

# Tarpology 501

Advanced Shade Tarp Techniques for  
Paleontological Field Excavations;  
Strategies for field paleontology on a  
warming planet

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# Outline

- UGS summer field work
- Heat related disorders
- Quarry shade
- Precautions



# UGS Summer Field Work July - August

2002 Crystal Geyser

2003 Crystal Geyser

2004 Crystal Geyser

2005 Crystal Geyser, Andrew's Site

2006 Don's Ridge, Crystal Geyser

2007 Don's Ridge, Doelling's Bowl

2008 Don's Ridge, Doelling's Bowl

2009 Don's Ridge, Doelling's Bowl

2010 Doelling's Bowl

2011 Doelling's Bowl

2012 Doelling's Bowl

2013 Doelling's Bowl

Early Cretaceous

Cedar Mountain Formation

*Falcarius utahensis* 2004

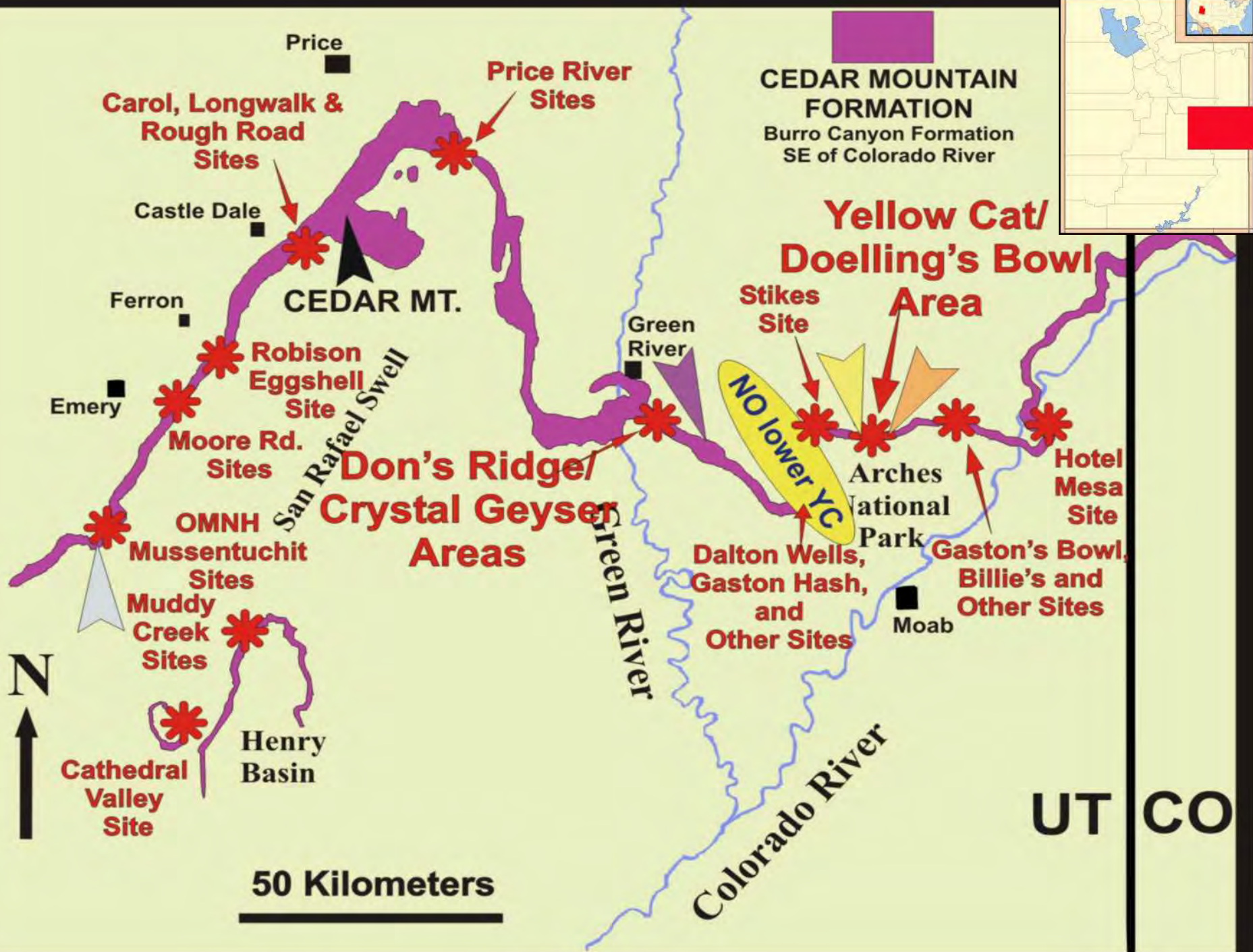
*Hippodraco scutodens* 2010 *Iguanacolossus fortis* 2010

*Yurgovuchia doellingi* 2012 *Martharaptor greenriverensis* 2012

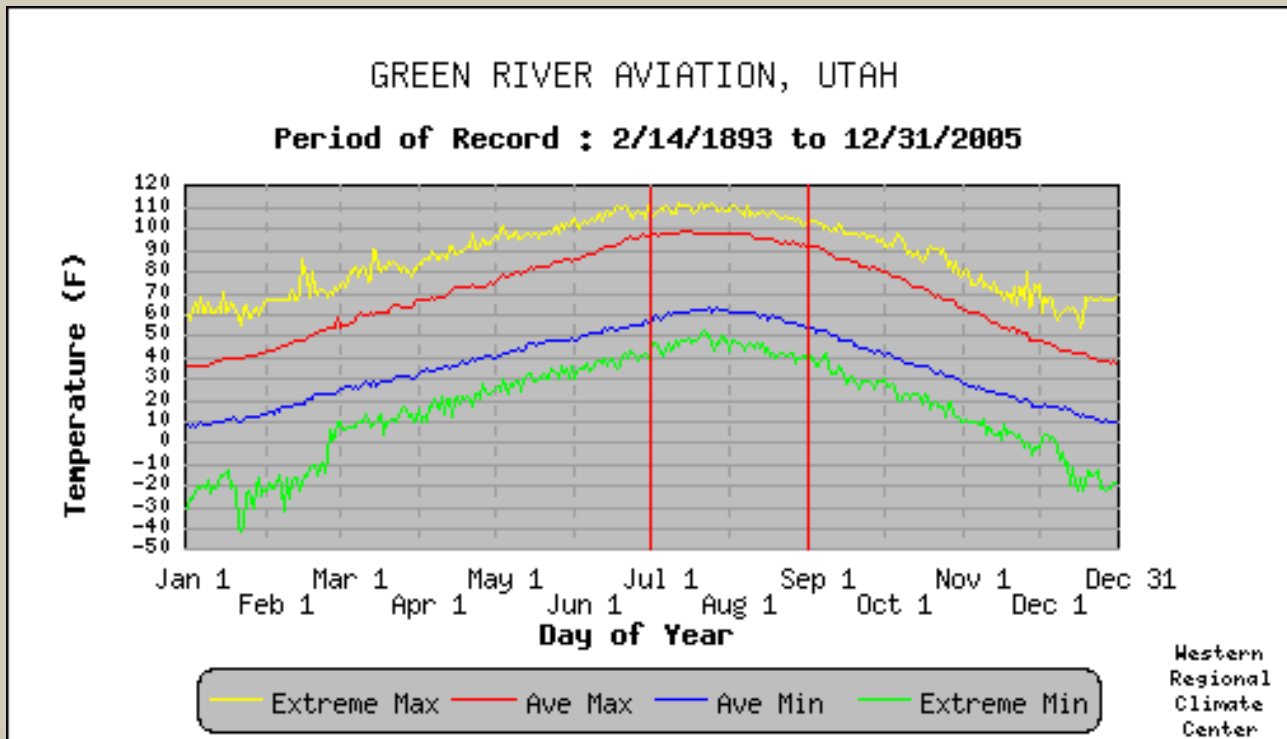
new sauropod, new ankylosaur, new iguanodont, new mammal, new crocodile

Many publications, numerous undergraduate students trained,  
multiple Master's and PhD thesis projects





Records from Green River, Utah indicate that July average daily temperature maximum\* is  $\sim 99^{\circ}\text{F}$  ( $37^{\circ}\text{C}$ ) and a record high of  $116^{\circ}\text{F}$  ( $46^{\circ}\text{C}$ ).



\*Ground surface temperatures much higher!  
Acetone boiling point  $138^{\circ}\text{F}$  ( $56^{\circ}\text{C}$ )



# Common heat related disorders

- **Dehydration** – Weakness, headache, muscle cramps, dizziness, confusion, fainting, impaired coordination and judgment
- **Heat Cramps** – muscle spasms, pain, usually in abdomen, arms or legs
- **Heat Exhaustion** – Heavy sweating or no sweating; cold/clammy skin, muscle cramps, weakness, dizziness, headache, nausea and vomiting, fainting, tiredness, anorexia
- **Heat Stroke** – Body temperature of  $\geq 103^{\circ}\text{F}$ ; headache, dizziness, nausea and vomiting, fainting, red/hot/dry skin, rapid pulse, dyspnea, loss of consciousness



# Skin Cancer

Each year, more new cases of skin cancer are diagnosed in the U.S. than new cases of breast, prostate, lung, and colon cancer combined. One in five Americans will develop skin cancer in their lifetime. One American dies from skin cancer every hour. Unprotected exposure to UV radiation is the most preventable risk factor for skin cancer.

## **Melanoma**

## **Non-melanoma Skin Cancers**

### **Basal Cell Carcinomas**

### **Squamous Cell Carcinomas**

## **Other Skin Damage**

Actinic keratoses  
premature aging

## **Cataracts and other eye damage**

## **Immune Suppression**



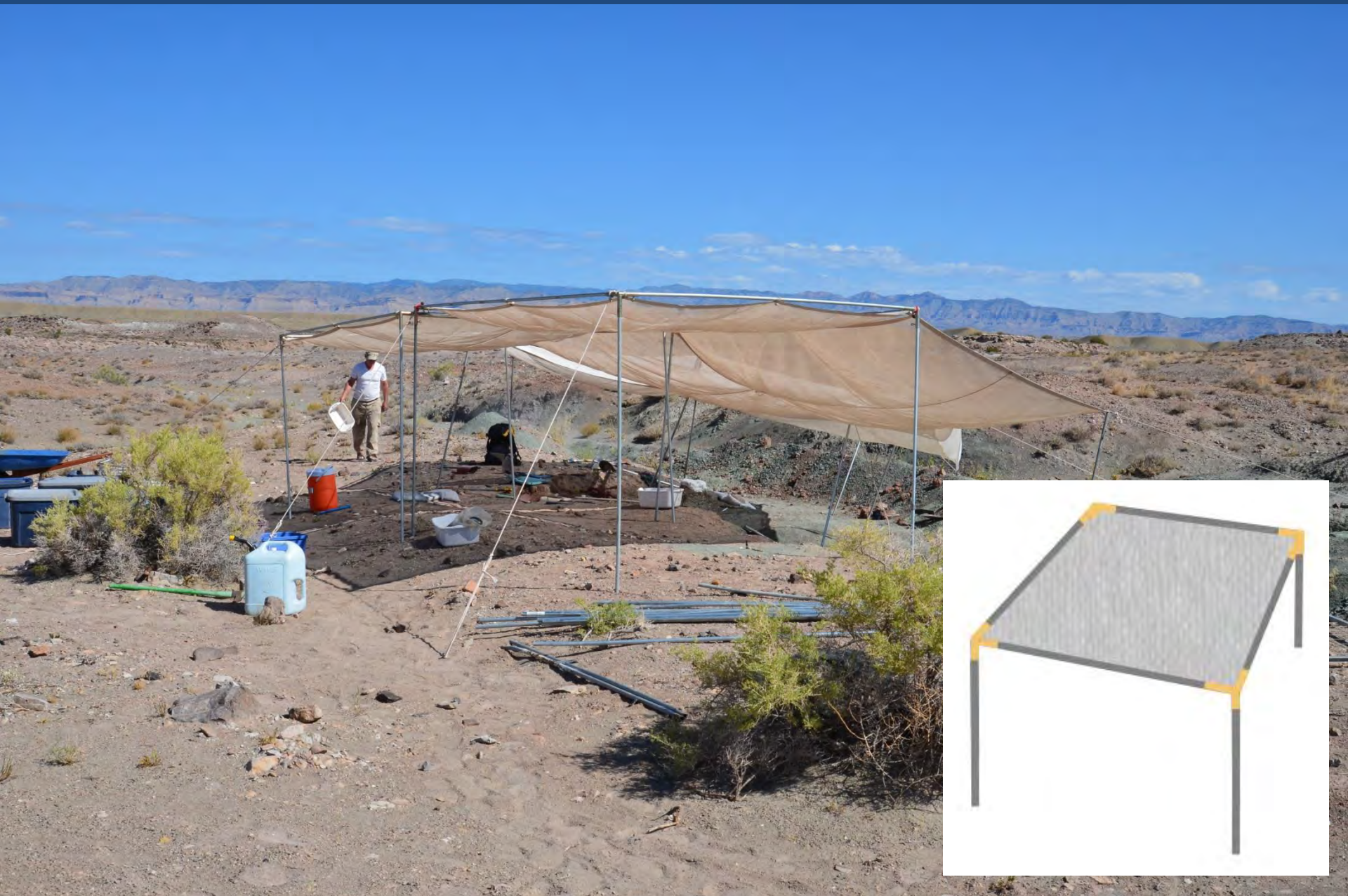
# Quarry shade

Protection, safety, comfort

Even lighting

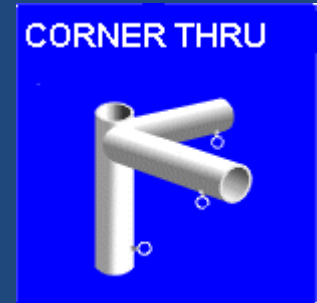
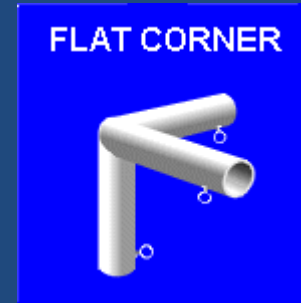






# Shade tarp parts

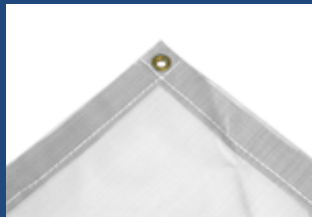
1) Shelter corner connectors



2) Electrical conduit ( $\frac{3}{4}$  inch)



3) Tarps



8' x 10'

4) Toggle Balls



5) Rope



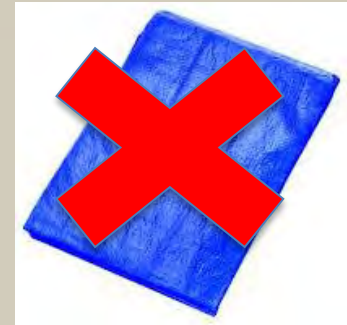
6) Spikes &/ Rebar





# Tarps

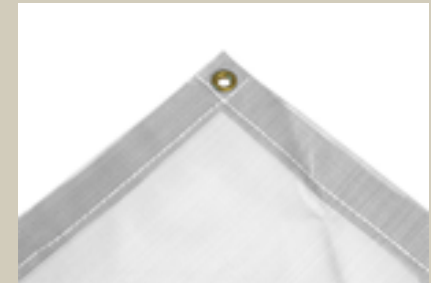
Must be **neutral color**, white, grey, black  
**No colored tarps!**



## Mesh Tarps

pros – do better in wind, lets air through, durable

cons – more expensive, not full shade



## Poly Tarps

pros – inexpensive, water-proof, full shade

cons – don't do well in wind, deteriorate sooner



**Canvas tarps** – still experimenting!

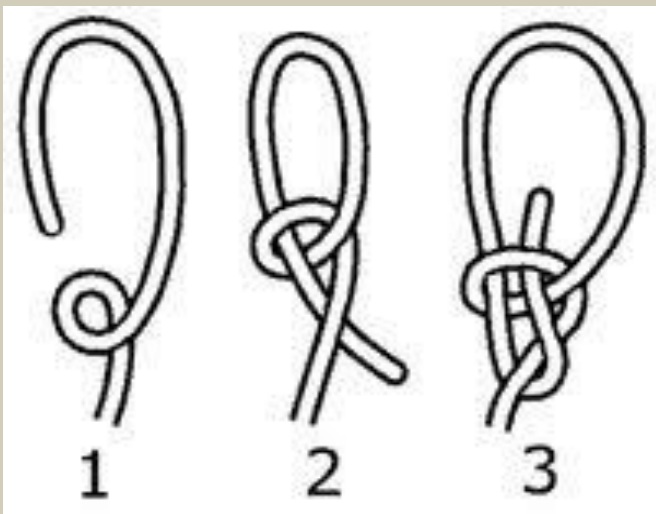


# Securing the frames with rope



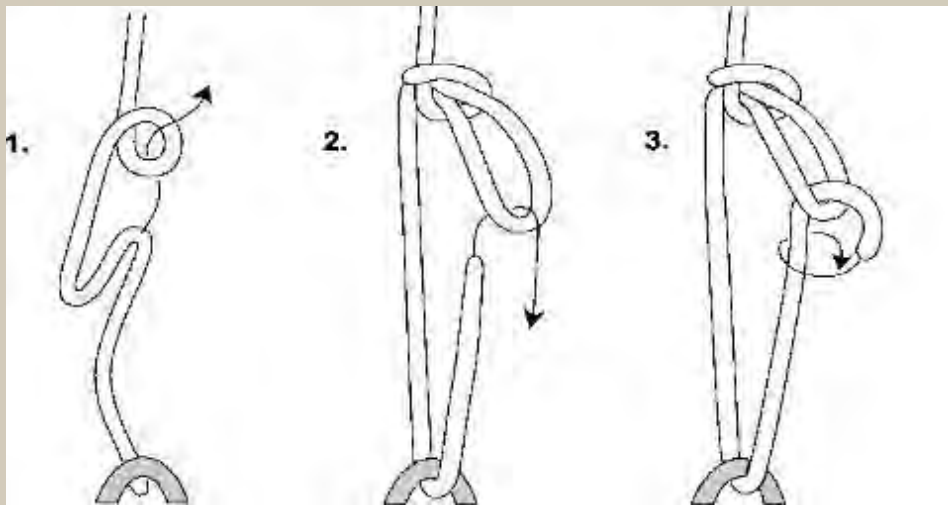
# Useful knots

**Bowline** – for attaching rope to the shade frames



Simple and easy to untie

# Trucker's Hitch\* – for tying the frame rope to spikes or rebar pounded into the ground



Allows for tensioning and tying off under tension  
Easy to untie when using slippery half hitches

\* A bad-ass knot with many uses that will earn you the admiration of colleagues and truck drivers the world over!



# Stringing additional tarps off of the frames lean-to style







# Shade tarps in use



















# Precautions

**Lightning** is the principal serious hazard with camp and quarry shade structures due to all of the metal poles. Best to move away during storms!

**Wind** is the main problem with shade tarps. Make sure they are well staked and keep an eye on the weather and approaching dust devils (“everyone grab a pole!”)

**Take down the tarps at the end of the day** to avoid any damage to fossils by wind moving the legs. Poly tarps can then be used to cover the quarry to protect from rain.













Thank you to all of the field crews who have had their fingers pinched by toggle balls while helping to set up our shade structures...

...and putting up with my shade tarp OCD “no... first the rabbit comes out of the hole!”

Stop by the preparator’s table to download a shade tarp parts and instruction pdf.

