

# Integrated Pest Management

Cornell Cooperative Extension  
Suffolk County

ccesuffolk.org



## Anti-fouling Paints and Boat Bottom Maintenance

### 4.3 Heat Stress and Boat Maintenance Activities

Not only can heat stress make you ill or even kill you, but it can also make you careless with product and pollutants and cause you to do a poor job in cleaning up pollutants or use poor judgement when you need to clean up or when you need to stop because your body can no longer handle the heat overload.

- Hydrate before you need to hydrate.
  - Before beginning your work, and especially if you will be sweating in protective gear, you should drink one or two cups of water, juice, or a sports drink.
- Limit the amount of caffeine drinks such as coffee and colas because caffeine increases fluid loss.
- Avoid alcoholic drinks—they also cause dehydration.
- When engaged in strenuous activity, or when working in hot environments like an indoor or enclosed spray booth, drink at least one quart of fluid per hour:
  - YES, THAT MEANS YOU NEED TO CARRY IT PLUS ONE THIRD MORE FOR EVAPORATIVE COOLING OR FOR THE PERSON WORKING WITH YOU THAT DID NOT BRING ENOUGH (and for spills).
- DO NOT RESTRICT YOUR FLUID INTAKE BECAUSE YOU ARE AFRAID YOU WILL NOT BE ABLE TO FIND AN OPEN BATHROOM.
- DRINK SOMETHING AT LEAST 30 MINUTES BEFORE YOU FEEL THIRSTY...BY THE TIME YOU ARE THIRSTY YOU ARE ALREADY WELL ON YOUR WAY TO DEHYDRATION.

#### DEHYDRATION:

- MILD: EXCESSIVE THIRST, IRRITABILITY, WEAKNESS AND NAUSEA.
- MODERATE: DIZZINESS, HEADACHE, DIFFICULTY WALKING, TINGLING SENSATION IN LIMBS.
- SEVERE: DIM VISION, PAINFUL URINATION, SWOLLEN TONGUE, DEAFNESS, NUMBNESS OF SKIN.
- AGAIN, A MINIMUM OF 2-3 QUARTS OF WATER A DAY AND MORE IF YOU ARE WORKING IN HEAT OR EXERTING A LOT OF ENERGY

(BEFORE YOU BEGIN WORK, KNOW IF YOU ARE ALREADY APPROACHING DEHYDRATION...URINE SHOULD BE AT LEAST 1 QUART IN A 24 HOUR

PERIOD SO MAKE SURE YOU ARE HYDRATED FULLY THE DAY BEFORE YOUR BOAT WORK IF YOU ARE PRONE TO NOT GETTING ENOUGH FLUIDS...)

#### DRINK WATER OR SPORTS DRINKS

- Drink before you feel thirsty.
- Drink at least 8 ounces before you go out, and then drink between a pint and a quart every hour to replace fluid lost to sweat.
- Drink water or sports beverages (diluting them will counteract the sugar content which may make you feel tired).
- If you drink alcohol, or caffeinated beverages (soda, coffee, tea), you may do more harm than good because the caffeine can cause you to lose more fluid than you take in.

#### MORE THAN JUST FLUIDS

- PART OF YOUR FLUID REPLACEMENT WITH CARBOHYDRATE/ELECTROLYTE SPORT BEVERAGE WILL HELP RETAIN FLUIDS AND MAINTAIN ENERGY AND ELECTROLYTE LEVELS—HOWEVER, BE SURE TO ALTERNATE SPORTS DRINKS WITH PLAIN WATER.
- CONTINUE DRINKING AFTER WORKING TO REPLACE FLUID LOSSES—THIRST DOES NOT NECESSARILY EQUAL (USUALLY UNDERESTIMATES) FLUID NEEDS, SO DRINK MORE THAN YOU THINK IS NECESSARY.
- ENHANCE REHYDRATION BY CONSUMING FLUIDS OR FOOD WITH SODIUM AND POTASSIUM ALONG WITH YOUR WATER: FOR EXAMPLE:
  - BANANAS
  - CITRUS FRUITS
  - LEMONADE
  - ORANGE JUICE
  - TOMATO JUICE

DISGUSTING BUT USEFUL: WHAT COLOR IS YOUR PEE

- SIGNS OF DEHYDRATION:
  - LOW VOLUMES OF DARK, CONCENTRATED URINE, OR PAINFUL URINATION
  - OTHER POSSIBLE SYMPTOMS OF DEHYDRATION:
    - RAPID HEART RATE
    - WEAKNESS
    - EXCESSIVE FATIGUE
    - DIZZINESS

- FAINTING: “SPOTS” BEFORE YOUR EYES, FEELING OF SUDDEN CHILL EVEN IN HEAT, NAUSEA

## **WATER LOSS AND WATER INTAKE**

Although, sweating does act to cool your body your body temperature will rise if you do not drink enough water to replace what you lose through sweating.

You may be losing more liquid this way than you think, or if you are not a sweater, this may impair your body’s ability to lose excess heat.

Have enough spare water so that you can wet down a hat or kerchief to wear around the head and neck for evaporative cooling.

Do not depend on water sources that you have not brought; they may be inaccessible or may have been turned off.

## **INFLUENCE OF AIR QUALITY**

A heatwave is defined as 3 or more days with highs at or above 90°. During these times, the air quality is likely to plummet.

During the summer, the NATIONAL WEATHER SERVICE commonly issues Air Quality Alerts when the ozone is high which leads to unhealthy air quality.

Heat stress and heat illnesses are more likely when air quality is poor, and it tends to be poor in urban and suburban areas like Long Island during heat events.

So along with checking the weather and pollen count before you go to work on your boat, check the AIR QUALITY and take appropriate measures such as potentially rescheduling.

## **HEAT STRESS**

Workload is a major factor in heat stress.

Because hard work causes the body to produce heat, heat stress is more likely to develop when you do heavy work or work without breaks, such as working towards a particular hull painting or scraping goal for a particular time in heat stress conducive temperatures.

Heat stress is the buildup in the body of heat generated by your muscles during work and by a warm or hot work environment

The symptoms of heat illness can be confused with symptoms of food poisoning, medication reaction and many other conditions.

Protective clothing that you wear when you work (PPE protective gear, Covid or work protective masks and gloves), or simply too much clothing because of a temperature change from when you set out or because your body is not a good judge of external temperature can increase your risk of heat stress.

Extra layers of clothing and gear protect you from exposure to sun or chemicals. Unfortunately, they also interfere with natural body cooling that occurs when sweat evaporates.

Be aware of this, and have an outfit that can accommodate the removal of some of these layers

As temperature, humidity, and/or amount of sunlight increase, so does the likelihood of heat stress.

Wind on the other hand, helps keep you cool.

Don't wear tight, dark clothes made of synthetic fibers. Loose clothing promotes air circulation, light colors promote deflection rather than absorption of the sun's heat, and natural fibers wick water away from your body and let air in so that you can cool off by evaporation from your skin surface.

Wear a wide brim hat. Remember, too, that the top of your head has thinner skin and will absorb more heat more quickly than other areas. Don't turn your skull into a crock pot just because you think hats aren't fashionable.

When your body becomes overheated, less blood goes to active muscles, the brain, and organs. You get weaker, become tired sooner, and may be less alert, less able to use good judgment, and less able to perform normally.

As strain from heat becomes more severe, your body temperature and heart rate can rise rapidly. If your physiology is already impaired because of underlying health conditions this can become critical very quickly.

Think about causes, and risk factors and types of heat illness and how these can contribute to boat maintenance related accidents by impairing a person’s judgment (slips, trips, falls, when to stop for a break or call halt).

Alcohol or prescriptions or lack of sleep can increase the risk of heat illness amongst other things.

## **TYPES OF HEAT ILLNESS AND FIRST AID**

- Early Heat Illness
  - Mild dizziness, fatigue, or irritability, decreased concentration, impaired judgment.
  - May lead to heat exhaustion or heat stroke.
  - Treatment: Loosen or remove clothing, rest in shade 30 min or more, drink water.
- General First Aid for Heat Illness
  - Get victim to a shaded or cooler area.
  - Carefully remove outer clothing that may be making the victim hot.
  - Cool the victim by sponging or splashing the skin (esp. face, neck, hands, and forearms) with cool water..always carry some spare for this purpose if doing boat work in heat.
  - If possible, have the victim take a cool shower.

- Have the victim drink as much cool water as possible.
- Keep the victim calm and quiet.
- Heat Cramps
  - Painful spasms of leg, arm, or abdominal muscles, heavy sweating, thirst.
  - Occurs during or after hard work, may be totally disabling.
  - Heat cramps are caused by dehydration--- you lose chemicals along with water when you sweat. The chemical loss causes an imbalance of chemicals in your muscles which causes them to contract.
  - Treatment: Loosen clothing, drink lightly salted beverages, massage cramped muscles, rest.
  - Get to the shade, rehydrate with cool fluids, massage muscles, knock off work for the day.
  - Muscles most often affected include those of your calves, arms, abdominal wall and back, although heat cramps may involve any muscle group involved in exercise.
  - Drink clear juice or an electrolyte-containing sports drink.
  - Practice gentle, range-of-motion stretching and gentle massage of the affected muscle group.
  - Don't resume strenuous activity for several hours or longer after heat cramps go away.

#### WHAT PUTS AN INDIVIDUAL AT RISK FOR HEAT CRAMPS?

- Exercise in the heat when the individual is not accustomed to exercising in hot conditions.
- Profuse sweating or body water loss during exercise coupled with large electrolyte losses.
- Consuming a diet that is chronically low or inadequate in the amount of sodium or other electrolytes required by the body for sweating. In other words, the daily sodium balance is not maintained as sweating demands increase in an effort to maintain a normal exercising body temperature.
- Exercising for an extended duration of time or participating in multiple exercise sessions per day without properly replacing electrolyte and water losses.
- Muscular fatigue.
- Wearing additional layers of clothing, protective gear, or equipment.

NOTE: A precursor to the initial onset of cramps involves muscle twitches.

#### HEAT EXHAUSTION

- This is worse---you are so dehydrated that your blood volume has even gone down.
- Decreased blood volume means inefficient circulation to vital organs.

- Expect weakness, irritability, nausea/vomiting, heavy sweating, and cramps in muscles.
- Go lie down in the shade or in air conditioning, raise your feet 8-12" above your head to improve circulation to the brain via gravity.
- Remove excess clothing, apply cool wet compresses to your body, and rehydrate.
- Do not go back to working on your boat and if you are not much better in half an hour, call a doctor.

#### SYMPTOMS OF HEAT EXHAUSTION

- Fatigue, headache, dizziness, muscle weakness, loss of coordination, fainting, collapse. Profuse sweating, pale, moist, cool skin, excessive thirst, dry mouth, dark yellow urine.
- Fast pulse.
- Low or normal oral temperature.
- Treatment:
  - Move to cooler, shaded area as quickly as possible.
  - Rest lying down.
  - If victim is conscious, have them drink as much water as possible.
  - DO NOT GIVE SALT!
  - If unconscious or if heat stroke is suspected, treat for heat stroke until proven otherwise.

#### HEAT STROKE IS A HEALTH EMERGENCY

Confusion is a critical sign of heat stroke.

If someone is acting strangely, don't assume they are joking around if the day's temperature is 90 or more.

You may not realize this is happening because there is no pain. With only a 2 degree F rise in body temperature, your ability to reason is impaired.

An increase of 5 degrees can be life threatening.

The most serious heat illness is heat stroke, which is fatal in 20% of cases.

Heat stroke is a worst-case scenario.

This condition carries a 50% death rate due to an uncontrollable rise in body temperature.

The first sign is confusion or fainting.

The victim will have hot, dry, red skin, rapid pulse and rapid breathing. The body temperature is 105 degrees or higher, which means the person is literally cooking.

Dial 911 and get the victim into the shade or somewhere cool immediately.

Often occurs suddenly.

Headache, dizziness, confusion, irrational behavior, coma. Sweating may slow down or stop, Fast pulse, if conscious, rapid breathing.

May also have convulsions, nausea, incoherent speech, very aggressive behavior.

Risk of damage to vital organs, including the heart, brain, central nervous system, liver and kidneys.

**BRAIN DAMAGE AND DEATH CAN RESULT EVEN WITH PROMPT TREATMENT.**

**IMMEDIATE TREATMENT REQUIRED.**

Move to shaded area, remove outer clothing and shoes, wrap in wet sheet, pour water on and fan vigorously, avoid overcooling. Treat shock if present, once temperature is lowered.

If victim vomits, make sure all vomit is cleared from mouth and nose to prevent choking.

Place victim on their side. Remove excess clothing, pack ice and cool cloths in the areas with maximum blood flow: neck, armpits, and groin. Place cool cloths elsewhere.

Do not give the person anything to drink! If you do, they may vomit, and choke to death. Once the body temperature has fallen below 102 degrees, take care not to chill the victim.

Transport to nearest medical facility at once, elevate legs.

**DO NOT GIVE SALT**

May also have heat cramps, nausea, urge to defecate, rapid breathing, chills, tingling of hands or feet, confusion, giddiness, slurred speech, irritability.

Victim may resist treatment – and those on the verge of heat stroke... fighting you may lead to heat stroke.

### **SUN BLOCK**

SPF (Sun Protection Factor) is the ratio between the time it takes UV light from the sun to make your skin red if you have applied sunscreen to the time it takes

to make your skin red if you haven't applied sunscreen.

If you use a sunscreen with SPF 15, you can stay in the sun fifteen times longer without reddening than if you used nothing at all.

Most sunscreens have an SPF of 3-12.

If you are doing boat maintenance outside, you need an SPF of 15 or HIGHER!

You also need to apply sunscreen at least 20 minutes before going outside to work so that it can sink into your skin.

You need to reapply what you sweat off on you face ears, neck, arms and the backs of legs...take advantage of reapplication interval to rehydrate.

### **MEDICAL CONDITIONS AND HEAT**

Besides the usual warning for heart patients, consider the effects of any other medications and conditions you might have that can interfere with your body's cooling capacity.

Thyroid conditions can make you really heat intolerant and common over-the-counter antihistamines can foul up your ability to dissipate excess heat.

Even after all these warnings, sometimes disaster can still strike. If any of the conditions described occur, get out of the sun and/or seek medical attention at once.

TIP: Have an inexpensive digital thermometer in your first aid kit. Dehydration can make your blood flow sluggish but a thermometer can still give you a ballpark number if you are approaching a critically high temperature.

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