

A



PRESENTATION

WINTER STORMS

SAFETY & SURVIVAL

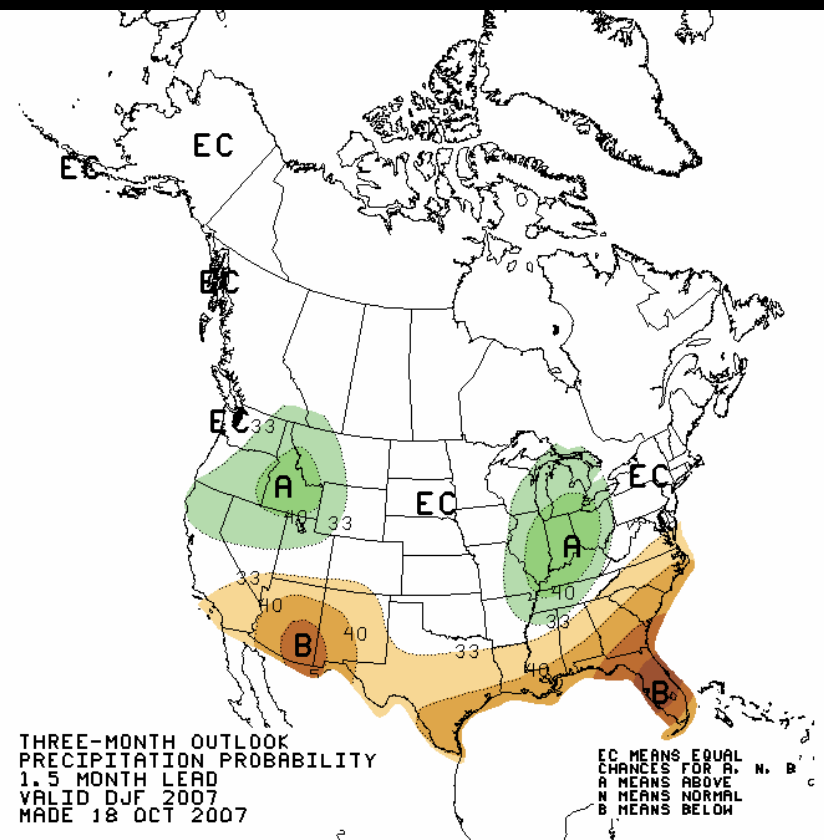
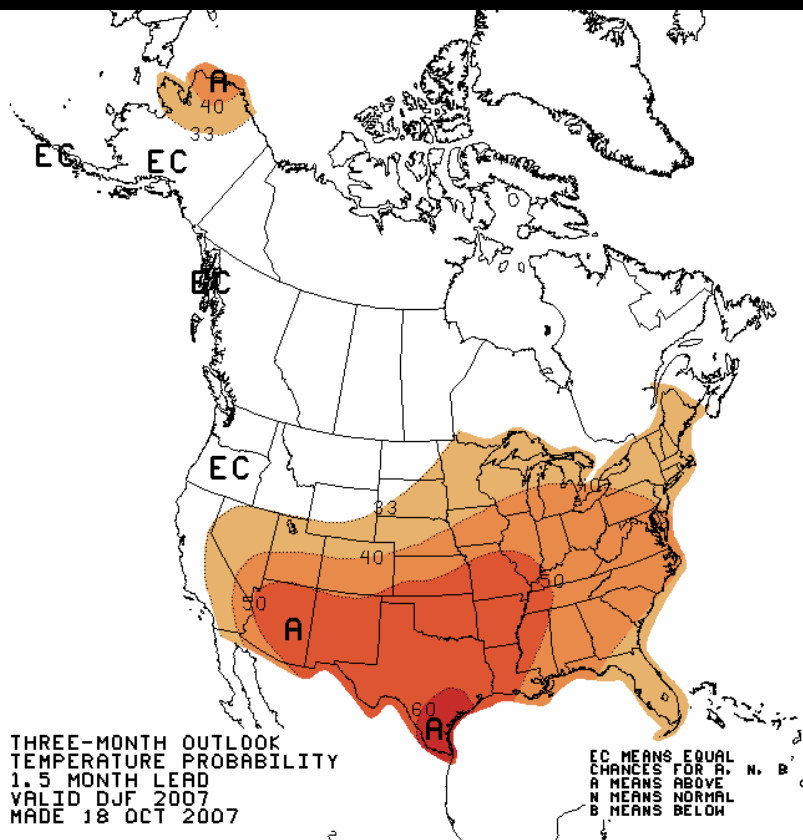
Updated for 2007

GOALS



- **Understand the need to plan and prepare for winter emergencies**
- **Differentiate between the types of winter storm emergencies**
- **Know the dangers of and first aid for Hypothermia and Frostbite**
- **Have a heightened knowledge of working and surviving in winter situations**

2007-2008 Winter Outlook



Case History: 2006- James Kim Family

Overview:

- The Kim Family left San Francisco on November 17th on a road trip to the Pacific Northwest. They had Thanksgiving in Seattle with family and then drove to Portland, Or. They were last seen by friends they had brunch with in Portland, Or. on Saturday, November 25.
- The family was last heard from at around 5:45 PM that day. A hotel clerk at the Tu Tu Tun lodge in Gold Beach, Oregon took a call from James. He said he was about five hours away. The hotel clerk said she would leave the keys out for them as the lobby would be closed after 10:00. The keys were still in the same place the next morning.

Case History: 2006- James Kim Family

What Happened? - 1

- They missed an Interstate 5 exit to their intended route, Oregon Route 42, and relying on internet maps decided to take Bear Camp Road instead.
- Late on the night of November 25, 2006, they ignored a posted sign warning of possible snow drifts ahead and continued up the mountain road. At an intersection, they accidentally turned off of Bear Camp Road and eventually ended up lost 15 miles down an unpaved, one lane side road before stopping for the night @ 2 AM.
- A snowstorm trapped them at this location.

Case History: 2006- James Kim Family

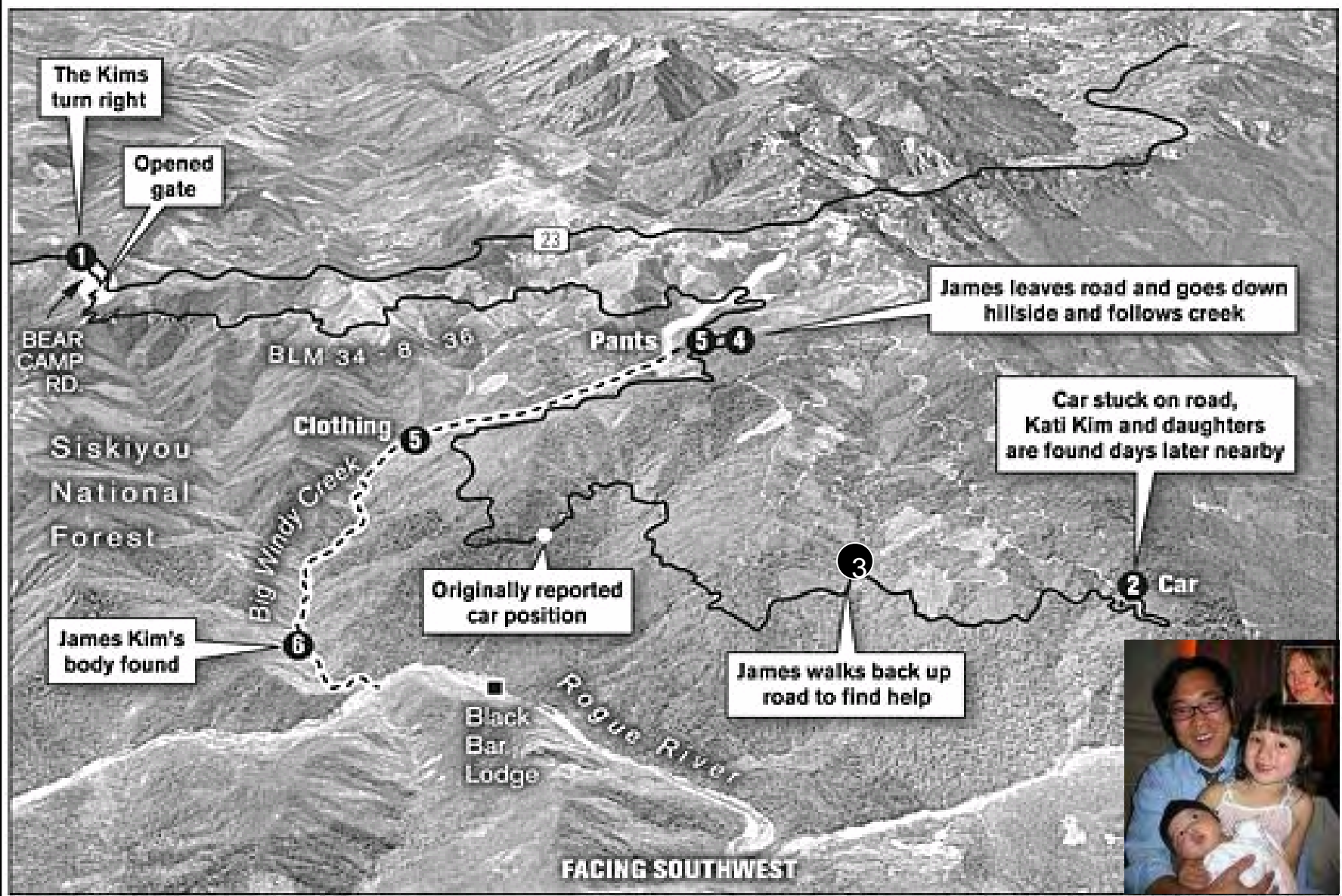
What Happened? - 2

- The family waited for rescue, surviving on limited resources. After spending six days waiting for rescue, James Kim left the car on Saturday, Dec. 2 to seek help.
- Wearing a jacket, James took 2 lighters, scissors and some colorful clothes to be cut into marking strips with him. He and his wife had attempted to locate their position using area road maps, and had estimated that the small town of Galice, Oregon was only four miles away. They were actually 33 miles from the town by road.

Case History: 2006- James Kim Family

What Happened? - 3

- On the following Monday, Dec. 4, searchers found Kati Kim and her children near the car, but could not locate James Kim. Searchers traced James Kim's path down Big Windy Creek's canyon in an effort to find him. His body was recovered in Big Windy Creek on Wednesday, December 6. According to medical examiners, James Kim died of hypothermia, but a precise time of death was not known.
- He had walked approximately 16 miles trying to find help before being overcome by the elements.



The Kims turn right

Opened gate

BEAR CAMP RD.

Siskiyou National Forest

James Kim's body found

BLM 34 8 36

Clothing

Big Windy Creek

Originally reported car position

Black Bar Lodge

Rogue River

FACING SOUTHWEST

23

Pants

James leaves road and goes down hillside and follows creek

Car stuck on road, Kati Kim and daughters are found days later nearby

3

James walks back up road to find help



2 Car

5-4

6

Case History: 2006- James Kim Family

Aftermath

- **The Kims had violated a number of rules:**
 - They had taken no emergency supplies
 - They left too late at night
 - They had left the main road in unfamiliar territory
 - They hadn't turned around or tried to back up after seeing the warning sign or once it began to snow and their gas tank edged toward empty
 - James left the only shelter he had, the car and his family

WINTER STORMS – *THE DECEPTIVE KILLER*

- **WINTER STORMS ARE CONSIDERED
DECEPTIVE KILLERS**

**BECAUSE MOST DEATHS ARE
INDIRECTLY RELATED TO THE STORM**

WINTER STORM DEATHS

- Automobile/other transportation accidents
- Exhaustion and heart attacks
- Hypothermia/Asphyxiation/
Carbon Monoxide
- House fires



WINTER STORM DEATHS

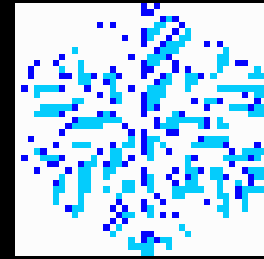
- Related to ice and snow:
 - About 70% involve automobiles.
 - About 25% are people caught out in the storm.
- Related to exposure to cold:
 - 50% are people over 60 years old.
 - *Over 75% are males.*
- Over all, about 20% of all winter deaths occur in the home

THE WEATHER HAZARDS

- SNOW
- BLACK ICE
- SLEET
- FREEZING RAIN
- ICE STORM
- STRONG WINDS
- EXTREME COLD
- WINTER FLOODING



SNOW



- ✓ **FLURRIES** - *Light snow falling for short durations. No accumulation or light dusting is all that is expected.*
- ✓ **SHOWERS** - *Snow falling at varying intensities for brief periods of time. Some accumulation is possible.*
- ✓ **SQUALLS** - *Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant. Snow squalls are best known in the Great Lakes region.*
- ✓ **BLOWING SNOW** - *Wind-driven snow that reduces visibility and causes significant drifting. Blowing snow may be snow that is falling and/or loose snow on the ground picked up by the wind.*
- ✓ **BLIZZARD** - *Winds over 35 mph with snow and blowing snow reducing visibility to near zero.*

BLACK ICE

- ✓ **Thin, transparent layer of ice which forms in the overnight hours on road surfaces**
- ✓ **Increases stopping distances by as much as 9 times!**
- ✓ **Loss of vehicle control and even the ability to stand makes this a dangerous condition**
- ✓ **Usually melts in sunlight**

SLEET

- ✓ **Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects. However, it can accumulate like snow and cause a hazard to motorists.**

FREEZING RAIN

- ✓ **Rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces, such as trees, power lines, cars, and roads, forming a coating or glaze of ice. Even small accumulations of ice can cause a significant hazard.**

ICE STORM

- ✓ **Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days**



STRONG WINDS

- ✓ **Strong winds create blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chill. Strong winds with these intense storms and cold fronts can knock down trees, utility poles, and power lines.**

EXTREME COLD

- ✓ Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to the cold can cause frostbite or hypothermia and become life-threatening. *Infants and elderly people are most susceptible.*

WINTER FLOODING

- Ice jams
- Snowmelt can cause river levels to rise



YOUR BEST DEFENSE?

STAY INFORMED!!!



TYPES OF WINTER WEATHER ADVISORIES

■ FROST/FREEZE WARNING:

- Below freezing temperatures are expected and may cause significant damage to plants, crops, or fruit trees. In areas unaccustomed to freezing temperatures, people who have homes without heat need to take added precautions.

TYPES OF WINTER WEATHER ADVISORIES

- **WINTER WEATHER ADVISORY:**
- Winter weather conditions are expected to cause significant inconveniences and may be hazardous. If caution is exercised, these situations should not become life-threatening.
- The greatest hazard is often to motorists.

TYPES OF WINTER WEATHER ADVISORIES

- WINTER STORM WATCH:
- Severe winter conditions, such as heavy snow and/or ice, are possible within the next day or two. **Prepare now!**

TYPES OF WINTER WEATHER ADVISORIES

- WINTER STORM **WARNING**:
- Severe winter conditions have begun or are about to begin in your area. Stay indoors!

TYPES OF WINTER WEATHER ADVISORIES

- **BLIZZARD WARNING:**
- **Snow and strong winds will combine to produce a blinding snow (near zero visibility), deep drifts, and life-threatening wind chills. Seek refuge immediately!**

PHYSICAL HAZARDS

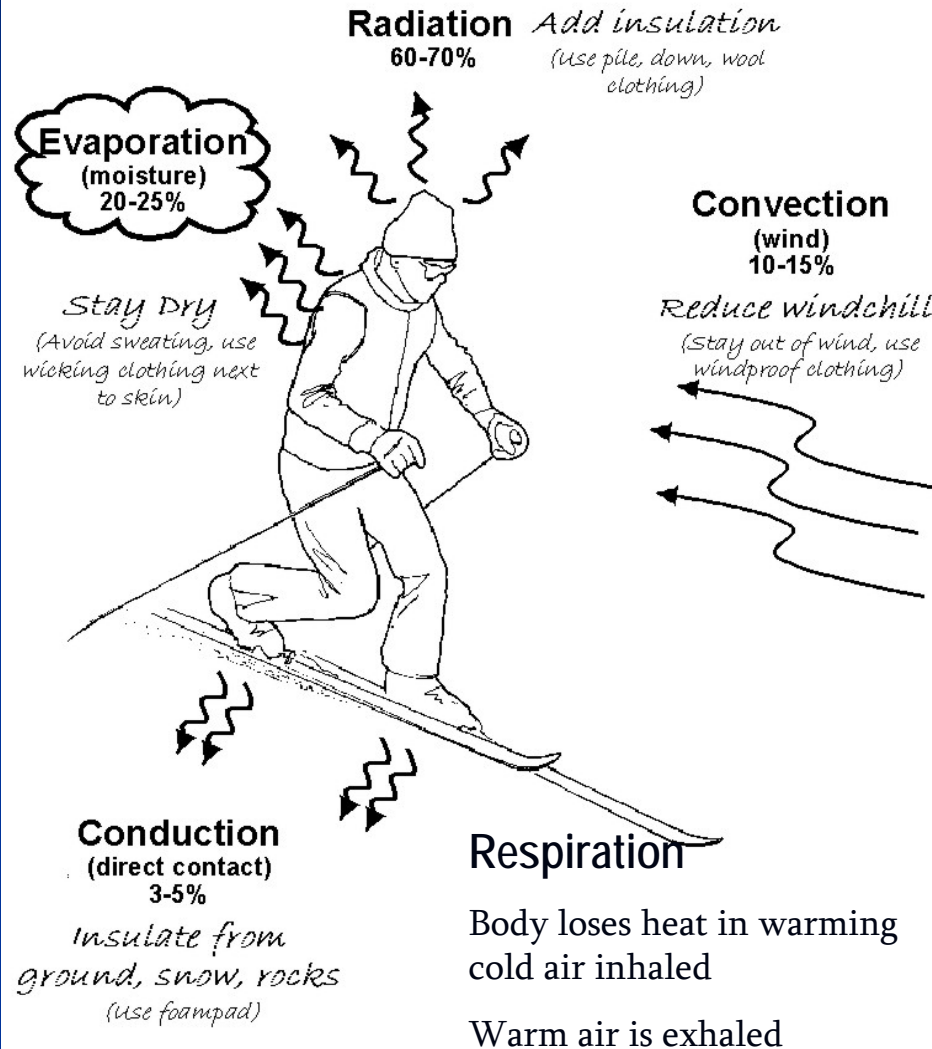
HYPOTHERMIA

THE SILENT KILLER

HYPOTHERMIA

- Normal body temperature - 98.6F
- Hypothermia occurs when body temperature drops to < 95F

Losing and Conserving Body Heat



HYPOTHERMIA

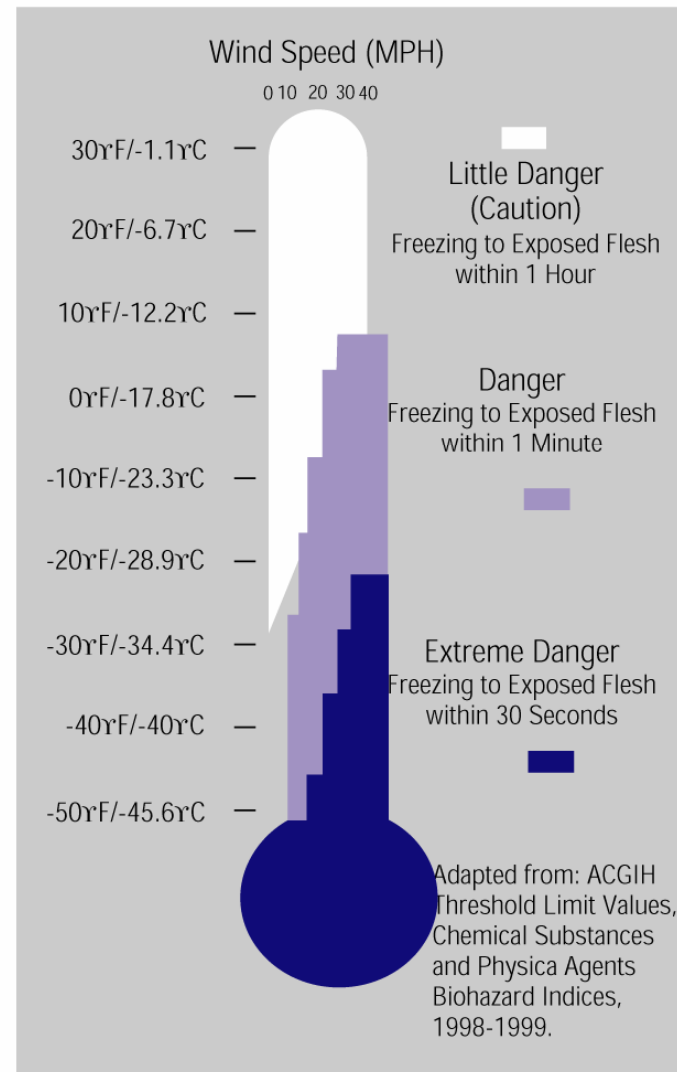
- Cold kills in 2 distinct steps
 - Exposure
 - cold
 - wind
 - Exhaustion

THE COLD STRESS EQUATION

**LOW TEMPERATURE + WIND SPEED + WETNESS
= INJURIES & ILLNESS**

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result.

Hypothermia can occur when *land temperatures* are **above** freezing or *water temperatures* are below 98.6°F/37°C. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing.



INCREASED RISKS!

- Predisposing health conditions
 - cardiovascular disease
 - diabetes
 - hypertension
- Medications
- Poor physical condition



Wind Chill Chart



Wind (mph)	Temperature (°F)																	
	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times

30 minutes

10 minutes

5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

MILD HYPOTHERMIA

- Body temperature 97F - 93F
- Shivering
- Alert
- Numbness in limbs, loss of dexterity, clumsiness
- Pain from cold

MILD HYPOTHERMIA FIRST AID

- Prevent further heat loss
- Give warm sweet liquids
- Apply gentle heat source
- Exercise to generate heat
- Keep head and neck covered

MODERATE HYPOTHERMIA

- Body temperature 93F - 90F
- Same symptoms as mild hypothermia except: shivering may decrease or stop

MODERATE HYPOTHERMIA FIRST AID

- Same as mild but limit exercise
- Sips of warm liquids if victim fully conscious
- No alcohol
- Checked by MD

SEVERE HYPOTHERMIA

- Body temperature 90 F - 82F
- Shivering decreased or stopped
- Confusion and loss of reasoning
- Slurred speech
- Semi to unconscious
- Muscular rigidity

SEVERE HYPOTHERMIA

FIRST AID

- Victim is in serious trouble
- Treat for shock
- Apply external heat source
- Avoid jarring victim
- No food or drink
- Transport gently to hospital

CRITICAL HYPOTHERMIA

- Body temperature < 82F
- Unconscious and may appear dead
- Little breathing
- Pulse slow
- Eyes dilated
- Body is rigid

CRITICAL HYPOTHERMIA FIRST AID

- Don't give up
- Handle with extreme care
- Tilt head to open airway
- CPR
- Stabilize temperature with external heat source
- Hospitalization

HYPOTHERMIA IN WATER

- Body heat loss is 25 times faster in water than in cold air
- Swimming increases heat loss by 35%

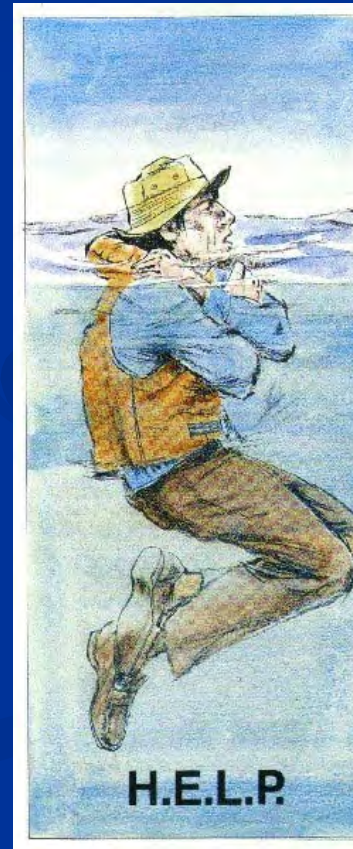
WATER IMMERSION SURVIVAL TIMES

Water Temperature	Exhaustion	Survival Time
32.5	15 min	15 min to 45 min
32.5 - 40	15 to 30 min	30 min to 90 min
40 to 50	30 min to 1 hr	1 hr to 3 hrs
50 to 60	1 hr to 2 hrs	1 hr to 6 hrs
60 to 70	2 hrs to 7 hrs	2 hrs to 40 hrs
70 to 80	3 hrs to 12 hrs	3 hrs to indefinite
Over 80	Indefinite	indefinite

H. E. L. P.

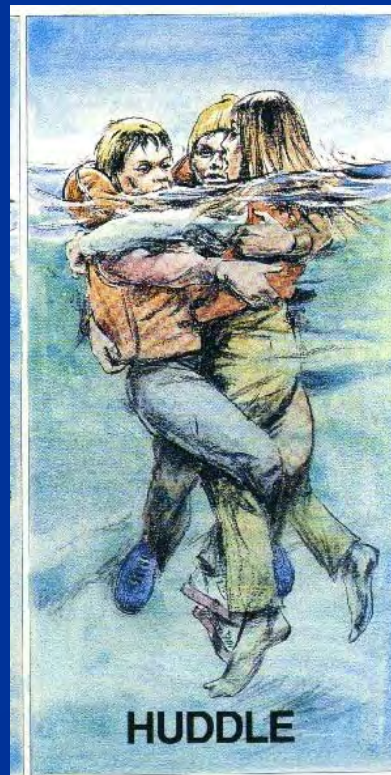
■ Heat Escape Lessening Posture

Reduces heat loss



HUDDLE

- Extends survival time by 50% over swimming or treading water



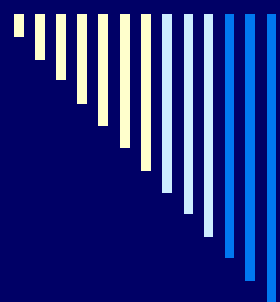
FROSTBITE

- Freezing of deep layers of skin
- Pale, waxy-white skin color
- Skin becomes hard and numb
- Usually affects:
 - Fingers and hands
 - Toes and feet
 - Ears and nose



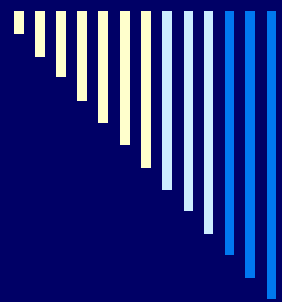
FROSTBITE FIRST-AID

- Move victim to warm dry area
- Remove wet or tight clothing
- Do not rub affected areas
- Gently place affected area in warm water
- Seek medical attention



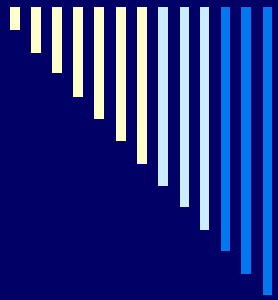
PROTECTING YOURSELF!

- Wear warm head covering**
- Wear layered clothing**
- Protect feet and hands**
- Drink plenty of fluids**
- Pace yourself during activities in the cold**



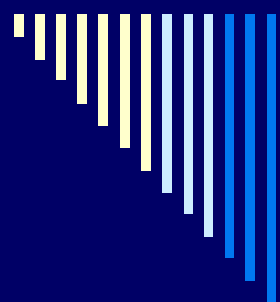
PROTECTING YOURSELF!

- ❑ Recognize conditions that lead to cold-induced injuries and illnesses
- ❑ Learn the signs and symptoms of cold-induced injuries and illnesses
- ❑ Train responders before cold weather
- ❑ Select proper clothing and headwear
- ❑ Take frequent breaks in warm area



PROTECTING YOURSELF!

- ❑ Perform non-emergency work in warmer part of day
- ❑ Avoid exhaustion and fatigue
- ❑ Use the buddy system
- ❑ Drink warm beverages.
Avoid those with caffeine
- ❑ Eat warm, high calorie foods



Winter Storm Preparedness at HOME

- ❑ ***Realize that you cannot concentrate on responses if you are worried about home!***
- ❑ Prepare your home before cold weather. Stock up on supplies.
- ❑ Have a disaster supplies kit ready!
- ❑ Service any snow-removal equipment **WELL BEFORE** it snows.
- ❑ Test/inspect generators and alternate heat sources. **CO Detectors?**



During a Winter Storm . . .

- ❑ Stay indoors and dress warmly.
- ❑ Eat and drink regularly.
- ❑ Conserve fuel.
- ❑ If outside, protect yourself from hazards.



IF YOU MUST GO – BE PREPARED!

Safety Items



Boots, Coats, Gloves, Spare Clothes, Sleeping Bag(s)



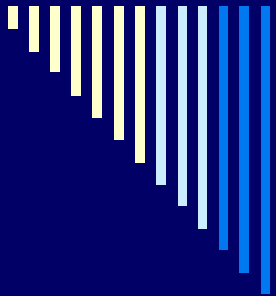
Food and Drink



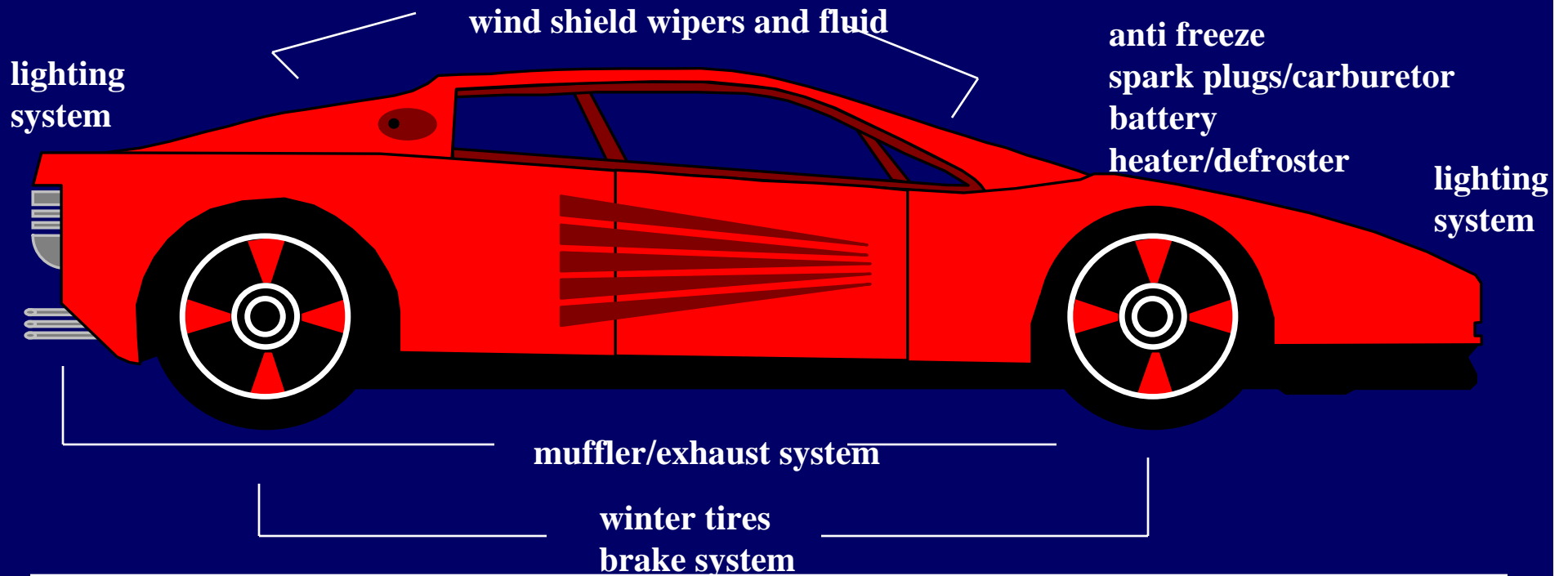
Jump Starter Box

Dynamotor powered radios and lights

Items for a Vehicular Preparedness Kit



WINTERIZE YOUR CAR!





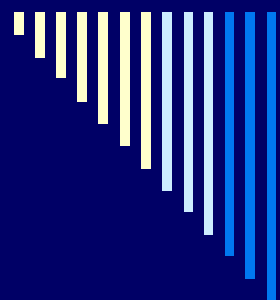
Winter Driving

- **Store non alcoholic beverages & non perishable food in your car.**
 - **Don't freeze! Be smart and have blankets or sleeping bags in your car.**
 - **Don't be a "peephole" driver.
Remove the snow from your car roof and the ice from your windows and mirrors. Have a broom and an ice scraper in your car.**
-



Winter Driving

- Remember that your car is "hungry" too. Always **refill** when the tank is **1/2 empty**.
 - Add gas line antifreeze regularly in extreme cold periods.
 - In case your battery fails or you break down, you will need a tow rope and a jumper cable or Jumpstarter in your car.
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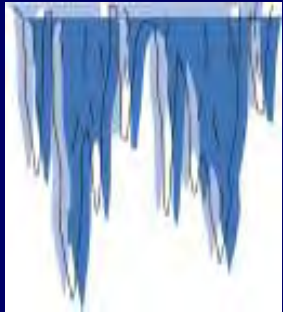


Winter Driving

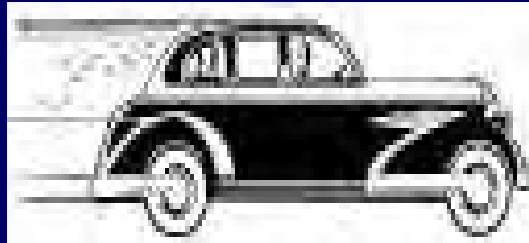
- **See and be seen during darkness and inclement weather! Have a flashlight handy.**
- **Have a shovel and rubber mats or pieces of old carpet in your car in case you get stuck.**



Adjust your speed to road conditions.



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Shift to the lowest gear needed before you go up or down a hill.



SKIDS!!!

- ❑ DO NOT HIT THE BRAKE! Steer in the direction of the skid.**
 - ❑ When the car is parallel with the road again - straighten the wheels.**
 - ❑ Avoid using the clutch - stay in 3rd gear or drive.**
 - ❑ Release the accelerator gently and gradually.**
-

THE TRUTH ABOUT SUV'S

- In 1998, there were 130 million passenger cars registered in the USA, and 16 million SUVs.
- According to the National Highway Traffic Safety Administration, there were 119,000 car rollovers and 36,000 SUV rollovers that year. That means that for every 100,000 vehicles, 91 cars rolled over -- and 225 SUVs, a figure almost three times as high.
- When it comes to deaths, the disparity is even greater; for every 100,000 vehicles there are 3.4 deaths in car rollovers, but 10.1 in SUV rollovers (a figure over three times as high).
- As to the rarity of rollover accidents, For the 130 million cars, there were 29,000 fatal accidents in 1998 -- a death rate of 22 per 100,000 vehicles. For the 16 million SUVs, there were 4,500 fatalities, which means a death rate of 28 per 100,000.

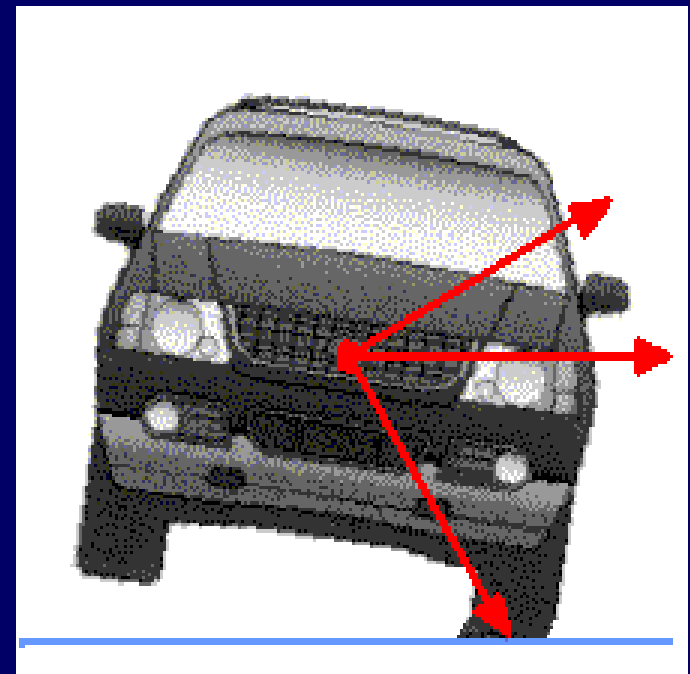
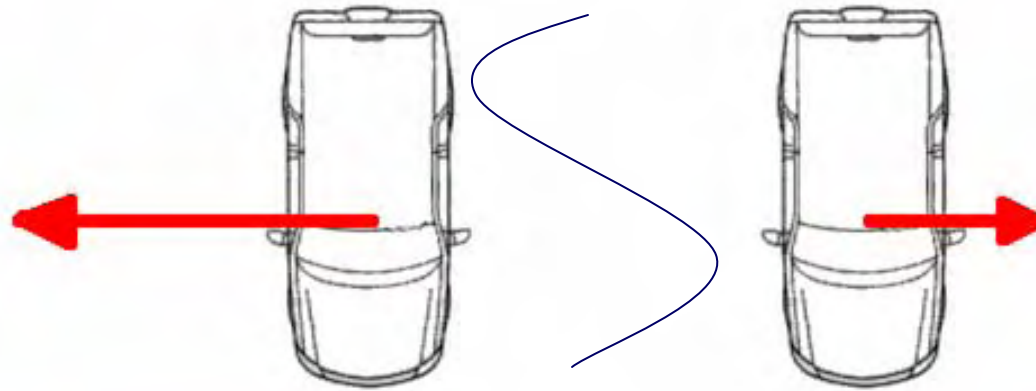


Why the higher figures???

- **The physical problem of the center of gravity being higher, makes an SUV much more likely to roll over.**
 - **Another factor may be psychological. According to 1999 NHTSA figures, 84 percent of fatalities in SUV rollovers were not wearing their seatbelts. This figure is significantly higher than the 68 percent of fatalities in car rollovers. It may be that the sense of safety one gets from the (undeserved) reputation of SUVs makes SUV riders more careless about their own safety. That attitude might carry forward into more reckless driving and other unsafe habits.**
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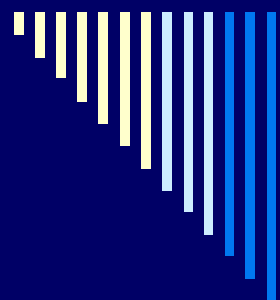
The chief hazard occurs when taking emergency action after steering in one direction and then being forced to rapidly correct in the opposite direction.

The result is a rollover!



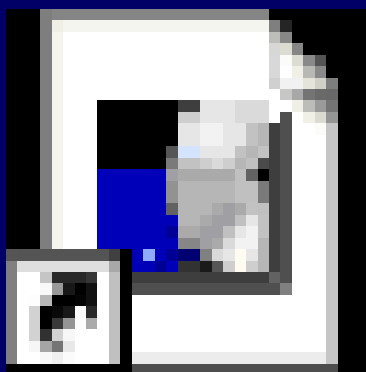
TYPES OF 4 WHEEL DRIVE

- ❑ **Part-Time 4WD** - Refers to a four-wheel drive system that operates on-demand and drives all four wheels by locking front and rear axles together via a shift lever. It usually includes two speed ranges (Hi and Lo). Part-time 4WD systems must be operated in 2WD mode on dry pavement, as they're designed to be used only in specific situations when extra traction is required.
- ❑ **Full-Time 4WD** - Describes a four-wheel-drive system that can be operated continuously on all surfaces. A full-time four-wheel-drive system may include the option of part-time operation (allowing you to shift into 2WD on dry pavement for example), and may or may not have Hi and Lo speed ranges.
- ❑ **Automatic Four-Wheel Drive (A4WD)** - This type of drive system automatically engages 4WD as needed. When internal monitors sense differences in individual wheel speeds, indicating that a tire is slipping, then 4WD is automatically engaged.
- ❑ **Shift on the Fly** - This type of system allows manual shifting from 2WD to 4WD Hi without coming to a stop. Most systems have a speed limit at which you can engage the system; typically it's under 60 mph.
- ❑ **All-Wheel Drive (AWD)** - A full-time single-speed system designed to supply drive power to all four wheels. The percentage of front/rear power delivery varies from system to system.



VIDEO

□ SURVIVING THE COLD



Movie.Ink

REVIEW - SURVIVING THE COLD

- 1) **FAMILIAR SCENES ARE SUDDENLY UNFAMILIAR IN A DEEP SNOW OR BLIZZARD!**
- 2) **IN SEGMENT 1, WHY DID THE TWO MEN (Ed & Paul) BECOME CONFUSED?**
- 3) **WHY WERE THEY LUCKY TO BE ALIVE?**

REVIEW - SURVIVING THE COLD

- 4) WHY IS IT A BAD IDEA TO WARM HANDS AND FEET FIRST IN A HYPOTHERMIC SITUATION?**
- 5) HOW SHOULD IT BE DONE?**
- 6) WHY ARE OLDER PEOPLE SO SUSCEPTABLE TO HYPOTHERMIA?**

REVIEW - SURVIVING THE COLD

- 7) IN SEGMENT 2, DENNIS BEAM AND HIS DAUGHTER KELLY, MADE SEVERAL MISTAKES, WHAT WERE THEY???**
- 8) WHAT DID KELLY DO THAT WAS A GOOD IDEA???**

REVIEW - SURVIVING THE COLD

**9) THE TWO COLLEGE STUDENTS
IN THE LAST SEGMENT DIED
EVEN THOUGH THEY DID MANY
THINGS RIGHT, WHY???**

SUMMARY

- ✓ **Use common sense!**
- ✓ **Prepare your home, your vehicle and yourself BEFORE winter arrives!**
- ✓ **Stay informed of changing weather conditions**
- ✓ **If you must drive, allow plenty of time for travel and plenty of distance between vehicles**

QUESTIONS OR COMMENTS?

