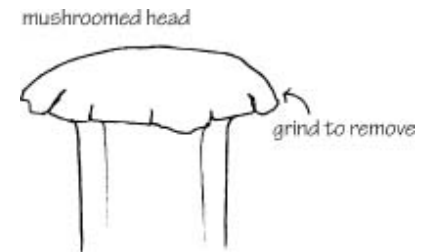


Of all the equipment placed at our disposal, the common hand tools are the most useful and the most often abused. A review of workplace injuries reveals that a large number of accidents involved the use of hand tools. In most cases, the victim disregarded the basic rules governing the use of hand tools:

- ❶ Choose the right tool for the job. Never use a makeshift arrangement.
- ❶ Use only tools in good condition — no tools with cracked or broken handles, none without handles, none with mushroomed or broken heads or deformed, eroded tips.
- ❶ Keep keen-edged blades sharp; store them safely when not in use.
- ❷ Do not use a hammer with a hardened face on a highly tempered tool, such as a drill, file, or die or jig. Metal chips may fly.
- ❶ Use wrenches of the right size for the job. Face the movable jaw on an adjustable wrench in the direction of the pull.
- ❷ Never apply a wrench to moving machinery; stop the machine, then remove all tools before starting it again.
- ❷ Never subject hand tools to extreme heat unless they are made for that purpose.
- ❶ Replace tools when their gripping surfaces are worn smooth. (Pliers, for example.)
- ❷ Never use any tool in such a way that you will be injured if it slips. Pre-analyze your movements and position your body accordingly.



### Power Tools Safety Tips — Famous Last Words:

*"It's only 110 volts — it can't really hurt you." "Let me just stretch a little and drill this one hole."*

*"Let me pull this saw blade guard back just to finish this one cut." "That breaker keeps tripping. Plug it in over there."*

Portable power tools are one of the greatest time and energy savers around. Since they are so readily available and useful, we tend to forget that they are powered, and have the potential to lacerate, amputate, break bones, electrocute, and kill.

#### Problems:

- Inadequate instructions
- Use of improperly grounded, non-double-insulated tools
- Protective guards were defective or removed
- Dull, cutting edges of blades and bits
- Hang-up of power cord twist plugs on ladder rungs
- Non-secure operator position

#### Solutions:

- Proper training in power tool use
- Preventive maintenance on power tools
- Inspections and defective tool reports
- Inspect and maintain cutting edges
- Shorten power cord to prevent hang-ups
- If you are performing elevated work, use fall protection.



**Chemicals enter the body in three common ways:**

- ▶ **inhalation** (breathing in),
- ▶ **ingestion** (eating, swallowing)
- ▶ **absorption** (through the skin or eyes).



**In the workplace, the most common way for chemicals to enter the body is through breathing (inhalation).**

Respirable contaminants include dusts, mists, fumes, vapors, and gas. When they are inhaled, a variety of unpleasant things can occur.

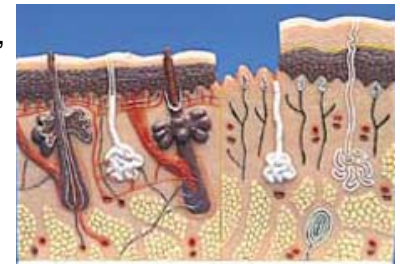
Chemicals can irritate the nose and sinuses, the throat, and lungs. Once in the lung, they can enter the bloodstream and affect other vital organs. Dusts and fibers can become trapped in your lungs causing permanent damage. Silica and asbestos are two such substances.

**Workers often unknowingly ingest toxic chemicals.** They handle chemicals and then perform an activity where a product enters their mouth (eating, drinking, smoking, etc.), or food and drinks are exposed to the chemical in the work environment.



Once swallowed, these substances can be absorbed by the stomach or intestines and enter into the bloodstream where they can cause damage to other organs. A number of work activities at JLab involve lead which is famous for creating dust and fume residue. Hygiene is especially important when working with lead, as is housekeeping and following approved work methods.

**The skin is usually an effective barrier to many chemicals.** However, certain chemicals, such as solvents, fuels, and thinners are easily absorbed through the skin. They then enter the bloodstream and can cause serious organ damage. Dry, cut, or cracked skin increases the likelihood of absorption. Solvents commonly dry out the skin, causing a type of dermatitis.



Mercury is easily absorbed by the skin and damages the central nervous system. Many organic solvents can penetrate the skin and then cause systemic health effects. Hydrofluoric acid, used to clean the accelerator cavities, is absorbed through the skin, and it can be lethal in sufficient doses.

**To limit chemical exposure, take the appropriate measures listed below:**



- ▶ Wear a respirator if the chemical produces airborne material. Use the product Material Safety Data Sheet to determine the chemical's properties, and consult with EH&S.
- ▶ Wash your hands before eating, drinking, or smoking.
- ▶ Do not have food or drink present when chemicals are in use.
- ▶ Wear gloves and other necessary protective clothing.



## STORM SURGE

**"The greatest potential for loss of life related to a hurricane is from the storm surge."** - Brian Jarvinen, National Hurricane Center

Storm surge is a bulge of water that is pushed toward the shore by the force of the winds swirling around the storm, especially in the front right quadrant of the storm. This advancing surge combines with normal tides to create the hurricane storm tide, which can increase the mean water level 15 feet or more. In addition, wind-driven waves are superimposed on the storm tide. This rise in water level can cause severe flooding in coastal areas, particularly when the storm tide coincides with the normal high tides.

Because much of the United States' densely populated Atlantic and Gulf Coast coastlines lie less than 10 feet above mean sea level, the danger from storm tides is tremendous. Although Jefferson Lab itself is well above the reach of storm surges, many of us live in more vulnerable areas. As Gulf Coast residents learned during Katrina, storm surge can be unexpectedly severe and a more potent destructive force than winds.

### Some recommendations for those who live in storm-flood-prone zones:

If you live in an evacuation zone and are ordered to evacuate by state or local officials, do so as quickly as possible. **Do not wait or delay your departure;** to do so will only increase your chances of being stuck in traffic or, even worse, not being able to get out at all.

**Minimize the distance you must travel** to reach a safe location; the further you drive the higher the likelihood of encountering traffic congestion and other problems on the roadways.

Select the **nearest possible evacuation destination**, preferably within your local area, and map out your route. Do not get on the road without a planned route, or a place to go.

Choose the home of the closest friend or relative outside a designated evacuation zone and **discuss your plan with them before hurricane season.** You may also choose a hotel/motel outside of the vulnerable area.

If neither of these options is available, consider the closest possible public shelter, preferably within your local area.

Use the evacuation routes designated by authorities and, if possible, **become familiar with your route by driving it** before an evacuation order is issued.

Prepare a separate **pet plan**; most public shelters do not accept pets. Good information is found at: [http://www.nhc.noaa.gov/HAW2/english/prepare/pet\\_plan.shtml](http://www.nhc.noaa.gov/HAW2/english/prepare/pet_plan.shtml)

Prepare your home prior to leaving by boarding up doors and windows, securing or moving indoors all yard objects, and **turning off all utilities.**

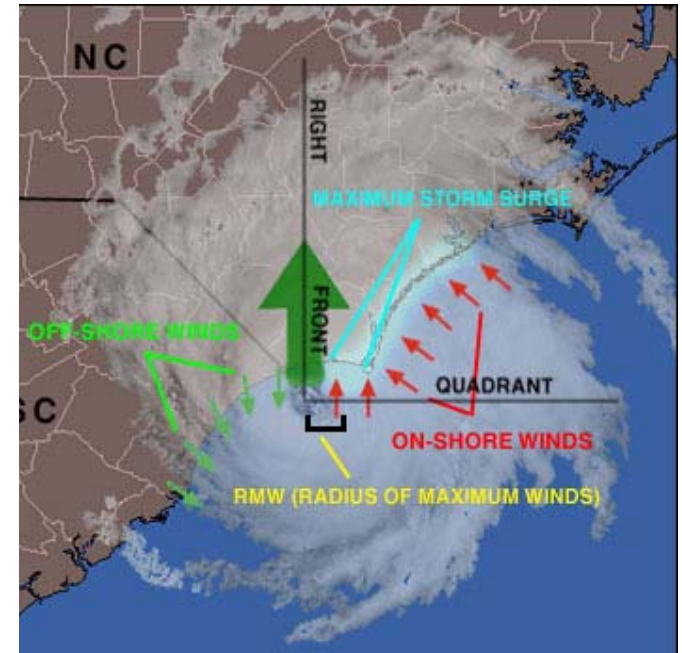
Before leaving, fill your car with gas and withdraw extra money from the ATM

Take all prescription medicines and special medical items, such as glasses and diapers. Take drinking water.

If your family evacuation plan includes an RV, boat, or trailer, leave early. Do not wait until the evacuation order or exodus is well underway to start your trip.

Expect traffic congestion and delays during evacuations. Expect and plan for significantly longer travel times than normal to reach your family's intended destination. Conserve fuel by turning off your engine if traffic congestion causes you to remain in place for more than 5 minutes.

Stay tuned to a local radio or television station and listen carefully for any advisories or specific instructions from local officials. Monitor your [NOAA Weather Radio](#)

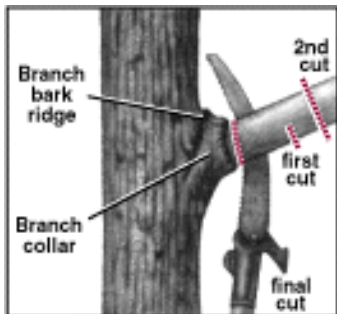


**A lesson-learned for JLab courtesy of Hurricane Isabel:**

**Damaged trees present the greatest wind-related risk to Lab buildings. Chances are good this is true in your yard as well.**



- ◆ Trees used for landscaping should be selected for resistance to wind and uprooting.
- ◆ Native plants are often best adapted for wind resistance.
- ◆ Consider “grooming” or culling trees that could reach buildings.
- ◆ Remember the Dennis-Floyd effect:  
**saturated ground + strong winds = high probability of uprooted trees**
- ◆ Pruning and thinning trees can prevent or minimize wind damage. Incorrect pruning can make a tree **more** susceptible to wind damage. Cut beyond the *branch collar*.



Correct pruning technique

**Resistance of tree species to hurricane-related damage**  
(in descending order of resistance)

Flood tolerance	Breakage	Uprooting	Salt	Deterioration by insect and disease
<b>bald cypress</b>	<b>live oak</b>	<b>live oak</b>	<b>live oak</b>	<b>live oak</b>
<b>pond cypress</b>	<b>palm</b>	<b>palm</b>	<b>palm</b>	<b>palm</b>
tupelo-gum	<b>bald cypress</b>	<b>bald cypress</b>	slash pine	sweet gum
sweet bay willow	<b>pond cypress</b>	<b>pond cypress</b>	longleaf pine	water oak
<b>sweet gum</b>	<b>sweet gum</b>	tupelo-gum	pond cypress	sycamore
river sycamore	tupelo-gum	red cedar	loblolly pine	<b>bald cypress</b>
birch cottonwood	mimosa	<b>sweet gum</b>	red cedar	pond cypress
green ash red maple	dogwood	sycamore	tupelo-gum	southern red oak
pecan mulberry	magnolia	longleaf pine	<b>bald cypress</b>	magnolia
American elm	sweet bay	mimosa	<b>sweet gum</b>	tupelo-gum
persimmon	southern red oak	southern red oak	water oak	sweet bay



A weak, co-joined branch: a candidate for pruning

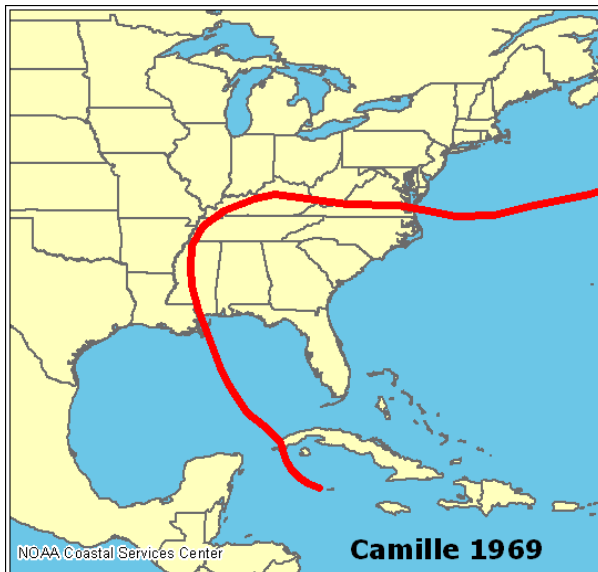


**But**, it is useful to look back at the storms that have affected Virginia and, in particular those that have affected our region. There are lessons to be learned.



Hurricane Hazel is regarded as the most violent hurricane to pass through Virginia in modern times. It retained hurricane-force winds as it passed through North Carolina and well into northern Virginia. It caused severe damage all the way into Canada. It was an anomalous storm in several ways, and it led to changes in hurricane forecasting methods. "Another Hazel" is the watchword for a future destructive hurricane in the Mid-Atlantic region.

Isabel is the most recent hurricane to affect JLab, and it illustrates how a minor storm can have major impact. Isabel caused much damage to trees throughout the region, including a branch that fell onto the electrical feed to JLab's primary substation. It was nearly four days before power was restored. By then, the cryogenic cooling to the beam line was lost. Recovery from that condition is always time-consuming. This experience was instrumental in the installation of additional emergency-power generators on site.



Hurricane Camille struck the Mississippi Gulf Coast as a Category-5 storm – winds in excess of 155 mph. Exact velocities are unknown since it destroyed the measuring instruments miles inland from its landfall. It caused a 25-foot storm surge, rivaled only by Katrina in 2005. Camille was a rain-maker on an epic scale. As it crossed over the Appalachian Mountains, it produced rain rates of a foot or more per hour. In Virginia, entire mountainsides slid into the valleys below, killing at least 130 people. It also produced torrential rain in the Tidewater area with severe surface flooding in poorly drained areas.

Floyd was a minimal hurricane as it moved across the Hampton Roads area. Nonetheless, it caused major damage to property because of its enormous rainfall. JLab received over 18 inches within a twelve-hour period. Because local storm-water run-off capacity was greatly exceeded, water could not drain fast enough from our site. Water rose to a foot or more at the end station truck-ramp doors. It was a night of furious sand-bag filling for Physics and Facilities staff. The drop-in flood gates for the truck ramp entrances are tangible evidence of Floyd lessons-learned.

