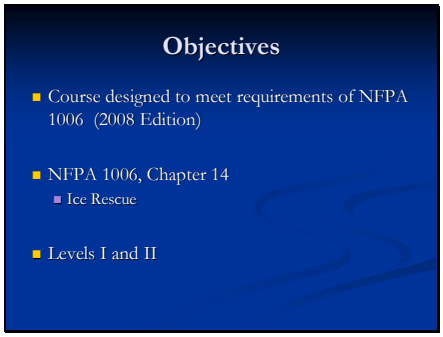
Slide 1

Welcome To the class
Course Roster – review, correct as needed, initial whether corrections made or not.
Objectives Sheet – have all students print name.
Eligibility Sheet – have all students print name.
Attendance Sheet – have all students fill out completely.
Hand out NHFST Manual / note taking guide.
Introduce Instructors.
Have Students introduce themselves.

Slide 2

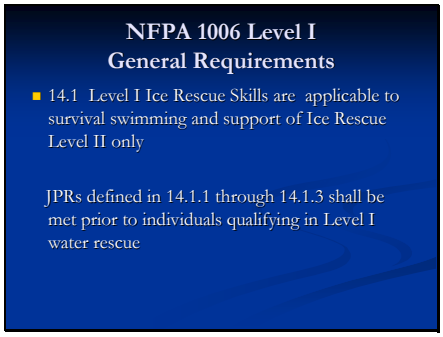


NFPA 1006 Technical Rescuer Professional Qualifications. Our programs are for the individual Firefighter or Rescue Technician which fall under 1006.

Departments follow NFPA 1670.

2008 is the latest revision. References Level I and II. Generally speaking Level I is "**Operations**" and II is "**Technician**".

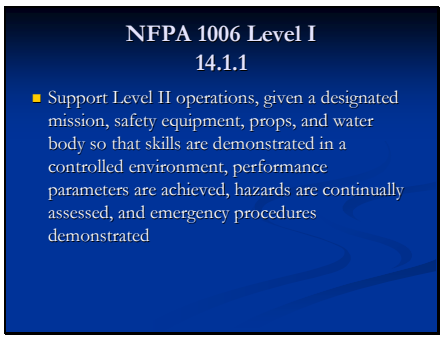
Slide 3



Level I is generally considered what used to be **Awareness and Operations** levels.

Operations take place from shore, bridges, etc. Not on, or thru the ice.
No swimming ability required.
Must be equipped with Proper PPE, i.e. floatation device!
This program does not separate out Level I and II certifications.

Slide 4

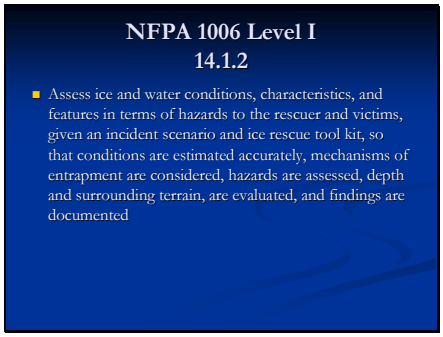


This level represents the minimum capability of organizations that provide response to technical search and rescue incidents.

Requisite Knowledge – Support procedures, including search patterns, equipment set-up, operation support equipment, and communication issues.

Requisite Skills – Basic support skills including the ability to serve as an upstream or downstream safety or spotter and tend a “GO” rescuer.

Slide 5

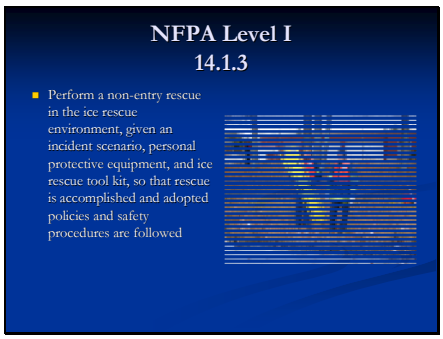


Size-up and Assessment.
Establish Command.
Activate ERP and call for Resources.
Scene Control.
Recognition of Hazards.
Rescue vs. Recovery.

Requisite Knowledge – Ice assessment, flow calculation methods, map or chart reading, local water hazards and conditions, entrapment mechanisms and human physiology and survival factors.

Requisite Skills – Determination of flow and environmental factors and the effect on victims and rescuers, and interpretation of maps and charts.

Slide 6



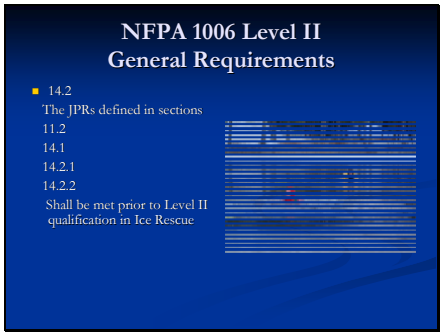
SHORE BASED! NO OPERATIONS ON or THRU the ICE!

Utilize throw ropes, poles, ladders, buoyant hose, etc.

Requisite Knowledge – Types and capabilities of PPE, effects of hydrodynamic forces on rescuers and victims, physiological effects of immersion and cold water near-drowning, hydrology and characteristics of water/ice, behavior of victims, water rescue rope-handling techniques, incident specific hazard identification, criteria for selecting victim retrieval locations based on water/ice environment and conditions, hazards and limitations of shore based rescue, local policies and procedures for rescue team activation, and information on local water environments.

Requisite Skills – The ability to select PPE specific to the ice rescue environment, don PPE, identify water hazards (upstream or downstream current or tides), identify hazards directly related to the specific rescue and demonstrate appropriate shore based victim removal techniques.

Slide 7

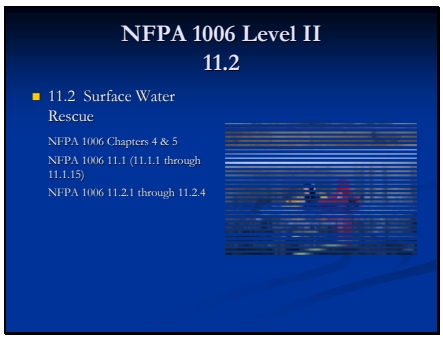


What is commonly referred to as **Technician** Level.

On and thru the ice.
In open water.
Students should be comfortable being in open water and able to swim.

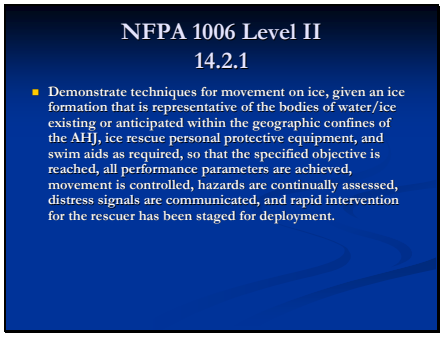
NHFST has chosen not to strictly follow the NFPA matrix at this time. The matrix lays out a formula, i.e. cannot obtain Trench Rescue Technician training until have already completed Confined Space, Vehicle and Machinery, and Rope Rescue. We have elected to provide basics in FF-II/ITRS then skills specific to each program without other prerequisites.

Slide 8



Refer to copy of NFPA 1006 2008 edition in the Instructor Guide for questions specific to the chapters and sections.

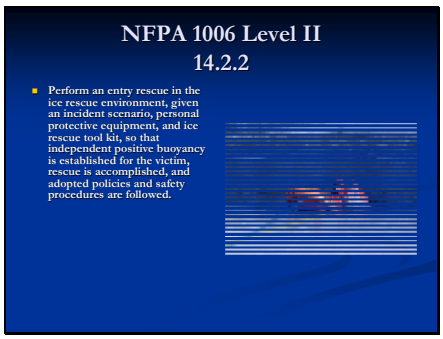
Slide 9



Requisite Knowledge. Hydrology and specific hazards anticipated for representative ice rescue environments (shoreline, in-water, and climatic), selection criteria for ice rescue personal protective equipment and swim aids for anticipated water conditions and hazards, and swimming techniques for representative body of water.

Requisite Skills. The ability to swim and float in different water conditions with and without flotation aids or swim aids as required, apply water survival skills, don and doff personal protective equipment, select and use swim aids, utilize communications systems, use task-specific equipment, and evaluate water/ice conditions to identify entry points and hazards.

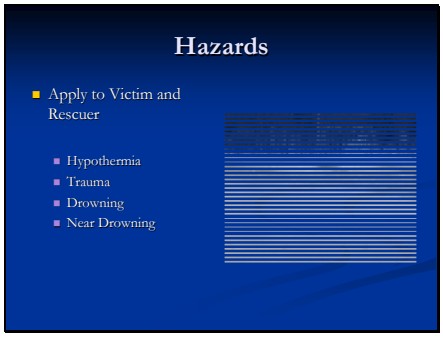
Slide 10



Requisite Knowledge. Types and capabilities of personal protective equipment, effects of hydrodynamic forces on rescuers and victims, hydrology and characteristics of water, behaviors of victims, physiological effects of immersion and cold water near-drowning, water rescue rope-handling techniques, incident-specific hazard identification, criteria for selecting victim retrieval locations based on water environment and conditions, hazards and limitations of entry rescue, local policies/procedures for rescue team activation, and information on local water environments.

Requisite Skills. The ability to select personal protective equipment specific to the water/ice environment, don personal protective equipment, identify water/ice hazards (i.e., upstream or downstream, current or tides), identify hazards directly related to the specific rescue, and demonstrate appropriate victim removal techniques.

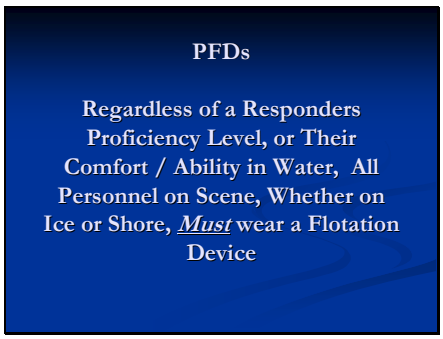
Slide 11



Every year there are news accounts of rescuers, whether professional or bystanders, that became victims due to lack of training, experience, or equipment.

The hazards are there regardless of whether it is an actual incident or training.

Slide 12



Every department should have a policy regarding wearing of PFDs.

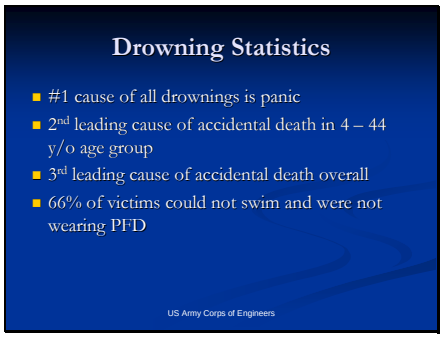
NHFST policy is that during training all students will wear a cold water rescue suit.

All Instructors will be wearing a USCG approved float coat.

A common sense approach to who on shore needs to be wearing a PFD can be related to rope rescue. Generally speaking, if you are less than your own height from the edge and trip you could go over so you need an edge protection line.

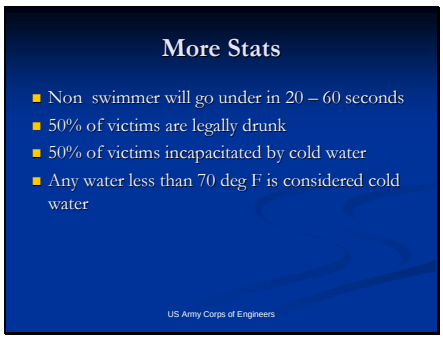
If you are on shore but close enough to the water's edge that if you were to slip, and fall in, you should be wearing a PFD!

Slide 13



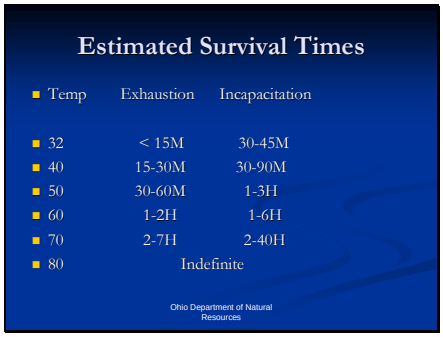
Source of statistics is at bottom of slide. These vary slightly depending on what source used but are all basically the same.

Slide 14



Stress that cold water, which is anything less than 70 degrees has a huge impact on victims ability to survive. Except for backyard swimming pools; not many bodies of water in New Hampshire get much above 70 degrees even in Summer.

Slide 15



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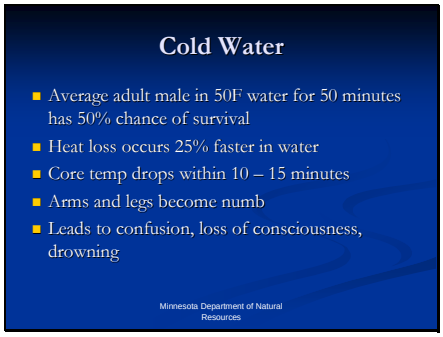
Slide 16



Water basically acts as a huge heat sink and draws body heat out of you.

Source of statistics is at bottom of slide. These vary slightly depending on what source used but are all basically the same.

Slide 17

Hypothermia

- Body unable to maintain its core temperature
- Contributing factors include age, activity, general health, trauma, ETOH
- Had person been hypothermic prior to fall through ice?

Parks Canada

Stress that hypothermia does not require you be wet and/or immersed in water, though, it certainly has an effect.

Slide 18

Stages of Hypothermia

Core Temp	Symptoms
99 – 96	Shivering
95 – 91	Shivering, Dysphasia
90 – 86	<LOC, <Shivering, Muscle contractions
85 – 81	HR and RR slow
80 – 78	Coma, Dysrhythmias, Reflexes cease

Brady - Essentials of Paramedic Care

Actual temperatures will require special thermometer.

Learn to recognize the signs and symptoms.

Protocols and Standard of Care will dictate treatment while enroute to medical facility.

Slide 19

Survival Factors

- Water Temperature
- Protective Clothing
- Body Size
- Body Fat Percentage
- Children Cool Faster Than Adults
- Water Movement Around Victim
- Victims Movement In Water

US Army Corps of Engineers

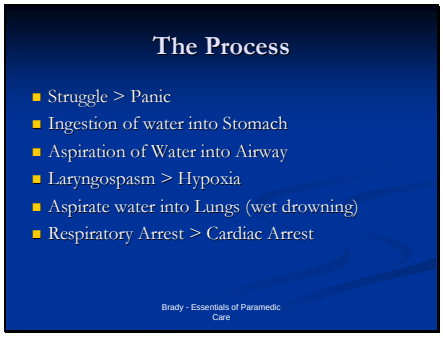
Go over treatment.
Ask Students for examples.
On the ice?
When do you start?
BLS vs. ALS?
During transport?

Slide 20

Inform Students that NFPA standard specifies they understand pathophysiology of drowning. This does not mean they need to be a Paramedic or that treatment of wet drowning will be any different from dry drowning.

Can be compared to a room and contents fire, though we all must understand the difference, does it really matter to the nozzleman whether the fire spread due to conduction, or convection?

Slide 21

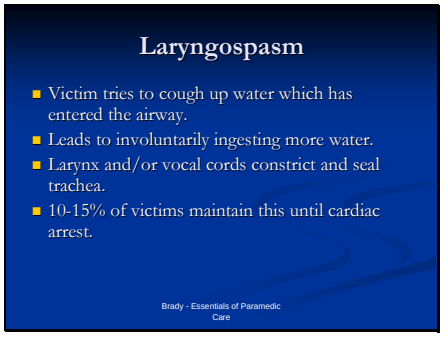


Cardiac Arrest treatment protocol is the same regardless of the type. Wet vs. dry, salt water vs. fresh.

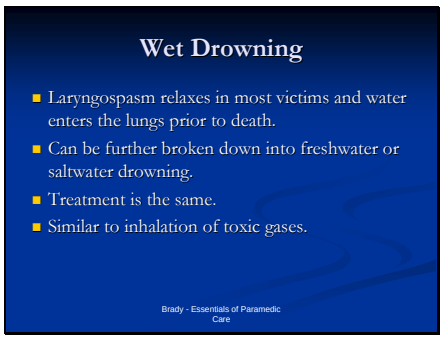
Only differences to consider might be history:
Diabetic?
Drugs or alcohol?
Trauma?
Hypothermia Protocol?

Ask students to provide other concerns.

Slide 22

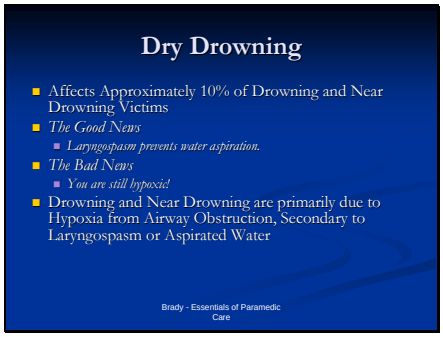


Slide 23



Stress that wet or dry, fresh or salt water, our treatment will be the same.

Slide 24



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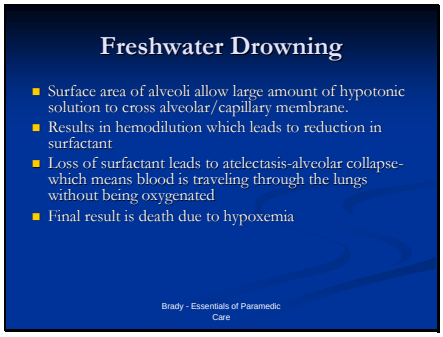
Slide 25



There is a difference between fresh and salt water……but! Do not read too much into it.

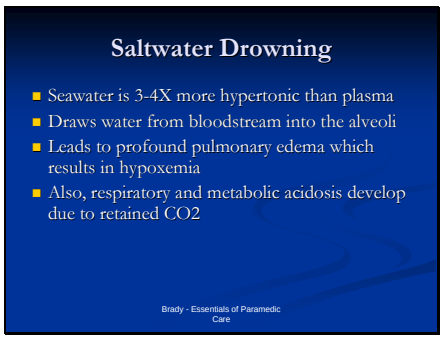
We need to be able to tell the hospital because they will be getting blood gases and labs.

If patient survives it may make a difference in long term ICU treatment.

Our treatment in field will always be consistent with protocols and Standard of Care.

Have Students refer to handout

Slide 26



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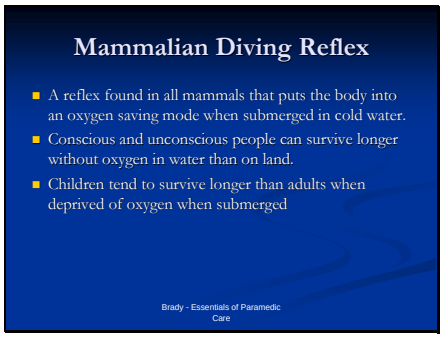
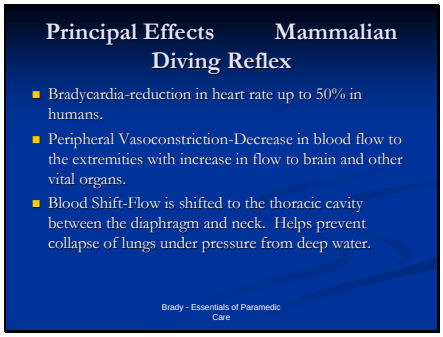


This is why there have been reported cases of victims found alive, and have recovered with no deficits, even after up to one hour submerged.

Will almost certainly require following the hypothermia treatment protocol.

Slide 28



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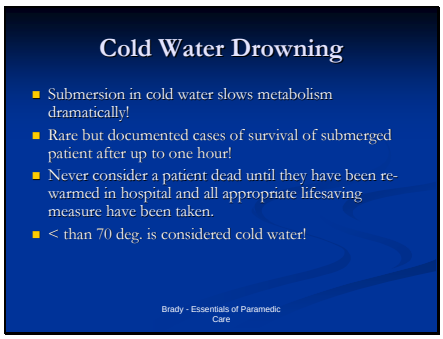
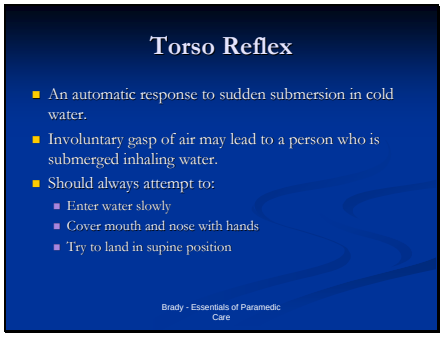
Slide 29



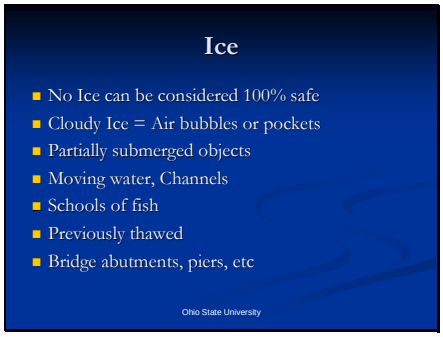
Slide 30



Ask Students if anyone has ever stepped into a shower expecting hot water and it was cold. Same thing happens.

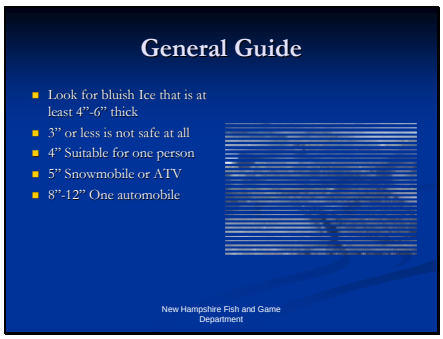
We will stress throughout the practical sessions the importance of entering the water slowly and bleeding the suit of trapped air. Explained more further on in the program.

Slide 31

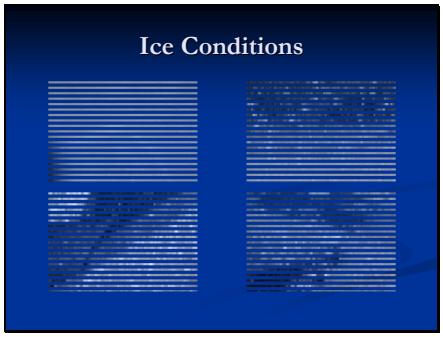


Make sure to point these things out when actually on the ice.

Slide 32



Slide 33



Explain to students that once out on the ice we will show differences, if available.

Top left is Milk Ice. Be suspect of it. Not considered well frozen and hard, contains air and snow. Sometimes aka snow ice.

Top Right is Clear or Hard Ice. Generally considered the strongest. Appears that you can look down through it and estimate its depth. Can appear bluish black.

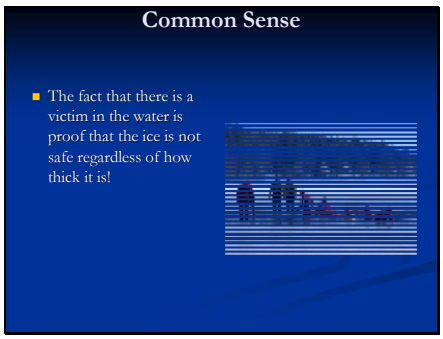
Bottom Left is Layer Ice. Formed at more than one time, thickness varies. One spot can be thicker than another spot right next to it.

Bottom Right is Old / Previously Frozen / Refrozen Ice. Similar to Layered ice. Should not be trusted. In this example the clear or black ice may be quite thin as just having refroze overnight and the milk ice actually thicker though not as solid.

We do not have pictures but NFPA term for new ice is Frazil Ice

Important to stress to the students that regardless of the type of ice, how thick it is, how many people and vehicles are on it, etc no ice can be considered safe to be on. There are simply too many variables

Slide 34

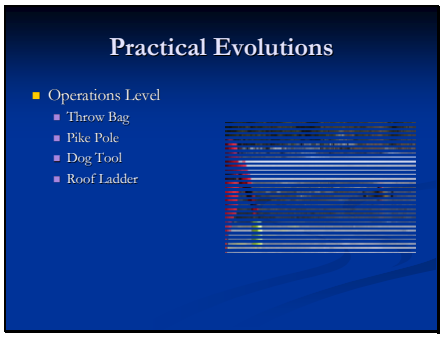


Talk to students realistically about expectations for both days.

Students should be aware that they will be in deep water both days. While a little concern is okay, students must be realistic and acknowledge whether they can be comfortable in the scenarios.

Similar to claustrophobia found in SCBA class we have found students here very afraid of water. While we can do our best to help them work through their fears we cannot cure them or allow them to endanger themselves or others if they panic.

Slide 35



All these are done on afternoon of day 1 with exception of roof ladder. This is discussed, not actually performed.

All students will don suits in classroom prior to travelling to site. Go over how to don suit, enter water, protect airway. Practice skills in firehouse prior to being on ice. Try to determine if any seriously hydrophobic students in class.

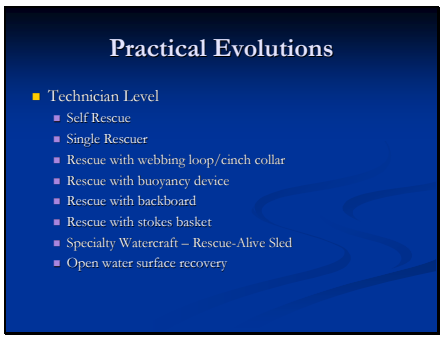
Break class into 4 groups of six students, one Instructor per group.

Goal is to give each Student at least two attempts at each evolution.

Have Students try throw bag with rope bagged, then on second attempt just haul rope in and throw again. Simulates a miss, and no time to rebag the rope.

If possible and practical site allows, have students throw ropes and attempt pole grab from ice or shore where they are level with victim, and from an elevation such as bridge where they are above victim. Throw bag especially can require different technique.

Slide 36

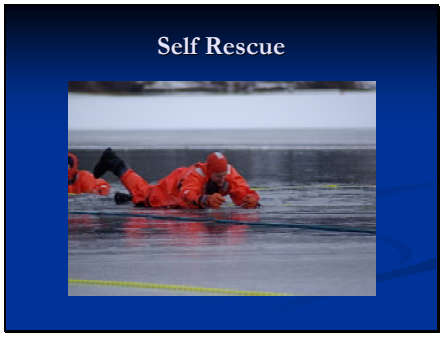


All these are done on day 2. Usually meet at the practical location, no need to meet back in classroom in morning.

Break class into 4 groups of six students, one Instructor per group.

Goal is to give each student at least two attempts at each evolution.

Slide 37



Each student will practice entering water correctly- Stress that this should be done slowly.

Each student has a safety line attached.

To enter the water, the student will:
Approach on chest with weight distributed.
Rotate and lower legs into water.
Hold neck of suit away while protecting airway, and allow air to bleed out of suit.
Assume buoyant position with body oriented straight up and down.

To get onto the ice shelf, the student will:
Reach as far forward as possible, with picks, and jam them into ice.
Kick with feet, while pulling themselves up onto ice shelf.
Once onto solid ice roll away from edge being careful to keep weight spread out.

Rotate through **Tender** and **Safety** positions, repeat at least once.

Slide 38

Assignments:
IC
Rescuer
Victim
Tender(s)

Victim enters water just as they were shown when performing Self – Rescue, then positions themselves at edge of ice.
Rescuer advances towards victim face first, crawling on chest, off to one side. Do not approach victim straight on. Approaching from victims left seems to work best for right handed Rescuer.
Enter water and assume neutral buoyancy as shown during Self – Rescue evolution, control Victim by using left hand to control their hands and place right arm over their back.
In one smooth motion pull Victim onto their side/back, making sure their shoulder does not get caught below ice edge, while at same time rolling onto your left side so that your left shoulder is up on edge of ice and your weight is on that shoulder.
Quickly signal for pull on your tender line and hold firmly onto victim.
As you are pulled onto ice the victim will come along also.

Have students rotate through all positions so that each has at least two opportunities to do each role.

Slide 39

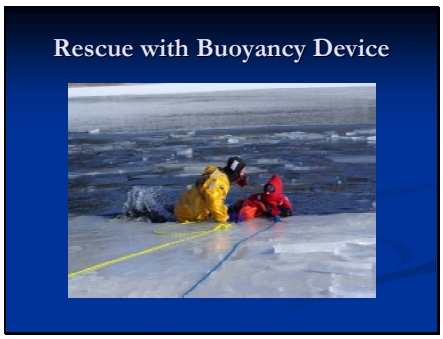
Assignments:
IC
Rescuer
Victim
Tender(s)

Rope configuration:
Attach yourself to **end** of tender line with figure 8 loop connected to carabiner on front of your harness.
Tie an alpine butterfly approx 5-6 feet up the line.
This connection will have the webbing loop for the victim attached to it. The reason it is done this way is so that when the line is hauled in the rescuer does not have to maintain a hold on the victim.
The victim is hauled out first and rescuer follows.
Also, having the 6' length between rescuer and victim allows rescuer to keep at least arms length away from a panicky victim or the ability to disconnect themselves if need be.

Victim enters water just as they were shown when performing Self – Rescue, then positions themselves at edge of ice.

Rescuer advances towards victim face first, crawling on chest, off to one side. Do not approach victim straight on. Approaching from victims left seems to work best for right handed Rescuer.
Enter water and assume neutral buoyancy as shown during Self – Rescue evolution, control Victim by using left hand to control their hands.
Using right arm place loop of webbing over victims head and arms.
Quickly call for pull on your tender line and hold firmly onto line and victim.
As victim is pulled up onto ice and line becomes taught you will also be pulled out of water and up onto ice.

Slide 40



Essentially the same as the webbing loop just instead of trying to get a loop of webbing around the victim you are just handing them a buoyancy device. Knots are tied same places for same reasons.

Slide 41

Again, essentially the same as the webbing loop and buoyancy device just instead of trying to get a loop of webbing around the victim you are just handing them a floating backboard. Knots are tied same places for same reasons.

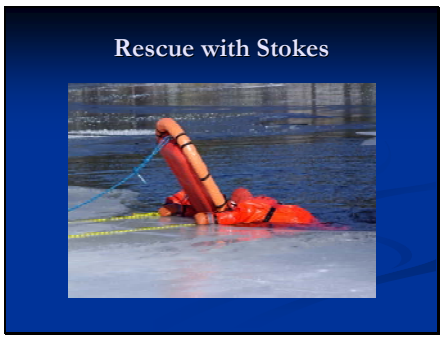
This, along with USCG approved buoyancy device and stokes litter equipped with flotation aids meet NFPA requirement "**so that independent positive buoyancy is established for the victim"** Level II 14.2.2 (Slide 10).

Have victim enter water same as on other evolutions.

Rescuer enters water same also.

Continually stress that rescuer approaches victim face first, on chest, weight distributed.
Make eye contact with victim.
Swing out to side so as to avoid breaking ice in front of victim, rotate and enter water, bleed suit, and obtain neutral buoyancy, all while keeping 6-8' away from victim.
Slide board towards victim while at same time submerging foot end of board.
As soon as victim is able to help themselves onto board, assist them in doing so while at same time straddling victim and board.
Call for pull on tender line and hold onto board and victim while being pulled onto ice.

Slide 42



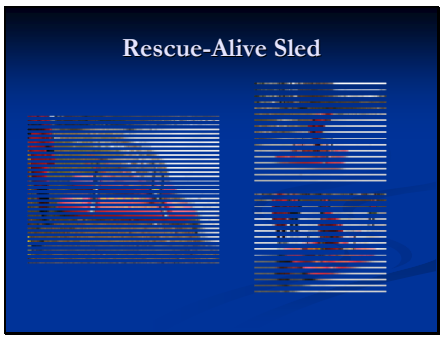
Again, essentially the same as the floating backboard evolution, but in this case they can be rolled into the basket and not just be on top of it. Even with full size adult without a flotation device this device is supposed to maintain buoyancy. (For this class; victims will always have cold water survival suit on). Knots are tied same places for same reasons.

This, along with USCG approved buoyancy devices and tools such as floating backboard meet NFPA requirement "**so that independent positive buoyancy is established for the victim"** Level II 14.2.2 (Slide 10).

Have victim enter water same as on other evolutions. Rescuer enters water in the same manner.

Continually stress that rescuer approaches victim face first, on chest, weight distributed.
Make eye contact with victim.
Swing out to side so as to avoid breaking ice in front of victim, rotate and enter water, bleed suit, and obtain neutral buoyancy; while keeping 6-8' away from victim.
Slide litter towards victim while at same time submerging foot end of basket. Have victim simulate unconscious or hypothermic patient who is unable to assist themselves.
While keeping the foot end of basket submerged and head end above edge of ice, maneuver basket next to victim.
Grab victim by right shoulder and roll them into basket.
Rescuer then straddles basket and victim and calls for pull on line attached to basket. Hold onto basket and victim while being pulled onto ice.

Slide 43



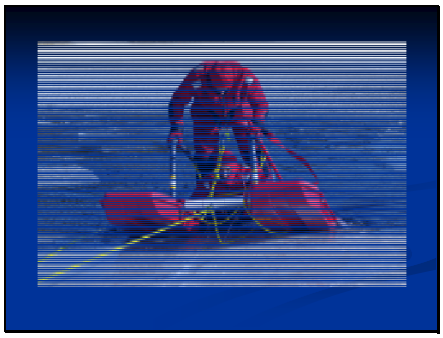
There are several different types of craft designed for water and ice rescue. This is not an endorsement of any particular product.

We chose the Rescue-Alive sled and find it works well. Not perfect, and has limitations, but due to length of program and costs, simply cannot buy and use each product on the market.

Demo in fire station prior to going out on ice.

View video(s) either now or and end of PowerPoint.

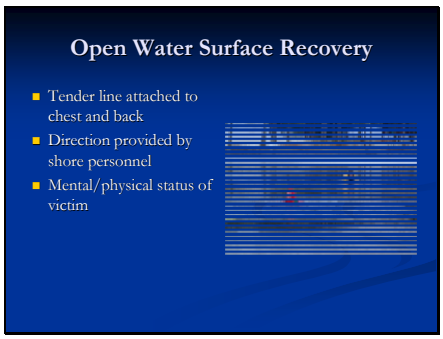
Slide 44



Points to discuss and reinforce:

Be proficient with whatever you have in your department.
Rescuer must stay back to insure pontoons do not submerge and go under the ice edge.
Sled is very susceptible to moving water. Can and will capsize if one end is on ice and other end is pushed along by current.
Sled is very stable but can be flipped. In the event it does remember that your victim is strapped to the sled and now underwater, and the handles prevent if from being pulled up onto the ice when upside down.
Does a good job in both open water and on solid ice. However, trying to move sled through open water that has large chunks of floating ice, is very difficult.
Haul team will pull on rope attached to sled, however, both rescuer and victim must have safety lines on them.

Slide 45

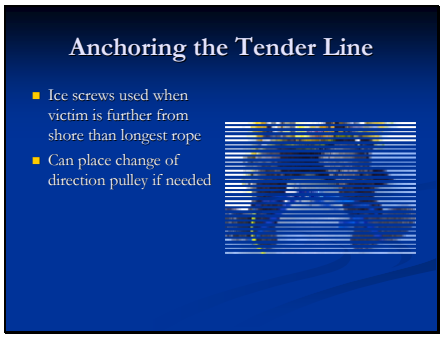


Not all victims will be conveniently hanging onto the ice shelf.

Having line attached to chest allows rescuer to backstroke toward victim without tension on back connection.
Once at victim, rescuer unhooks his chest connection, turns to face victim, and spins them around so that rescuer is behind victim with arms around them and underneath victims. This supports victim and keeps head above water.
Rescuer signals for pull from haul team and he is **slowly brought back to shore or edge of ice. Hauling slowly from rear with rescuer floating on their back helps to keep heads of both rescuer and victim above water.**

Note: Stress that this is not an approved lifeguard course! Dealing with a panicked swimmer is very dangerous and challenging and encourage students to get further training in those skills.

Slide 46



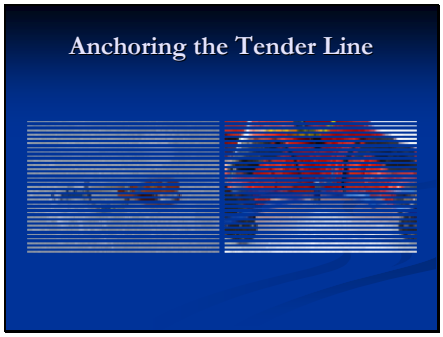
Each group of Students gets an ice screw and length of webbing. Allows for secure footing for members hauling on tender lines when victim is farther from shore than longest ropes.

Place ice screw so that 2-3” remains showing. Wrap pre-tied loop of webbing around screw with either simple wrap or a clove hitch then have tender sit in front of screw and place feet into ends.

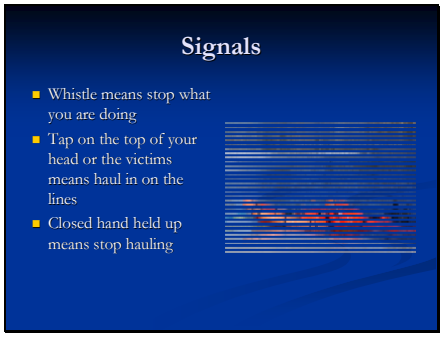
Can use pulley for change of direction but unless for some reason ice / water conditions dictate it has no real practical value.

Reminder: Make certain to always keep webbing, carabiners, pulleys, screws etc in the tote box when not being used. They tend to disappear into the slush and little piles of snow that get built up from everyone working in the area.

Slide 47



Slide 48



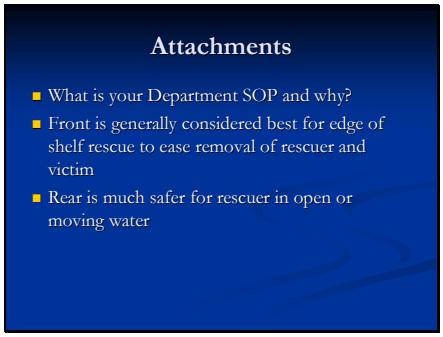
Each Instructor has a whistle. In the event a whistle is heard EVERYONE is to stop what they are doing and turn their attention to who blew the whistle. This is an indication of an impending or currently happening safety issue.

Students need to know two basic signals:

Rescuer tapping either the victims or their own head with an open hand means for the tenders to pull on the lines.

Rescuer holding up a closed fist is the signal for the tenders to stop hauling.

Slide 49



Discuss this with the class.

This is not a moving water class, never mind swift water.

Slide 50

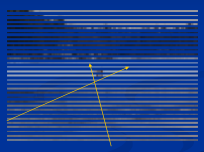
Attachments

- Consider end line knot to back and second attachment 3-4 feet up on line to chest.
- Allows rescuer to disconnect chest in event of needing to cross open water.
- Line on rear now allows rescuer to float on back while holding victim and be hauled in without being pulled under.

Slide 51

Locating Victim

- Verbal and visual contact
- Try to mark location by lining up victim with an object in the background
- Have rescuer not entering water "lock on" to last location in case victim submerges



Slide 52

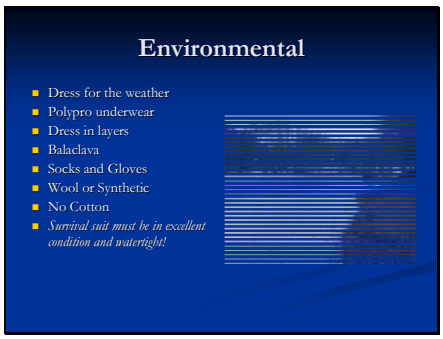
Safety

- Situational Awareness
- Hypothermia
- Frostbite
- Slips and Falls
  - *This is not a half hour in and out rescue!*
  - *We will be on the ice and in the water all day!*

Cannot stress enough to keep track of your Students! Accountability!

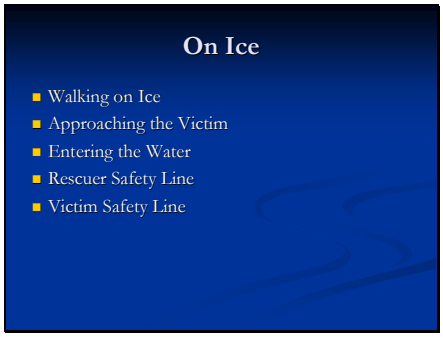
While an actual rescue may very well be accomplished quickly this class is all day long. Pay attention for signs of hypothermia in the students, and fellow Instructors.

Slide 53



This goes out with the acceptance letter.

Slide 54



Stress to be very careful walking on ice

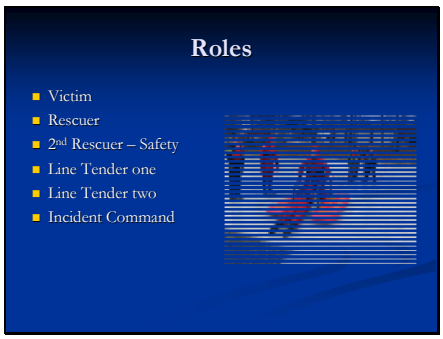
When approaching victim stress to:
Face first, make eye and voice contact.
Face down on ice, body weight distributed as much as possible. Never approach standing up

When entering the water:
Move to one side when entering water and keep 6-8' away from victim. This allows rescuer to purge suit and obtain neutral buoyancy, while keeping away from victim. Also helps prevent breaking away the shelf that victim was clinging to.

One tender is always monitoring rescuer tender line and / or equipment haul line.

If personnel allow, have one student tend victims safety line. Regardless whether it is tended or not, **all** victims and rescuers in the water **will** have an attached safety line in place that can be used to secure or retrieve them in event of an emergency.

Slide 55

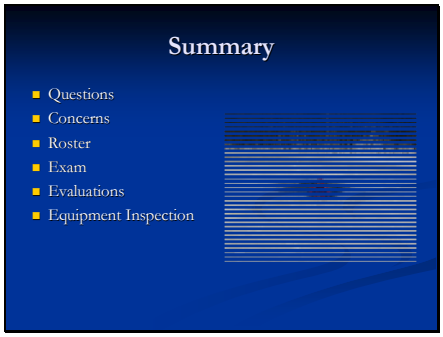


Goal is to have all students in each role at least twice.

Everyone will have different comfort levels, but, all must participate in all roles.

This class does not differentiate between Level I and Level II. There is no role where students do not enter water.

Slide 56



Answer any questions students may have.

Concerns? Injuries?

Again verify roster was complete and turned in.

Have all students eligible complete the exam. A student that did not complete practical skills cannot take written exam.

Have each student complete an evaluation.

Inspect and inventory all equipment. Double check students suits for loose equipment, carabiners, etc. Bring all equipment back to NHFA and hang all wet equipment in hose tower.

Rope logs not required.