOT RUNNING, then grab the gunwale or anything else that you can use to help pull you on to the boat. Next place a foot on top of the motors anti-cavitation plate, using your leg(s) and arms, try to stand on this plate. Once you are standing on the motor look for fixtures or structures in the boat that you could grab and pull yourself into the boat.
- **This technique should only be used as a last resort.**

SLIDE 26

- Carry survival suits (and make sure they are well maintained and readily accessible.)
- Practice re-boarding, donning survival suits quickly, signaling, simulate transmitting MAYDAYs, recovering a person overboard.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

(The gasp reflex followed by panic, hyperventilation and vertigo)
What happens if we are submerged or partially submerged when the gasp reflex happens?

(Inhaling water, choking, leading to more gasping and inhalation of water)

How would wearing a life jacket help in this scenario?

What is hyperventilation and how can it lead to panic and make problems worse?

How could a life jacket make difference in the way you might respond to sudden immersion?

SLIDE 31

A popular phrase encourages us to:
Stay Calm and Carry On

Panic is a killer. In virtually every emergency situation panic leads to less than desirable outcomes.

Not only does panic rob us of the intellectual capacity to make good decisions, it creates a viscous cycle that causes us to spiral downward (literally). Mention the compounding of small bad decisions lead to irreversible consequences.

How could wearing your life jacket change the panic equation?

What do we mean by the term vertigo? And how could it impact our ability to survive in cold water?

SLIDE 31

Life Jackets Save Lives: During a Cold Shock Response

STAY CALM and CARRY ON

WEAR YOUR LIFE JACKET and FLOAT ON

VERTIGO

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

(Vertigo: Not knowing up from down – a very dangerous scenario when managing sudden cold water immersion)

Could wearing a life jacket help?

*Could wearing a life jacket help you gain control, plan your next step and overcome the consequences of **Cold Water Shock**??*

SLIDE 32 **Cold Incapacitation**

*Following Cold Water Shock, what happens in the second phase of sudden cold water immersion (called **cold incapacitation**)?*

Recall that within 10-30 minutes there is localized cooling of extremities, muscle and nerve function are impaired, arms and legs become stiff and unresponsive.

SLIDE 33
Activities such as swimming, re-boarding a boat, using a radio or distress signal, or holding on to a floating object becomes difficult or impossible Perhaps give an example that folks might be able to relate to.

– Did you ever make snowballs as a child without gloves on? How did your fingers feel afterwards? Did they become stiff and hard to move?

Higher risk of drowning (even for good swimmers) if not wearing a life jacket.

SLIDE 32 **Life Jackets Save Lives:** **During a Cold Incapacitation**

- Localized cooling of extremities.
- Impairs function of muscles, nerves.
- Legs become stiff and unresponsive.

SLIDE 33 **Life Jackets Save Lives:** **During a Cold Incapacitation**

- Swimming & re-boarding are difficult
- Hard using radio or distress signal
- Holding on to floating object becomes very difficult.....or impossible!

BUT, what if the floating object (like, say a life jacket) was holding on to you?

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

How could wearing a life jacket help you survive the onset and eventual outcomes of Cold Water Incapacitation?

Could a life jacket aid in swimming or potentially re-boarding (if action is taken promptly)?

Could a life jacket make it easier to hold and operate a radio or activate a distress signal?

Could wearing a life jacket help you stay afloat?

Could it help you stay afloat long enough to get help or rescue yourself?

SLIDE 34

Help (or Self-Rescue) is Often Nearby

According to Professor Michael Tipton of the Institute for Naval Medicine in England, a study of drowning data revealed that more than 50% of open-water drowning deaths occurred within a mere three meters (or about ten feet) of safety, and more than 40% were within two meters (or roughly six feet) of safety.

Rocket Scientist Question #1: How could wearing a life jacket possibly make a difference in these open-water, sudden cold water immersion scenarios?

Rocket Scientist Question 2: How could wearing a life jacket possibly make a difference in a recreational boating sudden cold water immersion?

Could help or self-rescue still be nearby?

SLIDE 34

Life Jackets Save Lives: While Waiting for Help or Effecting Self-Rescue

- > 50% of open-water drowning victims were within 10 feet of safety.
- > 40% were within 6 feet!

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

SLIDE 35

Relate the powerful story of former University of South Florida football player Nick Schuyler:

This photo released by the U.S. Coast Guard, shows Nick Schuyler clinging to the engine of an overturned boat in the Gulf of Mexico, as the U.S. Coast Guard approaches in a rescue on Monday, March 2, 2009.

Schuyler, two NFL football players Marquis Cooper and William Buckley as well as a third friend, Corey Smith, left Clearwater on a fishing trip on Saturday morning and did not return. The other three went missing.

Schuyler told rescuers that the 21-foot boat was anchored when it flipped Saturday evening in rough seas and that the others got separated from the boat. *Schuyler, who was wearing a life jacket, had been clinging to the boat through the night.*

<https://www.cbsnews.com/news/survivor-found-in-nfl-boating-accident/>

Even in the Gulf of Mexico, where the water temperature was 68° at the time of the accident, Coast Guard officers estimated Schuyler was within five hours of succumbing to hypothermia. *Wearing a life jacket and climbing back aboard his overturned boat saved his life.*

How could the outcome have been different if Schuler wasn't wearing his life jacket?

SLIDE 35

**Life Jackets Save Lives:
While Waiting for Help or
Effecting Self-Rescue**

(image of rescued NFL player on overturned boat in the middle of Gulf of Mexico)

- Temperature of the water at the time of the NFL boating accident: 68°.

Thanks to his life jacket and his ability take appropriate measures to get out of the water before becoming incapacitated – *where self-rescue was literally just a few feet away* – **Nick Shuyler survived!!**

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Cold Water Immersion: A Hands-on Approach **Instructor Manual**

Recap:

Regardless of where you find yourself in the event of a sudden cold water immersion, wearing your life jacket is the single greatest intervention you can take to survive.

In the face of **Cold Water Shock** and the sudden gasp reflex, wearing a life jacket **MAY BE** your only shot at a second chance!

That means getting your breathing under control and thinking about your next step.

Even if you are unable to get immediate help or effect self-rescue, wearing your life jacket **MAY BE** the only way to help you overcome the onset of **Cold Water Incapacitation** due to loss of muscle control!

Floating is better than sinking when it comes to swimming, trying to re-board, activating a distress signal or simply staying alive long enough to be rescued.

Wearing a life jacket in this distressed situation gives you options for survival that just don't exist without one.

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Cold Water Immersion: A Hands-on Approach
Instructor Manual

Module 4 - Surviving Cold Water Immersion: Remembering 1-10-1 -- the Survival Code!

If remembering a code as simple as 1-10-1 could save your, would that be worth committing to memory?

SLIDE 37

*Three numbers: **Remember 1-10-1***

We have learned that surviving cold water immersion depends, first, on adequate flotation to prevent drowning, and timely self-rescue or rescue by others.

And, we know that wearing a life jacket, carrying a communication and distress signaling device, the ability to swim, a controlled entry into the water, surface conditions, length of time in the water, associated injuries or medical conditions, and alcohol use can all influence the outcome.

But 1-10-1 is an easy way to remember what to do in the event of sudden cold water immersion. (*Note: the information below does not apply to all persons in all cases, but it is the most important guideline to follow.*)

In its simplest form, the 1-10-1 code means one (1) minute, ten (10) minutes and one (1) hour. Now let's break that down in the context of surviving cold water immersion:

What do we mean by one minute?

SLIDE 36 (Module 4 cover slide)

SLIDE 37

1-10-1
ONE
TEN
ONE

If you can only remember ONE thing, **this is it!**

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Cold Water Immersion: A Hands-on Approach
Instructor Manual

SLIDE 38

One (1) Minute

- The initial reaction/cold shock response stage, including the gasping reflex, usually passes within one to three (1-3) minutes.

Try to stay calm and wait for the effects of cold water shock to subside.

Understanding this stage will soon pass may help reduce panic.

SLIDE 39

Ten (10) Minutes

Once breathing is under control, most people have at least ten minutes to take the actions necessary for self-rescue or for obtaining rescue before cold water incapacitation occurs.

Do not waste time and energy removing shoes or clothing. Even small amounts of air trapped in clothing will provide some buoyancy and thermal protection.

Perform the most important functions first:

If not already wearing, attempt to don life jackets or survival suits, and then assist others in doing so.

Account for any other members of the party. Check around and under the boat.

If not already deployed (and depending on the circumstances), activate emergency communication and/or distress signaling

SLIDE 38

1-10-1

1 Minute:

- Cold shock response phase usually passes in 1-3 minutes.
- Stay calm, gain control of your breathing and wait for effects to subside.
- Understanding that this stage will soon pass may help reduce panic.

SLIDE 39

1-10-1

10 Minutes:

- With life jacket on, you have about ten (10) minutes of meaningful movement.
- Account for others in your party.
- Develop and execute survival plan.
- Use that time to summon help, try re-boarding or swim for safety.
- DO NOT waste time removing shoes and clothing.
- Even small amounts of air trapped in clothing will provide some buoyancy and thermal protection.
- Get as much of your body OUT OF THE WATER as you can.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

devices such as an emergency locator beacon, transmit a MAYDAY on a VHF marine radio, or call 911 on a phone.

If in range of others, activate visual, sound distress signals.

Get all persons as much out of the water as is possible. Water transfers heat much faster than air of the same temperature.

For example, if the boat is not overturned, use the boat's re-boarding devices and practiced techniques to get back in. If overturned, climb on top of the hull.

If separated from the boat use any other available objects to get as much of your body out of the water as possible, even if it feels colder.

Make a plan.

SLIDE 40 **One (1) Hour**

Assuming you are wearing your life jacket, and assuming you took steps in the first minute of sudden cold water immersion to regain control of your breathing, and assuming you used the next ten minutes to develop and begin executing a plan, chances are you can survive in cold water for an hour, and probably a lot more depending your body weight and the temperature of the water.

SLIDE 40

1-10-1

1 Hour:

- Don't give up hope!
- You may have up to one hour of useful consciousness before a loss of consciousness and the onset of hypothermia, providing meaningful time for rescue or movement towards safety.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

This equates to at least one “golden” hour of consciousness that can be used to signal for help, summon assistance, pull yourself onto a floating object or swim for safety.

Simply knowing that the potential fatal effects of hypothermia can be forestalled for as long as hour or more can play a key role in bolstering your survival “instinct” and contributing to your overall survivability.

- Trigger your survival instinct with the awareness that – depending on your size and the relative water temperature – it could take an hour or more to succumb to hypothermia and/or lose consciousness.
 - This is why it is crucial to wear your life jacket to keep your head above water and assist in keeping an open airway.

SLIDE 41

1-10-1

1 Hour:

- Anything you can do to slow the rate of cooling by getting as much of your body out of the water as possible should be attempted.
- Even with limited mobility due to cold water incapacitation, you can often still make progress swimming for shore or a floatation aid to buoy more of your body out of the water.
- As long as you can remain afloat and maintain control of your breathing, there is always hope for rescue and survival!!

SLIDE 42

Hypothermia chart for men and women of different weights and body fat percentages.

SLIDE 42

Image of hypothermia chart.

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Instructor Manual

Module 5 – SAMPLE EXERCISES/ACTIVITIES

SLIDE 43 (Module 5 cover slide)

Chill Out!

Purpose: To demonstrate the physical effects of cold water on the body, loss of fine motor skills, and numbness in fingers.

Objectives: Experience what cold water feels like in a safe, controlled environment. Experience how cold water affects dexterity.

WARNING: *Some people may have certain health risks related to this activity; ask participants if anyone has a health condition related to cold prior to beginning this activity. Please do not make this a mandatory activity. Monitor length of time in the water and excuse participants from the cold water who demonstrate any hesitation or apprehension. Do not require a specific amount of time in water.*

Procedures:

1. Put ice in the bucket or container and fill $\frac{3}{4}$ full with cold water.
2. Form two or three lines around the bucket.
3. Take turns putting hands in the ice water.
4. Put on a life jacket and fasten the buckles as quickly as possible.

Discussion points:

1. *What is the first reaction when a person's arm enters the water?* Cold shock. The gasp may not be as pronounced because it is just part of the body instead of complete immersion.
2. *How does the person's arm feel after a few seconds of being in the water?* Loss of feeling in fingers makes it hard to put on a life jacket in the water. This is one important reason why everyone should wear a life jacket in an open boat or on deck.
3. *Would it be difficult to buckle buckles, zip zippers, or pull straps on the life jacket when in cold water?* **YES!** During the second stage of cold water immersion, blood flow is restricted as blood vessels constrict causing loss of feeling and dexterity.

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Instructor Manual

4. *Was anyone wearing a sweatshirt or jacket when putting on the life jacket? Did that make it harder to get the life jacket snug?* It is common to wear warm clothes when boating in cold water conditions, so it is important to make sure that the life jacket fits with all of the layers you may be wearing. The best life jacket is the one you wear!

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

Life Jacket Relay Race

Purpose: For students to experience the difficulty of putting on a life jacket in a hurry. Wearing a life jacket before an emergency arises ensures a greater chance of survival.

Materials: Two life jackets and space for the race.

Procedure: Divide the students into two equal teams. Have them form two lines. Place a life jacket at the feet of the first person in each line.

At the signal to go, the first person in each line will pick up the life jacket, put it on properly, run to the designated place, return to the starting point, remove the life jacket and give it to the next person in line. The race is over when the first team to have each person complete the exercise is finished.

Discussion Points: *How difficult is it to put on a life jacket when you are in a hurry?* It is always easier to have your life jacket on to start with in an emergency, rather than needing to put it on, especially if the life jacket is stored.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

Minute to Win It

Purpose: To demonstrate why it is important to properly wear a life jacket at all times in an open boat or on deck.

Materials: Three chairs, three life jackets, and a watch or clock with a second hand.

Procedure: Set up three chairs similar to how they would appear on a boat. Place the life jackets under each chair. Place a volunteer in each chair.

When told that the “boat is sinking,” each person will have one minute to correctly put on their life jacket. At the end of one minute determine how many of the three “victims” are wearing their life jackets correctly or at all. (*Be sure not to point fingers at those students who did not meet the challenge.*)

Discussion Points: Your body reacts to cold water in three stages: cold shock response, cold incapacitation, and immersion hypothermia. It is very important to have your life jacket on before an emergency arises, since it may be very difficult (or impossible) to locate and put one on in an emergency situation. As someone once mentioned, *“If you were driving your car and started skidding towards something, would you be able to put your seatbelt on before hitting it?”* This would be a good analogy that could be used in this section. Driving is an everyday experience that people can easily relate to.

Make sure your life jacket fits before an emergency arises. Put your life jacket on before getting into any boat. Be familiar with your life jacket.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

Sinking Ship

Purpose: To demonstrate that preparation is key. Having a life jacket on already is the best prevention in an emergency situation.

Materials: Ten chairs, a pile of miscellaneous items found on a boat, including survival gear, five life jackets (different types and styles), and a watch or clock with a second hand.

Procedure: Set up one set of five chairs as though they were seats on a boat. Set up another set at least six feet away in a similar configuration. Between the two sets, place a pile of boating gear and five life jackets. Mix up the pile to simulate a disorganized boat. Place five volunteers in one set of chairs.

Ask the volunteers to climb aboard one by one and help each student show the class how each type of life jacket is correctly put on. Each student will have one minute to grab whatever items might be useful in a survival situation. When the minute is up, they will abandon ship to the second set of chairs.

Discussion Points:

- It can take less than a minute for a boat to sink.
- All tasks are difficult when hurried, cold, and experiencing cold water immersion.
- Each type of life jacket requires some knowledge and practice to put on correctly.
- Sometimes people are unable to put their life jacket on when they need it.
- It is always better to have the life jacket on and fitting properly to start with than having to put it on in an emergency, especially if it is not accessible.
- Having your life jacket on gives you more time to get survival gear, send a MAYDAY, or help another person on your boat.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

Small Group Presentation

Write the following on the board:

1. Type of life jacket:
2. Features and benefits:
3. How would this life jacket help during the three stages of cold water immersion?
4. Best place to wear this life jacket:
5. When would I wear this life jacket? Weather? Body of water?
6. Can I waterski, go tubing, or use a personal watercraft with this life jacket?
7. Which type of life jacket is your favorite and why?

INSTRUCTIONS: Break up students into small groups of 4-5. Allow about 10 minutes for each group to work on the answers to each question.

Each member of the group is encouraged to answer a question, one student can be the “model” while the group is presenting their life jacket to the entire class. Each group presents its life jacket and answers each of the questions. This is great practice for presentations, public speaking, working in groups, and increased information retention.

MATERIALS: Various types of life jackets in relevant sizes.

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Cold Water Immersion: A Hands-on Approach
Instructor Manual

CHOOSING and USING LIFE JACKETS: Types and Uses
SLIDE 44

Offshore Life Jacket



SLIDE 45

Offshore Life Jacket

- U.S. Coast Guard approved for offshore use
- Tends to turn unconscious wearers face-up in water
- Bright orange color: highly visible
- Offers more buoyancy
- Read the label for intended use

SLIDE 46

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Instructor Manual

Nearshore Life Jacket



SLIDE 47

Nearshore Life Jacket

- U.S. Coast Guard approved for nearshore use
- Turns some unconscious wearers face-up in water
- Intended for calm, inland waters and areas where there is a good chance of quick rescue
- Bright orange or other colors
- Read the label for intended use

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Instructor Manual

Nearshore Flotation Aids



SLIDE 49

Nearshore Flotation Aids

- U.S. Coast Guard approved for use in calm, inland waters or areas of quick rescue
- Not designed to turn a wearer face-up in water
- Some styles not designed for impact activities
- Wide range of sizes and colors available
- Read the label for intended use

SLIDE 50

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Inflatables



SLIDE 51

Inflatables

- Follow manufacturer's instructions for arming devices and routine maintenance
- Understand how the device operates and, if possible, get in the water and deploy for skill-building and familiarization
- Wear inflatable life jackets on the outside of clothing layers
- Read the label for intended use

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Instructor Manual

Special Use Life Jackets

FLOAT SUIT



SLIDE 53

Special Use Life Jackets

- **READ THE LABEL!**
- Some are U.S. Coast Guard approved, specific to age, activity, or approved only when worn
- Comfortable to wear
- Many styles and colors are available

SLIDE 54

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Read the Label



SLIDE 55

Read the Label

Read the label on the life jacket and make sure it is U.S. Coast Guard approved, the proper size for the user, and appropriate for the activity.

SLIDE 56

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Inspection Serviceability



This life jacket is not serviceable. Life jackets must be in serviceable condition.
SLIDE 57

Serviceability

- Fabric has no rips or holes
- Flotation material is not damaged, exposed or hardened
- Straps, buckles, and zippers all work

SLIDE 58

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Instructor Manual

Wearing

SLIDE 59

- Wear the life jacket for its intended use
- Is it approved for waterskiing, tubing, and personal watercraft?
- Is it intended for offshore or nearshore use?

Fitting

SLIDE 60

- Fasten all straps, buckles, and zippers
- Lift on shoulder straps to test fit
- Adjust for a snug, comfortable fit

Immersion (Survival) Suits

SLIDE 61

Survival suits are effective aids if you have time to put one on.

- Not a substitute for a U.S. Coast Guard approved life jacket for recreational boats
- Designed to prolong the length of time a person can survive in cold water
- Impractical to wear when operating a boat; restricts maneuverability
- Currently unavailable in sizes to fit children under 44 lb.

Remember Cold Water Immersion

SLIDE 62

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Instructor Manual

Not For Publication -- for background development only

Survivor Found in NFL Boating Accident (Related Story)

The Coast Guard on Monday narrowed the search area for two NFL players and a third man missing since a weekend fishing trip off the Florida Gulf Coast, after crews rescued a fourth man clinging to their capsized boat. Survivor Nick Schuyler, a former University of South Florida player, told rescuers that the boat the four friends were aboard was anchored when it flipped Saturday evening in rough seas, said Coast Guard Capt. Timothy M. Close. Since then, Schuyler, who was wearing a life vest, had been hanging onto the boat found by a Coast Guard cutter 35 miles off Clearwater.

CBS News correspondent Kelly Cobiella reports that Schuyler's rescue was the first sign of hope in a search that had started in the early morning hours on Sunday, and has covered more than 16,000 square miles - more than a an area one-third the size of Florida.

Schuyler said the other three men got separated from the boat. The 21-footer belongs to Oakland Raiders linebacker Marquis Cooper, who, along with free-agent defensive lineman Corey Smith and former South Florida player William Bleakley, remained missing.

Schuyler was conscious but appeared weak as he was being taken off a helicopter at Tampa General Hospital and placed on a stretcher. His father said his son was in serious but stable condition and that he "looks OK."

"He's got some cuts and bruises. He's dehydrated," said Stuart Schuyler.

Schuyler's mother, Marsha Schuyler, said her son told her that he survived by thinking about how he didn't want her to go to his funeral.

The family's joy at him being found alive was tempered by the search for his friends.

"We still have three men missing, and we're not going to talk too much until we find these guys," said his father, Stuart Schuyler. "We're all praying for them. These guys are all very close friends."

Coast Guard photos showed Schuyler wearing a yellow jacket and orange life vest and sitting on the hull of the capsized boat as a rescue cutter approached. A helicopter lowered a basket to haul him aboard. The search area is now "substantially smaller," based on where they found the boat and Schuyler, Close said.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

Smith's family planned to drive to Florida from Richmond, Va., Tuesday, after the snowy weather in the East made getting a flight impossible, said Yolanda Newbill, one of Smith's sisters. She said they have been in contact with the Coast Guard every few hours since the search began.

"We have never lost hope," Newbill said. "We have total faith that (he) will be coming home."

Ray Sanchez of Tampa, a cousin of Cooper, said he was told the men were together "for a good period of time" after the boat flipped. He said the family was confident the Coast Guard would find them.

"My cousin's a powerful swimmer," he said.

The water temperature in the area was 68°F. After 18 hours in 64-degree water, hypothermia will set in, said Coast Guard Petty Officer 2nd Class James Harless. How long someone can survive depends on how big the person is, he said. Cooper is 6-foot-3, 230 pounds, and Smith, 6-foot-2, 250 pounds.

The four friends left Clearwater Pass early Saturday in calm weather, but heavy winds picked up through the day and the seas got heavy, with waves of 7 feet and higher, peaking at 15 feet on Sunday. A relative alerted the Coast Guard early Sunday after the men did not return as expected. The Coast Guard said it did not receive a distress signal.

The men were aboard an Everglades-manufactured boat, which is built with compressed foam encased in Fiberglas, making it difficult to sink. The weather had improved, with waves subsiding to 6 to 8 feet, National Weather Service meteorologist Todd Barron said.

However, Bob Zales, president of National Association of Charter Boat Operators, said waves that high can capsize a boat the size of Cooper's.

"A boat that size, personally, I wouldn't get out any farther than 20 or 30 miles offshore," Zales said. "But I see people all the time 40, 50 miles offshore."

Cooper and Smith, who were teammates with the Tampa Bay Buccaneers in 2004, have been on fishing trips before, according to Ron Del Duca, Smith's agent.

The 29-year-old Smith, of Richmond, had 30 tackles, including three sacks, and an interception in 12 games last season for the Detroit Lions. He also played for the San Francisco 49ers and was a standout at North Carolina State.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

Cooper, 26, played college ball at Washington, and has spent five seasons with five different teams, appearing in 26 games with the Buccaneers in 2004 and 2005. He's played sparingly since. He grew up in Gilbert, Ariz., and his father Bruce is a prominent sportscaster for KPNX-TV in Phoenix.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

COLD WATER IMMERSION RESPONSE FACTORS

An individual's response to cold water immersion can be affected by several factors, including:

- Speed of immersion
- Habituation (A form of learning in which a person decreases or ceases its responses to a stimulus after repeated or prolonged presentations).
- Aerobic fitness
- Pre-existing medical conditions
- Body type
- Protective clothing
- Water conditions

Cold Shock Response: What happens?

Within the first three minutes effects may include gasping, hyperventilation, vertigo, and changes in blood pressure, heart rate, and rhythm. What to do? Within the first one to three minutes wait for the effects of the cold shock response to subside

Cold Incapacitation: What happens?

Within first 30 minutes, arms and legs may become numb and muscles become weaker. What to do?

- Assess the situation.
- Plan, prioritize, and perform the most important functions first.
- TEN minutes (at least) for meaningful 10 activity

**If not wearing a life jacket, there is a higher risk of drowning. Use emergency communication and distress signaling devices as soon as appropriate while there is sensation and function in fingers.*

Immersion Hypothermia: What happens?

After 30 minutes or more, core body temperature begins to drop. What to do?

- Slow heat loss by getting out of the water as much as possible or keeping movements to a minimum.

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Instructor Manual

- Be prepared to activate distress signals when potential rescuers are in range.
- If rescue is NOT likely, continue self-rescue and survival activity as in the stage before.
- BE POSITIVE.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

BACKGROUND RESOURCES

Overview

Our scientific understanding of the impacts of sudden cold water immersion on the human body, and the implications for surviving sudden cold water immersion, have significantly advanced over the last few decades. For example, it has been a commonly held misbelief and misunderstanding that perhaps the greatest risk associated with sudden and sustained exposure to cold water was succumbing to hypothermia.

Hypothermia is a medical emergency that occurs when your body loses heat faster than it can produce heat, causing a dangerously low body temperature. Normal body temperature is around 98.6 F (37 C). Hypothermia (*hi-poe-THUR-me-uh*) occurs as your body temperature falls below 95 F (35 C). [*Mayo Clinic, 1/18*]

However, dying from hypothermia has been frequently misreported in the press as both journalists and the public struggle to understand the physiology of cold water immersion on the human body. Make no mistake, prolonged exposure of the human body to cold or very cold water, as well as to cold air temperatures, *can indeed* result in death from hypothermia.

However, as one experienced boating safety professional has accurately remarked (when suddenly exposed to cold water) “*one should hope to live long enough to die from hypothermia.*” The point is, when suddenly exposed to cold or very cold water, it is frequently NOT the hypothermia that gets you!

Numerous other complicating factors like drowning from swim failure or inhaling a lung full of water as the result of the gasp reflex when exposed suddenly to very cold water are far more likely to lead to cold water immersion related fatalities than will hypothermia. So it turns out this is *really good news* when it comes to surviving cold water immersion.

If falling overboard, for example, in very cold water does not immediately lead to risk of hypothermia, then perhaps there are steps that can be taken to mitigate the risks of CWI and the less-than-likely immediate death of exposure due to hypothermia. When armed with the knowledge (and skills) that sudden immersion in cold water is not necessarily a life ending experience, boaters and other outdoor recreationists who find themselves in CWI scenarios have tools at their disposal that can contribute to their survivability.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

Cold Water Immersion: A Hands-on Approach is a train-the-trainer program designed to spread the message about the dangers of cold water immersion and the importance of wearing a life jacket to reduce the risk of death. The program was developed to teach trainers how to deliver the message and to equip them with the tools and resources they need to present it effectively. The key messages of the program stress the importance of preparation, wearing your life jacket and how to respond in the event of a sudden, accidental cold water immersion.

The program will communicate to the target audience - *boating safety and injury prevention advocates* - information they need and the resources available to help them make boaters aware of the risks of not wearing a life jacket – particularly when boating in cold water (generally accepted as temperatures below 70° F.) In addition to this *Instructor Manual*, the initiative includes a variety of resources and information leveraging materials already available in the public domain.

The basic premise of the program is to train trainers across the country, build on the investment already made in Cold Water Boot Camp USA (see more about this key safety initiative here: <https://nationalwatersafetycongress.wildapricot.org/Boot-Camp>), and capitalize on the virtual army of boating safety educators seeking a compelling way to get their constituents into life jackets. *Cold Water Immersion: A Hands-on Approach* teaches trainers *how* to deliver the message, and gives them the tools and resources to deliver it.

This manual will include information on everything instructors need to help them teach a wide variety of audiences about the risks of cold water immersion, and provide a solid tool to break down the barriers to life jacket wear. The manual will include a range of learning objectives and lesson plans targeting different audience ages and knowledge levels. These will be complemented by PowerPoint presentations that will make up the visual component of the program.

In addition to the learning objectives and lesson plans, the manual will offer insights on how to engage and leverage local media, how to create and manage a successful cold water awareness booth at a trade show, and how to use a variety of ‘hands-on’ and ‘hands-in’ exercises than can be carried out with and without special equipment.

Audience/student engagement is a proven method to get the message across and reinforce the need to wear a life jacket to reduce the risk of cold water death. A sample of interactive devices and activities are included to help in a variety of teaching environments, such as stand-alone opportunities in classrooms, trade shows, and civic and community meetings,

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

or as an add-on, specialized, cold water immersion module for other boating or safety awareness courses, injury prevention presentations and public safety training seminars. A Red Cross study, 'Drownings and Other Water Related Injuries In Canada – 10 Years of Research' (2006), revealed that between 1991 and 2000 there were over 5,000 drownings in Canada. Cold water immersion was linked to 2,007 (or 35%) of these deaths. Some 772 victims drowned while boating, 246 while snowmobiling, and 150 while engaging in other activities on the ice, such as skating and ice fishing. Another 278 died after falling into cold water, and 132 died in aquatic activities, like scuba diving and swimming.

The study estimated that, based on assigning a conservative value of \$2 million for each life in direct and human capital costs, **over \$4 billion dollars could be saved** in one decade alone if cold water immersion deaths were prevented. The good news is that they can be.

The Red Cross study echoed the research of Professor Michael Tipton of the Institute of Naval Medicine in England, which revealed that 55% of open-water drowning deaths occurred within a mere three meters of safety, and 42% within two meters of safety. The research also found that two-thirds of these victims were known to be good swimmers.

Tipton's study also revealed that the common denominator among these deaths was that they all occurred in cold water. This finding triggered still ongoing studies into how immersion into cold water affects an individual, and how boaters and others can better understand and manage this significant factor in deaths due to drowning.

The Red Cross study also pointed out that the highest incidence of drowning occurs in males aged 20 to 59. Most were in small vessels and engaged in activities unrelated to purely recreational boating. Rather, they were using a boat for other pursuits, such as fishing or hunting. These activities are often carried on early and late in the boating season, when water temperature is at its coldest, or in areas where it never rises significantly.

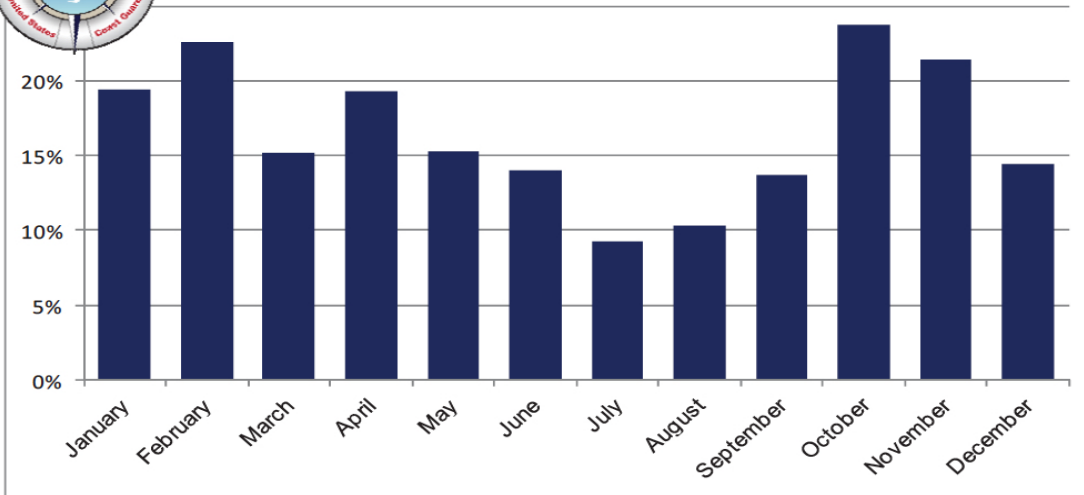
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Figure 1 PERCENT OF ACCIDENTS THAT ARE FATAL BY MONTH



A study by Smart Risk and the Canadian Safe Boating Council (CSBC) focused more on recreational boaters and found that 41% of those that drowned while boating were within 10 meters of shore, and an additional 22% were within 10 to 15 meters of shore. They were all close to safety but too far to save themselves due to the effects of cold water on their bodies.

Drownings in the United States can be expected to be similar to those in Canada and the United Kingdom. In 2014, the U.S. Coast Guard received reports for 4,064 boating incidents; 2,678 boaters were reported injured, and 610 died. Most boating deaths that occurred during 2014 were caused by drowning (78%). More than 8 in 10 victims were not wearing a life jacket.

U.S. Coast Guard data in 2014 also shows that falls overboard account for more than a quarter of boating deaths. When combined with capsizing, flooding or swamping, and ejections from a departing vessel, the number of deaths reached 398 of the year's total of 610. When a victim is in cold water, the death-to-accident ratio is significant. When water temperature is below 50 degrees Fahrenheit, the death ratio is over 45%, as compared to 11% when water temperature is between 70 and 90 degrees. In cold water, a victim's chances of survival are low. If the victims had been wearing life jackets, the statistics would have been much different.

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

So, why don't boaters wear their life jackets?

The Smart Risk/CSBC study found that people believe life jackets or personal flotation devices (PFDs) are for those who have not yet learned to swim. In a survey of young men in the demographic group most at risk (males between 25 and 45 years of age), the vast majority felt they did not need a PFD because they perceived themselves to be good swimmers. The survey went on to state that 'there is a perception that experienced boaters are not at risk and, in fact, life jackets are not required if the boater is skilled, and that they are only for children who are still learning.' Moreover, there is a sense among small craft operators (as well as on larger ships), that what is most important is that life jackets or PFDs be present on the vessel – not that they actually be worn. A survey of boaters in the target demographic group found that 64% feel safe as long as their PFD is 'within reach.'

This concept of cold-water awareness and how it affects even the strongest swimmer is an ideal proposition for raising awareness of the importance of wearing a life jacket. Studies in Canada have found that the main reasons for not wearing one can be dispelled through education about the risks of cold water. It is most important to break down the barriers to life jacket wear by demonstrating that everyone is at risk of drowning if they are not wearing their life jacket in cold water.

Professor Michael Tipton of the Institute of Naval Medicine in England, which revealed that 55% of open-water drowning deaths occurred within a mere three meters of safety, and 42% within two meters of safety.

The research also found that two-thirds of these victims were known to be good swimmers.

Tipton's study also revealed that the common denominator among these deaths was that they all occurred in cold water.

The Red Cross study also pointed out that the highest incidence of drowning occurs in males aged 20 to 59.

Most were in small vessels and engaged in activities unrelated to purely recreational boating. Rather, they were using a boat for other pursuits, such as fishing or hunting.

These activities are often carried on early and late in the boating season, when water temperature is at its coldest, or in areas where it never rises significantly.

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Instructor Manual

CAUSES OF COLD WATER IMMERSION

The following are the leading causes of cold water immersion:

Swamping and/or capsizing – due to overloading, poorly secured or shifting loads, improper boat handling in rough water, loss of power or steering, anchoring from the stern, wrapping an anchor, mooring, or pot line around a drive unit, or taking a wave over the transom during a sudden stop.

Falling overboard – most commonly due to slipping, a loss of balance while standing or moving around the boat, striking another boat or object, sudden grounding, or when reaching for objects overboard.

Ejection - while the boat is underway, a sudden change in speed or direction or striking an object or other vessel, causing passengers and/or the operator to be ejected from the boat

Swimming to retrieve a drifting boat – a loose boat drifting away produces an almost irresistible impulse to intentionally leave a place of safety to swim after it. Don't do it.

THE EFFECTS OF COLD WATER IMMERSION

1. INITIAL REACTION—COLD SHOCK RESPONSE

- Within the first 1- 3 minutes
- Involuntary gasping and hyperventilation, panic and vertigo, can result in water inhalation.
- Higher risk of drowning if not wearing a life jacket.

2. SHORT TERM IMMERSION—COLD INCAPACITATION

- Within 10-30 minutes of immersion
- Localized cooling of extremities affects muscles and nerves, impairing their function
- Arms and legs become stiff and unresponsive.
- Activities such as swimming, re-boarding a boat, using a radio or distress signal, or holding on to a floating object becomes difficult or impossible
- Higher risk of drowning (even good swimmers) if not wearing a life jacket

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Cold Water Immersion: A Hands-on Approach

Instructor Manual

3. LONG TERM IMMERSION—IMMERSION HYPOTHERMIA

- After at least 30 minutes of immersion, depending on factors
- Gradual cooling of the body core will occur at a rate dependent upon factors including water temperature, clothing worn, body type, physical condition and other factors
- As body core temperature falls, hypothermia symptoms will range from mild to severe, eventually unconsciousness.
- Higher risk of drowning if not wearing a life jacket.

PREPARING FOR COLD WATER IMMERSION

Most immersion events happen quickly and unexpectedly. So, while prevention is best, it is also important to be prepared. Taking these simple steps will help ensure the best possible outcome:

- Always wear a life jacket when in an open boat or on an open deck. Trying to put your life jacket on in cold water is extremely difficult (if not impossible) and costs precious time and energy. If people insist on not wearing life jackets, suggest that they have a life jackets in locations that can be reached by a person swimming outside the boat. (Not stored in a T-top for example.)
- Carry emergency communication and distress signaling devices **ON YOUR PERSON**. An emergency locator beacon, a small hand held VHF radio, a waterproof cell phone, a whistle, and some visual distress signals may save the day. Today's devices are smaller, lighter, and easy to carry.
- Unless the boat is designed so that a person in the water can easily get back into the boat unassisted, equip the boat with a re-boarding ladder, rope ladder, foot sling, or a swim platform.
- Carry survival suits. Make sure they are well maintained and readily accessible.
- Practice re-boarding your boat, donning survival suits quickly, signaling, transmitting MAYDAYs, recovering a person overboard, and other cold-water survival techniques described in this section.
- Drills are fun and build skill and confidence.

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